



Drew Corso, PMP
AEP Manager – Projects, Central & Northwest Ohio
8500 Smiths Mill Road
New Albany, Ohio 43054
9/26/2023

Administrator, DOSD
Attn: Greg Fedner, P.E.
Section Manager, Plan Review Section City of Columbus
1250 Fairwood Avenue
Columbus, Ohio 43206

Subject: AEP Marion Road Substation Expansion and Rebuild, Type III Variance Request

Dear Mr. Fedner:

American Electric Power (AEP) has expedited the rebuilding and significant expansion of the existing Marion Road Substation to help meet existing local energy needs and support future growth in the Columbus, Ohio, community. To accommodate the Marion Road Substation Expansion and Rebuild, AEP is requesting a variance from the City of Columbus' Storm Water Drainage Manual (SWDM) for parcels **PIDs 010-104424-00** and **010-104425-00**.

Specifically, AEP is requesting a Type III Variance for relief from the applicable requirements of Section 1.3 – "Stream Corridor Protection Zone (SCPZ)." The variance requested is as follows:

-
- The entire 3.02-acre SCPZ area outside top of bank of the existing concrete channels on the Marion Road Station property is expected to have permanent impacts requiring mitigation. AEP requests to remove the SCPZ from the Marion Road Station property and mitigate offsite in accordance with the terms of the SWDM.
 - The SCPZ conservation easement to the City of Columbus will be applied to only the off-site mitigation area. No SCPZ conservation easement will exist on the Marion Road Station property, though the City will be granted a 30-foot-wide drainage easement for the channels.
 - Due to the time sensitivity of the station expansion project, AEP requests to separate the Marion Road Station Expansion and Rebuild project (CC-20181) from the action to establish off-site mitigation of the Marion Road Station SCPZ area. Moving forward, the off-site mitigation project would proceed under a separate CC number, Stormwater Pollution Prevention Plan (SWPPP), and construction schedule.



Based on consultation with the city and per the city's SWDM and other approved variance documents the following information is provided in support of the application:

Project Name: AEP Marion Road Substation Expansion and Rebuild

Address: 869 Marion Road, Columbus, Ohio 43207

PID: 010-104424-00, 010-104425-00

Site Disturbance: 17.00 acres

Total Site Area: 17.16 acres

Primary Project Contact:



DREW CORSO | MGR - PROJECTS

AJCORSO@AEP.COM | M: 740.953.9056

8500 SMITHS MILL ROAD, NEW ALBANY, OH 43054

Environmental Project Contact:



AMY TOOHEY | PEMP Environmental Coordinator

AJTOOHEY@AEP.COM | M: 614.565.1480

8500 SMITHS MILL ROAD, NEW ALBANY, OH 43054

Additional information pertaining to the requested variance is included in the enclosed application. If you or your staff have specific questions, please feel free to reach out to me directly via email or, if you prefer, on my mobile. We look forward to working with you and the City of Columbus on this critical infrastructure project.

Respectfully,

A handwritten signature in blue ink that reads "Andrew J. Corso".

American Electric Power
Manager—Projects, Central and Northwest Ohio
ajcorso@aep.com
Mobile: 740-953-9056

Table of Contents

Section 1 – Reason Variance is Requested	5
1.0 Executive Summary	5
2.0 Project Background	8
3.0 Existing Site Conditions	10
4.0 Variance Application Purpose	14
Section 2 – Provide Site Development Alternatives	17
5.0 Full Compliance Plan (No Impact)	17
5.1 Hardship Statement—Full Compliance (No Impact)	19
6.0 Minimal Impact Plan	20
6.1 Hardship Statement—Minimal Impact	21
7.0 Preferred Development Plan	23
7.1 Request for Relief—Preferred Development Plan	26
Section 3 – Demonstrate Adequate Mitigation	27
8.0 Mitigation	27
Section 4 – Conclusion	31
9.0 Conclusions	31
Section 5 – Exhibits	32
Section 6 – Appendices	38
Appendix A: Ecological Assessment of the Marion Road Station Property	38
Stream Channel Protection Zone (SCPZ) Evaluation – Executive Summary	38
Biological Setting of the SCPZ To Be Mitigated Off-Site	38
Description of Streams To be Mitigated Offsite	39
Vegetation	40
Filtration Value of Existing Vegetation: Demonstrating Improvement with Revegetation and Mitigation	45
HHEI Forms Evaluation at the Marion Road Station Site	45
Appendix B: Calculating SCPZ Width at the Marion Road Station	58
Appendix C: Off-Site Mitigation Site Selection and Mitigation Plan	60

Figures

Figure 1. Marion Road Station Property	8
Figure 2. Existing Easements on Marion Road Station Property Ditches	11
Figure 3. Current Ditch Condition (Facing West)	13
Figure 4. Current Land Use (Facing South)	14
Figure 5. Existing Marion Road Station with City of Columbus SCPZ	17
Figure 6. Minimal Impact Option at Marion Road Station	21
Figure 7. Preferred Development Option at Marion Road Station	25
Figure 8. Location of Native Trees to be Mitigated Off-site	27
Figure 9. Proposed Seed Mix Planted Under Electrical Transmission Lines	28
Figure 10. Hydrology of Marion Road Station Property	39
Figure 11. Location of Native Trees in SCPZ	44
Figure 12. Hydrology of Marion Road Station Property	58
Figure 13. EPA Hydrologic Unit (HUC)-12 Showing Marion Road Station Site and Neighboring HUC-12s	60
Figure 14. Potential Off-Site Mitigation Area with Conservation Easement.....	63

Tables

Table 1. Summary of HHEI Surveys.....	40
Table 2. Existing Native Trees in the Marion Road Station SCPZ Associated with Stream 1.....	42
Table 3. Existing Native Trees in the Marion Road Station SCPZ Associated with Stream 2 (Kian Run).....	43
Table 4. SCPZ Width for Each Channel Segment	59

SECTION 1 – REASON VARIANCE IS REQUESTED

1.0 Executive Summary

American Electric Power (AEP) has expedited the rebuilding and significant expansion of the existing Marion Road Substation (currently referred to as Marion Road Station) to help meet existing local energy needs and support future growth in the Columbus, Ohio, community by providing greater energy capacity and improved reliability. This will be accomplished by replacing existing aging station and transmission line equipment and by significantly enlarging the existing station footprint to accommodate additional equipment. The latter will handle increased existing load demands, as well as future growth in the community. New technology will be installed that can detect and reroute power automatically when some types of outages occur.

To accommodate the Marion Road Substation Expansion and Rebuild on the referenced property, AEP is requesting a variance from the City of Columbus' Storm Water Drainage Manual (SWDM) for parcels with **PIDs 010-104424-00** and **010-104425-00**.

Specifically, AEP is requesting a **Type III Variance** for relief from the applicable requirements of "Section 1.3 – "Stream Corridor Protection Zone (SCPZ)." The requested variance is as follows:

-
- The entire 3.02-acre SCPZ area outside top of bank of the existing concrete channels on the Marion Road Station property is expected to have permanent impacts requiring mitigation. AEP requests to remove the SCPZ from the Marion Road Station property and mitigate offsite in accordance with the terms of the SWDM.
 - The SCPZ conservation easement to the City of Columbus will be applied to only the off-site mitigation area. No SCPZ conservation easement will exist on the Marion Road Station property, though the City will be granted a 30-foot-wide drainage easement for the channels.
 - Due to the time sensitivity of the station expansion project, AEP requests to separate the Marion Road Station Expansion and Rebuild project (CC-20181) from the action to establish off-site mitigation of the Marion Road Station SCPZ area. Moving forward, the off-site mitigation project would proceed under a separate CC number, Stormwater Pollution Prevention Plan (SWPPP), and construction schedule.
-

The following sections detail the Full Compliance/No Impact, Minimal Impact, and Preferred Development options. Neither the Full Compliance/No Impact nor Minimal Impact options allow for the planned Marion Road Station Rebuild and Expansion. The Preferred Development option balances necessary site development with improvements to on-site stormwater

management and non-woody vegetation and allows for mitigation of the SCPZ area, including trees and shrubs, at an off-site location.

The Full Compliance/No Impact option limits new site work to improvement of the driveway and bridges providing access to the substation property. This would require 0.06 acres of the SCPZ to be mitigated on-site for a new bridge spanning the south channel without touching the concrete lining. An additional 0.72 acres of the SCPZ is crossed by overhead electrical lines, which cannot have tall trees growing underneath (Figure 5). This acreage would require ongoing periodic on-site mitigation as trees would need to be removed from the power line right-of-way (ROW) zone—including in the SCPZ—once they grow tall enough to interfere with the electrical lines. This scenario creates ongoing mitigation expenses to just maintain current transmission station operations and does not allow for station upgrades, expansion, or significant maintenance activities.

The Minimal Impact option also includes upgrading the station driveway with the addition of the new bridge crossing requiring on-site mitigation of 0.06 acres. The 0.72 acres of overhead electrical line ROW in the SCPZ would be permanently removed and mitigated on-site on contiguous ground. The area under the existing power lines removed from the SCPZ function would be planted with non-woody vegetation and maintained to prevent trees from regrowing (Figure 6). This option would allow the transmission station to continue current functions, but significant maintenance—such as replacement of an aged overhead line with a new, parallel line—would require removing trees from additional portions of the SCPZ and mitigating on- or off-site. Significant station work, such as expansion of the station or upgrading of equipment, would require off-site mitigation of most of the SCPZ as there is not sufficient room for both land uses on the property.

The Preferred Development option allows for the station upgrade and expansion, which includes both a larger station pad and additional overhead and underground electrical lines. Stormwater detention basins and the upgraded station driveway and south bridge also would be built. These activities would increase AEP's site usage to 92% of the property, including permanent impacts to a large portion of the SCPZ. In addition to the new infrastructure, nearly the entire site below elevation 748 feet would be stripped and regraded to consolidate existing floodwater storage and to create room for the station expansion. This regrading would impact the entire SCPZ area outside the concrete channels. Figure 7 shows the station rebuild and expansion in relation to the SCPZ. While the stream HHEI scores are projected to stay the same from current conditions to after construction of the Preferred Development option, the 3.02 acres of SCPZ cannot be replanted on-site to the current mix of trees, shrubs, and shorter vegetation without creating future conflicts with electric lines. Instead, the approximately 25% of the station property that can be vegetated is planned to be seeded with a mix of native grasses and forbs and maintained without woody plants. The entire SCPZ acreage, including 78 native trees (6" dbh) removed under the Preferred Development option, is planned to be mitigated off-site. AEP has researched off-site mitigation locations that are in proximity to the

Marion Road Station, have a waterway that can be improved, and are available for AEP to own and grant City of Columbus a conservation easement. A proposed off-site mitigation property and conceptual stream mitigation plan is discussed in Appendix C.

2.0 Project Background

AEP has been operating an electrical substation, currently called Marion Road Station, on the referenced 17.16-acre property since 1949 (PIDs 010-104424-00, 010-104425-00). The area is largely industrial and commercial, with a few single-family residences located north of the Station property across from Marion Road (Figure 1).

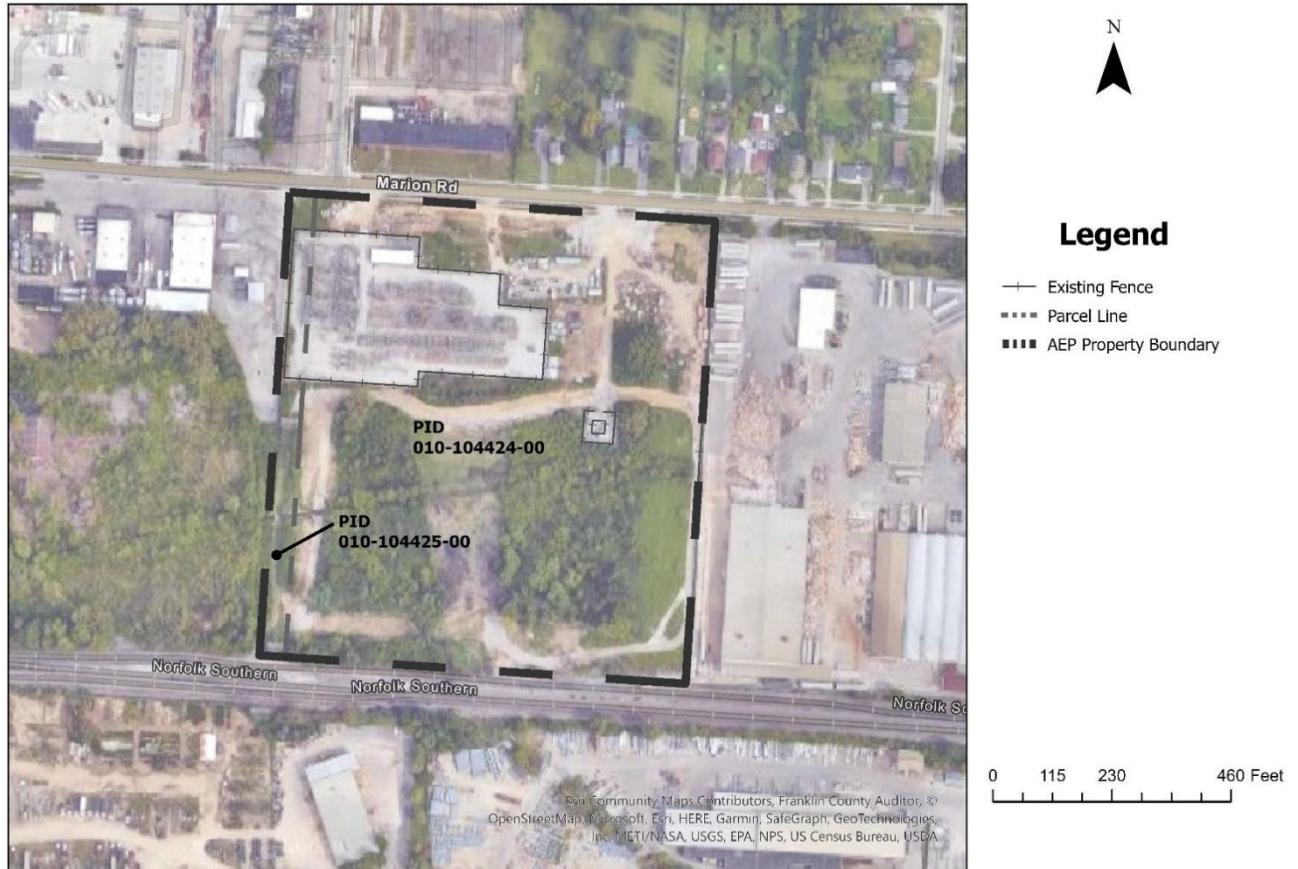


Figure 1. Marion Road Station Property

Marion Road Station is a critical infrastructure hub, coupled with a few other nearby substations and an intricate network of interconnected overhead and underground transmission and distribution lines. It provides energy delivery to more than 30,000 residential, small business, and commercial customers in and around the Livingston, South Side, and Far South Side areas (hereafter referred to as *The Greater South Side Area*) of downtown Columbus.

Over the past several years, economic development around the area of the Marion Road Station property has driven increased power consumption and reduced existing capacity on aging infrastructure. To help increase reliability and capacity, AEP invested approximately \$30,000,000 in The Greater South Side Area in 2021 and 2022. This work included the following:

- Replaced or installed 1,395+ poles;

- Added or replaced 2,418+ fuses;
- Replaced or installed 138,307 line feet of overhead power lines;
- Replaced or installed 223,347 line feet of underground power lines; and
- Trimmed 56 miles of trees from theROW.

AEP's funds invested in The Greater South Side Area have increased reliability and capacity as measured by Customer Minutes of Interruption (CMI). The following CMI year-over-year comparison shows:

- August 29, 2021 to August 29, 2022 = 8,060,040 CMI
- August 29, 2022 to August 29, 2023 = 5,130,200 CMI
 - 22% Improvement

Additionally, in response to future economic development—an anticipated 300,000+ net population growth for Franklin County by 2050 and a 3,000,000+ net population growth for Central Ohio by 2050 (*Mid-Ohio Planning Commission (MORPC) 2020 Census Data Growth in Central Ohio*)—AEP is investing \$40,140,000 from transmission (Transmission Co.) and \$37,400,000 from distribution (AEP Ohio) for a combined total of \$77,540,000 to rebuild and expand the Marion Road Station starting in 2023 through 2027.

AEP plans to replace all existing aging station and transmission line equipment and enlarge the existing station footprint significantly to accommodate both higher load demands that already exist, as well as future growth in the community. New technology will be installed that can detect and reroute power automatically when outages occur, thereby increasing reliability in The Greater South Side Area.

A new private drive entrance will be created for access to the property without passing through the station itself. The new drive will run along the east property line toward the south property line and swing to the west, ending at a large vehicle turnaround and work pad area. The private drive will cross both existing drainage ditches with new concrete span bridges, allowing the City of Columbus, Franklin County, and AEP Field Services to access all three (3) newly installed stormwater detention basins, as well as transmission and distribution overhead and underground power lines and structures. The existing large cell tower, cell tower foundation, cell tower control house and equipment, and large billboard will be removed to accommodate the Marion Road Substation Expansion and Rebuild.

The planned station expansion, including additional transmission and distribution lines, is scheduled to begin construction in late 2023 and to conclude construction in early 2027. This will increase AEP's site utilization to 92% of the Marion Road Station property.

Early Marion Road Station expansion and site improvement plans called for the open storm sewer channels to be encased in underground pipes for fuller utilization of the entire site. When it became clear that significant quantities of floodwater would still back up onto the property and limit use of the site, AEP redesigned the station layout to the most compact

footprint possible. The compact design is presented later in this document as the Preferred Development Plan alternative (see the [Preferred Development Plan](#) section of this document). The rebuilt substation will be raised 1 foot in elevation to better protect the substation from future abnormal rain and weather events.

AEP also is addressing many of the most common outage risks for the Marion Road Substation Expansion and Rebuild. The leading risks of outages are listed below with mitigation of the same:

- **Risk:** Aging and malfunctioning equipment and infrastructure.
 - **Mitigation:** Replace all existing aging transmission and distribution station equipment and powerlines on the property.
- **Risk:** Unforeseen circumstances (i.e., animals on equipment and powerlines, trees in conflict with powerlines).
 - **Mitigation:** Install animal fences and humane deterrents on new equipment and powerlines and remove all trees and tall vegetation from the Marion Road Station property.

3.0 Existing Site Conditions

The Marion Road Station property is located at 869 Marion Road, Columbus, Ohio 43207, and has been operating as an electrical power transmission station since 1949. The project setting is largely industrial, including the neighboring properties to the east and west. The southern edge of the site is bounded by railroad tracks with an active spur line to the recycling company to the east. There are a few single-family residences located north of Marion Road ([Figure 1](#)).

The Marion Road Station operates as a 138kV/40kV and 138kV/13.8kV electrical transmission and distribution substation. The existing infrastructure consists of a 2.76-acre fenced gravel pad with transmission and distribution substation equipment, (29) overhead transmission and distribution towers and other structures, (20) underground transmission and distribution vaults, (1) control house, 2,967 In feet of station security fencing, (3) private driveways, (1) billboard sign, (1) large cell tower with cell tower control house, (1) large cell tower foundation, and (5) overhead and (18) underground transmission and distribution electrical lines entering the substation and bisecting almost every part of the property. These, combined with associated electrical line safety offsets, utilize approximately 72% of the site.

The Marion Road Station property is bisected by a Y-shaped ditch that is part of the current City of Columbus storm sewer system. Records indicate that both branches originally were unnamed tributaries of Kian Run that were channelized as the city was developed. Franklin County holds easements on both channels as petition ditches, which the Ohio Revised Code (Section 6137.12) dictates as 25 feet from bank (permanent) up to 75 feet from bank (temporary) easements. [Figure 2](#) shows the south half of the existing Marion Road Station property with the ditches and related easements.

Legend

- City of Columbus SCPZ
- Franklin County Petition Ditch (Temporary Easement)
- Franklin County Petition Ditch (Permanent Easement)
- Drainage Ditch



0 50 100 200 Feet

Figure 2. Existing Easements on Marion Road Station Property Ditches

By the 1960s, both ditches were lined with concrete in a trapezoidal shape approximately 9 feet wide at the bottom and 20 feet wide at the top (Figure 3). Upstream, each lined ditch is fed by a storm sewer pipe with smaller capacity than the ditch. The two ditches combine near the west edge of the Marion Road Station property before flowing west across two adjacent properties and then returning underground via a large storm sewer pipe. During large rain events, the downstream receiving pipe is overwhelmed, and stormwater backs up and is temporarily stored on the three properties crossed by the open channels. The AEP Marion Road Station property can store more than 15,000 cubic yards of stormwater that back up onto the site, covering nearly 5.5 acres (

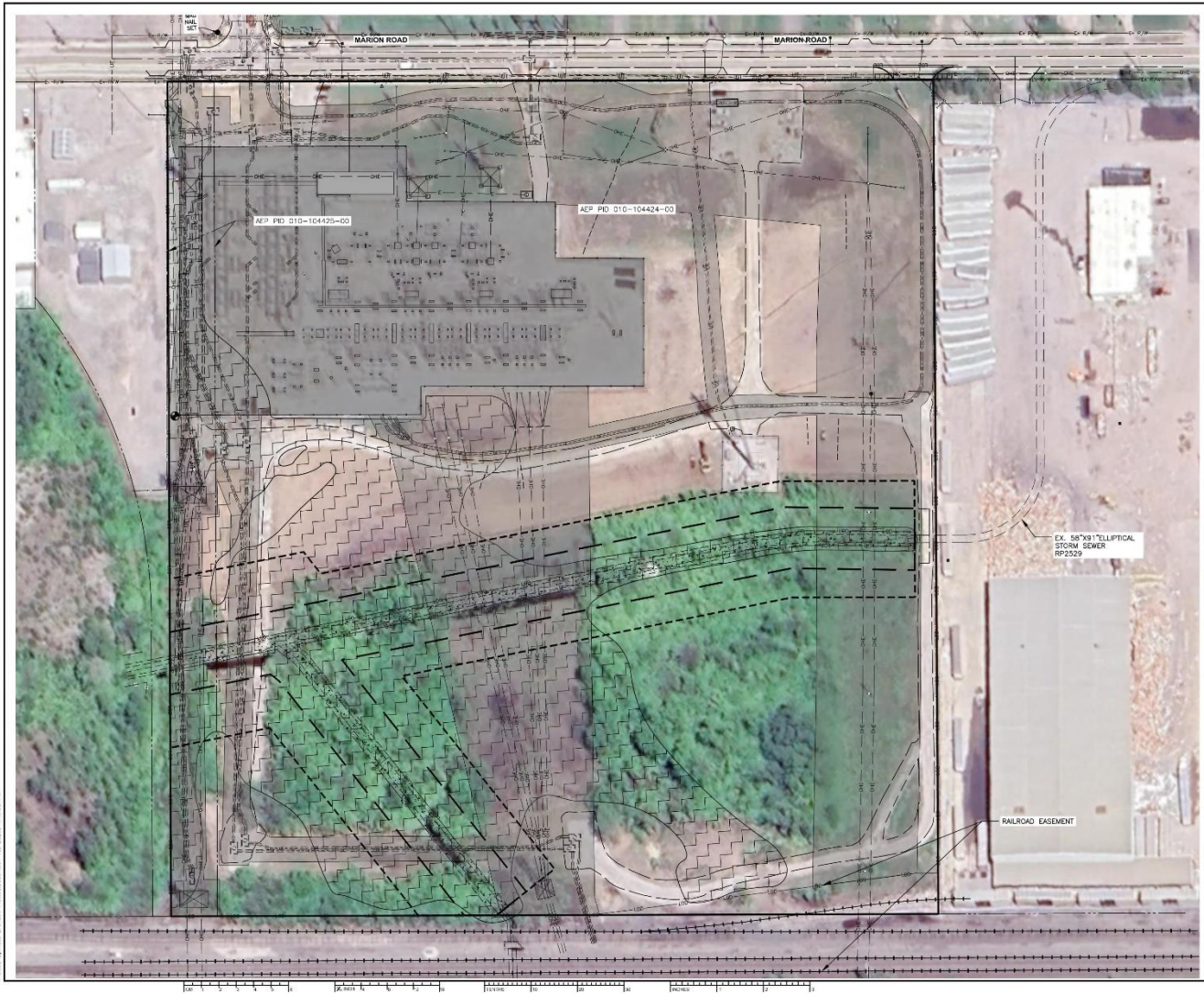


Exhibit 1). Despite this periodic flooding, the Marion Road Station property is not a regulated FEMA floodplain.



Figure 3. Current Ditch Condition (Facing West)

The electrical station operations predate current Ohio Environmental Protection Agency (OEPA) and city regulations, with no on-site detention of stormwater or ecological management to remove invasive species. Vegetation maintenance occurs on an as-needed basis to support station operations, including clearing and grubbing for installation of below-ground electric lines and removing trees and shrubs from beneath overhead lines. The current vegetation in the SCPZ area is a mix of maintained (brush hogged) utility right-of-way and opportunistic aggressive species. Areas of concentrated trees and shrubs generally have minimal understory or ground growth (Figure 4).



Figure 4. Current Land Use (Facing South)

Headwater Habitat Evaluation Index (HHEI) analysis was completed in February 2023 and again in August 2023 to provide a more complete picture of the concrete-lined ditches in different seasons. A third HHEI was performed for the planned development alternative. The HHEI forms are included in [Appendix A: Ecological Assessment of the Marion Road Station Property](#) along with a fuller writeup of the site ecology. A survey of trees over 3 inches in diameter at breast height (dbh) was completed in August 2023 and determined that the area was generally populated with dead ash trees, Callery pear trees, and a variety of aggressive/opportunistic species. There is no vegetative growth on the stream banks, as they are lined with concrete.

4.0 Variance Application Purpose

The site development plan attempts to balance the regulated electric utility station operational needs with City of Columbus, OEPA, and Franklin County requirements. As a result, the following is being requested for a variance related to the SCPZ:

- The entire 3.02-acre SCPZ area outside top of bank of the existing concrete channels on the Marion Road Station property is expected to have permanent impacts requiring

mitigation. AEP requests to remove the SCPZ from the Marion Road Station property and mitigate offsite in accordance with the terms of the SWDM.

- The SCPZ conservation easement to the City of Columbus will be applied to only the off-site mitigation area. No SCPZ conservation easement will exist on the Marion Road Station property, though the City will be granted a 30-foot-wide drainage easement for the channels.
- Due to the time sensitivity of the station expansion project, AEP requests to separate the Marion Road Station Expansion and Rebuild project (CC-20181) from the action to establish off-site mitigation of the Marion Road Station SCPZ area. Moving forward, the off-site mitigation project would proceed under a separate CC number, Stormwater Pollution Prevention Plan (SWPPP), and construction schedule.

The Preferred Development Plan design improves current on-site hydrology: off-site water crossing the property remains unchanged; new detention reduces peak on-site runoff to the ditches over pre-construction levels; and pre-release treatment capturing more than 75% of the direct runoff from the station expansion pads is added. The stormwater detention basins will be constructed and sized to collect and store a total volume of stormwater greater than the increased runoff from the new hard surfaces for all storm sizes. The site design also allows for continued storage of at least the same volume of floodwater that currently backs up onto the property while minimizing interference with safe operation of the electrical substation.

The Preferred Development Plan also replaces the current patchwork of invasive and opportunistic vegetation on the Marion Road Station site with native grasses and pollinator-friendly habitat covering up to 25% of the property, including areas outside the effective-watershed SCPZ and condensed flood storage zone. This revegetation plan eliminates conflicts between station operations and on-site vegetation, creating a stable and beneficial site ecology. Since AEP's site development plans are not compatible with either woody vegetation or establishment of a conservation easement, off-site mitigation is planned for the full SCPZ area under the Preferred Development Plan.

As outlined in the following pages, the limitations of the No Impact/Fully Compliant and Minimal Impact SCPZ options applied at the Marion Road Station property create a significant hardship for AEP's existing Marion Road Station operations. The limitations also prevent the station expansion necessary to increase capacity to meet existing and future system demand and reduce improvements for access to and maintenance of existing and planned distribution and transmission lines around the station.

Should the Preferred Development Plan not be implemented as planned for this project, increasing existing and future demand would put greater and greater stress on the existing capacity of Marion Road Station and several other nearby stations and infrastructure. These stresses, when combined with a series of simultaneous out-of-norm events, can cause emergency outages. The outages in June 2022 on the Greater South Side Area of Columbus

occurred due to severe storms causing damage to transmission lines that feed power to the Columbus area. Damage to the lines meant there were fewer transmission lines available to carry electricity to customers. As temperatures climbed into the 90s and demand for energy grew, the lines quickly became overloaded, requiring emergency forced outages to prevent cascading outages. The Marion Road Station expansion and system upgrades are designed to increase capacity and, at the same time, reduce stress on the energy delivery system in the Greater South Side Area.

Secondarily, if the Preferred Development Plan is not implemented as planned, the delay to find an alternate site to build a new station would dramatically increase the risk of future forced outages in the area and place an undue burden on AEP customers. The costs of finding and acquiring another site to provide the necessary energy capacity to serve increased existing and future demand would be significant and would require the approval of governing bodies, such as PJM. The current market value for a property of similar size and location is roughly \$8,000,000–\$12,000,000, plus the additional cost to relocate (3) 138kV power lines, (3) 40kV lines, and (17) distribution feeders. The monetary cost of this additional powerline relocation work is difficult to estimate as it would require ROW acquisition costs from property owners in addition to the physical costs of construction, which would be largely determined by the distance away from the existing station. Conservatively, the relocation costs would be in excess of \$30,000,000 and, depending on the distance away from the existing station, could be tens of millions of dollars higher. These additional costs likely would be borne by the rate payers (AEP customers). It also is important to note there would be significant public concern and pushback with relocating the station and all the power lines to another site.

The Preferred Development Plan to upgrade and more fully utilize the existing Marion Road Station Property and existing infrastructure is the most cost-effective method for accommodating the existing and future increase in energy demand in the area while still meeting the environmental expectations of the various regulatory agencies.

SECTION 2 – PROVIDE SITE DEVELOPMENT ALTERNATIVES

5.0 Full Compliance Plan (No Impact)

The Full Compliance Plan (No Impact) alternative calls for maintaining the area within the SCPZ untouched, aside from the removal of invasive species and replanting of native species within the SCPZ corridor and installation of a new private driveway. If native trees do need to be removed, they would be mitigated on-site by replanting one to one in the SCPZ or ground added to the SCPZ easement. Acreage permanently removed from the SCPZ also would be mitigated on-site. The SCPZ width would be based on the full drainage area served by the storm sewer system conveying water across the site and the equation provided in section 1.3.1.2 of the SWDM. SCPZ width calculations are included in [Appendix B: Calculating SCPZ Width at the Marion Road Station](#). [Figure 5](#) provides a snapshot of the site with existing electrical infrastructure and SCPZ.

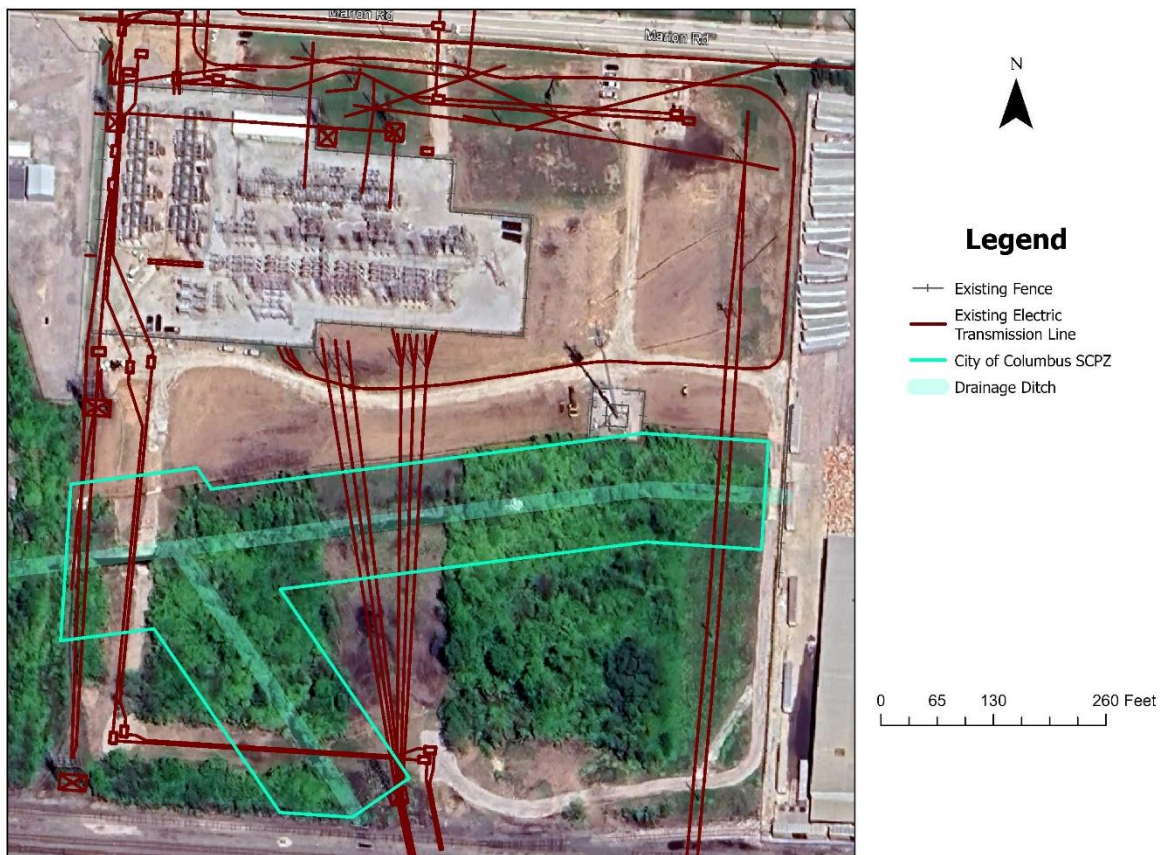


Figure 5. Existing Marion Road Station with City of Columbus SCPZ

The site has two existing driveway crossings over the open ditches that are suitable for light vehicular traffic only, one at the east property line and one at the west. The east crossing is over the storm sewer pipe, so the footprint is outside of, but adjacent to, the SCPZ. A replacement of the west crossing to access the southwestern portion of the site would be

installed near the south edge of the property and would be remediated on a one-to-one basis on ground adjacent to the SCPZ. The terms of the SWDM also allow for maintenance of—but not substantive alteration to—the other infrastructure already in the SCPZ, including the overhead electric tower, telecommunications tower, and underground electric lines crossing the SCPZ.

As shown on

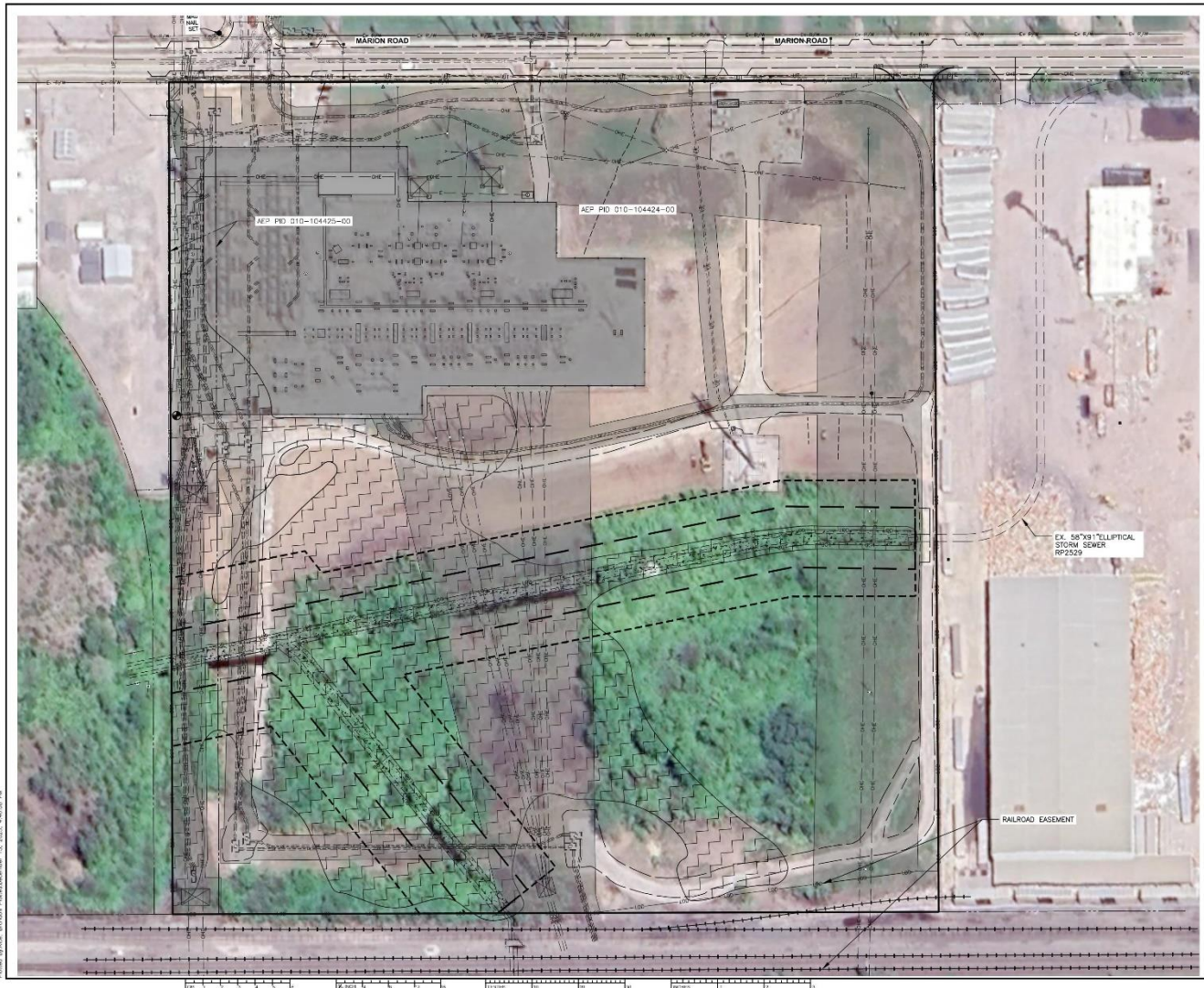


Exhibit 1, during large storm events, floodwater stored on the site can back up into the western portion of the power station. For technical and safety reasons, AEP is unable to use flood storage areas for station equipment, overhead structures, underground vaults, or most access drives and work pads. AEP would fill to raise the ground surface inside of and adjacent to the station fence where floodwater is encroaching near station equipment, including underground power vaults south of the station. AEP then would excavate elsewhere on the site (outside the SCPZ) an equivalent amount of floodwater storage (**Exhibit 2**).

The channels themselves would remain untouched, and water quality and quantity would be largely unchanged from current conditions. If AEP were to remove invasive species and manage site vegetation according to the SWDM, habitat quality would improve. On-site mitigation also would expand the quantity of habitat created and put into the SCPZ conservation easement as trees would be continuously removed from interference with on-site electrical lines.

5.1 Hardship Statement—Full Compliance (No Impact)

The Full Compliance (No Impact) alternative produces significant hardships for AEP's Marion Road Station current operations and restricts use of the property to the point where AEP would be unable to expand the station to meet current and future increased energy demand ([Exhibit 4](#)).

Specific hardships to the Full Compliance (No Impact) alternative are as follows:

- Electrical power station operations require the station pad and equipment be installed with certain standards (i.e., proximity to other equipment, road access, elevation at least one (1) foot above possible high water). AEP has worked internally to tailor a custom station expansion to the existing site with the most compact footprint as possible to meet current City of Columbus SWDM regulations. However, with National Electric Safety Code (NESC)-required equipment clearances, the customized compact station expansion and necessary stormwater control measures will not fit in the open area north of the full drainage area SCPZ of the Full Compliance (No Impact) alternative.
- With the increased current and future energy demand in the area, the station needs to be expanded to meet these current and future needs. So much so that the Marion Road Substation Expansion and Rebuild has been expedited to meet the increased capacity and demand. The station is part of an intricate network of other transmission and distribution stations that are interconnected via transmission and distribution power lines. It is not economically or physically feasible to relocate the station to another urban property and then reroute the (3) 138kV, (3) 40kV, and (17) distribution powerlines to the new location. When considering current property values, the equivalent property purchase could be in the \$8,000,000–\$12,000,000 range, and rerouting all infrastructure to a new location, if technically possible, could add \$30,000,000+ to the overall project cost, above and beyond what is currently allocated for the Preferred Development Plan.
- Specific pieces of station equipment inside the fence supply electrical power to each overhead and underground line. Lines are then located to cross the property as necessary to interact with the supply grid without interfering with each other. New lines must also be installed while the existing lines are still in service, so are by necessity installed in areas without existing overhead lines. Vegetation is the leading cause of power outages in the electric system. The North American Electric Reliability Corporation (NERC) standard FAC-003 requires utilities to manage their vegetation to ensure reliable service and to prevent repetitive costs for trimming vegetation. NERC is

overseen by the Federal Energy Regulatory Commission (FERC), which regulates the interstate transmission of electricity, making preventing vegetation from growing in or adjacent to powerlines a federal mandate. The National Electric Safety Code (NESC) also mandates clearances from vegetation. AEP's vegetation management policy restricts all tall vegetation (trees, tall shrubs, etc.) from power line areas to comply with FERC and NESC standards. Mitigation by replanting trees removed for interfering with electrical lines would lead to an endless cycle of mitigation just to maintain current operational levels and would be a constant drain on Overhead and Maintenance (O&M), which is carried by AEP's rate payers (customers) and could put AEP in opposition to NERC FAC-003.

- Underground lines are installed by trenching between vaults. They are maintained and replaced by new duct banks installed in a new location while the existing lines are still in service, and emergency repairs can require digging up the buried lines. Access must also be maintained to the vaults and areas around the vaults for maintenance and emergency repairs. The tree-covered conservation easement associated with the full drainage area SCPZ limits maintenance access and poses conflicts with underground transmission and distribution lines.
- In the Full Compliance (No Impact) alternative, existing electrical and telecommunications structures inside the SCPZ could not be replaced in the same location. AEP must be able to maintain and replace structures due to emergency events and/or aging infrastructure. Replacement structures need to align with existing off-site right-of-way easements. Changing easements in a developed area is difficult, expensive, and may be impossible due to existing off-site development.
- A large portion of the property continues to store floodwater and restricts AEP's access to maintain equipment during and after storm events and to install new or replacement lines and equipment. Condensing the flooded footprint would require creating additional storage in the SCPZ.

6.0 Minimal Impact Plan

The Minimal Impact Plan alternative would be very similar to the No Impact Plan. The difference between the Full Compliance (No Impact) and Minimal Impact Plans would be:

- The permanent removal of trees and shrubs from the electrical line ROW areas, replanting those areas with a native seed mix of tall grasses and forbs, and maintenance of the ROWs with annual brush hogging once the new vegetation is established. Trees removed to create clear ROWs would be mitigated on-site by replanting one-to-one in ground added to the SCPZ easement ([Exhibit 3](#)). [Figure 6](#) shows the areas under overhead lines that would be permanently cleared under the minimal impact option.

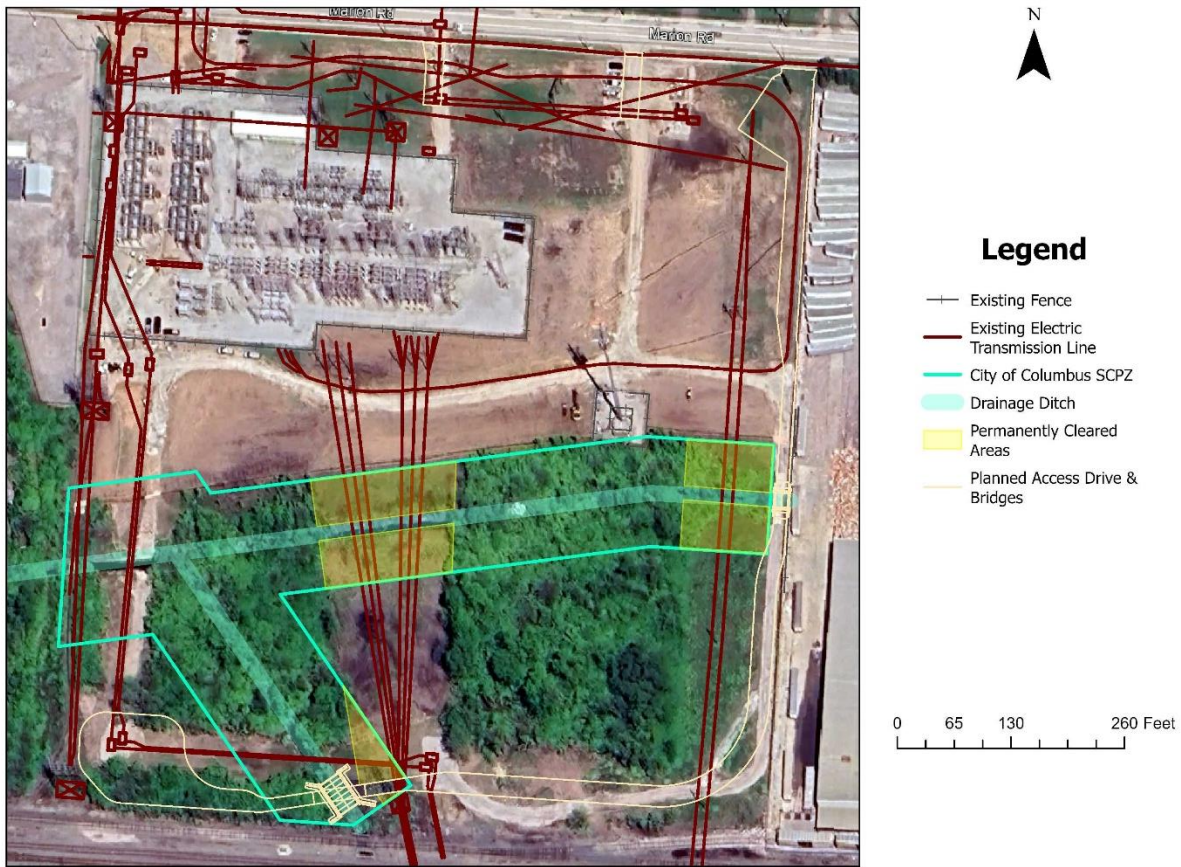


Figure 6. Minimal Impact Option at Marion Road Station

The Minimal Impact Plan would allow AEP to continue activities at the Marion Road Station unchanged from its current operational condition but would not allow for station upgrades or expansion. In-channel site hydrology would be relatively unchanged: the same amount of water would run off of, cross over, and be stored on, the site during flood events. However, if AEP were to remove invasive species, plant native species, and otherwise manage site vegetation according to the SWDM, habitat quality would improve. Replacement of aggressive and invasive species in the ROW with native grasses and forbs would improve on-site habitat, and the denser, grass-based vegetation will decrease off-site movement of sediment and other contaminants. On-site mitigation efforts would also expand the quantity of habitat created and put into the SCPZ conservation easement.

6.1 Hardship Statement—Minimal Impact

The Minimal Impact Plan alternative produces similar significant hardships as the Full Compliance Plan (No Impact) alternative. The Minimal Impact Plan alternative limits use of the property to the point where AEP would be unable to expand the station to meet current and future increased energy demand (Exhibit 4).

Specific hardships to the Minimal Impact Plan alternative are as follows:

- Electrical power station operations require the station pad and equipment be installed with certain standards (i.e., proximity to other equipment, road access, elevation at least one (1) foot above possible high water). However, with NEC-required equipment clearances, the customized compact station expansion and OEPA stormwater control measures will not fit in the open area north of the full drainage area SCPZ of the Minimal Impact Plan alternative.
- It is not economically or physically feasible to relocate the station to another urban property and then reroute the (3) 138kV, (3) 40 kV, and (17) distribution powerlines to the new location. When considering current property values, the equivalent property purchase could be in the \$8,000,000–\$12,000,000 range. Rerouting all infrastructure to a new location, even if technically possible, could add \$30,000,000+ to the overall project cost, above and beyond what currently is allocated for the Preferred Development Plan.
- Overhead power lines cannot have tall vegetation (trees or tall shrubs) under or near them. New replacement lines must be installed while the existing lines are still in service, so are by necessity installed in areas without existing overhead lines. Under the Minimal Impact Plan, areas where new lines could be installed would have trees and be in the SCPZ. Required future mitigation by replanting trees removed for interfering with new electrical lines would lead to an endless cycle of mitigation just to maintain current operational levels, would be a constant drain on Overhead and Maintenance (O&M), which is carried by AEP’s rate payers (customers), and does not align with federal standards that require utilities to avoid vegetation management practices that lead to unnecessary tree trimming.
- Underground lines are installed by trenching between vaults. They are maintained and replaced by new duct banks installed in a new location while the existing lines are still in service, and emergency repairs can require digging up the existing buried lines. Access also must be maintained to the vaults and areas around the vaults for maintenance and emergency repairs. The tree-covered conservation easement associated with the full drainage area SCPZ limits maintenance access and poses conflicts with underground transmission and distribution lines.
- In the Minimal Impact Plan alternative, existing electrical and telecommunications structures inside the SCPZ could not be replaced in the same location. AEP must be able to maintain and replace structures due to emergency events and/or aging infrastructure. Replacement structures need to align with existing off-site ROW easements. Changing easements in a developed area is difficult, expensive, and may be impossible due to existing off-site development.
- A large portion of the property continues to store floodwater and restricts AEP’s access to maintain equipment during and after storm events and to install new or replacement lines and equipment. Condensing the flooded footprint would require creating additional storage in the SCPZ.

7.0 Preferred Development Plan

The Preferred Development Plan allows for AEP's planned expansion to proceed on schedule while maintaining compliance with OEPA and City of Columbus stormwater requirements, continuing to store the same quantity of off-site floodwater as the site currently stores, maintaining the City of Columbus drainage and stormwater control practice (SCP) easements, maintaining the Franklin County Petition Ditch easement and preferred maintenance, as well as planting and managing as much habitat as possible both on- and off-site. The Preferred Development Plan construction activities scheduled for late 2023 through 2027 are expected to impact 17.00 of the 17.16-acre Marion Road Station site. The aggressive construction schedule is dictated by the large scope of work, electric line outage schedules, and the availability of necessary equipment.

The Preferred Development Plan allows AEP to perform the tailored compact station expansion, including increasing the station size, adding new equipment, and installing new overhead and underground lines and supporting structures for the circuits run from this station. The expanded station and associated power line infrastructure re-routing will satisfy existing and projected future energy delivery demand and capacity.

The expanded station also will comply with stormwater quantity and quality regulations with installation of three detention basins totaling 0.80 acres. The detention basins are required to store site runoff separately from the floodwater backing up onto the Marion Road Station property, including being designed to prevent backflow or overtopping by floodwaters, and to meet other design criteria. Lack of elevation change on the property, the extensive floodwater storage, and large amount of existing and planned infrastructure sharply limits possible locations to install and outlet the required on-site detention.

A new main access drive and vehicular turnaround will be installed down the east property line, turn to the west parallel to the south property line, and end in the southwest corner of the site with a large turnaround and work pad adjacent to existing underground and overhead structures. This access drive includes two different Concrete Span (Conspan) bridge crossings through or adjacent to the SCPZs. Both Conspans will be installed outside the concrete banks of the existing ditches. Spur access drives also will be installed to reach overhead structures, work pads around underground power line vaults, and the stormwater detention basins. The main access drive, Conspans, and access drive spurs will allow for maintenance activities on energy delivery infrastructure, as well as access for the City of Columbus SCP easements applied to the three detention basins and for the Franklin County Petition Ditch Easement. The station infrastructure following the planned 2023 to 2027 expansion is shown on [Exhibit 5](#).

The Preferred Development Plan continues to provide the same 15,000+ cubic yards of floodwater storage currently impacting the site. The station upgrades and associated runoff detention basins will displace a significant quantity of the current floodwater storage. To create compensatory storage, the site grading plan calls for starting at the edge of the existing

concrete channels and excavating outward on slopes shallower than 3:1. This method requires excavation of nearly all open ground on-site below the 748-foot contour line to create the necessary flood storage volume. The new inundation area relative to the station infrastructure is shown on [Exhibit 6](#).

None of the site work proposed in the Preferred Development Plan affects the size, shape, or slope of the concrete channels or the off-site water crossing the site in them. The only in-channel work planned is the termination of outlet pipes with backflow prevention to drain the three new stormwater detention basins. Due to the lack of elevation change across the site, the detention basins must outlet near the bottom of the existing channels to function. The new on-site detention slows the rate of runoff leaving the Marion Road Station property for all storm sizes as compared to pre-development conditions. Additionally, the two detention basins located adjacent to new hard surfaces are sized as large as the site constraints will allow to capture >75% of the station expansion and work pad runoff. This maximizes engineered treatment of runoff from the areas with equipment and vehicles.

Under the Preferred Development Plan, the Marion Road Station SCPZ's functions would be mitigated on a separate, off-site parcel owned by AEP and placed under conservation easement with the City of Columbus. This allows for full mitigation of the impacted SCPZ acreage, including native trees, while allowing the station expansion, stormwater detention, and continued floodwater storage on the Marion Road Station site.

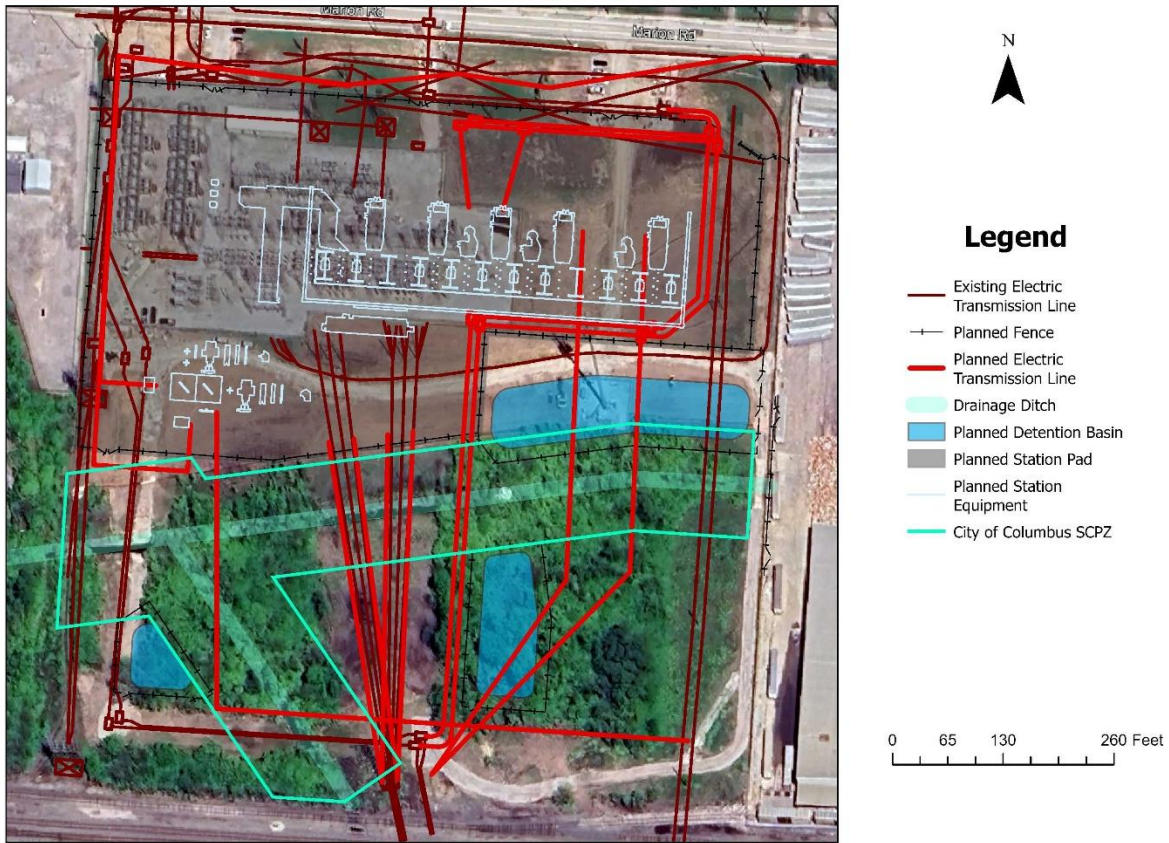


Figure 7. Preferred Development Option at Marion Road Station

To provide the highest quality site runoff and stored floodwater without vegetative interference with power lines, the Preferred Development Plan calls for the area adjacent to the concrete ditches, planned floodwater inundation area, and upland areas not needed for other uses—altogether totaling approximately 25% of the site—to be planted and maintained with a native seed mix of tall grasses and forbs (Exhibit 6). Typical maintenance, once established, is a single mowing per year to control woody plants. As part of the county petition ditch maintenance, the county also has requested periodic regrading and reseeding from the edge of the concrete ditch outward as necessary to remove sediment deposits, to repair gullies, and to otherwise maintain positive sheet flow through grassy vegetation to the ditches. In addition, off-site mitigation is planned to remediate the entire SCPZ area following the requirements of the SWDM. Off-site mitigation is planned to include native trees, as trees will be permanently removed from the Marion Road Station site. Mitigation is discussed in detail in Section 8 and Appendix C.

An Ohio EPA Primary Headwater Habitat Evaluation Form (HHEI) was completed for the Marion Road Station property during site visits in February 2023 and August 2023. A post-construction HHEI also was created for both channels using the post-construction Preferred Development Plan conditions. The Preferred Development Plan conditions received the same score as the existing conditions, meaning the ecological value of the on-site waterways would remain

comparable after clearing, regrading, and planting the site to grass-based vegetation. These HHEI forms are included in [Appendix A: Ecological Assessment of the Marion Road Station Property](#). Stream and existing vegetation assessments would be included in the full stream mitigation plan prepared for the chosen mitigation site(s).

7.1 Request for Relief—Preferred Development Plan

The Preferred Development Plan for the Marion Road Substation Expansion and Rebuild balances the existing and future energy delivery demand and capacity to the Columbus, Ohio, community with compliance to the City of Columbus, Ohio EPA, and Franklin County requirements. Due to the significant hardships presented and described for the Full Compliance Plan (No Impact) and Minimal Impact Plan, coupled with the benefits of the Preferred Development Plan listed in this document, AEP requests the following relief from strict adherence to the SWDM related to the SCPZ:

- The entire 3.02-acre SCPZ area outside top of bank of the existing concrete channels on the Marion Road Station property is expected to have permanent impacts requiring mitigation. AEP requests to remove the SCPZ from the Marion Road Station property and mitigate offsite in accordance with the terms of the SWDM.
- The SCPZ conservation easement to the City of Columbus will be applied to only the off-site mitigation area. No SCPZ conservation easement will exist on the Marion Road Station property, though the City will be granted a 30-foot-wide drainage easement for the channels.
- Due to the time-sensitivity of the station expansion project, AEP requests to separate the Marion Road Station Expansion and Rebuild project (CC-20181) from the action to establish off-site mitigation of the Marion Road Station SCPZ area. Moving forward, the off-site mitigation project would proceed under a separate CC number, Stormwater Pollution Prevention Plan (SWPPP), and construction schedule.

SECTION 3 – DEMONSTRATE ADEQUATE MITIGATION

8.0 Mitigation

Off-site mitigation, following a formal site-specific stream mitigation plan, is proposed for the permanent impacts to the entire Marion Road Station property SCPZ area. In addition, the Proposed Development Plan includes an on-site vegetation planting and maintenance plan that is supportive of clean stormwater and biodiversity.

The permanently impacted SCPZ area is 3.02 acres. An additional 0.45 acres of channel will not be directly impacted. The entire area is proposed to be mitigated off-site. A tree survey was conducted for the Marion Road Station site, and [Figure 8](#) shows the location of native trees within the SCPZ. Native trees removed from the Marion Road Station site are planned to be included in off-site mitigation, particularly as the shade they provide is their major benefit to the open channels on the Marion Road Station site.

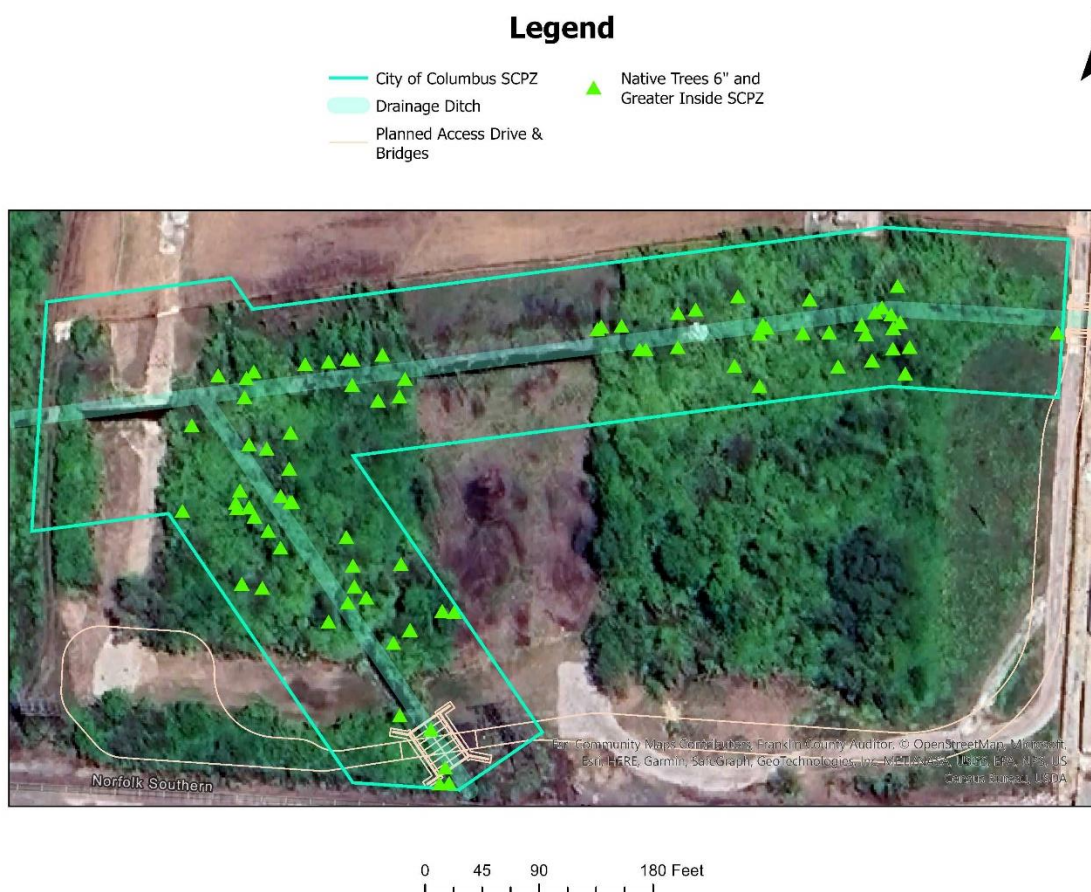


Figure 8. Location of Native Trees to be Mitigated Off-site

AEP also is planning a permanent change in vegetation across the entire Marion Road Station site, including the vegetated portion of the SCPZ. As outlined elsewhere in this document,

woody plants are not compatible with electrical transmission station operations. Therefore, the site is planned to be replanted with a mix of tall native grasses and forbs (Figure 9) and will be maintained without woody plants.



Figure 9. Proposed Seed Mix Planted Under Electrical Transmission Lines

The Preferred Development Plan creates a comparable ecological value at the Marion Road Station site and performs equivalent vegetative functions as the current site vegetation. On-site HHEI scores for the two streams remain the same from pre-construction conditions to projected post-construction conditions. The planned off-site mitigation will allow for creation of a SCPZ conservation easement as well as mitigation of native trees, the two activities most at odds with the Marion Road Station site.

Specifically, the Preferred Development Plan's on-site and off-site mitigation addresses functions of the SCPZ as listed in Section 1 of the SWDM:

- Reduce stream bank erosion and thereby protect structures.
 - On-site: The planned removal of trees from the station site will have a net positive impact on the quality and stability of concrete lining in the channels as they are currently impacted by tree roots. This also removes the source of woody debris entering the channel and impacting downstream City stormwater structures.
 - Off-site: Most sites under consideration for off-site mitigation are undeveloped. The site-specific mitigation plan will, therefore, focus on streambank stability and similar impacts.
- Add to the natural character and provide viewsheds within the community.
 - On-site: The Marion Road Station neighborhood is largely industrial, and the SCPZ area is not and will not be visible to the public.
 - Off-site: The site-specific mitigation plan will consider this function during the design process. Most sites under consideration are more favorably located to meet this function than the Marion Road Station site.
- Prevent or reduce flood-related damage.
 - On-site: Excavation for compensatory floodwater storage, regrading, and reseeding the site as planned reduces the risk of flood damage to the electrical power station and transmission infrastructure while continuing to store the same quantity of floodwater on-site.
 - Off-site: Once a site has been chosen, the site-specific mitigation plan will consider the streambank ecology and stability.
- Remove sediment, nutrients, and pollutants from the stormwater entering the stream.
 - On-site: The regrading and revegetation plan for the Marion Road Station site increases stormwater contact with plants having a high stem density near the ground surface, which is recommended by USDA, DNR, and other agencies for vegetative removal of sediment and sediment-bound contaminants. The engineered detention basins reduce the quantity of stormwater runoff for all storm sizes and provide treatment of detained water.
 - Off-site: The sites being considered for off-site mitigation allow for a much wider variety of land uses and vegetation than the Marion Road Station site. The final site-specific mitigation plan will seek to optimize stormwater quality.
- Provide shade that maintains cooler water temperatures.
 - On-site: The trapezoidal shape of the concrete channels prevents shade-providing trees from growing near the water.
 - Off-site: Most sites under consideration feature streams with natural banks, allowing for the creation or improvement of tree canopy to shade the water.

- Maintain biological diversity.
 - On-site: The Marion Road Station site currently has limited biological diversity and native species. The Preferred Development Plan replaces it with a mix of native grasses and forbs.
 - Off-site: Once an off-site mitigation location is selected, the site-specific mitigation plan will seek to maintain or improve biological diversity.
- Maintain adequate flows of water to underground aquifers.
 - On-site: Many of the grass and forb native species planned for the Marion Road Station site are known for having deep root systems that would encourage infiltration from both stormwater runoff and impounded flood water.
 - Off-site: The off-site mitigation location will allow a wider range of vegetation options than the Marion Road Station site, including planting of native trees and other deep-rooted vegetation.
- Provide greenway corridors for wildlife and to provide other environmental and aesthetic values.
 - On-site: The Preferred Development Plan designates approximately 25% of the entire property to be maintained in the wildlife-friendly native grasses and forbs. These areas are contiguous and compatible with station functions, allowing for a stable habitat.
 - Off-site: Once the off-site mitigation property is selected, the mitigation plan will seek to optimize the final site design and maintain or improve the site's environmental impacts, as well as providing a conservation easement for long-term protection.

The Preferred Development Plan's off-site mitigation plan will follow industry standards for stream mitigation to address mitigation unable to be performed on the Marion Road Station site. AEP has been conducting site-selection activities in both the HUC-8 and HUC-12 to locate one or more suitable locations as close to the Marion Road Station property as possible. The on-site channels are described as perennial streams in the HHEI, with a total length of 1,197 feet from survey and covering 0.45 acres. An additional 3.02 acres of SCPZ riparian area is outside the channels. Appendix A discusses the existing conditions at the Marion Road Station site that are to be mitigated off-site and Appendix C provides information regarding AEP's proposed off-site mitigation property and conceptual mitigation plan.

SECTION 4 – CONCLUSION

9.0 Conclusions

Of the three alternatives described in this document, the Preferred Development Plan is the only alternative that will allow AEP to meet increased current and future demand and capacity in a timely and fiscally responsible manner.

Without the requested variance, the hardships listed in the Minimal Impact and Full Compliance Plan alternatives will eliminate the option to build the required station expansion at the Marion Road Substation site. Any delay in this expedited critical infrastructure project will further negatively impact reliability in The Greater South Side Area. It may also restrict future economic growth if AEP must find an alternative property to purchase, build the new station on, and reroute the (3) 138kV, (3) 40kV transmission, and (17) distribution powerlines to the new location. The rough order of magnitude cost estimate for the alternate site would add roughly \$38,000,000–\$42,000,000+ of additional cost to the \$77,540,000 (\$40,140,000 investment from Transmission Co. and \$37,400,000 from AEP Ohio) critical infrastructure project, which would be paid for by the rate payers (AEP customers).

The Preferred Development Plan provides comparable ecological value after the station expansion as compared to current conditions: size and function of the stormwater conveyance ditches remains unchanged; peak stormwater runoff from Marion Road Station for all storm sizes is reduced; engineered pretreatment for water captured by detention basins is added and is expected to treat more than 75% of the station expansion; the same quantity of floodwater is stored on the property as currently; and invasive and opportunistic vegetation is replaced with native grasses and forbs covering up to 25% of the substation property. HHEI assessments calculate the same quality score for post-construction conditions as was assessed in the August 2023 on-site survey. Additionally, off-site mitigation is planned to compensate for native trees removed from the Marion Road Station site. The off-site mitigation property is also planned to have the entire SCPZ conservation easement applied to it. The Preferred Development Plan balances the property use required for AEP to expand existing ongoing operations to supply 30,000+ customers in The Greater South Side Area of downtown Columbus, Ohio, while improving water quality and water quantity values and providing the best possible ecological outcomes for both the Marion Road Station site and the off-site mitigation property.

SECTION 5 – EXHIBITS

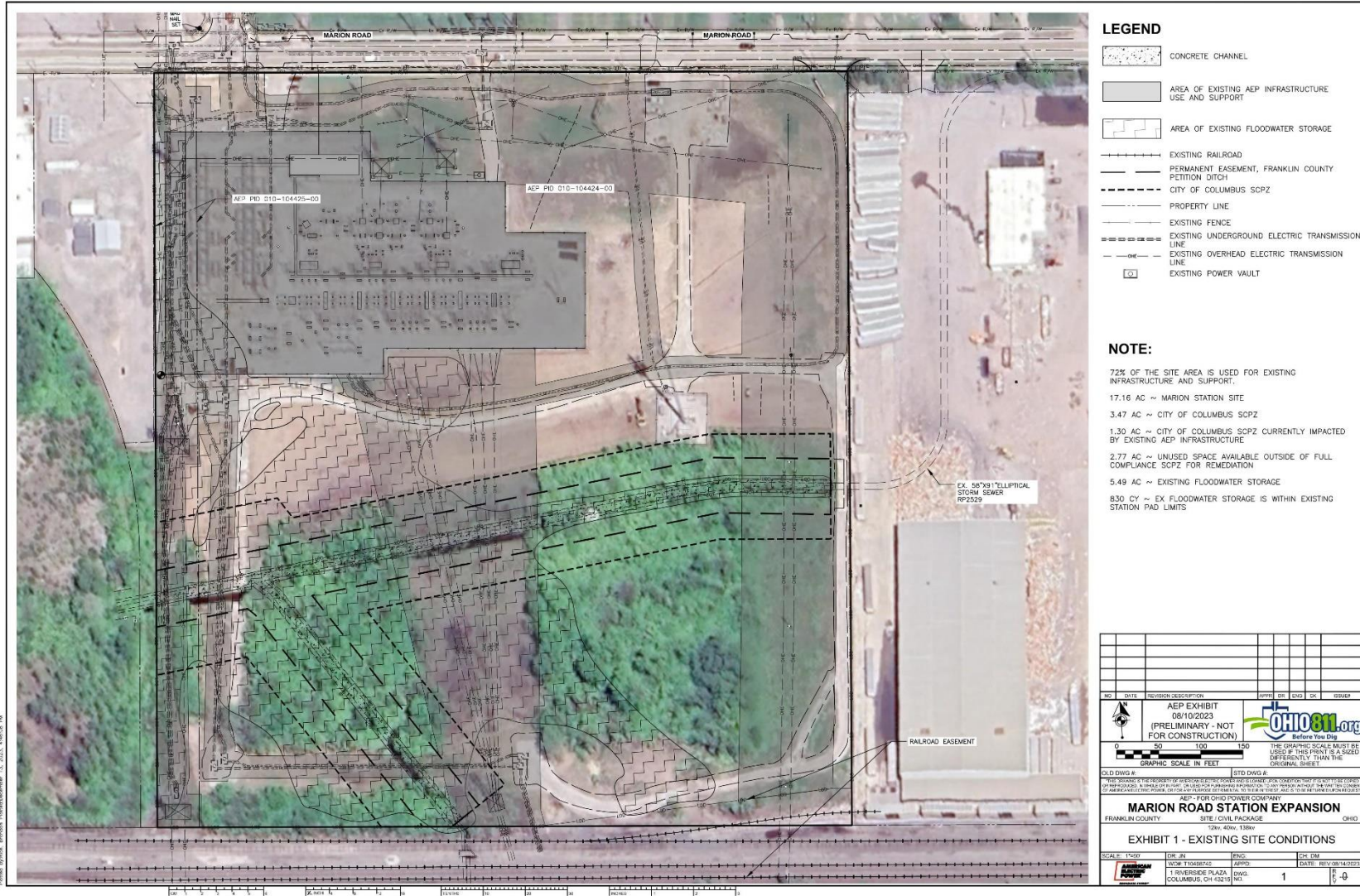
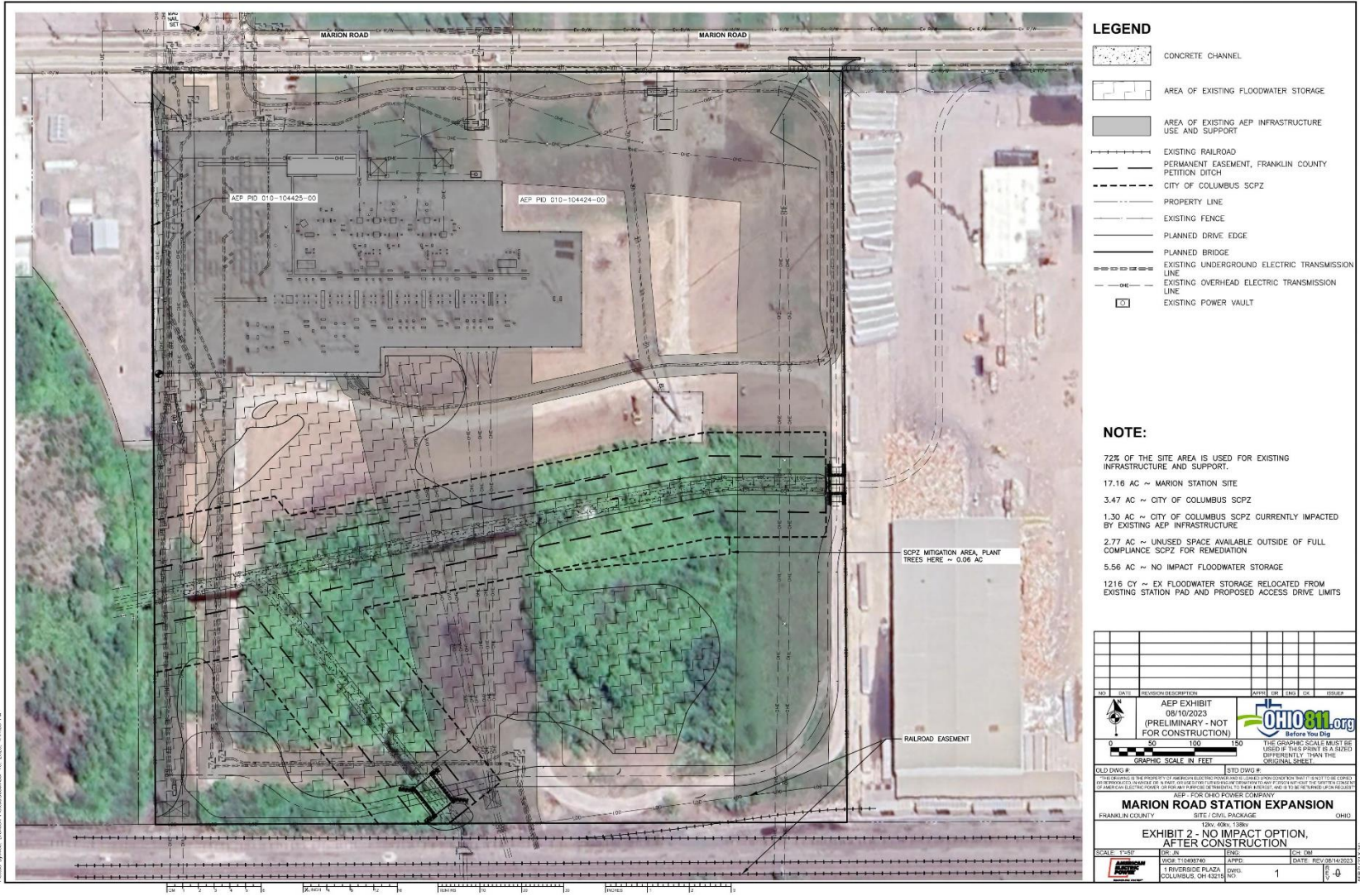


Exhibit 1



C:\Users\jgarcia\OneDrive\Documents\Marion Road Station Expansion\01-Design\13-Civil\Infrastructure\Existing\DWG\02 - No Impact
 Title Block - Revision: 11/2023
 Date: 11/20/23 4:44:30 PM

Exhibit 2

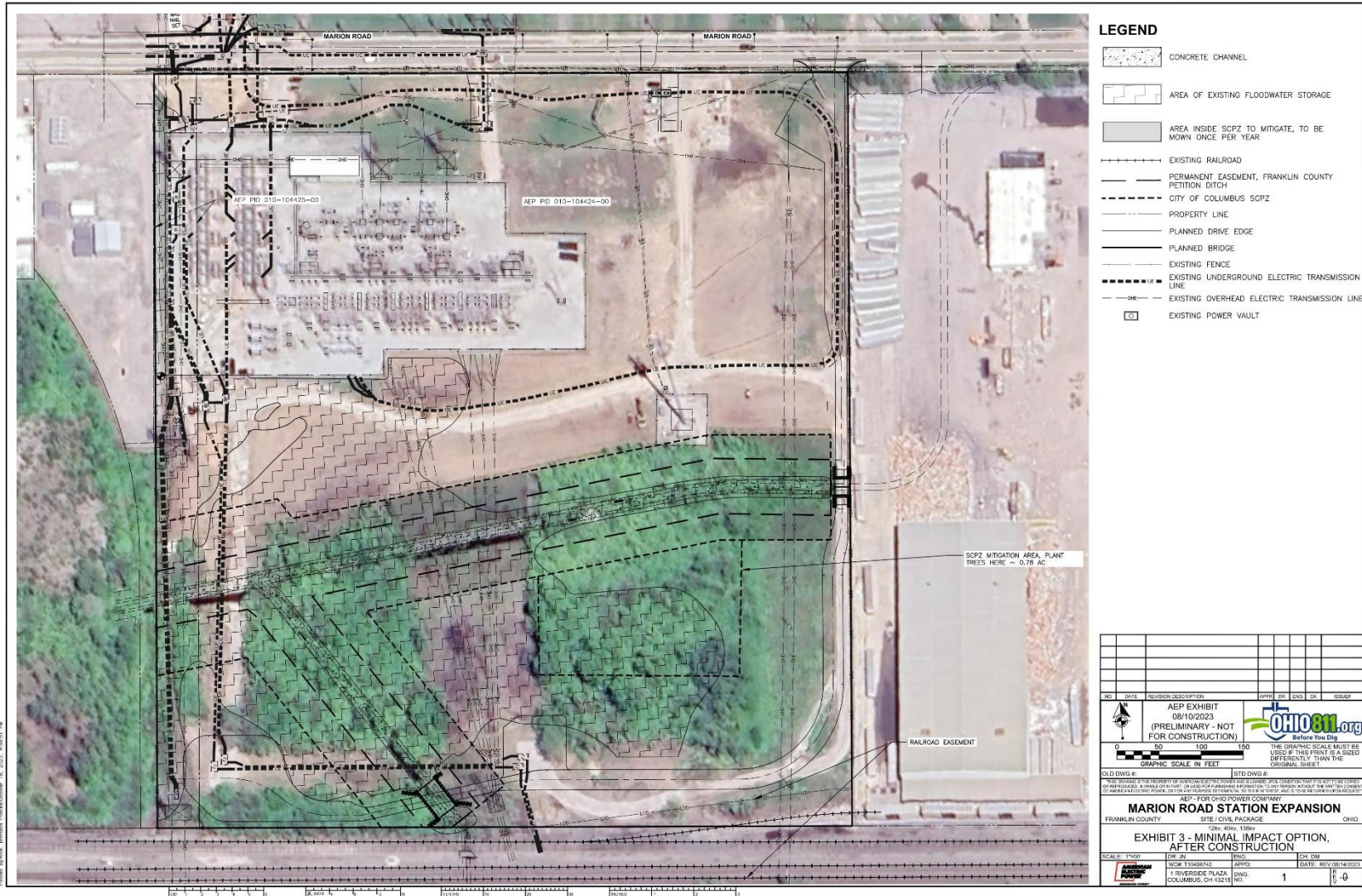


Exhibit 3

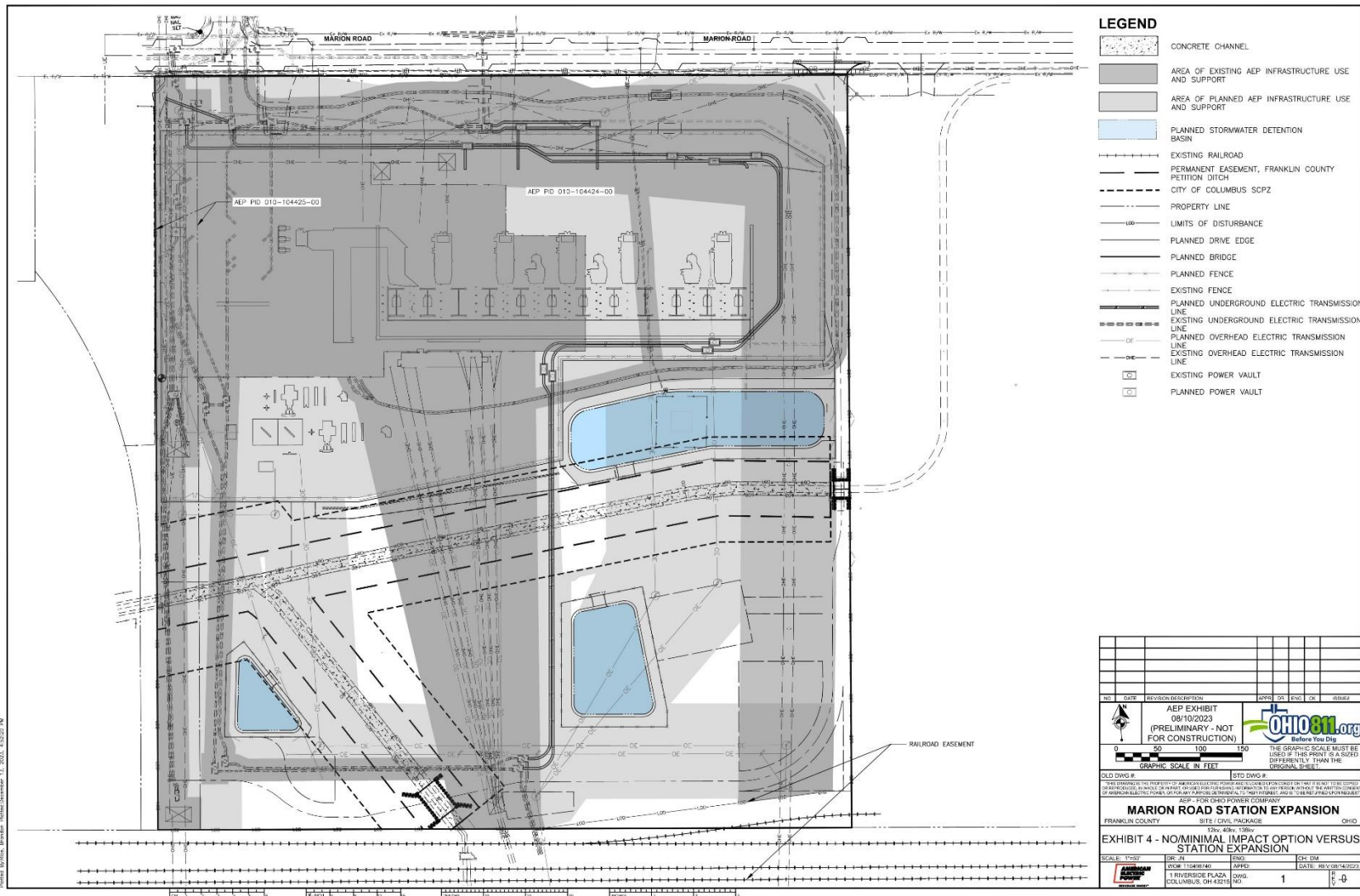


Exhibit 4

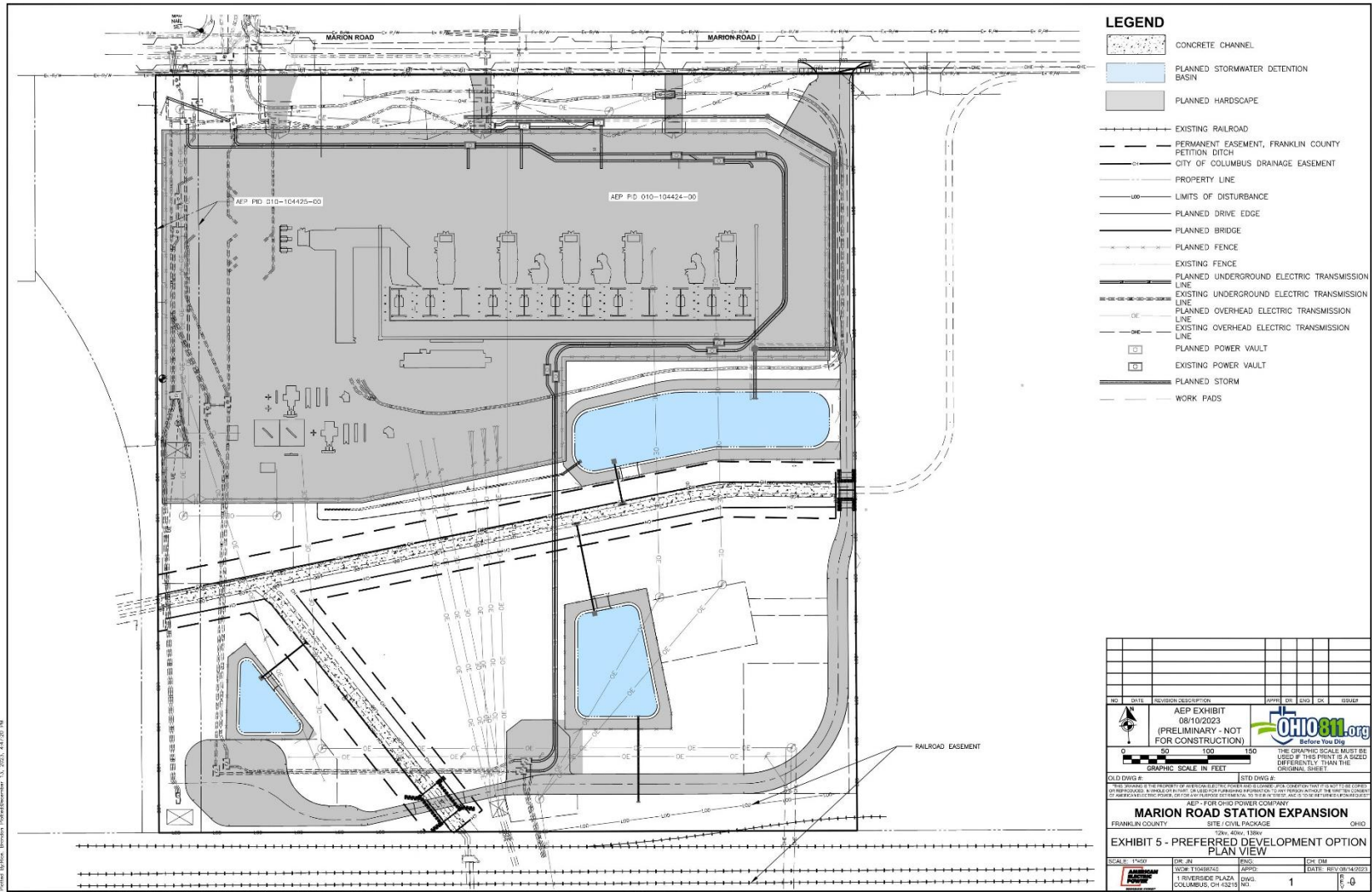


Exhibit 5

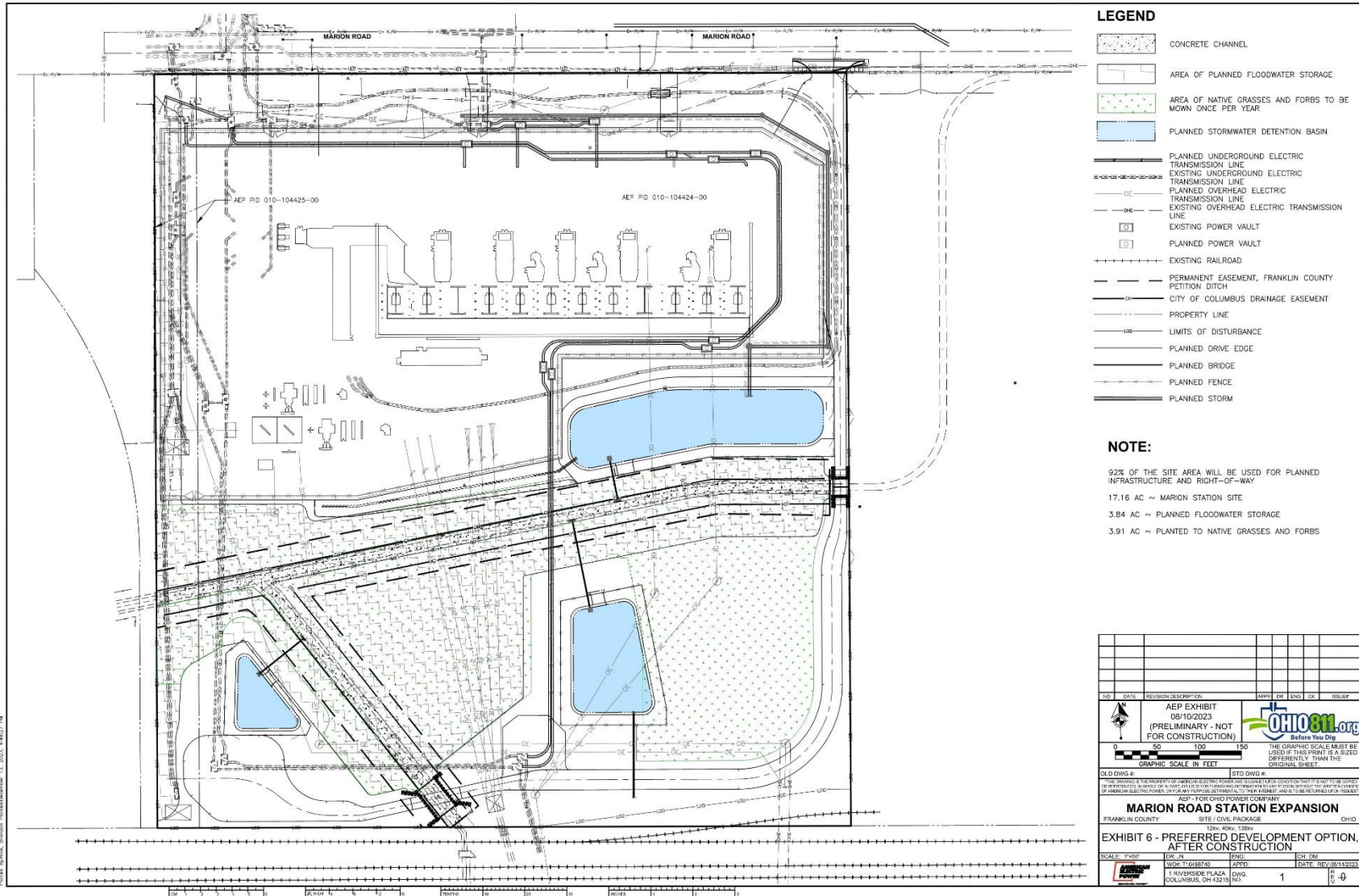


Exhibit 6

SECTION 6 – APPENDICES

Appendix A: Ecological Assessment of the Marion Road Station Property

Stream Channel Protection Zone (SCPZ) Evaluation – Executive Summary

AEP completed an ecological survey of the Marion Road Station project area and streams in February 2023. A second ecological survey was conducted in August 2023 to obtain data during the growing season. The HHEI evaluations of the streams include the current conditions observed during both site visits and a projected post-construction evaluation. There was no change in the HHEI score from pre-construction to a projection of post-construction conditions: **the proposed station expansion and rebuild project has no impact on the streams' quality.**

The ecological survey concluded that the streams are not in a natural state, not subject to lateral movement, not subject to natural streambank erosion, existing vegetation does not contribute to stream stabilization, and the existing vegetation has minimal water quality benefit through infiltration. The Preferred Development Plan will improve the on-site water quality by the installation of three post-construction stormwater detention basins, removal of invasive vegetation, and planting of native grasses and forbs. Off-site mitigation is planned for the entire SCPZ, including native trees permanently removed from the station site.

Overall, the Preferred Development Plan provides a solution for compatibility of the electric utility function of the property, which predates the SCPZ regulations, and affords an improvement to the water quality of the site in addition to the off-site mitigation. This appendix discusses the existing conditions of the Marion Road Station SCPZ area, which will serve as a baseline for the off-site mitigation plan.

Biological Setting of the SCPZ To Be Mitigated Off-Site

The Marion Road Station property was characterized as containing maintained electrical ROW (3.58 acres), early successional forest (6.42 acres), and industrial land use (7.16 acres). The maintained ROW generally lacks woody species and is periodically brush hogged. The early successional forest area is dominated by non-native species, electrical structures, invasive species, and native highly tolerant taxa. Industrial land use is characterized by little or no habitat present, such as the electrical transmission station equipment area. The SCPZ area is a somewhat fragmented habitat with areas being cleared due to the presence of electrical lines and other areas containing a mix of trees and aggressive non-native species. The SCPZ consideration area contains maintained electrical rights-of-way, and early successional growth, and an existing stream crossing at the west side of the property. A second existing vehicle crossing, along the east edge of the property, crosses over the storm sewer pipe before it releases into the open ditch.

The Marion Road Station property contains two concrete-lined (banks and stream bed) streams (tributaries of Kian Run). For the purposes of the project, the streams are identified as the east-

west stream (Stream 1 on HHEI Forms) and the north-south stream (Stream 2 on the HHEI forms). As shown in Figure 10, both streams enter the property from City of Columbus stormwater pipes and daylight on AEP property, and, after exiting the AEP property, rejoin an underground stormwater pipe. For purposes of discussion and survey, an area of 125 feet total width (based on centerline of the stream) was reviewed during initial site assessments. In general, vegetation is limited to the top of the concrete banks for both streams.

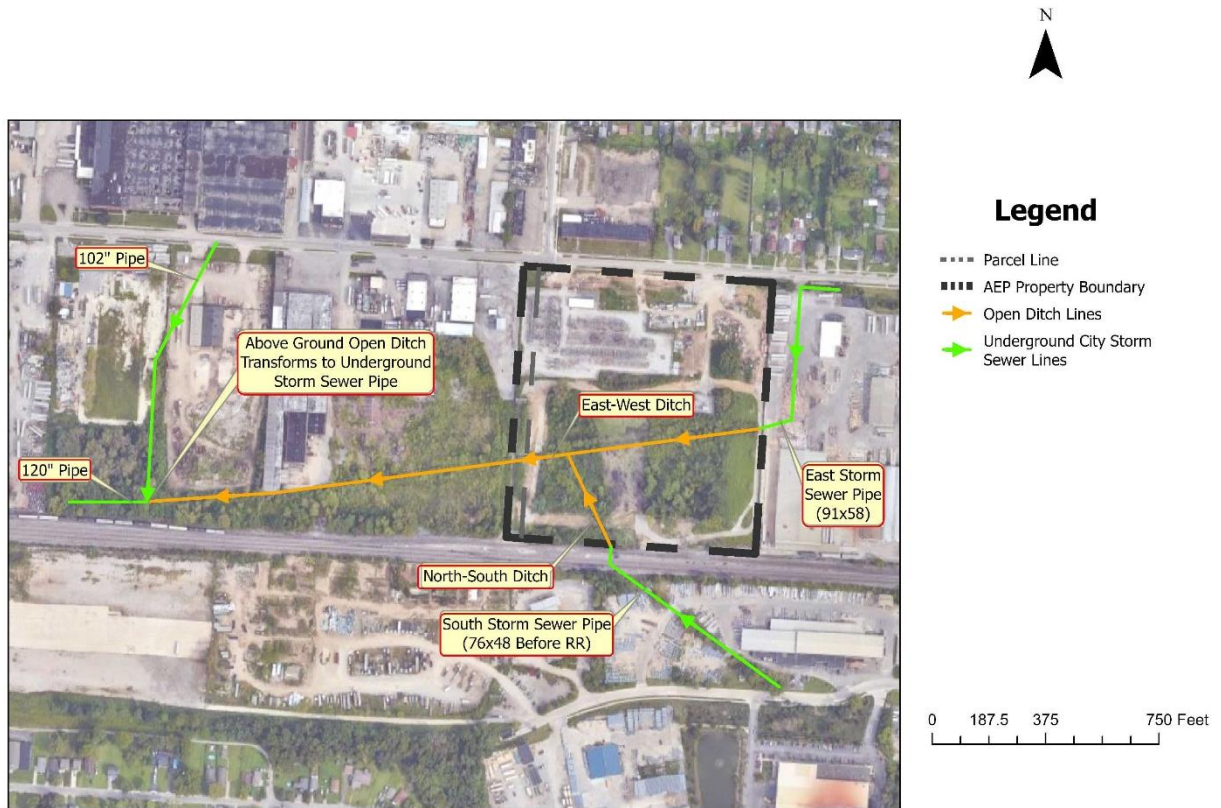


Figure 10. Hydrology of Marion Road Station Property

The streams are modified warm water habitats and are part of the City of Columbus stormwater system. The streams currently receive sheet flow from the adjacent land as the station predates regulatory requirements for treated water quality or quantity. Filtration of the water into the stream is overland flow through existing vegetation of trees and maintained utility ROW areas. The top of the bank contains a mix of invasives or opportunistic species, non-native trees, and a limited number and variety of native species of trees and shrubs. Approximately 72% of the site contains existing utility lines, driveways, and other utility-related land uses where no trees are located. There are no wetlands located on the property based on the 2023 ecological/wetland surveys.

Description of Streams To be Mitigated Offsite

The streams are contained in trapezoid-shaped channels with a concrete stream bottom and concrete banks. Due to the concrete on the channel and banks, vegetation does not grow in

these areas. The on-site ecological survey measured the east-west channel as approximately 12 feet wide at the top of bank with an observed high-water mark (OHWM) width of 10.3 feet and OHWM depth of water of 0.7 foot. The ecological survey for the north-south channel measures 14 feet at the top of bank, with the OHWM width at 10.6 feet and an OHWM depth of 1 foot. (Channel descriptions in the Appendix are based on the ecological field observation notes. Dimensions elsewhere in this document are based on the site’s topographic survey.) The ecological surveys confirmed the streams have concrete walls while available stream data and recording is limited. Neither stream is located in a regulated floodplain. A fuller description is included on the HHEI forms included in this Appendix.

Listed below is a summary of the stream characteristics and HHEI scores for the two on-site HHEI surveys conducted in 2023 and the post-construction survey projected for the Preferred Development Plan. The difference between the February and August scores was an increase in bank full width at the second field visit.

Table 1. Summary of HHEI Surveys

STREAM ID	Latitude	Longitude	Stream Type (1)	Stream Name	Delineated Length (feet)	Bank Full Width (feet)	OHWM Width (feet) (2)	Method (3)	Score Feb/ Aug/ post	Cat/OAC Designation
Stream 1 (E-W)	39.92143	-82.97106	Perennial-channelized ditch	UNT to Kian Run	822	12	10.3	HHEI	61/ 66 /66	Modified Class II PHW
Stream 2 (N-S)	39.92090	-82.97165	Perennial-channelized ditch	Kian Run	384	14	10.6	HHEI	61/ 71/ 71	Modified Class II PHW

(1) Stream Classification is based on Federal Register, Vol. 67, No. 10 (USACE 2002). (2) OHWM-Ordinary High Water Mark. (3) HHEI Headwater Habitat Evaluation Index.

Based on the review of available mapping, aerial photos, engineering plans, and recorded easements, the streams have been channelized for more than 100 years. Engineering plans from the 1960s show that concrete channels were installed for both streams, and the City of Columbus easements were shown on those engineering plans. These two streams also are identified as Petition Ditches, Franklin County jurisdiction, and as such are subject to the Ohio Revised Code Section 6137.12. The natural vegetation and stream characteristics have been eliminated during the channelization episodes over the years, including during the concrete channel installation. The natural features of the stream were removed with the installation of the concrete channel, and there is no erosion of the stream banks, as they are concrete. The banks are stable due to the installation of the unvegetated concrete ditches. Based on the HHEI evaluation, the streams have a flat gradient and no sinuosity.

Vegetation

The areas that contain trees and shrubs are a combination of non-native and native trees. The dominant non-native species in the area are Amur honeysuckle (*Lonicera maackii*) and Callery pear (*Pyrus calleryana*). Native tree species are green ash (*Fraxinus pennsylvanica*), American

elm (*Ulmus americana*), and black cherry (*Prunus serotina*). Most of the trees are less than 6 inches dbh. It should be noted that the approximately 46 green ash trees are dead. These tree species all grow above 15 feet tall and pose a conflict to utility lines.

Indicative of the aggressive growth of the non-native species, three non-native species represent half of the tree growth in the area. These areas are mixed with multiflora rose (*Rosa multiflora*), grape vines (*Vitis riparia*, *Vitis vulpina*), Virginia creeper (*Parthenocissus quinquefolia*), and other vine varieties. Also noted are common varieties such as sugar maples (*Acer saccharinum*) and box elder (*Acer negundo*) present but in numbers lower than invasives and the previously listed native species. Overall, the area contains a mix of aggressive invasive species of trees and vines and dead green ash trees. All of these species pose a conflict to utility lines. Native trees in the SCPZ are listed in [Table 2](#) by species and size, and their locations are shown in [Figure 11](#).

Table 2. Existing Native Trees in the Marion Road Station SCPZ Associated with Stream 1

SCPZ Area	Species	DBH Inch
Stream 1	Acer saccharinum	6.75
Stream 1	Acer saccharinum	7.75
Stream 1	Acer saccharinum	6
Stream 1	Acer saccharinum	8.25
Stream 1	Acer saccharinum	10
Stream 1	Acer saccharinum	14
Stream 1	Acre saccharinum	8
Stream 1	Acre saccharinum	7.5
Stream 1	Catalpa speciosa	8.25
Stream 1	Celtis occidentalis	6
Stream 1	Celtis occidentalis	9.25
Stream 1	Fraxinus pennsylvanica	12
Stream 1	Fraxinus pennsylvanica	6.25
Stream 1	Fraxinus pennsylvanica	6.5
Stream 1	Fraxinus pennsylvanica	8
Stream 1	Fraxinus pennsylvanica	11
Stream 1	Fraxinus pennsylvanica	8
Stream 1	Gleditsia triacanthos	8
Stream 1	Gleditsia trianthos	7
Stream 1	Juglans nigra	7
Stream 1	Morus alba	7
Stream 1	Populus deltooides	10.5
Stream 1	Populus deltooidies	6
Stream 1	Prunus serotina	8.25
Stream 1	Prunus serotina	8
Stream 1	Prunus serotina	11.75
Stream 1	Prunus serotina	8.75
Stream 1	Prunus serotina	8.25
Stream 1	Prunus serotina	10.5
Stream 1	Prunus serotina	6.75
Stream 1	Prunus serotina	13
Stream 1	Prunus serotina	6
Stream 1	Prunus serotina	7
Stream 1	Prunus serotina	13
Stream 1	Prunus serotina	9
SCPZ Area	Species	DBH Inch
Stream 1	Salix nigra	11
Stream 1	Ulmus amaricana	6
Stream 1	Ulmus americana	8
Stream 1	Ulmus americana	8.5
Stream 1	Ulmus americana	6
Stream 1	Ulmus americana	8
Stream 1	Ulmus americana	15
Stream 1	Ulmus americana	6
Stream 1	Ulmus americana	6
Total of 44 Native Trees within Stream 1 SPCZ		

Table 3. Existing Native Trees in the Marion Road Station SCPZ Associated with Stream 2 (Kian Run)

SCPZ_Area	Species	DBH Inch
Stream 2	Acer negundo	8.25
Stream 2	Acer saccharinum	8
Stream 2	Acer saccharinum	7.25
Stream 2	Acer saccharinum	13
Stream 2	Acer saccharinum	6
Stream 2	Catalpa speciosa	6.75
Stream 2	Celtis occidentalis	13.5
Stream 2	Celtis occidentalis	12
Stream 2	Celtis occidentalis	6
Stream 2	Fraxinus pennsylvacania	8
Stream 2	Fraxinus pennsylvanica	13.5
Stream 2	Fraxinus pennsylvanica	6
Stream 2	Fraxinus pennsylvanica	7.5
Stream 2	Juglans nigra	8
Stream 2	Prunus serotina	6
Stream 2	Prunus serotina	12.75
Stream 2	Prunus serotina	13
Stream 2	Prunus serotina	10
Stream 2	Prunus serotina	7.5
Stream 2	Tilia americana	7.2
Stream 2	Tilia americana	6.5
Stream 2	Ulmus americana	11.5
Stream 2	Ulmus americana	12.75
Stream 2	Ulmus americana	6
Stream 2	Ulmus americana	8.5
Stream 2	Ulmus americana	9.5
Stream 2	Ulmus americana	14
Stream 2	Ulmus americana	19
Stream 2	Ulmus americana	9.25
Stream 2	Ulmus americana	7.75
Stream 2	Ulmus americana	7.5
Stream 2	Ulmus americana	9.5
Stream 2	Ulmus americana	14
Stream 2	Ulmus americana	8.25
Total of 34 Native Trees within Stream 2 SPCZ		

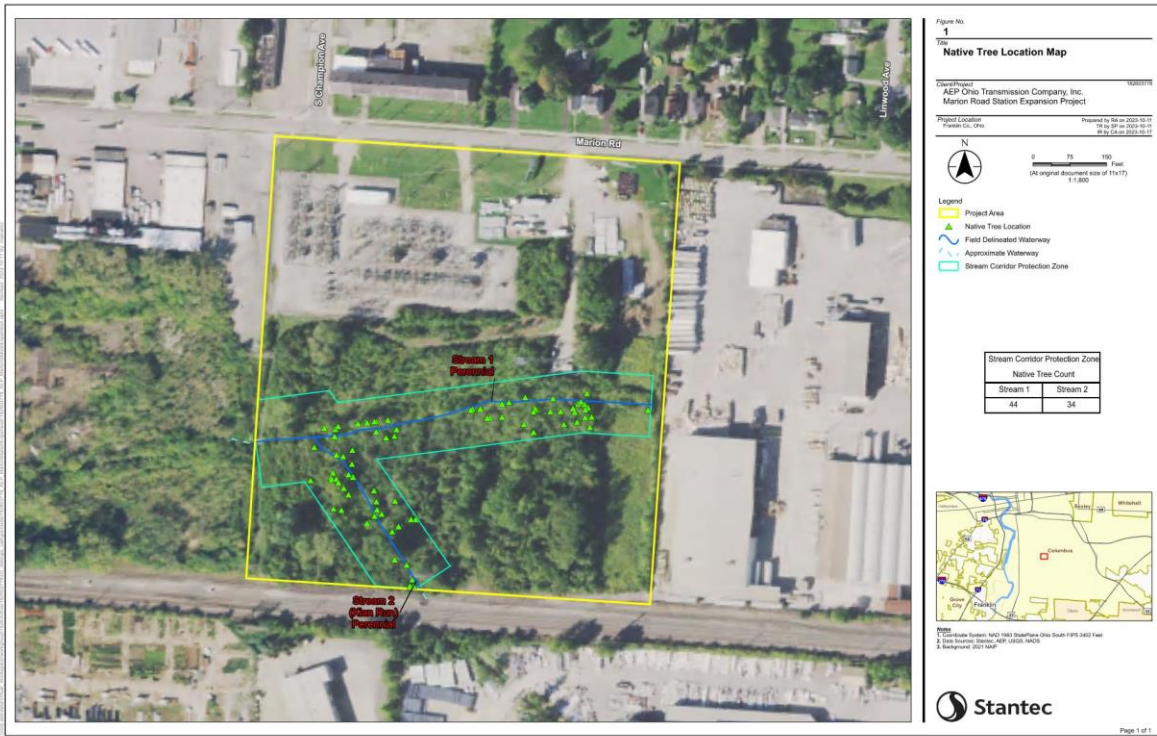


Figure 11. Location of Native Trees in SCPZ

The other vegetation noted in the SCPZ area contains common species generally found in areas of full sun with disturbed soil and are somewhat opportunistic. The species in the SCPZ included honey locust (*Gleditsia triacanthos*), varieties of goldenrod (*Solidago caesia*, *Solidago canadensis*), common yarrow (*Achillea millefolium*), common buckthorn (*Rhamnus cathartica*), and poison ivy (*Toxicodendron radicans*). There are also dogwood varieties: roughleaf and silky (*Cornus drummondii*, *Cornus amomum*). Other flowers of note include giant ironweed (*Vernonia gigantea*), prostrate ticktrefoil (*Desmodium rotundifolium*), and timothy grass (*Phleum pratense*); the exact locations/count were not recorded.

What is noted as absent are native grasses such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), or Indiangrass (*Sorghastrum nutans*). The variety of flowers and grasses present are a mixture commonly found in areas of prior disturbance and are mainly located in areas of full sun. These forbs and non-woody plants provide a slightly higher benefit to the filtering of sheet flow on-site versus the woody areas.

Filtration Value of Existing Vegetation: Demonstrating Improvement with Revegetation and Mitigation

With the installation of the concrete ditches, the streams have reduced influence from any adjacent vegetation. The stream banks are unvegetated, and filtration is limited to the vegetation adjacent to the concrete bank walls. The vegetation on the banks has limited function due to the type and characteristics of the existing vegetation. In the existing areas of trees, between shrub growth and shading, there is minimal understory that can filter sheet flow. The areas of utility right-of-way contain vegetation that can filter sheet flow. These forbs and other non-woody plants in the utility right-of-way provide a slightly higher benefit to filtering of sheet flow on-site versus the woody areas.

Though erosion issues were not observed during the site assessments, there would be a benefit to installing native grasses and forbs along the streams. The revegetation of the areas adjacent to the stream banks would benefit the stream with improved sheet flow filtration. There would be an ecological benefit of removing invasive species and revegetation of the SCPZ area with native seed mix. The native seed mix is a combination of species that would benefit pollinators, and other species utilizing dense grass vegetation. The benefit of revegetation would be dense low-growing species, beneficial flowers species, soil stability with root structure, and compatibility with the utility function/requirements of the Marion Road Station property.

The Marion Road Station site use does not allow for on-site mitigation of native trees impacted by the planned station expansion and equipment upgrade. In addition to the on-site revegetation described above, AEP plans to mitigate impacted trees at an off-site location. Off-site mitigation is discussed in Appendix C.

HHEI Forms Evaluation at the Marion Road Station Site

The HHEI metrics and scoring consider physical characteristics of the channel, including substrate types, pool depth, and bank full width. These are not altered during the proposed site work, so there is no change in the quantitative score. AEP completed evaluation in the winter of 2023 and then in summer 2023 with consistent results for pre- and post-construction evaluations.

Ohio EPA Primary Headwater Habitat Evaluation Form 61

HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION Marion Road Station Expansion
 SITE NUMBER Stream 1E-W RIVER BASIN Scioto River DRAINAGE AREA (mi²) < 1
 LENGTH OF STREAM REACH (ft) 821 LAT. 39.92143 LONG. -82.97106 RIVER CODE _____ RIVER MILE _____
 DATE 02/16/23 SCORER T. Gillette COMMENTS Perennial - Channelized ditch

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 10%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	<input checked="" type="checkbox"/> 40%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **20.00%** (A) 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12** TOTAL NUMBER OF SUBSTRATE TYPES: **4**

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): **13**

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS TOB W-9' D 5', OHWM W-6' d-1' AVERAGE BANKFULL WIDTH (meters): **1.80**

HHEI Metric Points
 Substrate Max = 40
16
 A + B
 Pool Depth Max = 30
25
 Bankfull Width Max=30
20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY ☆NOTE: River Left (L) and Right (R) as looking downstream☆

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> (Per Bank) Wide >10m	<input type="checkbox"/>	<input type="checkbox"/> Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/> Moderate 5-10m	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/> Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/> Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/> None	<input type="checkbox"/>	<input type="checkbox"/> Fenced Pasture
		<input type="checkbox"/>	<input type="checkbox"/> Conservation Tillage
		<input type="checkbox"/>	<input type="checkbox"/> Urban or Industrial
		<input type="checkbox"/>	<input type="checkbox"/> Open Pasture, Row Crop
		<input type="checkbox"/>	<input type="checkbox"/> Mining or Construction

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Klan Run Distance from Evaluated Stream 1.75 mi
 CWH Name: Distance from Evaluated Stream
 EWH Name: Distance from Evaluated Stream

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 02/16/23 Quantity: 0.05

Photograph Information: Upstream, downstream, substrate

Elevated Turbidity? (Y/N): N Canopy (% open): 70%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:

Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) pH (S.U.) 6.70 Conductivity (µmhos/cm) 143

Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

Additional comments/description of pollution impacts:

BIOTIC EVALUATION

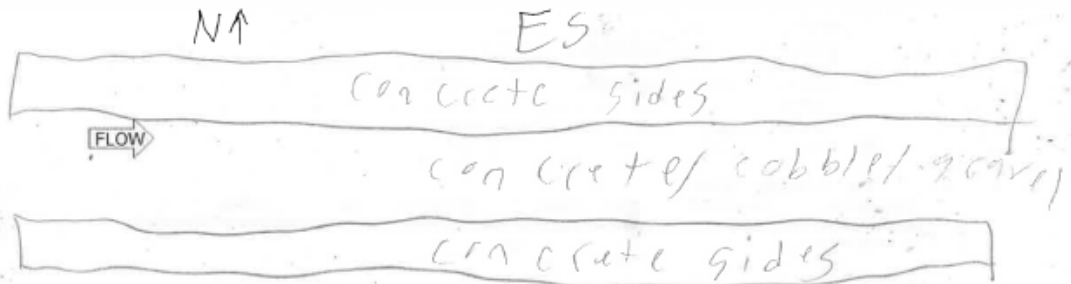
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

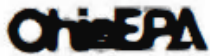
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

61

HHEI Score (sum of metrics 1, 2, 3):

SITE NAME/LOCATION **Marion Road Station Expansion**

SITE NUMBER **Stream 2 N-S** RIVER BASIN **Scioto River** DRAINAGE AREA (mi²) **1.00**

LENGTH OF STREAM REACH (ft) **382** LAT. **39.92090** LONG. **-82.97165** RIVER CODE _____ RIVER MILE _____

DATE **02/16/23** SCORER **T. Gillette** COMMENTS **Perennial - Channelized ditch**

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 10%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	<input checked="" type="checkbox"/> 40%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **20.00%** (A) 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **12** TOTAL NUMBER OF SUBSTRATE TYPES: **4**

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): **13**

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input checked="" type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS **TOB W-9' D 5', OHWM W-6' d-1'** AVERAGE BANKFULL WIDTH (meters): **1.80**

HHEI Metric Points

Substrate Max = 40

16

A + B

Pool Depth Max = 30

25

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

☆NOTE: River Left (L) and Right (R) as looking downstream ☆

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide >10m (Per Bank)		Mature Forest, Wetland	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow <5m		Residential, Park, New Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Conservation Tillage	
		Urban or Industrial	
		Open Pasture, Row Crop	
		Mining or Construction	

COMMENTS: _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS: _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Kian Run Distance from Evaluated Stream 1.75 mi
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 02/16/23 Quantity: 0.05

Photograph Information: Upstream, downstream, substrate

Elevated Turbidity? (Y/N): N Canopy (% open): 70%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:

Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) pH (S.U.) 6.70 Conductivity (µmhos/cm) 143

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

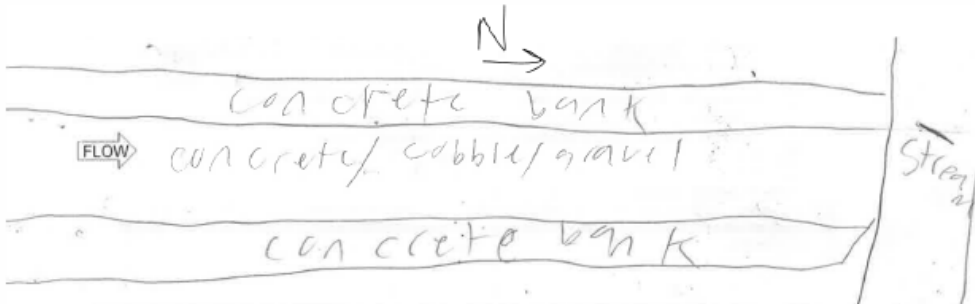
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

66

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION Marion Station Extention
 SITE NUMBER Stream 1E-W RIVER BASIN Scioto River DRAINAGE AREA (mi²) <1
 LENGTH OF STREAM REACH (ft) 821 LAT. 39.92143 LONG. -82.97106 RIVER CODE R4SBC RIVER MILE _____
 DATE 08/30/23 SCORER T. Gillette COMMENTS Perennial - Channelized ditch

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pt]	0%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> MUCK [0 pts]	0%
<input type="checkbox"/> SAND (<2 mm) [8 pts]	10%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	40%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 20.00% (A) 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 4

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 13

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS TOB W-12' D 1.5', OHWM W-10.3' D- 0.7' AVERAGE BANKFULL WIDTH (meters): 3.60

HHEI Metric Points

Substrate Max = 40

16

A + B

Pool Depth Max = 30

25

Bankfull Width Max=30

25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Per Bank)		(Most Predominant per Bank)	
Wide >10m		Mature Forest, Wetland	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field	<input checked="" type="checkbox"/>
Moderate 5-10m		Residential, Park, New Field	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture	<input type="checkbox"/>
Narrow <5m		Conservation Tillage	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial	<input type="checkbox"/>
None		Open Pasture, Row Crop	<input type="checkbox"/>
		Mining or Construction	<input type="checkbox"/>

COMMENTS _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input checked="" type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
--	---	---	---	--

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Kian Run Distance from Evaluated Stream 1.75
 CWH Name: _____ Distance from Evaluated Stream _____
 EWH Name: _____ Distance from Evaluated Stream _____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: NRCS Soil Map Stream Order
 County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 08/24/23 Quantity: 2.40in.
 Photograph Information: Upstream, downstream, substrate
 Elevated Turbidity? (Y/N): N Canopy (% open): 70%
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
 Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) pH (S.U.) 6.70 Conductivity (µmhos/cm) 143
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

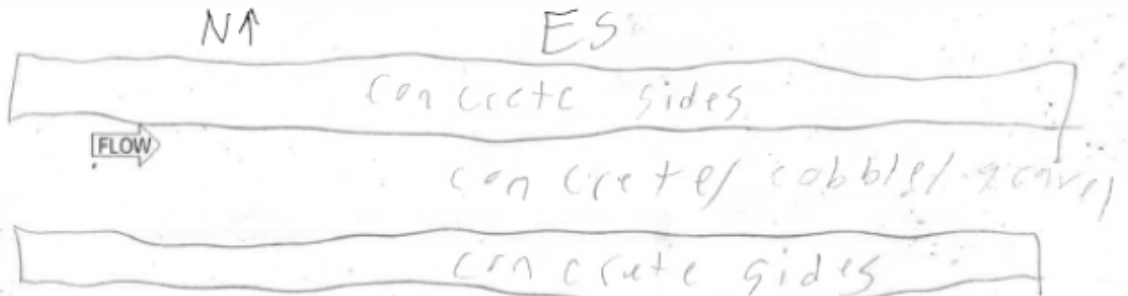
Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
 Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
 Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
 Comments Regarding Biology: _____

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

71

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION Marion Station Extention

SITE NUMBER Stream 2 N-S RIVER BASIN Scioto River DRAINAGE AREA (mi²) <1

LENGTH OF STREAM REACH (ft) 382 LAT. 39.92090 LONG. -82.97165 RIVER CODE R4SBC RIVER MILE

DATE 8/30/23 SCORER T. Gillette COMMENTS Perennial - Channelized ditch

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input type="checkbox"/> 0%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="checkbox"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="checkbox"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input checked="" type="checkbox"/> 20%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="checkbox"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input checked="" type="checkbox"/> 30%	<input type="checkbox"/> MUCK [0 pts]	<input type="checkbox"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input checked="" type="checkbox"/> 10%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	<input checked="" type="checkbox"/> 40%

Total of Percentages of Blldr Slabs, Boulder, Cobble, Bedrock 20.00% (A) 100% (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 4

2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS MAXIMUM POOL DEPTH (centimeters): 13

3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):

<input checked="" type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (<= 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]	

COMMENTS TOB W-14' D 3', OHWM W-10.6' d- 1' AVERAGE BANKFULL WIDTH (meters): 4.20

HHEI Metric Points

Substrate Max = 40

16

A + B

Pool Depth Max = 30

25

Bankfull Width Max=30

30

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wide >10m		Mature Forest, Wetland	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Narrow <5m		Residential, Park, New Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Mining or Construction	

COMMENTS:

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 81 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0	<input type="checkbox"/> 3.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5	<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

<input checked="" type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
--	---	---	---	--

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Kian Run Distance from Evaluated Stream 1.75 mi.
 CWH Name: Distance from Evaluated Stream
 EWH Name: Distance from Evaluated Stream

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: NRCS Soil Map Stream Order
 County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 08/24/23 Quantity: 2.40 in.
 Photograph Information: Upstream, downstream, substrate
 Elevated Turbidity? (Y/N): N Canopy (% open): 70%
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
 Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) pH (S.U.) 6.70 Conductivity (µmhos/cm) 143
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

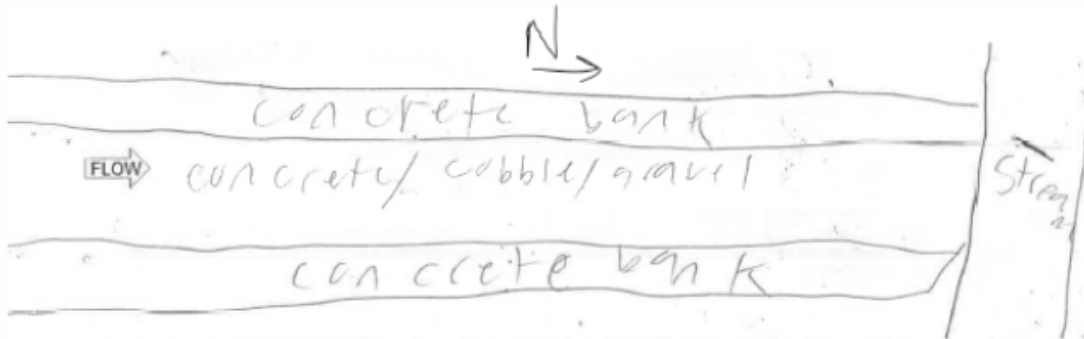
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
 Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
 Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
 Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

66

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION Marion Station Extention - Potential Post Construction Review - Not Official Review
 SITE NUMBER Stream 1E-W RIVER BASIN Scioto River DRAINAGE AREA (mi²) <1
 LENGTH OF STREAM REACH (ft) 821 LAT. 39.92143 LONG. -82.97106 RIVER CODE R4SBC RIVER MILE _____
 DATE 08/30/23 SCORER T. Gillette COMMENTS Perennial - Channelized ditch

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

<p>1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.)</p>				<p>HHEI Metric Points</p> <p>Substrate Max = 40</p> <div style="border: 1px solid black; padding: 5px; text-align: center; font-weight: bold;">16</div> <p>A + B</p>																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/> BLDR SLABS [16 pts]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> BOULDER (>256 mm) [16 pts]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> BEDROCK [16 pt]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> COBBLE (65-256 mm) [12 pts]</td><td style="text-align: center;">20%</td></tr> <tr><td><input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]</td><td style="text-align: center;">30%</td></tr> <tr><td><input type="checkbox"/> SAND (<2 mm) [6 pts]</td><td style="text-align: center;">10%</td></tr> </tbody> </table>	TYPE	PERCENT	<input type="checkbox"/> BLDR SLABS [16 pts]		0%	<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%	<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> SAND (<2 mm) [6 pts]	10%	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>TYPE</th> <th>PERCENT</th> </tr> </thead> <tbody> <tr><td><input type="checkbox"/> SILT [3 pt]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> FINE DETRITUS [3 pts]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> CLAY or HARDPAN [0 pt]</td><td style="text-align: center;">0%</td></tr> <tr><td><input type="checkbox"/> MUCK [0 pts]</td><td style="text-align: center;">0%</td></tr> <tr><td><input checked="" type="checkbox"/> ARTIFICIAL [3 pts]</td><td style="text-align: center;">40%</td></tr> </tbody> </table>	TYPE	PERCENT	<input type="checkbox"/> SILT [3 pt]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%	<input type="checkbox"/> MUCK [0 pts]	0%	<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	40%	<p>Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock <u>20.00%</u> (A) 100% (B)</p>	
TYPE	PERCENT																															
<input type="checkbox"/> BLDR SLABS [16 pts]	0%																															
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%																															
<input type="checkbox"/> BEDROCK [16 pt]	0%																															
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	20%																															
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%																															
<input type="checkbox"/> SAND (<2 mm) [6 pts]	10%																															
TYPE	PERCENT																															
<input type="checkbox"/> SILT [3 pt]	0%																															
<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%																															
<input type="checkbox"/> FINE DETRITUS [3 pts]	0%																															
<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%																															
<input type="checkbox"/> MUCK [0 pts]	0%																															
<input checked="" type="checkbox"/> ARTIFICIAL [3 pts]	40%																															
<p>SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: <u>12</u></p>		<p>TOTAL NUMBER OF SUBSTRATE TYPES: <u>4</u></p>																														
<p>2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td><input type="checkbox"/> > 30 centimeters [20 pts]</td> <td><input type="checkbox"/> > 5 cm - 10 cm [15 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 22.5 - 30 cm [30 pts]</td> <td><input type="checkbox"/> < 5 cm [5 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]</td> <td><input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]</td> </tr> </tbody> </table> <p>COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): <u>13</u></p>				<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]	<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]	<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]	<p>Pool Depth Max = 30</p> <div style="border: 1px solid black; padding: 5px; text-align: center; font-weight: bold;">25</div>																						
<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]																															
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]																															
<input checked="" type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts]																															
<p>3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td><input type="checkbox"/> > 4.0 meters (> 13') [30 pts]</td> <td><input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]</td> </tr> <tr> <td><input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]</td> <td><input type="checkbox"/> ≤ 1.0 m (<= 3' 3") [5 pts]</td> </tr> <tr> <td><input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]</td> <td></td> </tr> </tbody> </table> <p>COMMENTS <u>TOB W-12' D 1.5', OHWM W-10.3' d- 0.7'</u> AVERAGE BANKFULL WIDTH (meters): <u>3.60</u></p>				<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]	<input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (<= 3' 3") [5 pts]	<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]		<p>Bankfull Width Max=30</p> <div style="border: 1px solid black; padding: 5px; text-align: center; font-weight: bold;">25</div>																						
<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]																															
<input checked="" type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input type="checkbox"/> ≤ 1.0 m (<= 3' 3") [5 pts]																															
<input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]																																

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH		FLOODPLAIN QUALITY	
L	R	L	R
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Per Bank) Wide >10m		(Most Predominant per Bank) Mature Forest, Wetland	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Moderate 5-10m		Immature Forest, Shrub or Old Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Narrow <5m		Residential, Park, New Field	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
None		Fenced Pasture	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Conservation Tillage	
		Urban or Industrial	
		Open Pasture, Row Crop	
		Mining or Construction	

COMMENTS: _____

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

<input checked="" type="checkbox"/> Stream Flowing	<input type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent)
<input type="checkbox"/> Subsurface flow with isolated pools (Interstitial)	<input type="checkbox"/> Dry channel, no water (Ephemeral)

COMMENTS: _____

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

<input checked="" type="checkbox"/> None	<input type="checkbox"/> 1.0	<input type="checkbox"/> 2.0
<input type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5
		<input type="checkbox"/> 3.0
		<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

Flat (0.5 ft/100 ft) Flat to Moderate Moderate (2 ft/100 ft) Moderate to Severe Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? Yes No QHEI Score (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

WWH Name: Kian Run Distance from Evaluated Stream 1.75mi.
 CWH Name: Distance from Evaluated Stream
 EWH Name: Distance from Evaluated Stream

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 08/24/23 Quantity: 2.40 in.
Photograph Information: Upstream, downstream, substrate
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) pH (S.U.) 6.70 Conductivity (µmhos/cm) 143
Is the sampling reach representative of the stream (Y/N) Y If not, please explain:

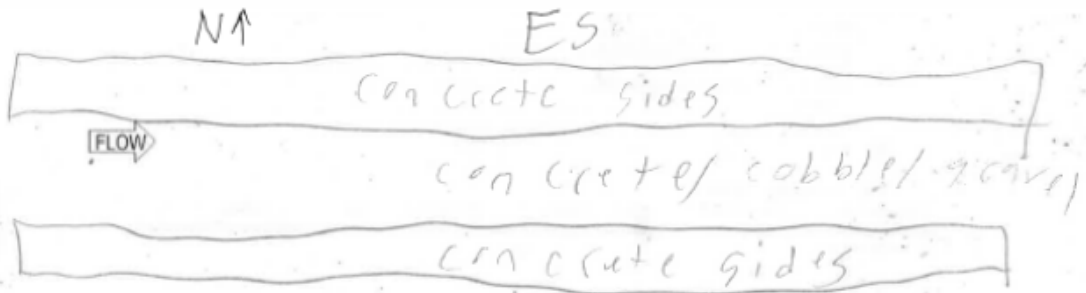
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N
Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





Primary Headwater Habitat Evaluation Form

71

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION Marion Station Extension - Potential Post Construction Reivew - Not Official Review
SITE NUMBER Stream 2 N-S RIVER BASIN DRAINAGE AREA (mi²) <1
LENGTH OF STREAM REACH (ft) 382 LAT. 39.92090 LONG. -82.97165 RIVER CODE R4SBC RIVER MILE
DATE 02/16/23 SCORER T. Gillette COMMENTS Perennial - Channelized ditch

NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PHWH Streams" for Instructions

STREAM CHANNEL MODIFICATIONS: NONE / NATURAL CHANNEL RECOVERED RECOVERING RECENT OR NO RECOVERY

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.
TYPE PERCENT TYPE PERCENT
BLDR SLABS [16 pts] 0% SILT [3 pt] 0%
BOULDER (>256 mm) [16 pts] 0% LEAF PACK/WOODY DEBRIS [3 pts] 0%
BEDROCK [16 pt] 0% FINE DETRITUS [3 pts] 0%
COBBLE (65-256 mm) [12 pts] 20% CLAY or HARDPAN [0 pt] 0%
GRAVEL (2-64 mm) [9 pts] 30% MUCK [0 pts] 0%
SAND (<2 mm) [6 pts] 10% ARTIFICIAL [3 pts] 40%
Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 20.00% (A) 100% (B)
SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12 TOTAL NUMBER OF SUBSTRATE TYPES: 4
2. Maximum Pool Depth (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check ONLY one box):
> 30 centimeters [20 pts] > 5 cm - 10 cm [15 pts]
> 22.5 - 30 cm [30 pts] < 5 cm [5 pts]
> 10 - 22.5 cm [25 pts] NO WATER OR MOIST CHANNEL [0 pts]
COMMENTS TOB W-14' D 3', OHWM W-10.6' d- 1' MAXIMUM POOL DEPTH (centimeters): 13
3. BANK FULL WIDTH (Measured as the average of 3-4 measurements) (Check ONLY one box):
> 4.0 meters (> 13') [30 pts] > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
> 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts] < 1.0 m (<= 3' 3") [5 pts]
> 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts]
COMMENTS TOB W-14' D 3', OHWM W-10.6' d- 1' AVERAGE BANKFULL WIDTH (meters): 4.20
HHEI Metric Points: Substrate Max = 40, 16, A + B; Pool Depth Max = 30, 25; Bankfull Width Max=30, 30

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY (NOTE: River Left (L) and Right (R) as looking downstream)

RIPARIAN WIDTH (Per Bank) L R: Wide >10m, Moderate 5-10m, Narrow <5m, None
FLOODPLAIN QUALITY (Most Predominant per Bank) L R: Mature Forest, Wetland, Immature Forest, Shrub or Old Field, Residential, Park, New Field, Fenced Pasture
L R: Conservation Tillage, Urban or Industrial, Open Pasture, Row Crop, Mining or Construction

COMMENTS:

FLOW REGIME (At Time of Evaluation) (Check ONLY one box):

Stream Flowing, Subsurface flow with isolated pools (Interstitial), Moist Channel, isolated pools, no flow (Intermittent), Dry channel, no water (Ephemeral)

COMMENTS:

SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check ONLY one box):

None, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, >3

STREAM GRADIENT ESTIMATE: Flat (0.5 ft/100 ft), Flat to Moderate, Moderate (2 ft/100 ft), Moderate to Severe, Severe (10 ft/100 ft)

ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):

QHEI PERFORMED? - Yes No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

<input checked="" type="checkbox"/> WWH Name: <u>Kian Run</u>	Distance from Evaluated Stream	<u>1.75 mi.</u>
<input type="checkbox"/> CWH Name: _____	Distance from Evaluated Stream	_____
<input type="checkbox"/> EWH Name: _____	Distance from Evaluated Stream	_____

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION

USGS Quadrangle Name: Franklin County, OH NRCS Soil Map Page: _____ NRCS Soil Map Stream Order: _____
County: Franklin Township / City: Urban Twp/Columbus

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 08/24/23 Quantity: 2.40 in.
Photograph Information: Upstream, downstream, substrate
Elevated Turbidity? (Y/N): N Canopy (% open): 100%
Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____
Field Measures: Temp (°C) 11.70 Dissolved Oxygen (mg/l) _____ pH (S.U.) 6.70 Conductivity ($\mu\text{mhos/cm}$) 143
Is the sampling reach representative of the stream (Y/N): Y If not, please explain:

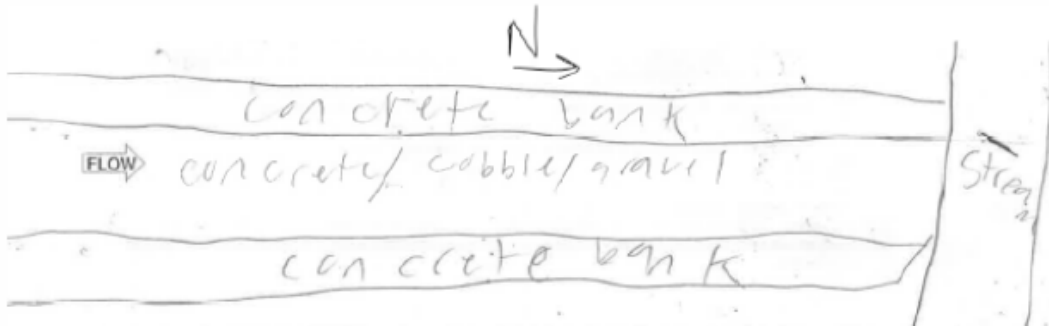
Additional comments/description of pollution impacts:

BIOTIC EVALUATION

Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N): N Voucher? (Y/N): N Salamanders Observed? (Y/N): N Voucher? (Y/N): N
Frogs or Tadpoles Observed? (Y/N): N Voucher? (Y/N): N Aquatic Macroinvertebrates Observed? (Y/N): N Voucher? (Y/N): N
Comments Regarding Biology:

DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location



Appendix B: Calculating SCPZ Width at the Marion Road Station

The site has two channels creating a Y shape where they intersect near the west property line. The east-west ditch is approximately 814 feet long, measured in CAD, and is fed by the larger-diameter pipe. The north-south ditch intersects the east-west ditch approximately 150 feet from the west property line and is approximately 350 feet long. The combined ditch travels an additional 1,000 feet across two neighboring properties before returning underground in a 10-foot diameter pipe. (Figure 12)

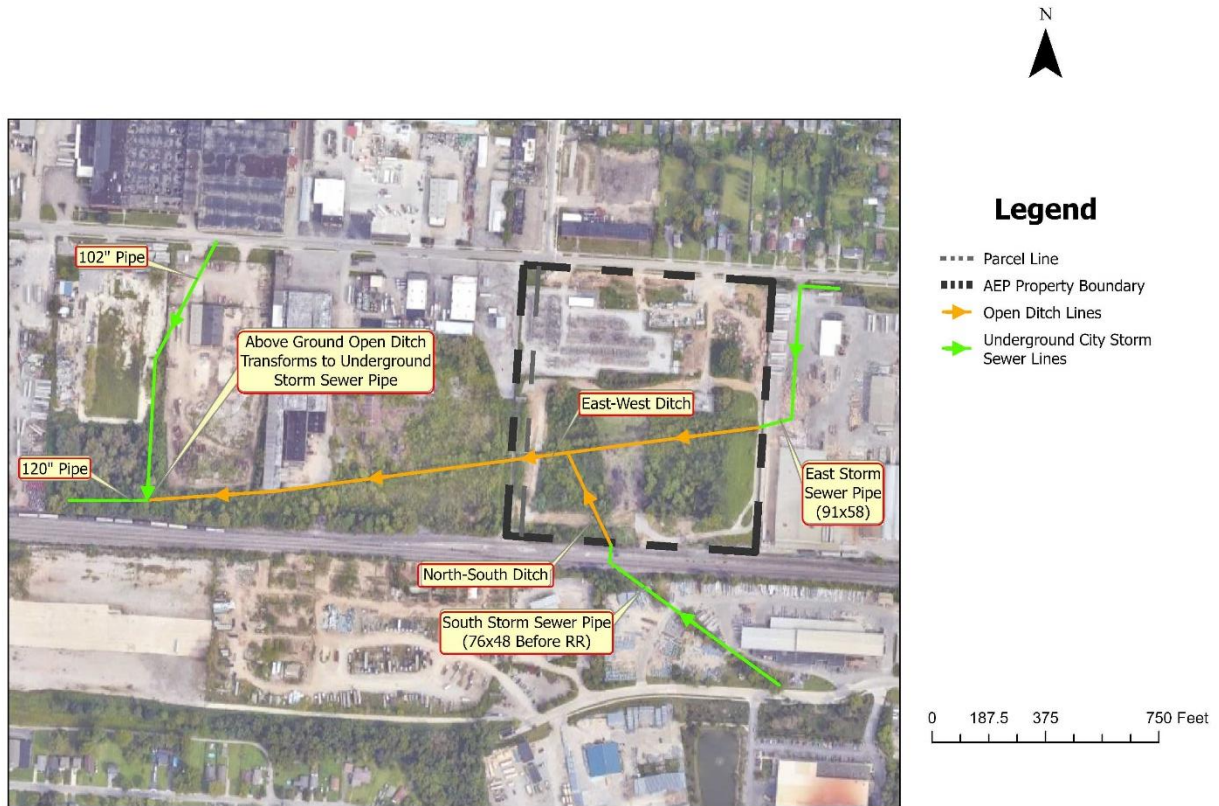


Figure 12. Hydrology of Marion Road Station Property

The United States Geological Survey (USGS) StreamStats tool is the usual methodology for estimating watersheds upstream from a specific point. Given the extensive history of channelization, rerouting, and piping of stormwater as the area became developed, StreamStats did not seem to be applicable at this site. A conversation with USGS staff confirmed that they do not recommend trying to use their tool for an urban area like this site as the results are likely to be erroneous.

Instead, upon consultation with the City of Columbus, the city's records—including the city utility GIS, original water and sewer construction plans, record drawings of private sewer systems, and city atlas maps—were used to develop boundaries of the watersheds contributing to the two pipes outletting on the Marion Road Station property. These watersheds were compared to the watershed areas supplied by the City of Columbus during this records search

and found to largely agree. The result was a drainage area of 633 acres (0.99 square mile) for the pipe entering the property from the south and 420 acres (0.66 square mile) for the pipe entering the property from the east.

This was enough information to calculate the stream corridor protection zone (SCPZ) width in Section 1.3.1.2 of the Stormwater Drainage Manual (SWDM). This equation states that the width of the SCPZ, in feet, equals the drainage area in square miles^{0.38} x 147.

Table 3 is a summary of watershed sizes and calculated SCPZ widths using the equation in SWDM Section 1.3.1.2.

Table 4. SCPZ Width for Each Channel Segment

Ditch Segment	Drainage Area (mi²)	SCPZ Width (ft)
East-West	0.66	125
North-South	0.99	146
Combined	1.65	178

Appendix C: Off-Site Mitigation Site Selection and Mitigation Plan

Site Selection

AEP looked for suitable off-site mitigation locations in the same and adjacent EPA HUC12 (hydrologic unit code) watershed delineation areas. The HUC12 containing the Marion Road Station site has very limited opportunities to mitigate waterways, so adjacent HUC12s were also examined for suitable properties. The HUC12 containing the Marion Road Station and surrounding HUC12 watersheds are shown in Figure 13. In addition to proximity, AEP tried to locate properties with a waterway that could be improved, sufficient adjacent land for the SCPZ, and properties over which AEP could have or gain ownership to convey a conservation easement to City of Columbus.

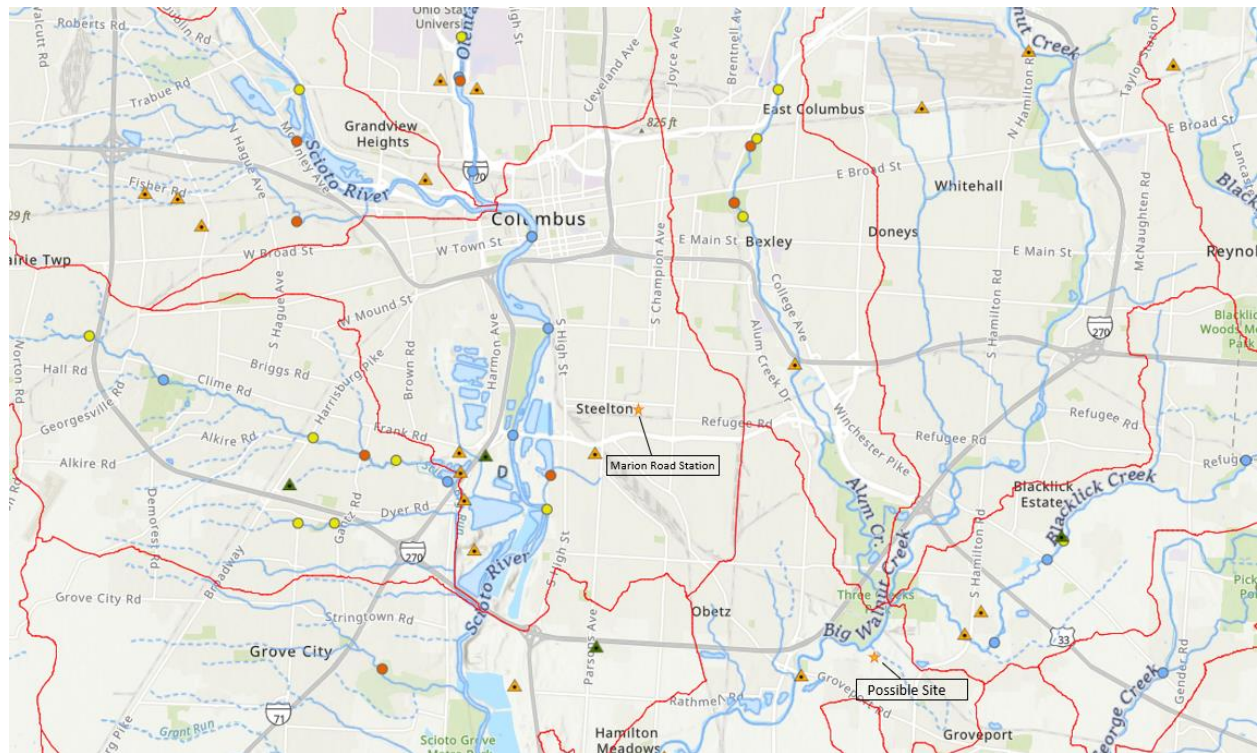


Figure 13. EPA Hydrologic Unit (HUC)-12 Showing Marion Road Station Site and Neighboring HUC-12s

AEP began off-site mitigation efforts by looking for sites near the Marion Road Station property. Few suitable properties exist near the Marion Road Station site, and none have been located that are of sufficient size to mitigate on one property. As discussed in Section 4.0, between per-acre cost, limited availability of property for sale, and AEP's fiduciary responsibility to rate payers, purchasing mitigation property in Columbus can create a serious hardship. Similarly, the per-unit cost of mitigation increases when mitigation is performed across multiple properties. The most reasonable option is to utilize a single, suitable property already owned by AEP.

Following common mitigation site screening guidance, AEP looked at adjacent HUC12s for additional properties with an existing waterway that could possibly be mitigated. AEP has identified four potential mitigation sites, listed below:

- Unnamed Tributary of Kian Run – 797 Marion Rd, Columbus OH (Not AEP property: adjacent to Marion Road Station)
 - Kian Run-Scioto River HUC12 050600012302
 - The property is not feasible based on the following:
 - This property contains only +- 586 linear ft of the “Unnamed Tributary to Kian Run,” requiring acquisition of at least a second property.
 - There appears to be impending development on the property that would eliminate the opportunity to utilize this property as a mitigation site. The property only has similar mitigation value to the Marion Road Station site.

- Holton Ditch – 3810 Bixby Rd, Columbus OH (AEP Property)
 - Lockborne-Alum Creek HUC12 050600011603
 - The property is feasible based on the following:
 - This property contains over 1,600 linear ft of the “Holton Ditch.”
 - There is sufficient acreage on the property to account for SCPZ mitigation at a 2 to 1 ratio within a maximum 250 ft SCPZ corridor.

- Unnamed Tributary to Alum Creek-- 4909 Westerville Rd, Columbus OH (AEP Property)
 - Bliss Run-Alum Creek HUC12 050600011602
 - The property is not feasible based on the following:
 - This property contains only +-839 linear ft of the “Unnamed Tributary to Alum Creek,” requiring acquisition of at least a second property.
 - There is not sufficient acreage on the property to account for SCPZ mitigation at a 2 to 1 ratio within a maximum 250 ft SCPZ corridor.
 - Property appears to have little mitigation value based on existing vegetation and meanders of the stream. Essentially, there are no areas of stream improvement available.

- Reece Ditch – 6000 West Broad St, Columbus OH (AEP Property)
 - Scioto-Big Run HUC12 050600012301 (Edge bordering Hellbranch Run)

- The property is not feasible based on the following:
 - This property contains only +-300 linear ft of the “Reece Ditch,” requiring acquisition of at least a second property.
 - There is not sufficient acreage on the property to account for SCPZ mitigation at a 2 to 1 ratio within a maximum 250 ft SCPZ corridor.

Of the sites examined, the Holton Ditch site is most suitable for off-site mitigation. It currently is owned by AEP and borders both Big Walnut Creek and Holton Ditch, near Three Creeks Metro Park, and is in a HUC12 adjacent to the one containing the Marion Road Station site. It also has sufficient acreage and stream length to allow all mitigation to be performed at one location. This site is discussed below.

Overview of Proposed Site

The AEP Holton Ditch property contains approximately 1,660 feet of Holton Ditch, including 1,166 feet where a wide riparian zone on both banks is owned by AEP. The landowner for the remaining Holton Ditch riparian zone is Franklin County Parks, ensuring no future development should occur.

Holton Ditch appears to have been impacted by previous land activities and could be improved. The zone bordering Holton Ditch is a mixture of woods and open field, so the area appears suitable for mitigating the trees removed from the Marion Road Station site. Additional in-depth ecological investigation of the stream is underway.

Basic assumptions for the first conceptual design:

-Concrete channel length on the Marion Road Station property ranges from 1,197 feet measured from the topographic survey to 1,203 feet measured during the HHEI survey. The round number of 1,200 linear feet to be placed under conservation easement was used for the first conceptual design. This mitigates the streams at a 1 to 1 ratio.

-Section 1.3.1.2 of the SWDM indicates the maximum width of an SCPZ is 250 feet, centered on the channel. Since the potential SCPZ area does not have slopes 15% or greater or wetlands that would increase the required width, a conservation easement width of 125 feet on either side of Holton ditch was used for the first conceptual design. A FEMA floodway exists for the Big Walnut Creek but is not in the proposed SCPZ for Holton Ditch.

-The total SCPZ area at Marion Road station is 3.02 acres outside top of bank and 0.45 acres of concrete-lined trapezoidal channels for a total acreage of 3.47. Mitigating acreage offsite at a 2 to 1 ratio would require a stream mitigation and conservation easement area of at least 6.94 acres.

-As shown in Tables 2 and 3, a total of 78 native trees (6 dbh and above) are impacted in the Marion Road Station SCPZ. At minimum, an equivalent number are planned to be identified as present or would be planted in the off-site mitigation area.

Figure 14 shows a potential mitigation area and conservation easement applied to Holton Ditch. This conceptual design protects 1,422 linear feet of Holton Ditch and a total of 6.96 acres. The majority of the ditch is already shaded by trees. Holton Ditch and some of the surrounding area is also a FEMA Special Flood Hazard Area with a base flood elevation of 726 feet. A FEMA Floodway exists nearby for Big Walnut Creek, but does not overlap with the proposed SCPZ and conservation easement area for Holton Ditch.

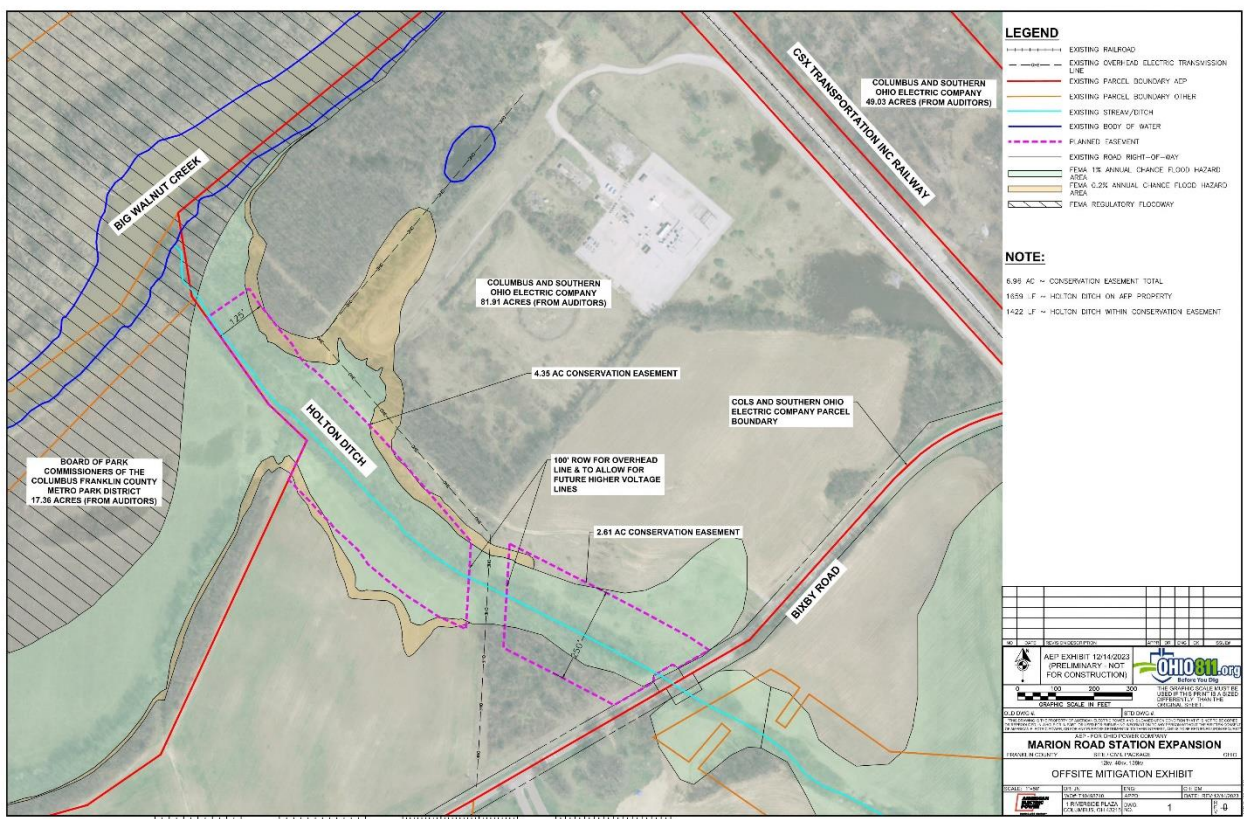


Figure 14. Potential Off-Site Mitigation Area with Conservation Easement

Conceptual Mitigation Plan

The goal of the mitigation plan is to provide replacement for the elimination of the SCPZ from the Marion Road Station that includes two concrete lined streams. The Marion Road station SCPZ is based on the calculations as provided in Appendix B, will result in the removal of 3.47 acres of SCPZ including the 1,200 linear feet of two concrete-lined ditches. The mitigation SCPZ

will contain a stream and will be of better quality than the two concrete-lined ditches. The off-site mitigation will provide for the improvement of the stream and riparian corridor contained in the SCPZ and conservation easement to be granted to the City of Columbus. It should be noted that the existing HHEI of the concrete-lined channels is 66 and 71 HHEI score which remained unchanged in post-construction evaluation.

The mitigation approach is based on a pre-existing evaluation, onsite mitigation activities, and post-mitigation evaluation, discussed below. The entire off-site mitigation SCPZ will be placed in conservation easement held by the City of Columbus per the SWDM. The off-site mitigation work is planned to be performed under its own CC plan, SWPP, and Stormwater Management Performance Bond.

Pre-Existing Evaluation of Mitigation Site

To assess the quality of the existing stream corridor and create a baseline to measure improvement, the following will be completed for the selected mitigation site by an ecological/biological consultant employed by AEP and well-versed in mitigation activities:

- An evaluation/measure of the habitat in the area regarding the riparian corridor to identify invasive species, including trees, shrubs, and other types of vegetation.
- An evaluation/measure of the stream (e.g. Holton Ditch) noting bank condition, channel morphology, pool/riffle quality, stream canopy, and gradient. Overall sinuosity and erosion issues of the stream will be recorded. A HHEI will be prepared for the area of stream located in the mitigation area.
- Evaluation of adjacent land areas and receiving waters, and positive/negative influences to and from each.
- Cultural Resource investigations will be completed in the event that a Clean Water Act permit is required.
- Identification of the FEMA regulated floodplain/floodway of the subject stream.
- The end result of the evaluation will be the formulation of the mitigation plan to improve the SCPZ inclusive of the stream corridor.

Mitigation Plan Implementation

As the in-depth study of the potential off-site mitigation site has not yet been completed, only conceptual measures can be outlined here. It is proposed to remove any invasive tree species where possible without impacting the stability of the stream banks. It is proposed to replant native species to the stream corridor to provide bank stability or shading and resulting in total on-site native trees equal to the 78 removed at Marion Road Station. A native seed mix will be used in areas of clearing of invasive vegetation or other activities, including clearing of the ROW

maintained for the overhead power line that crosses Holton Ditch outside the proposed conservation easement.

Post-Mitigation Evaluation

After implementation of site mitigation, the following measures will be completed:

-Assessment of the quality of the resulting stream and stream corridor, noting improvements and summarizing mitigation measures implemented at the site.

-A post-construction HHEI will be prepared for the area of stream located in the mitigation area.

-Closeout of any Clean Water Act Permit certification of completion.

-Filing and permanent signage of the City of Columbus conservation easement for the SCPZ area.