LETTER OF NOTIFICATION FOR THE

MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INSTALLATION OF THE HOLLOWAY STATION PROJECT

PUCO Case No. 14-0141-EL-BLN

Submitted pursuant to OAC 4906-11-01

AEP Ohio Transmission Company
(AEP Ohio Transco)

February 2014

LETTER OF NOTIFICATION
Muskingum River-Tidd 345 kV Transmission Line Relocation and Installation of the Holloway Station Project

American Electric Power Ohio Transmission Company (AEP Ohio Transco) is providing the following information in accordance with the procedures delineated in Ohio Administrative Code Section 4906-11-01: Letter of Notification Requirements of the Rules and Regulations of the Ohio Power Siting Board (OPSB).

4906-11-01(B) GENERAL INFORMATION

1. **The name of the project and applicant's reference number, if any, names and reference numbers(s) of resulting circuits and a brief description of the project, and why the project meets the requirements of a letter of notification.**

   The proposed Muskingum River-Tidd 345 kV Transmission Line Relocation and Installation of the Holloway Station Project (Project) was originally referred to as Ghost Town Station and is identified on tab 2012_OTC_Table 1 in the Long-Term Forecast Report (LTFR) for 2012.

   The Project consists of constructing a new 345/138 kV transmission substation to be known as Holloway Station on property owned by AEP Ohio Transco and relocating the existing Muskingum River-Tidd 345 kV transmission line into the new station. A 138 kV tie line will connect the proposed 345 kV and 138 kV yards of Holloway Station. A Letter of Notification to construct extensions from four existing 138 kV lines owned by FirstEnergy to the Holloway Station will be submitted to the OPSB under separate cover by FirstEnergy or one of their subsidiaries.

   As proposed in this Letter of Notification, Holloway Station and the adjacent transmission line work will be constructed on property owned by AEP Ohio Transco adjacent to Hawthorne Hill Road in Mead Township, Belmont County, Ohio. Figure 1 shows the location of the project in relation to the surrounding vicinity. The property is approximately 62 acres in size. Two residences are currently situated along the eastern portion of the property, with the remainder primarily forested, but partially cleared for existing transmission line rights-of-way. The fenced portion of the proposed 345 kV yard of Holloway Station is approximately five acres and situated on the eastern portion of the property along Hawthorne Hill Road. The approximately 600-foot northern 345 kV relocation will connect the Muskingum River-Tidd 345 kV line and Holloway Station to form Kammer-West Bellaire-

Tidd and Holloway-Tidd 345 kV circuits. The approximately 800-foot southern 345 kV relocation will connect the Muskingum River-Tidd 345 kV line and Holloway Station to form a Beverly-Holloway and Kammer-West Bellaire-Tidd 345 kV circuits. The existing portion of the Muskingum River-Tidd 345 kV line between the two new relocations will be removed, and the approximately four-acre fenced portion of the 138 kV yard will be positioned in the approximate location of the removed line, to the west of the 345 kV yard. An approximately 400-foot long 138 kV tie line will connect the 345 kV and 138 kV yards of Holloway Station. A preliminary overview of the station yards, 345 kV transmission line relocation, and 138 kV tie line is provided as Figure 2A. Preliminary equipment layouts for the 345 kV and 138 kV station yards are provided as Figures 2B and 2C, respectively. A preliminary grading plan is provided as Figures 3.

The transmission line portions of the Project, including two 345 kV transmission line relocations totaling approximately 0.35 mile in length and an approximately 0.2-mile 138 kV tie line, meet the requirements for a Letter of Notification because it is within the types of projects defined by Items (1)(a), (1)(d), and (1)(g) of Attachment A of the interim process defined in the OPSB's September 4, 2012 Finding and Order in Docket 12-1981-GE-BRO. These items state:

> *(1) Rerouting or extension of new construction of single or multiple circuit electric power transmission line(s) as follows:*
>
> *(a) Line(s) three hundred kV and above, and greater than 0.1 mile but not greater than two miles in length.*
>
> *(d) Line(s) one hundred twenty-five kV and above, but less than three hundred kV, and greater than 0.2 miles in length but not greater than two miles in length.*
>
> *(g) Lines(s) that are necessary to maintain reliable electric service as a result of the retirement or shutdown of an electric generating facility located within the state.*

The station portion of the Project meets the requirements for a Letter of Notification because it is within the types of project defined by Item 5(d) of the OPSB's Second Finding and Order issued in Docket 12-1981-GE-BRO on December 17, 2012. This item states:

(5) In light of the increase in the number of applications subject to the accelerated review process as a result of S.B. 315, and, in effort to further delineate the necessary processes for these types of cases, the Board finds it appropriate to further refine the interim process initiated in the September 4, 2012, finding and order. Accordingly, the following processes shall be established:

(d) An applicant filing a letter of notification application after the date of this order that is for an electric transmission line that qualifies under the accelerated review process provided for in Section 4906.03(F)(1), Revised Code, and provision (1)(g) of the Interim 12-1981-GE-BRO-4-Attachment, should file any associated substation facility as part of its letter of notification application. The associated substation will not be subject to additional filing requirements before the Board.

2. If the proposed letter of notification project is an electric power transmission line or gas or natural gas transmission line, a statement explaining the need for the proposed facility.

The purpose of this Project is to help alleviate loading and provide voltage stability on the transmission system due to generation retirements. This will improve the reliability in eastern Ohio, including the Canton area, and in western Ohio by providing flexibility for system power flows. In early 2012, approximately three Gigawatts of generation retirements were announced near the shores of Lake Erie. The original impact to the transmission system was so severe that FirstEnergy decided to convert several of the announced retired units to synchronous condensers in order to maintain voltage stability. As a part of PJM, the First Energy system relies on the PJM Market to meet their demands. AEP's 765kV transmission system, being the major transmission highway, carries most of the portion of this supply to the AEP-FirstEnergy seam in Canton. The FirstEnergy and AEP seam in Canton is served by a radial 765kV line. Loss of this line impacts AEP's underlying system and drives the need for reinforcements in the AEP footprint.

The Holloway Station projects serve as an alternative source into the FirstEnergy areas in eastern Ohio, including the Canton area, and Western Ohio. It is one of the projects identified by AEP as reinforcement in its footprint. Holloway Station will be a new 345/138kV station that will be feeding the FirstEnergy owned Brookside and Longview Stations in Western Ohio; and the FE proposed Harmon and the existing FirstEnergy

Bluebell Stations in the Canton area. Holloway Station will not only provide an alternate route for current to flow to all these FirstEnergy stations, but it will also provide much needed voltage support for both areas. The project was submitted to PJM and approved by their board on July of 2012. The relocation of the Tidd-Muskingum River 345kV line to energize Holloway Station is crucial in order to provide more reliability to the aforementioned areas; as all the support will be coming from AEP's 345kV system.

3. **The location of the project in relation to existing or proposed lines and stations shown on maps and overlays provided to the public utilities commission of Ohio in the applicant's most recent long term forecast report.**

   This project is referenced on tab 2012_OTC_Table 1 in AEP Ohio Transco's LTFR for 2012. Figure 1 shows the general location of the Project in relation to AEP Ohio Transco's existing Muskingum River-Tidd 345 kV line and FirstEnergy's four existing 138 kV lines.

4. **The alternatives considered and reasons why the proposed location or route is best suited for the proposed facility. The discussion shall include, but not be limited to impacts associated with socioeconomic, natural environment, construction, or engineering aspects of the project.**

   AEP Ohio Transco and its siting consultant, URS, conducted a Site Selection Study in January 2013 to identify and evaluate potential sites for Holloway Station in the vicinity of the intersection of the Muskingum River-Tidd 345 kV line and the four First Energy 138 kV lines. The purpose of this site selection study was to assist in identifying sites best suited for the station and associated transmission line interconnections. It was designed to identify and compare suitable sites that minimize the overall effects on ecology, sensitive land uses, and cultural features while maintaining economic and technical feasibility.

   In this study, the Project vicinity presents significant siting challenges due to the steep terrain of most of Belmont County. Relatively flat areas of adequate size for the proposed facility are extremely limited, without major grading and filling activities. With one 345 kV and four 138 kV existing electric transmission lines to be connected to the proposed station, potential sites far from the intersection of these lines are greatly constrained due to the potential impacts associated with routing new transmission lines through this challenging landscape. Thus, practical candidates are very limited. AEP and URS limited the study area to within two miles of the intersection of the source transmission lines.

Ultimately, five preliminary sites were identified with the potential to meet the Project's basic technical requirements, as shown on Figure 4. AEP and URS collected and tabulated desktop land use, ecological, cultural, and technical data, and that data was used to compare the sites. Specific criteria considered in the evaluation included forested areas, National Wetland Inventory areas, mapped streams, threatened and endangered species, previously recorded cultural resources, residences, institutions and other sensitive land uses, size of the overall property, and distances to the source transmission lines.

Very few quantitative attributes provided significant differentiation between the candidates. Distances to the source transmission lines showed the greatest differentiation and provided the best comparative value. While these distances suggest the relative costs of new lines and potential engineering difficulties associated with greater lengths, they are also indicative of potential impacts in the other categories associated with relocation/extension of new transmission line interconnections. For example, one mile of 345 kV right-of-way at the typical width of 150 feet through a wooded area is likely to require clearing approximately 18 acres of trees. The potential for affecting streams, wetlands, residences, cultural resources, and other sensitive features increases with longer lengths for the interconnections. Site 1 is the only candidate site that offers adjacent interconnection to all of the source transmission lines on the same overall property. Overall, the engineering factors suggested Site 1 is the best engineering candidate. Site 1 would require more tree clearing for the footprint of the station than the other sites. However, when including the distances from the candidate sites to the source transmission lines, Site 1 would actually have the least total tree clearing and would reduce the number of transmission line stream crossings.

Based on the results of the Site Selection Study, AEP Ohio Transco commissioned ecological and cultural resource field studies at and adjacent to the initial Site 1 candidate. No fatal flaws were identified during these field studies and AEP Ohio Transco ultimately purchased the approximately 62-acre Project property that included the Site 1 candidate. Two residences are located on the overall property and will be removed as part of the Project. This circumstance was mitigated through financial compensation to the previous land owners.

5. The anticipated construction schedule and proposed in-service date of project.

Tree and vegetation clearing is scheduled to begin in March 2014. This allows AEP Ohio Transco to adhere to seasonal habitat clearing restrictions associated with the Indiana bat

requested by the Ohio Department of Natural Resources (ODNR) and the United States Fish and Wildlife Service (USFWS), although habitat is extremely limited on the station property despite the extent of overall forested area on site. Once clearing is completed, construction of the station, 345 kV relocation, and 138 kV tie line will begin in May 2014. The in-service date for the Project is December 2015.

6. **An area map of not less than 1:24,000-scale clearly depicting the facility's centerline with clearly marked streets, roads, and highways, and clearly written instructions for locating and viewing the facility.**

   Figure 1 provides the proposed Project centerline on the United States Geologic Service (USGS) 7.5-minute topographic map of the Businessburg, Ohio quadrangle. To access the Project location from public roads, take Interstate 70 East from Columbus for approximately 115 miles to Exit 219, to Interstate 470 East. Continue on Interstate 470 East for 6.3 miles to Exit 6 and take State Route 7 South toward Shadyside, Ohio. Take State Route 7 South for 6.8 miles and exit right toward Shadyside onto McGee Road for 0.9 mile. Turn right onto Cash Ridge Road and then immediately left onto Wegee Road/County Road 48. Follow Wegee Road for 2.2 miles to Hawthorne Hill Road and turn right (north), continuing 0.5 mile to the proposed site, which is on the left (west).

7. **A list of properties for which the applicant has obtained easements, options, and/or land use agreements necessary to construct and operate the facility and a list of the additional properties for which such agreements have not been obtained.**

   AEP Ohio Transco purchased the overall station property in December 2013. No additional properties, easements, options, or land use agreements are necessary.

(C) TECHNICAL FEATURES OF THE PROJECT

1. **Operating characteristics, estimated number and types of structures required, and right-of-way and/or land requirements.**

   Transmission Lines Data

   The Muskingum River-Tidd line is operated at 345 kV and the proposed relocation will not change the operating characteristics. The 345 kV transmission line relocation to Holloway Station will consist of 1,851,000 cm Type 13 ACCR-TW (Kammer-West Bellaire-Tidd Circuit) and 2,156,000 cm ACSR (84/19) (Beverly-Station Circuit & Holloway-Tidd Circuit).

Two 0.646" diameter 48-Fiber Optical Groundwire (OPGW) will be used as shield wires. The insulator assemblies will consist of two strings of 18 porcelain disc insulators for each phase. The 345 kV transmission line relocation structures to be installed will include eight self-supporting dead end structures.

The 138 kV tie line will consist of 1,926,900 cm Type 13 ACSR-TW, utilizing a bundle of two subconductors per phase. One 7#8 alumoweld overhead groundwire will be used as shield wire. The insulator assemblies will consist of two strings of 9 porcelain disc insulators for each phase. Structures to be installed along the 138 kV tie line will include three self-supporting dead end structures and two self- supporting single pole, davit arm tangent structures.

Figure 2A provides the layout of the proposed transmission line relocation and tie line. Structure sketches are included in Figures 5 through 7.

Holloway Station Data

The equipment and facilities described below will be installed within the fenced area of the proposed station. Typical cross sections of the substation equipment proposed for the Project are shown in the Figures 8 and 9. Figure 10 provides example photographs of similar 345 kV and 138 kV yards.

Breakers: There will be five 345kV breakers and 20 138kV breakers installed at the station. These breakers are SF6 gas insulated, dead tank breakers. The 345kV breakers are ganged 3-pole operation on individual frames, while the 138kV breaker is ganged 3-pole operation on a common frame.

Switchgear: The 345kV switchgear will consist of 15 group-operated three-phase disconnect switches. The 138kV switchgear will consist of 59 group-operated three-phase disconnect switches.

Bus Arrangement and Structures: The 345kV yard will utilize a breaker-and-a-half configuration. The 138kV yard will utilize a double bus, double breaker configuration.

Equipment support steel structures will be designed using hot-rolled structural steel shapes such as wide flange, tubing, channels and angles or as folded plate tapered tubular structures. Dead-end structures will be made of tapered tubular steel. All yard structures

will be ASTM A36, ASTM A500, or ASTM A572 steel hot-dip galvanized for corrosion protection.

Transformers: One 345/138kV, 675MVA three-phase, oil filled auto transformer will be installed. Transformer oil containment provisions will be designed and constructed to meet the requirements of the Environmental Protection Agency's SPCC rule.

Control Buildings: The control houses will consist of a pre-engineered or factory fabricated metal buildings to contain all substation control and relay panels and miscellaneous equipment. This would include an RTU, DC distribution panel, batteries, battery chargers, and other miscellaneous equipment. The control houses will include building HVAC and internal lighting. The substation facility will not be manned. Plumbing facilities are not required. A 16-foot by 48-foot control house in the 345kV yard, and a 16-foot by 72-foot control house in the 138kV yard.

Other Major Equipment: Other equipment can include surge arresters, capacitor voltage transformers (CVT's), line traps, and station service voltage transformers (SSVT's).

Lighting systems at the station will be necessary for safety, security, and to comply with applicable standards. There are two different illumination levels for station yard lighting systems. NESC Section 11, Table 111-1 recommends a two foot-candle illumination level in stations for general service lighting. The IES Lighting Handbook, Figure 2-1, recommends a 0.5 foot-candle horizontal illumination level for general security lighting. Security lighting is intended to illuminate the areas inside the station yard that might attract vandalism or theft. Service lighting is intended to provide additional lighting for unscheduled callouts to the station.

2. For electric power transmission lines, the production of electric and magnetic fields during the operation of the proposed electric power transmission line.

(a) Calculated Electric and Magnetic Field Levels

Three loading conditions were examined: (1) normal maximum loading, (2) emergency line loading, and (3) winter normal conductor rating. Normal maximum loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter normal (WN) conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry

during winter conditions. It is not anticipated that this line would operate at its WN rating in the foreseeable future. Loading levels used in the EMF calculations are presented below. These levels are based on the 2014 projected system conditions. The corresponding designs, including phase configurations, are shown in Figures 11 and 12.

PROJECTED LOADING LEVELS			
Line	**Line Loading**		
	Normal (A)	Emergency (A)	Rating (A)
Kammer-West Bellaire 345 kV Line	1078	1262	1078
Beverly-Holloway 345 kV Line	716	819	716
Holloway-Tidd 345 kV Line	289	476	289

The calculated electric and magnetic fields are summarized below. Typical cross section profiles at normal maximum loading conditions are shown in Figures 13 through 16.

EMF CALCULATIONS				
		Magnetic Field (mG)*		
Line	**Electric Field (kV/m)***	**Normal Maximum Load**	**Emergency Load***	**Winter Normal Rating**
Holloway-Tidd 345 kV and Kammer-West Bellaire 345 kV, Structure 243 – 243A	0.06/3.2/0.06	15.83/49.84/20.2	25.1/69.8/28.9	89.5/244.8/89.5
Holloway-Tidd 345 kV and Kammer-West Bellaire 345 kV, Structure 243B – 244	0.07/3.8/0.07	16.7/62.4/21.6	26.55/86.3/30.9	94.2/302.7/94.2
Beverly-Holloway 345 kV and Kammer-West Bellaire 345 kV, Structure 243 – 243A	0.06/3.2/0.06	34.1/94.9/39.4	43.1/113.7/47.54	89.5/244.8/89.5
Beverly-Holloway 345 kV and Kammer-West Bellaire 345 kV, Structure 243B – 244	0.07/3.8/0.07	36.1/117.3/42	45.7/139.6/50.7	94.2/302.7/94.2

* EMF levels (left ROW edge/maximum/right ROW edge) calculated one meter above ground assuming balanced currents and nominal voltages. Electric fields reflect normal and emergency operation.

(b) Discussion of the Company's Design Alternatives Regarding EMF Levels

Line construction associated with the Project is proposed in locations that would not place them in close proximity to existing residential areas and, therefore, will not significantly increase EMF exposure of the public.

3. **The estimated cost of the project by Federal Energy Regulatory Commission account, unless the applicant is not an electric light company, a gas company or a natural gas company as defined in Chapter 4905. of the Revised Code (in which case, the applicant shall file the capital costs classified in the accounting format ordinarily used by the applicant in its normal course of business).**

   The 2014 capital cost estimates for the proposed project have been tabulated by the Federal Energy Regulatory Commission (FERC) Electric Plant Transmission Accounts:

ESTIMATES OF APPLICABLE INTANGIBLE AND CAPITAL COSTS		
FERC Account Number	**Description**	**Cost**
350	Land and Land Rights	$2,100,000
352	Structures & Improvement	$29,642,800
353	Substation Equipment	$17,047,300
354	Towers & Fixtures	Not Applicable
355	Poles & Fixtures	$4,786,400
356	Overhead Conductors & Devices	$734,800
357	Underground Conductors & Devices	Not Applicable
358	Underground-to-overhead Conversion Equipment	Not Applicable
359	Right-of-way Clearing, Roads, Trails or Other Access	Not Applicable
	TOTAL	**$54,311,300**

(D) SOCIOECONOMIC DATA

1. **A brief description of land use within the vicinity of the proposed project, including: (a) a list of municipalities, townships and counties affected; and (b) estimates of population density adjacent to rights of way within the study corridor (the U.S. census information may be used to meet this requirement.)**

   On behalf of AEP Ohio Transco, URS prepared a Socioeconomic, Land Use, and Agricultural District Review Report. This report is included as Appendix A.

2. **The location and general description of all agricultural land (including agricultural district land) existing at least sixty days prior to submission of the letter of notification within the proposed electric power transmission line right-of-way, or within the proposed electric power transmission substation fenced-in area, or within the construction site boundary of a proposed compressor station.**

   No agricultural land will be impacted by the construction of the Project, as detailed in Appendix A.

3. **A description of the applicant's investigation (concerning the presence or absence of significant archaeological or cultural resources that may be located within the area likely to be disturbed by the project), a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

   A Phase I Archaeological Investigation was conducted for this project. Weller & Associates, Inc. has initiated a Phase I archaeological investigation for the Project. A copy of this report will be provided to the Ohio Power Siting Board under separate cover.

4. **Documentation that the chief executive officer of each municipal corporation and county, and the head of each public agency charged with planning land use in the area in which any portion of the facility is to be located have been notified of the project and have been provided with a copy of the letter of notification. The applicant shall describe the company's public information program used in the siting of the proposed facility. The information submitted shall include either a copy of the material distributed to the public or a copy of the agenda and summary of the meeting(s) held by the applicant.**

   AEP Ohio Transco met with Mr. Matt Coffland, President, Belmont County Commissioners; Mr. Fred Bennett, Belmont County Engineer; and Mr. Ed Good, President, Mead Township Trustees in January 2014 to discuss the Project. Copies of this Letter of Notification have been sent to the Belmont County Commissioners and Mead Township Trustees, as well as Belmont County Public Library facilities including Martins Ferry Main Library and Shadyside Branch Library. Copies of the cover letters to these officials and local libraries are attached in Appendix B.

   AEP Ohio Transco will advise local officials of features and the status of the proposed Project.

5. **A brief description of any current or pending litigation involving the project known to the applicant at the time of the letter of notification.**

   There is no known current or pending litigation involving this Project.

6. **A listing of local, state, and federal governmental agencies known to have requirements which must be met in connection with the construction of the project, and list of documents that have been or are being filed with those agencies in connection with siting and constructing the project.**

   A Notice of Intent will be filed with the Ohio Environmental Protection Agency for authorization of construction stormwater discharges under General Permit OHC000003. Approximately 275 feet of one ephemeral stream is located within the preliminary grading limits for the Project and will be filled. Stream impacts less than 300 feet in length automatically qualify for a Nationwide 12 permit. There are no other known local, state, or federal requirements that must be met prior to commencement of the proposed Project.

(E) ENVIRONMENTAL DATA

1. **A description of the applicant's investigation concerning the presence or absence of federal or state endangered species (including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest) that may be located within the area likely to be disturbed by the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

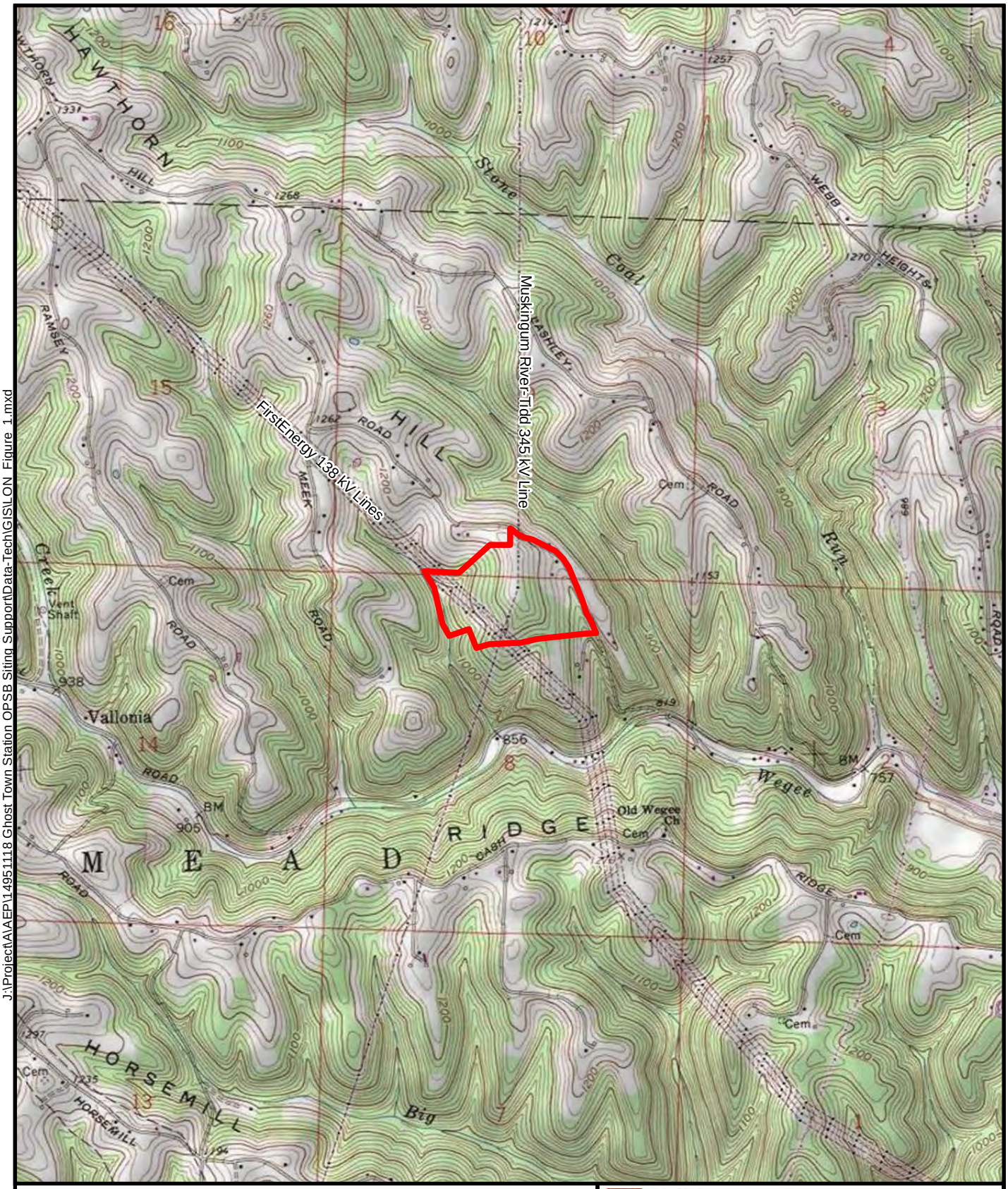
   On behalf of AEP Ohio Transco, URS prepared a Threatened and Endangered Species Report. URS coordinated with the USFWS and ODNR regarding special status species in the vicinity of the Project. To address special status species concerns, AEP Ohio Transco proposes to adhere to seasonal tree clearing restrictions associated with Indiana bat habitat. AEP Ohio Transco plans to phase construction to conduct tree clearing beginning in March 2014 so clearing of any potential bat habitat trees is complete by April 1, 2014. No impacts to threatened or endangered species are expected. The full Threatened and Endangered Species Report for the Project is included as Appendix C.

2. **A description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains, wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the areas likely to be disturbed by the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

   On behalf of AEP Ohio Transco, URS prepared an Areas of Ecological Concern, Wetland Delineation, and Stream Assessment Report. No impacts to wetlands are anticipated. Approximately 275 feet of one ephemeral stream is located within the preliminary grading limits for the Project and will be filled. The full Areas of Ecological Concern, Wetland Delineation, and Stream Assessment Report for the Project is included as Appendix D.

3. **Any known additional information that will describe any unusual conditions resulting in significant environmental, social, health or safety impacts.**

   To the best of AEP Ohio Transco's knowledge, no unusual conditions exist that would result in environmental, social, health, or safety impacts. Construction and operation of the proposed Project will meet all applicable safety standards established by the Occupational Safety and Health Administration, and will be in accordance with the requirements specified in the latest revision of the National Electrical Safety Code as adopted by the Public Utilities Commission of Ohio. The Stormwater Pollution Prevention Plan (SWPPP), which will include the Access Plan, will be provided to the OPSB under separate cover, after submission of this Letter of Notification.



LEGEND:

Project Property

0 2,000 4,000

Scale in Feet

N

AEP OHIO TRANSMISSION COMPANY

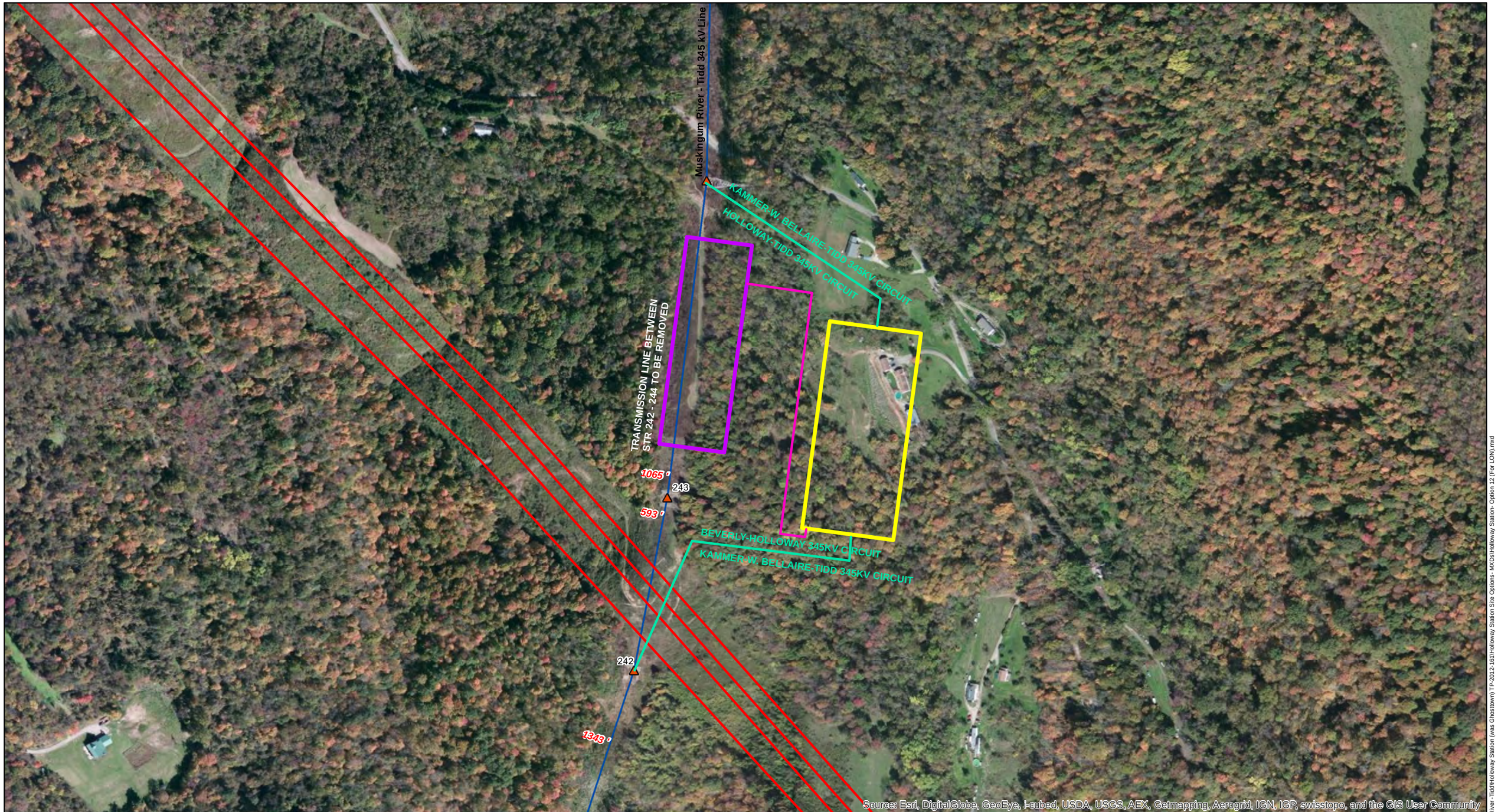
Holloway Station

FIGURE 1
PROJECT OVERVIEW

JOB NO.14951118

URS

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_Figure_1.mxd



Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet

138kV Substation
345kV Substation
First Energy 138kV Lines
AEP 138kV Tie Line
AEP 345kV Relocation

0 125 250 500 750 1,000 Feet

FIGURE 2A
Holloway Station Preliminary Layout

Transmission Line Engineering Group

Source: American Electric Power, ESRI
Comments:

Drawn By: s248914
Date: 1/27/2014

AEP®
700 Morrison Rd.
Gahanna, OH 43230-6642
PH: (614) 716-1000
Fax: (614) 552-1818

Path: H:\Internal\TL_Projects\345kV\Muskingum River-Tidd\Holloway Station (was Ghosttown) TP-2012-1611\Holloway Station Site Options- MXDs\Holloway Station- Option 12 (For LON).mxd

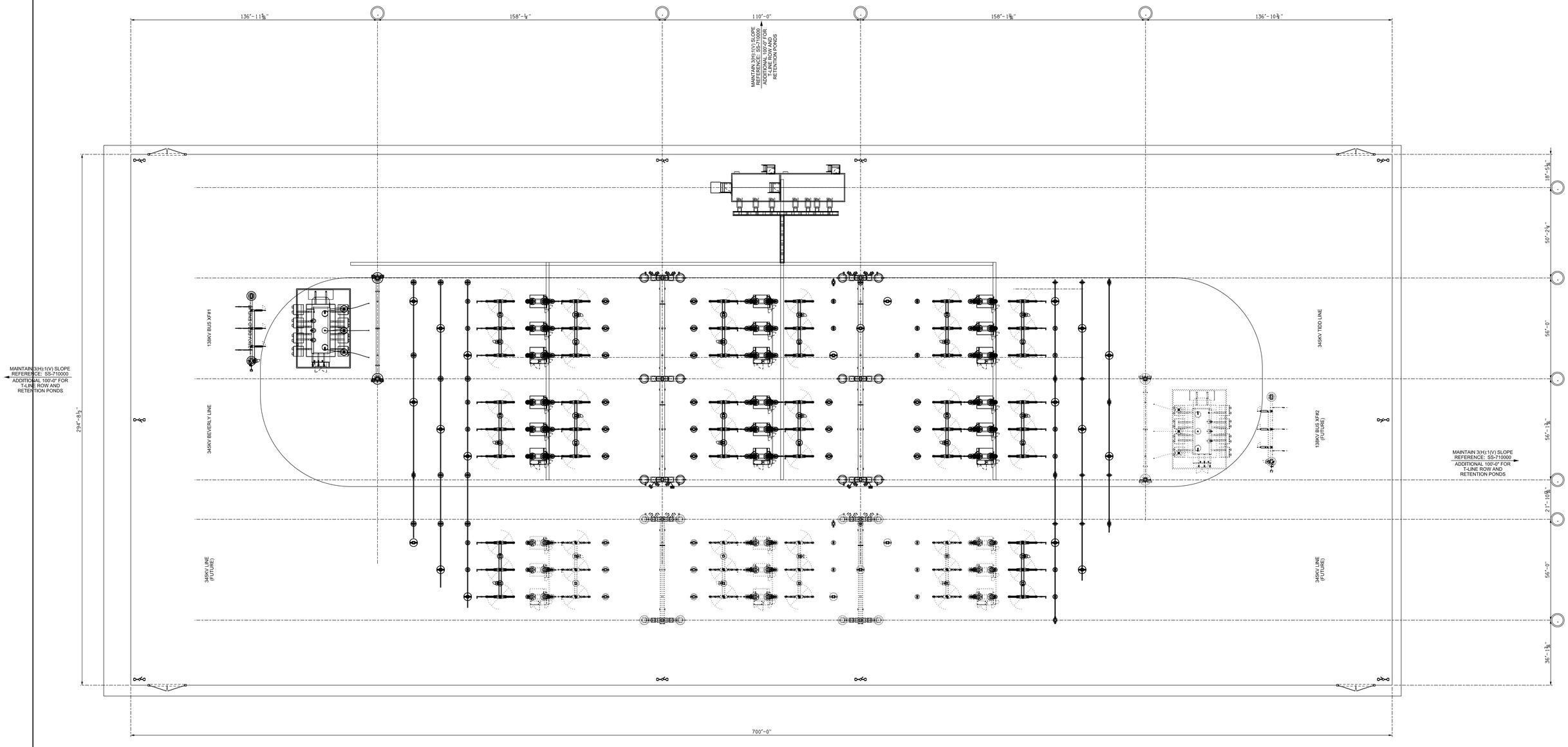


FIGURE 2B

OLD DWG #: OLD DWG	STD DWG #: STD DWG

OPCO

HOLLOWAY STATION

SHADYSIDE — OHIO

345KV

STATION LAYOUT PLAN

SCALE: 1" = 20'	DR: CBC	ENG: CBC	CH:
AMERICAN ELECTRIC POWER	WO#:	APPD:	DATE:
1 RIVERSIDE PLAZA COLUMBUS, OH 43215	DWG. NO. E-1301		REV. 0

NO	DATE	REVISION DESCRIPTION	APPR	DR	ENG	CK	ISSUE#

DWG. NO. E-1301

STATION ENGINEERING

PLOTTED BY 5226890 ON 12/20/2013 AT 08:32 AM

AEP C (30 X 40)

c:\pwworkl\d0412558\E1301.dgn

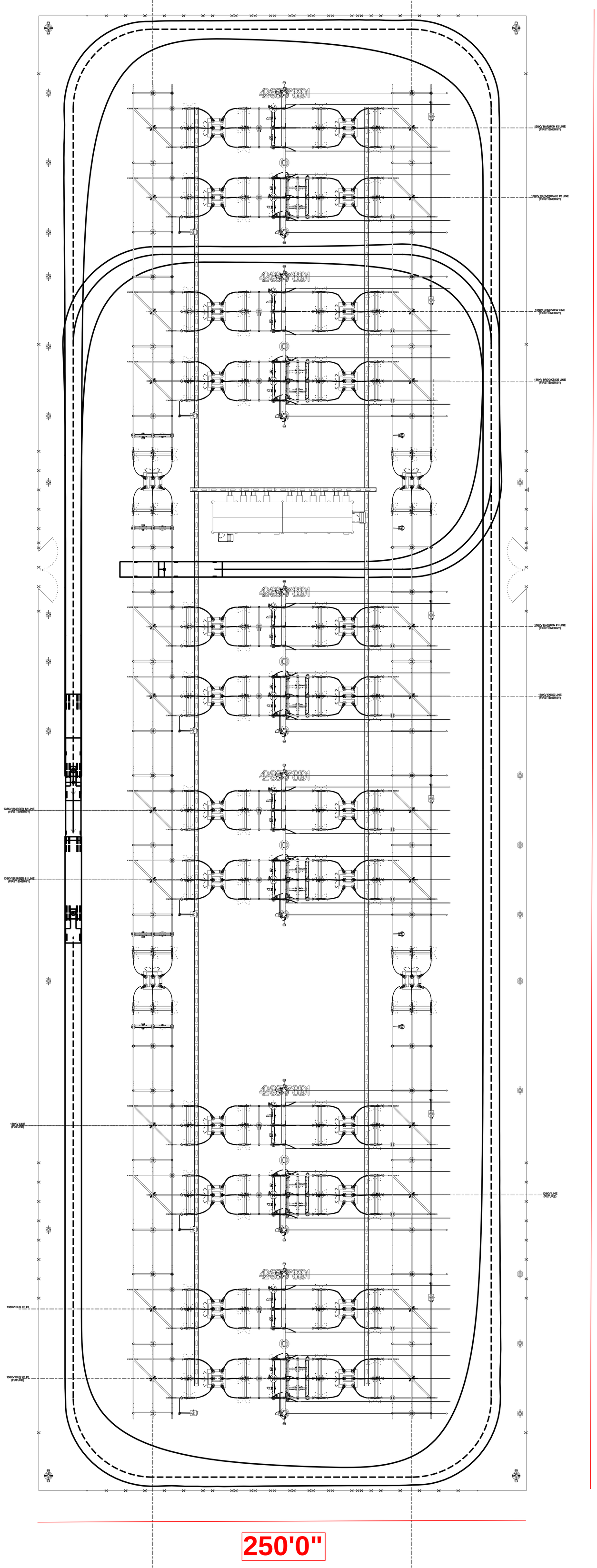
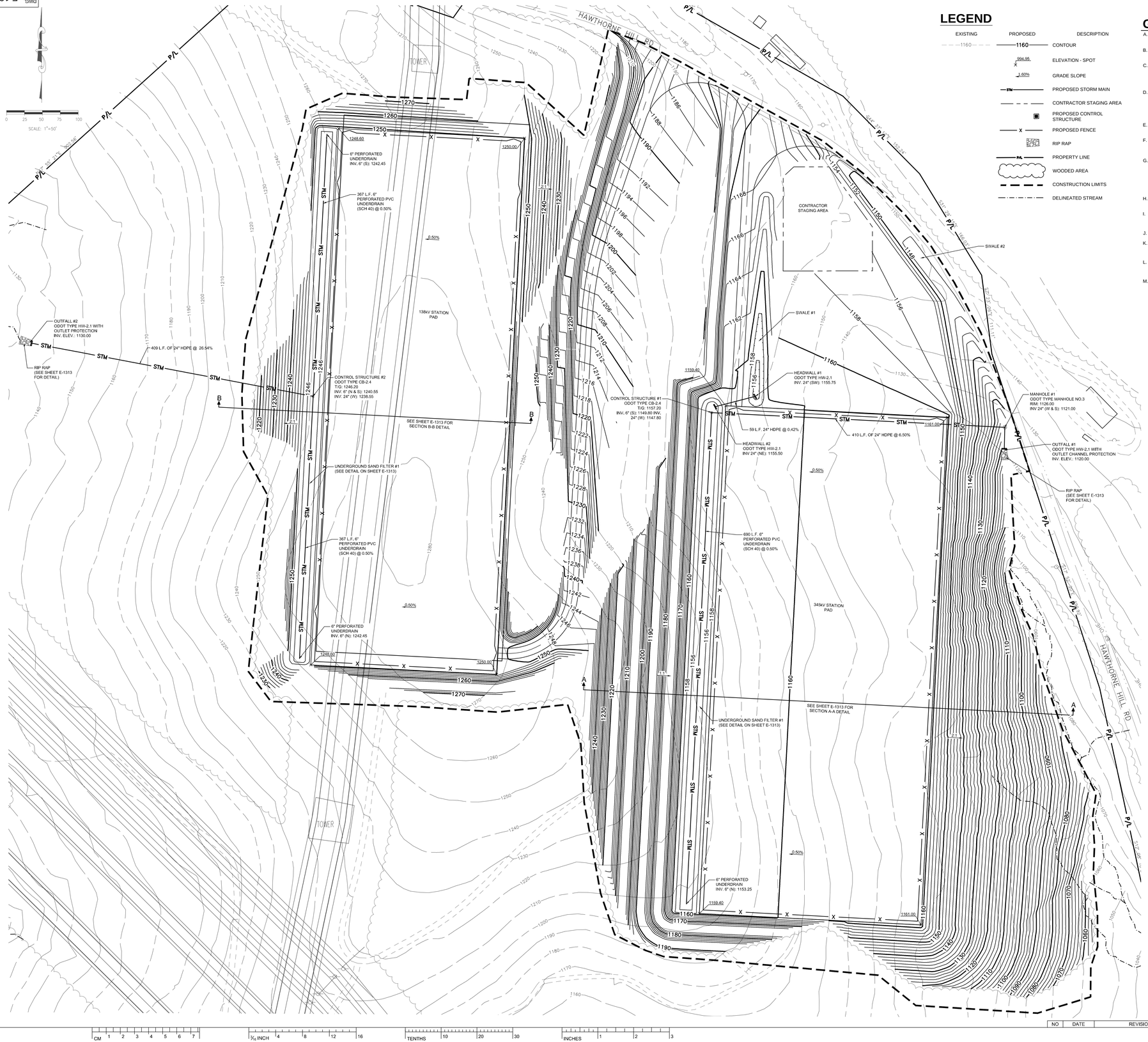


FIGURE 2C

138 kV STATION LAYOUT PLAN

DWG NO. E-1308



LEGEND

EXISTING	PROPOSED	DESCRIPTION
1160	1160	CONTOUR
	994.95 X	ELEVATION - SPOT
	1.60%	GRADE SLOPE
	STM	PROPOSED STORM MAIN
		CONTRACTOR STAGING AREA
		PROPOSED CONTROL STRUCTURE
	X	PROPOSED FENCE
		RIP RAP
	P/L	PROPERTY LINE
		WOODED AREA
		CONSTRUCTION LIMITS
		DELINEATED STREAM

GENERAL NOTES:

A. THE EXISTING CONDITIONS SHOWN ON THIS DRAWING ARE DERIVED FROM THE FILED SURBEY DOCUMENTED ON DRAWING E-1306.

B. THE CONTRACTOR SHALL VERIFY ALL INFORMATION IN THE FIELD PRIOR TO CONSTRUCTION.

C. UNDERGROUND UTILITIES ARE DEPICTED FROM AVAILABLE INFORMATION, BUT ARE NOT KNOWN TO BE ACCURATE OR COMPLETE. IF UNDOCUMENTED UNDERGROUND UTILITIES ARE ENCOUNTERED DURING CONSTRUCTION, IMMEDIATELY NOTIFY THE ROICC.

D. STOCKPILE ALL TOPSOIL IN THE CONTRACTOR STAGING AREA. THE LIMITS OF THE STOCKPILE SHALL BE SURROUNDED AND PROTECTED BY COMPOST FILTER SOCK TO PREVENT DISCHARGES OF SEDIMENT FROM EXITING THE STOCKPILE AREA. A DETAIL OF THE COMPOST FILTER SOCK IS SHOWN ON DRAWING E-1312.

E. THE CONTRACTOR SHALL SEED AND MULCH ALL DISTURBED AREAS AFTER FINAL GRADING AND SAND FILTER INSTALLATION IS COMPLETE.

F. THE CONTRACTOR SHALL VERIFY ALL EXISTING GRADES IN THE FIELD PRIOR TO BEGINNING THE GRADING ACTIVITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

G. THE PROPOSED CONTOUR LINES AND SPOT ELEVATIONS ARE THE RESULT OF AN ENGINEERED GRADING DESIGN AND REFLECT A PLANNED INTENT WITH REGARD TO DRAINAGE AND MOVEMENT OF STORMWATER RUNOFF. THE CONTRACTOR SHALL CONTACT THE ENGINEER IF HE HAS ANY QUESTIONS REGARDING THE INTENT OF THE DESIGN OR HAVE ANY PROBLEMS WITH THE CONTINUITY OF THE GRADES OR CONTOURS.

H. THE CONTRACTOR SHALL NOT DISTURB EXISTING VEGETATION UNLESS REQUIRED TO PERFORM GRADING OPERATION.

I. THE DETAILS FOR THE DRAINAGE STRUCTURES AND RIP RAP DETAIL CAN BE FOUND IN THE LATEST EDITION OF THE ODOT STANDARD CONSTRUCTION DRAWINGS.

J. THE CIVIL DETAILS ARE SHOWN ON SHEET E-1313 TO E-1314.

K. THE CONTRACTOR SHALL PROVIDE TEMPORARY STORMWATER PIPING OR PUMPING DURING REMOVAL, REPLACEMENT, AND/OR THE FURNISHING OF DRAINAGE STRUCTURES.

L. SIDE INLETS SHALL NOT BE INCLUDED ON EITHER CONTROL STRUCTURE, PER ODOT STANDARD DRAWINGS.

M. THE CONTRACTOR SHALL UTILIZE THE ERONET S150 EROSION CONTROL BLANKET WHEN THE SLOPE OF THE FINISHED GRADE IS BETWEEN 3:1 AND 2:1. IF THE SLOPE OF THE FINISHED GRADE IS 1:1, THE CONTRACTOR SHALL UTILIZE THE ERONET C125 EROSION CONTROL BLANKET. SEE THE GRADING PLAN AND CROSS SECTION A-A AND B-B FOR THE AREAS WHERE THESE PRODUCTS WILL BE REQUIRED.

HOLLOWAY SITE DEVELOPMENT

138 KV PAD		
ELEVATION	1250	FEET
DIMENSIONS	260 X 750	FEET
CUT VOL.	184210	CUBIC YARDS
FILL VOL.	5540	CUBIC YARDS
DRIVE SLOPE	10.0	PERCENT
345 KV PAD		
ELEVATION	1160	FEET
DIMENSIONS	310 x 710	FEET
CUT VOL.	201120	CUBIC YARDS
FILL VOL.	212570	CUBIC YARDS
DRIVE SLOPE	3.4	PERCENT
TOTAL		
CUT	385330	CUBIC YARDS
FILL	218110	CUBIC YARDS
EXCESS		
FILL REQUIRED	0	CUBIC YARDS
WASTE	167220	CUBIC YARDS

OHIO UTILITIES PROTECTION SERVICE
CALL BEFORE YOU DIG
811 OR 1-800-362-2764

FIGURE 3

OLD DWG #: STD DWG #:

OPERATING COMPANY
HOLLOWAY STATION
CITY STATE

138kV, 345kV
SITE GRADING & DRAINAGE PLAN
XXXXXXXX

SCALE: 1" = 50' | DR: ADJ | ENG: DPF | CH: SJL
WO#: | APPD: XXX | DATE: 1/20/2014

AMERICAN ELECTRIC POWER
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

DWG. NO. E-1308 REV 0

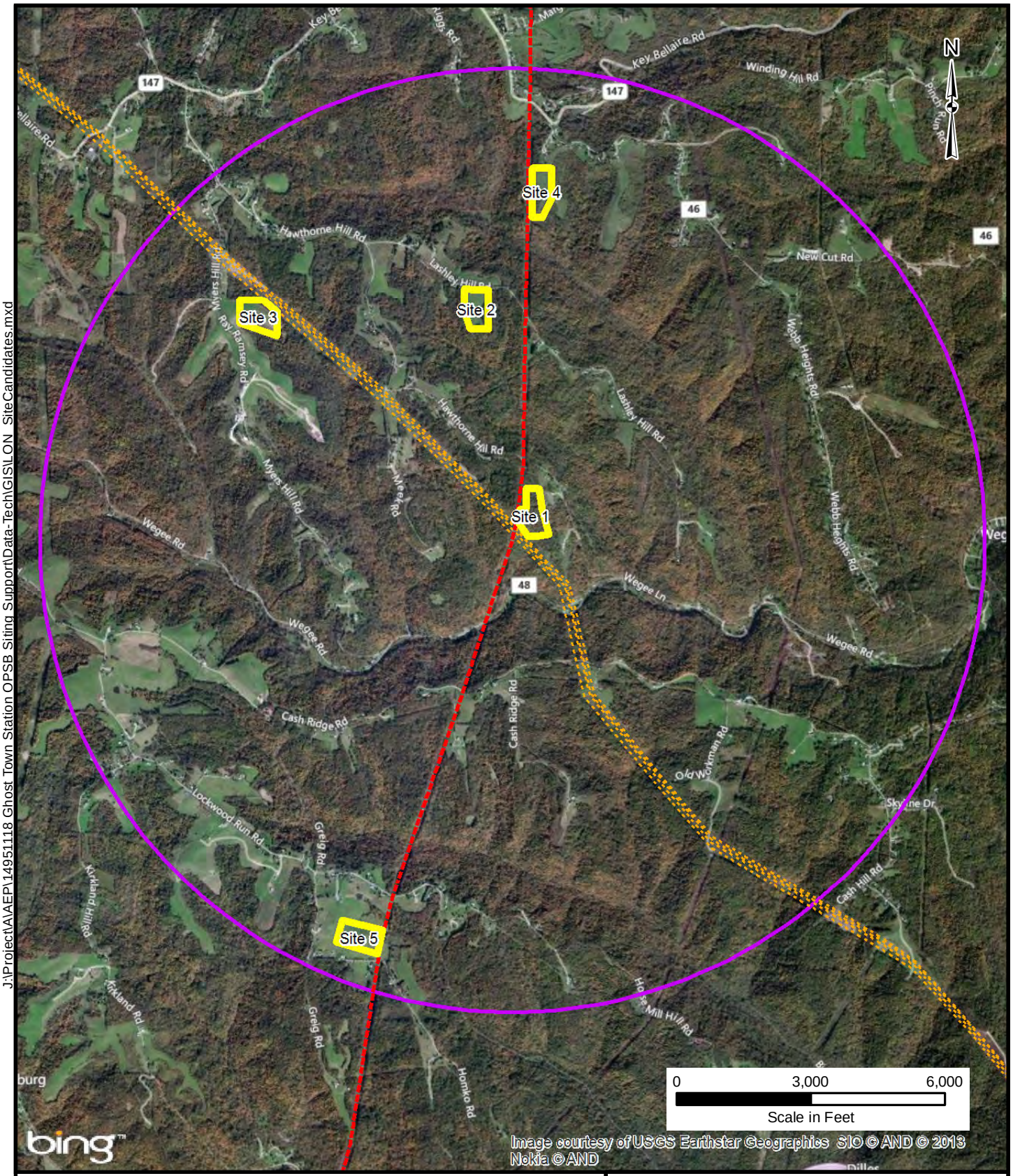
NO	DATE	REVISION DESCRIPTION	APPR	DR	ENG	CK	ISSUE#

CM 1 2 3 4 5 6 7 | 3/16 INCH 4 8 12 16 | TENTHS 10 20 30 | INCHES 1 2 3

AEP G (9 X 46)

CADFILEPATH

PLOTTED BY $USER$ ON DD-MMM-YYYY AT HH:MM STATION ENGINEERING



LEGEND:

- Candidate Site
- Muskingum River - Tidd 345 kV Transmission Line
- FirstEnergy 138 kV Transmission Line
- Study Area

AEP OHIO TRANSMISSION COMPANY

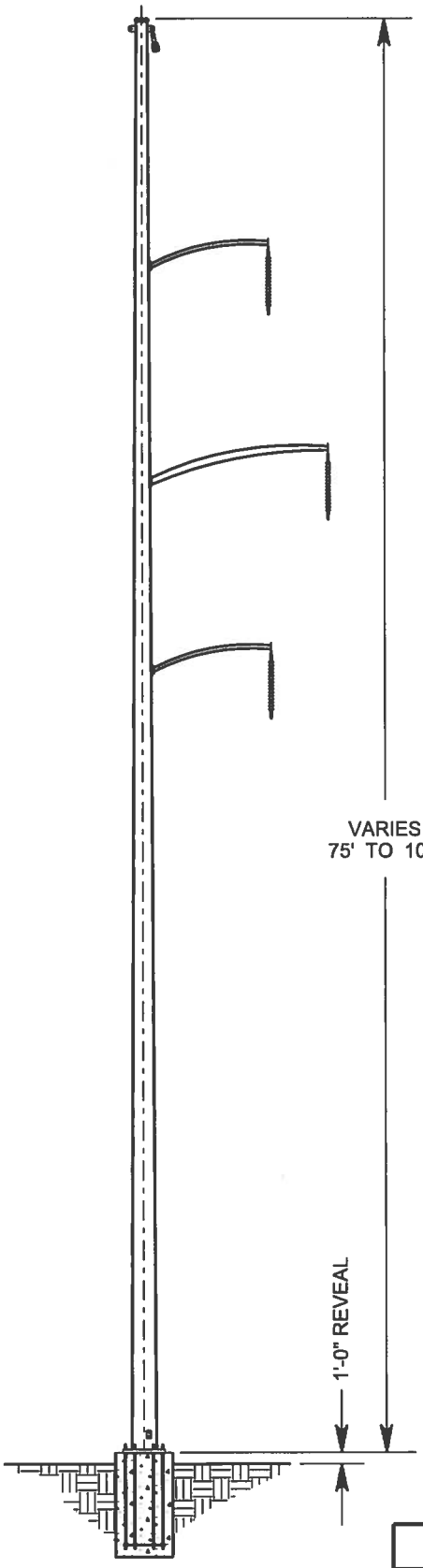
Holloway Station

FIGURE 4
SITE SELECTION STUDY CANDIDATES

JOB NO. 14951118

URS

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_SiteCandidates.mxd



HOLLOWAY STATION

AEP AMERICAN ELECTRIC POWER

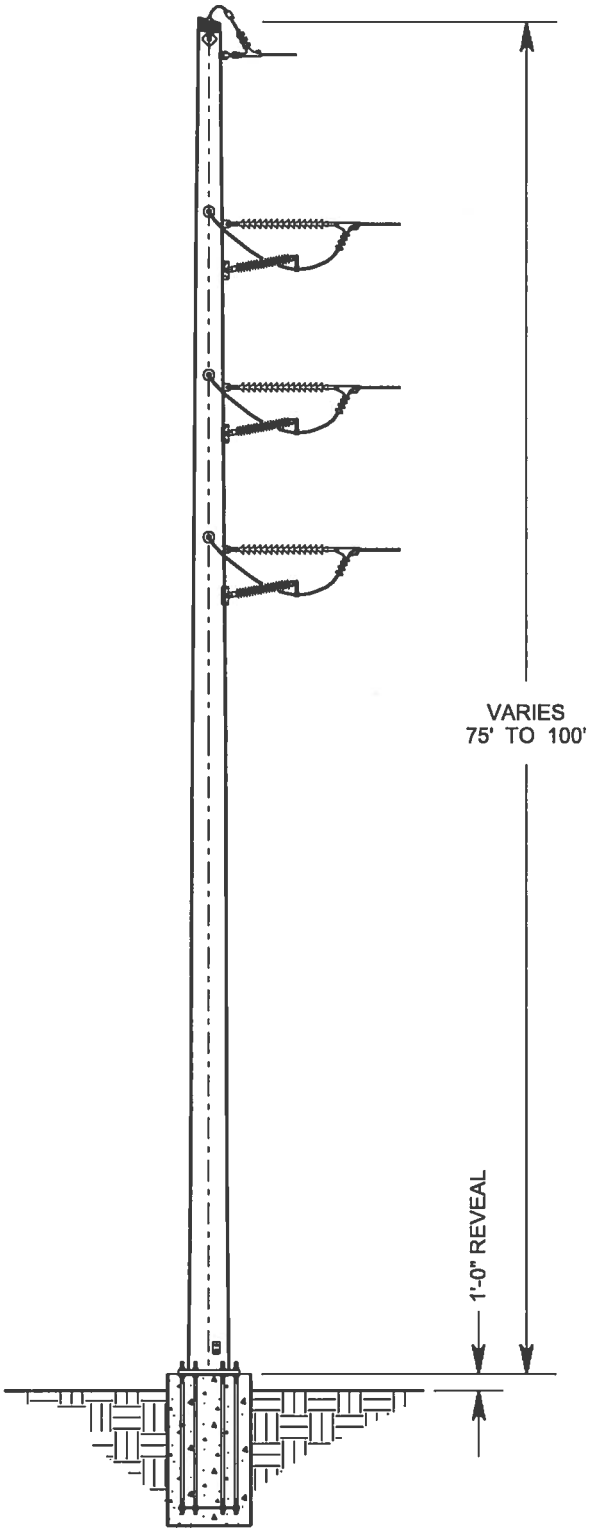
PROPOSED 138kV SINGLE CIRCUIT
STEEL POLE

NOT TO SCALE

FIGURE 5

W:\AEP\SITING\HOLLOWAY\STRUCTURES.DGN

COMPUTER GENERATED DWG. . DO NOT MANUALLY REVISE



HOLLOWAY STATION

AEP AMERICAN ELECTRIC POWER

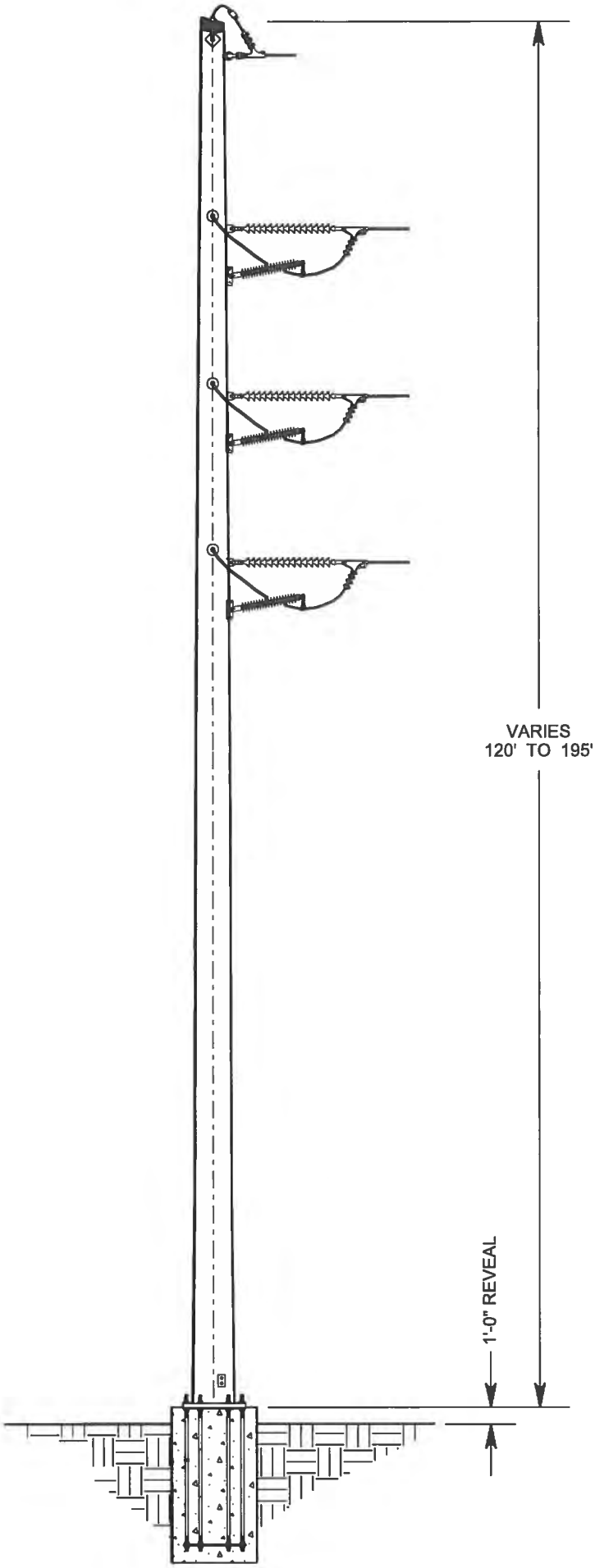
PROPOSED 138kV DEADEND
STEEL POLE

NOT TO SCALE

FIGURE 6

W:\AEP\SITING\HOLLOWAY\STRUCTURES.DGN

COMPUTER GENERATED DWG , DO NOT MANUALLY REVISE



HOLLOWAY STATION

AMERICAN ELECTRIC POWER

PROPOSED 345kV DEADEND
STEEL POLE

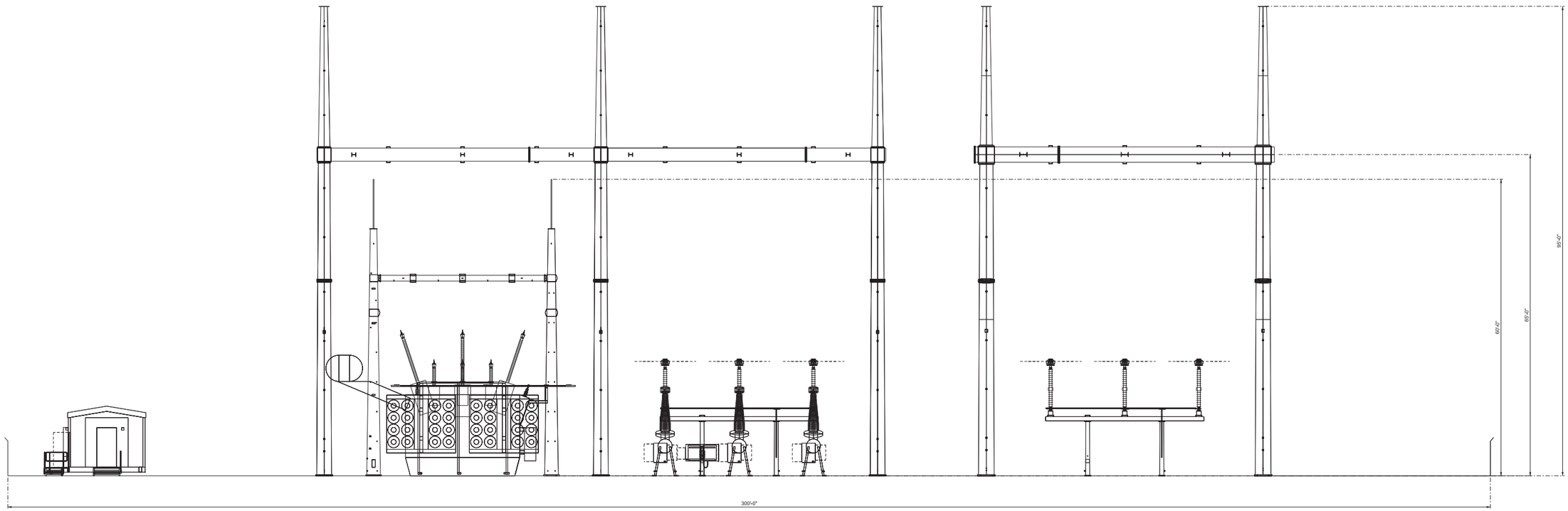
NOT TO SCALE

FIGURE 7

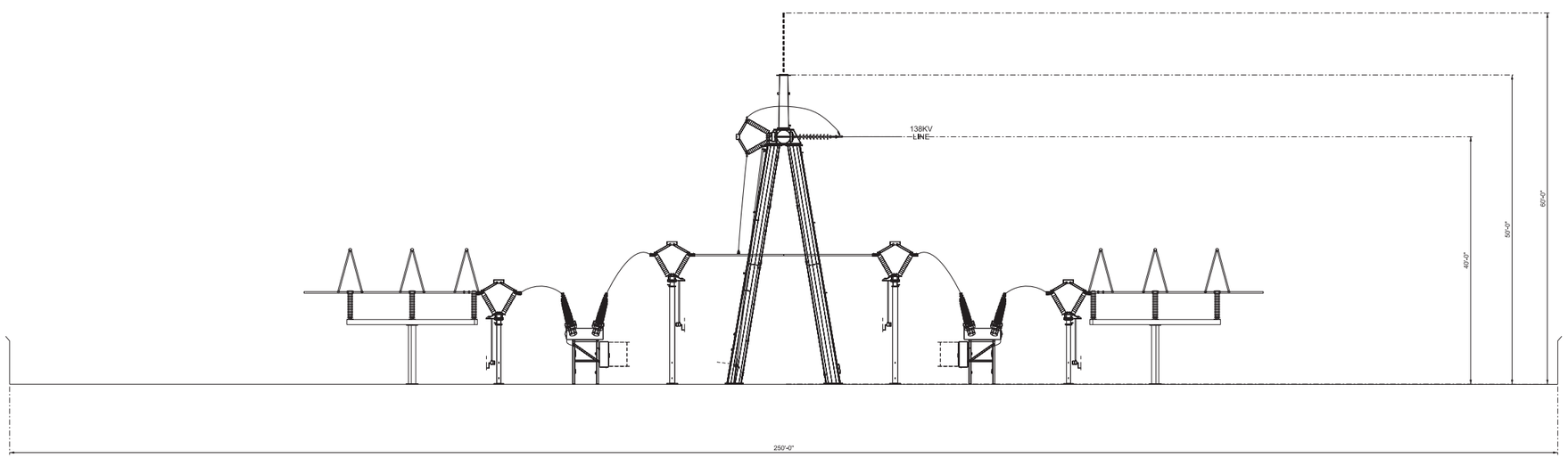
W:\AEP\SITING\HOLLOWAY\STRUCTURES.DGN

COMPUTER GENERATED DWG . DO NOT MANUALLY REVISE

345KV STATION



138KV STATION



OLD DWG #: 2EAS005U SH. C		STREDWG #:	
"THIS DRAWING IS THE PROPERTY OF AMERICAN ELECTRIC POWER AND IS LOANED UPON CONDITION THAT IT IS NOT TO BE COPIED OR REPRODUCED, IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO ANY PERSON WITHOUT THE WRITTEN CONSENT OF AMERICAN ELECTRIC POWER, OR FOR ANY PURPOSE DETRIMENTAL TO THEIR INTEREST, AND IS TO BE RETURNED UPON REQUEST"			
OHIO TRANSMISSION COMPANY HOLLOWAY STATION SHADYSIDE OHIO			
FIGURE 8 ELECTRICAL ASSEMBLY - SOUTH VIEW			
SCALE: 1/8" = 1'-0"	DR: CBC	ENG: CBC	CH:
AEP AMERICAN ELECTRIC POWER	WOR:	APPD:	DATE:
1 RIVERSIDE PLAZA COLUMBUS, OH 43215	DWG. NO. E-2101		REV. 0

NO	DATE	REVISION DESCRIPTION	APPR	DR	ENG	CK	ISSUE#

CM 1 2 3 4 5 6 7 | 1/16 INCH 4 8 12 16 | TENTHS 10 20 30 | INCHES 1 2 3

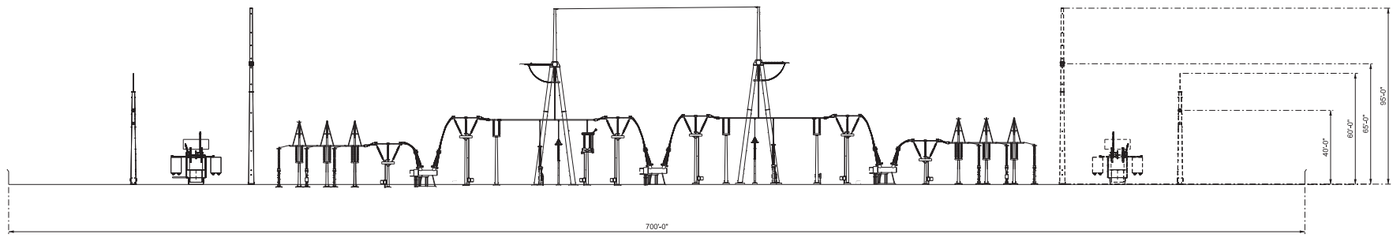
H:\Internal\Sta_Proj\GAH Group 2\TEAM 23\Corey\PROJECTS\TP-2012-161\EPC PREP\Holloway_Sttng\Holloway1.dgn

PLOTTED BY S225890 ON 1/8/2014 AT 04:06 PM STATION ENGINEERING

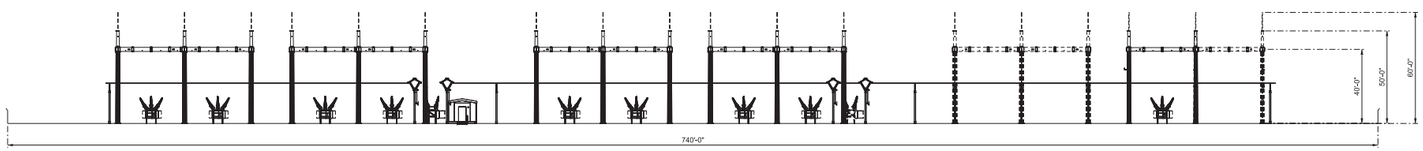
AEP G (30 X 48)

DWG. NO. E-2101

345KV STATION



138KV STATION



ISSUE#	NO	DATE	REVISION DESCRIPTION
OLD DWG #:			STD DWG #:

OHIO TRANSMISSION COMPANY

HOLLOWAY STATION

SHADYSIDE OHIO

345/138KV

ELECTRICAL ASSEMBLY

GENERAL SECTION VIEW

DWG. NO. E-2102

WO#: STATION PROJECTS ENGINEERING

SCALE: 1" = 30'

DR: CBC

CH: CBC

ENG:

DATE:

APPROVED BY

FIGURE 9

ELECTRICAL ASSEMBLY

EAST VIEW

AMERICAN ELECTRIC POWER

1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

REV 0

PLOTTED BY S22580 ON 1/8/2014 AT 04:09 PM

STATION ENGINEERING

AEP G (30 X 46)

H:\Internal\Sta_Proj\GAH Group 2\TEAM 23\Corey\PROJECTS\TP-2012-161\EPC PREP\Holloway_Sitting\Holloway2.dgn

DWG. NO. E-2102

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_SimilarStations.mxd

AEP OHIO TRANSMISSION COMPANY

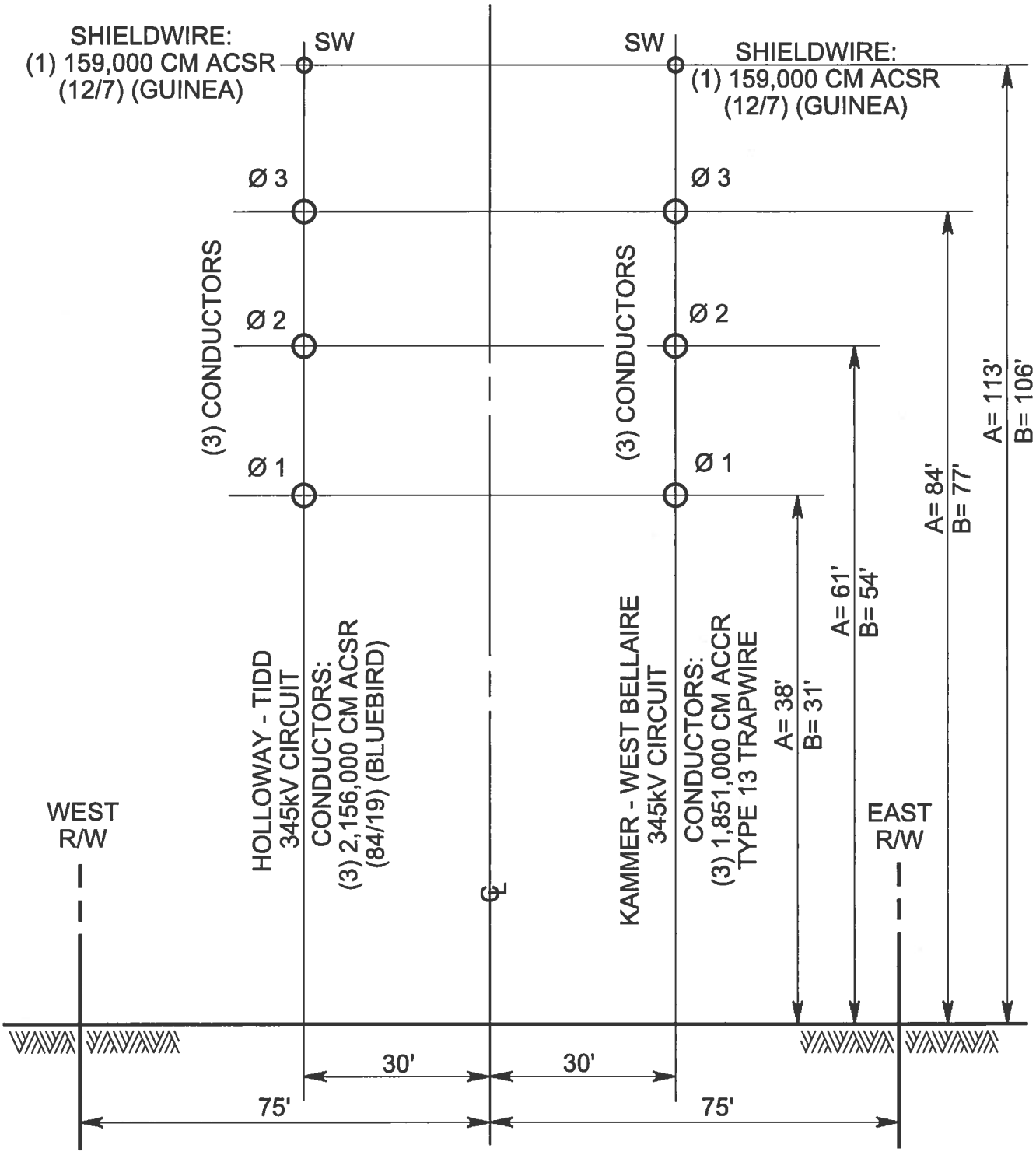
Holloway Station

FIGURE 10
EXAMPLE PHOTOGRAPHS OF
A SIMILAR STATION FACILITY

JOB NO. 14951118

URS

AASSY



PROPOSED CONFIGURATION

DIMENSION "A" - DOUBLE CIRCUIT - VERTICAL CONFIGURATION.
(UNDER EMERGENCY & NORMAL MAX. LINE LOADING)

DIMENSION "B" - DOUBLE CIRCUIT - VERTICAL CONFIGURATION.
(UNDER WINTER NORMAL
CONDUCTOR RATING)

AEP AMERICAN ELECTRIC POWER

HOLLOWAY
STATION

TYPICAL PHASE ARRANGEMENT
MUSKINGUM - TIDD 345kV LINE
TWO POLE DEADEND STRUCTURE

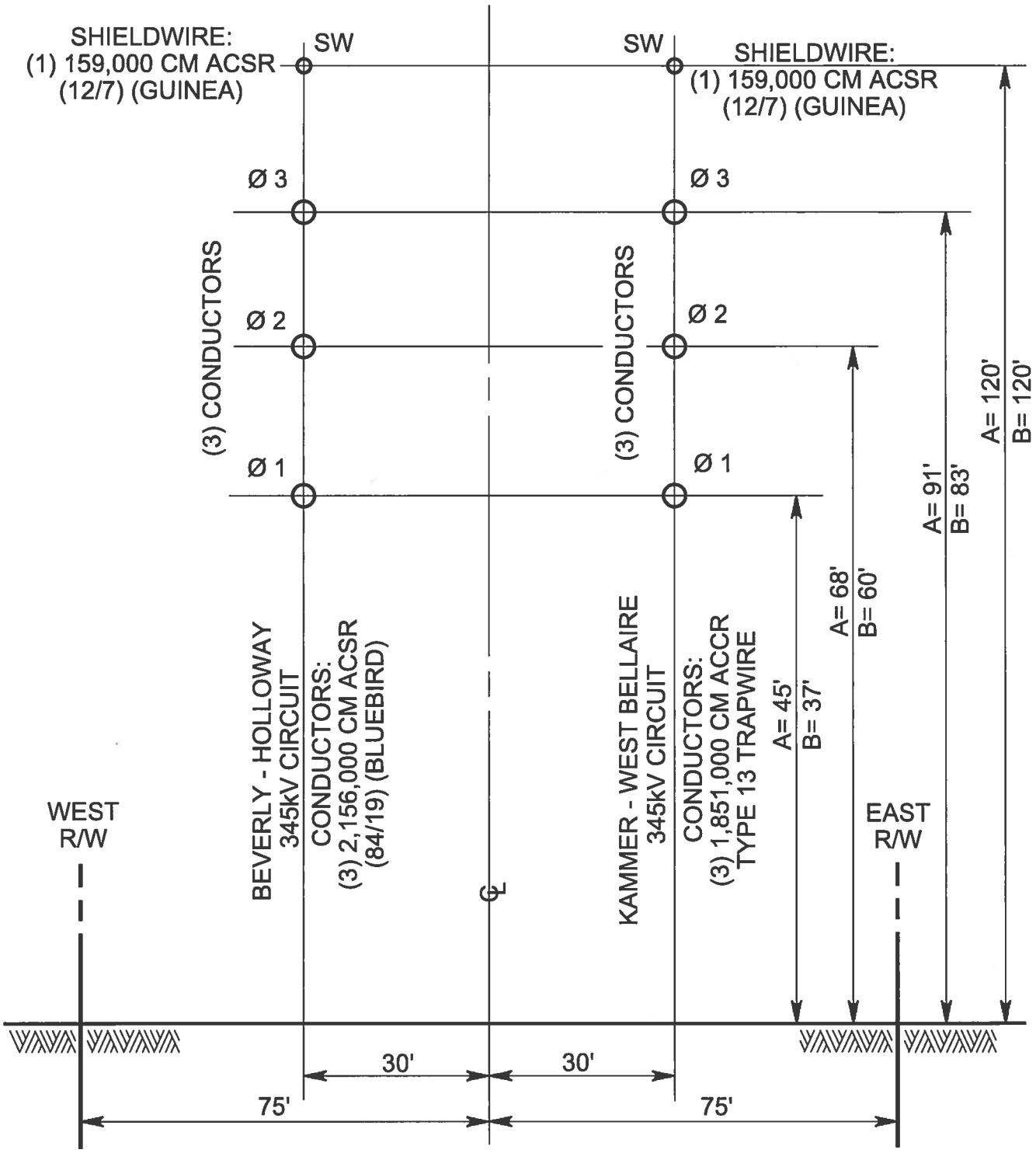
W:\AEP\SITING\HOLLOWAY\PHASING_DIAGRAM.DGN

NOT TO SCALE

FIGURE 11

COMPUTER GENERATED DWG. , DO NOT MANUALLY REVISE

AASSY



PROPOSED CONFIGURATION

DIMENSION "A" - DOUBLE CIRCUIT - VERTICAL CONFIGURATION.
(UNDER EMERGENCY & NORMAL MAX. LINE LOADING)

DIMENSION "B" - DOUBLE CIRCUIT - VERTICAL CONFIGURATION.
(UNDER WINTER NORMAL
CONDUCTOR RATING)

AEP AMERICAN ELECTRIC POWER

HOLLOWAY
STATION

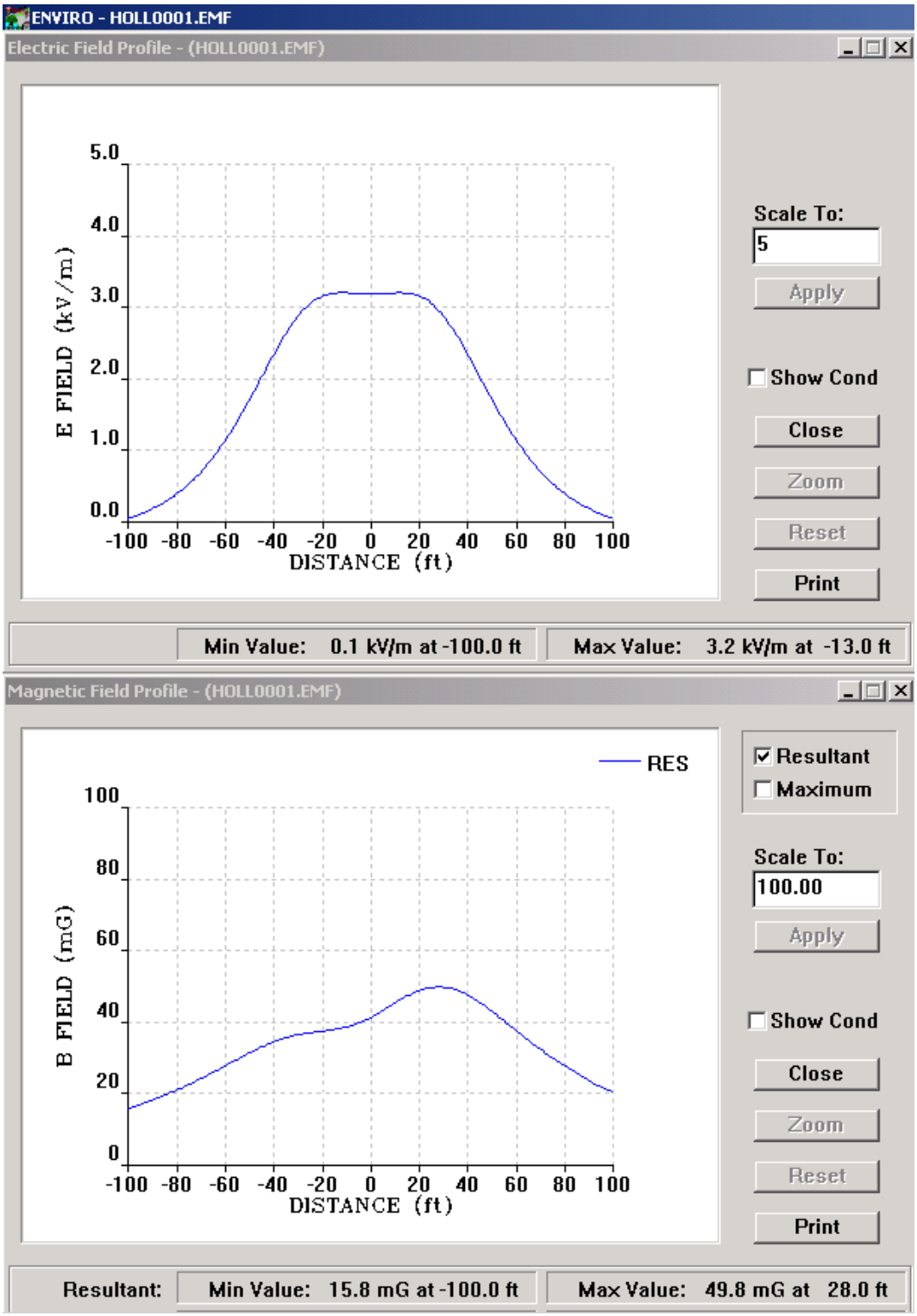
TYPICAL PHASE ARRANGEMENT
MUSKINGUM - TIDD 345kV LINE
TWO POLE DEADEND STRUCTURE

W:\AEP\SITING\HOLLOWAY\PHASING_DIAGRAM.DGN

NOT TO SCALE

FIGURE 12

COMPUTER GENERATED DWG. , DO NOT MANUALLY REVISE



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_emf13.mxd

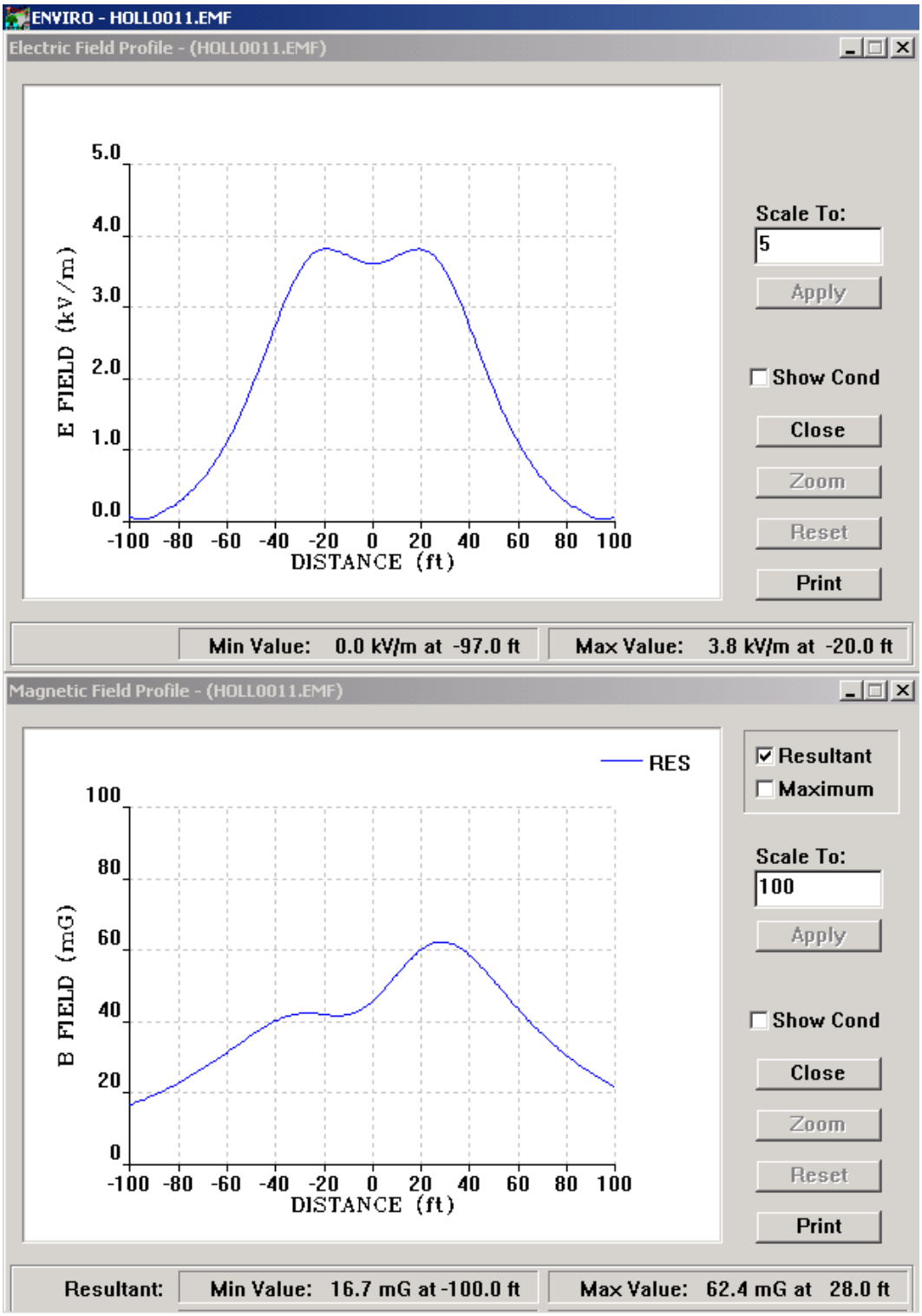
AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 13
EMF PROFILE - HOLLOWAY-TIDD 345 kV AND KAMMER-WEST BELLAIRE 345 kV
STRUCTURE 243 – 243A
NORMAL MAXIMUM LOADING

JOB NO. 14951118

URS



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_emf14.mxd

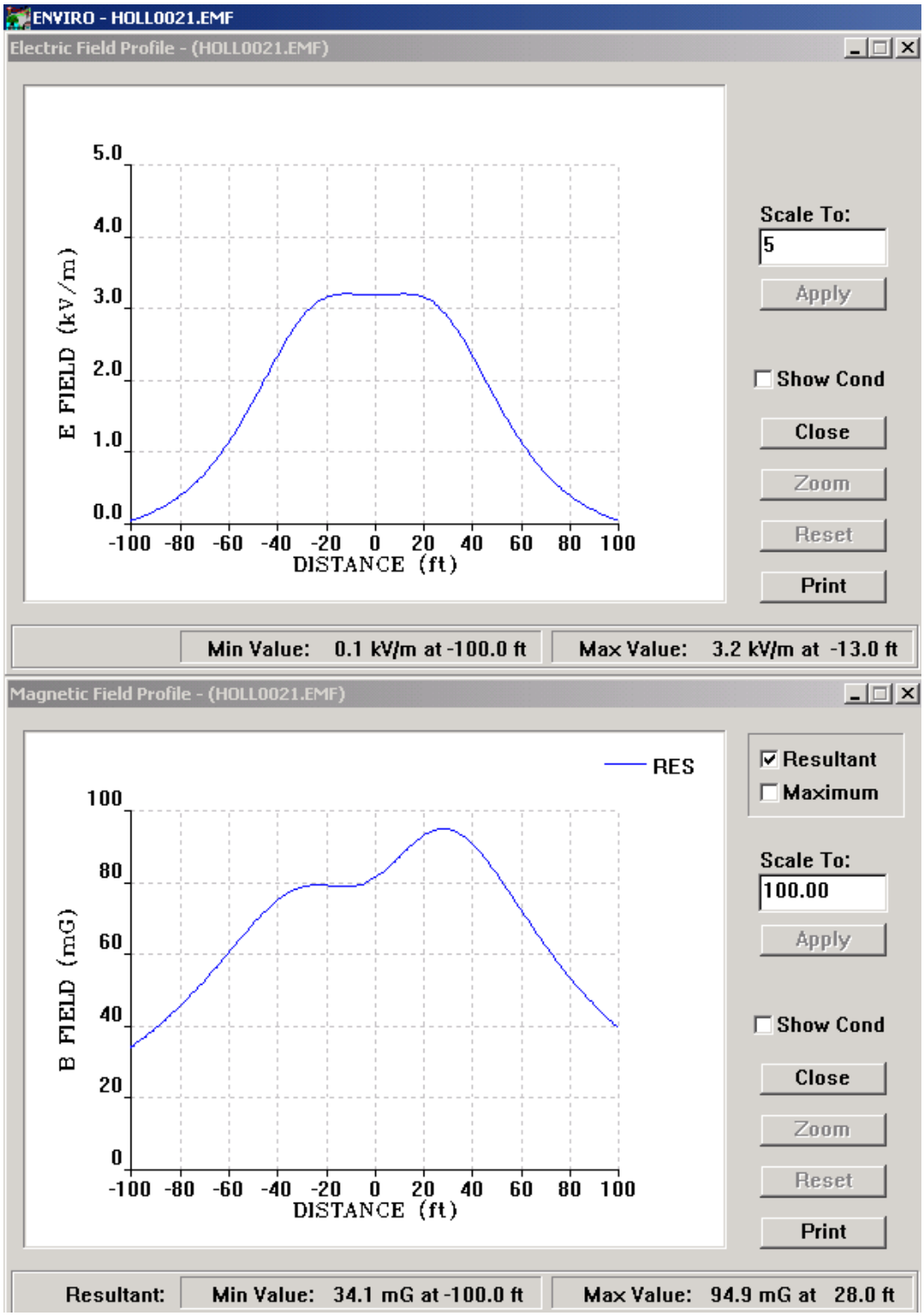
AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 14
EMF PROFILE - HOLLOWAY-TIDD 345 kV AND
KAMMER-WEST BELLAIRE 345 kV
STRUCTURE 243B – 244
NORMAL MAXIMUM LOADING

JOB NO. 14951118

URS



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_emf15.mxd

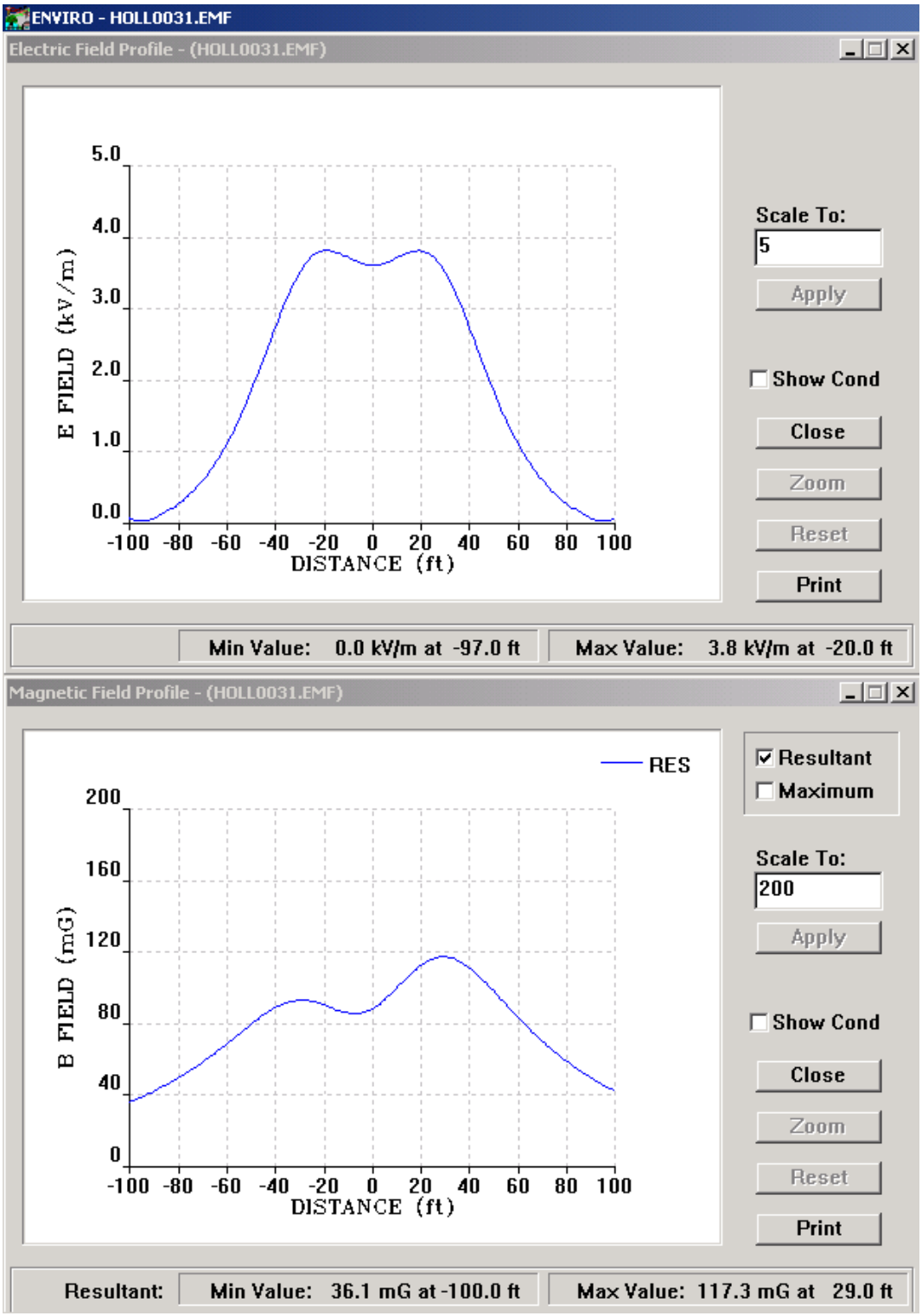
AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 15
EMF PROFILE - BEVERLY-HOLLOWAY 345 kV
AND KAMMER-WEST BELLAIRE 345 KV
STRUCTURE 243 – 243A
NORMAL MAXIMUM LOADING

JOB NO. 14951118

URS



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_emf16.mxd

AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 16
EMF PROFILE - BEVERLY-HOLLOWAY 345 kV
AND KAMMER-WEST BELLAIRE 345 KV
STRUCTURE 243B – 244
NORMAL MAXIMUM LOADING

JOB NO. 14951118

URS

APPENDIX A

SOCIOECONOMIC, LAND USE, AND AGRICULTURAL DISTRICT REVIEW REPORT

MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INTALLATION OF HOLLOWAY STATION PROJECT

SOCIOECONOMIC, LAND USE, AND AGRICULTURAL DISTRICT REVIEW REPORT

Prepared for:

American Electric Power Ohio Transco
700 Morrison Road
Gahanna, Ohio 45230

Prepared by:

URS
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

Project #: 14951118

January 2014

TABLE OF CONTENTS

TABLES

Number

FIGURES
(follow text)

Number

1.0 PROJECT DESCRIPTION

This document presents the socioeconomic, land use, and agricultural district review conducted by URS Corporation (URS) for American Electric Power Ohio Transco's (AEP Ohio Transco) proposed Muskingum River-Tidd 345 kV Transmission Line Relocation and Installation of Holloway Station Project (Project). PJM, the regional transmission organization that coordinates electric transmission in the Project area, mandated tying AEP Ohio Transco's Muskingum-Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to relocate the existing Muskingum River-Tidd 345 kV transmission through a new 345/138 kV Holloway Station on a property at the intersection of the lines in Belmont County, Ohio, as shown on Figure 1. FirstEnergy will subsequently construct 138 kV extensions from their lines to the station.

As part of the Ohio Power Siting Board (OPSB) Letter of Notification (LON) requirements, AEP Ohio Transco is required to assess and report the socioeconomic, land use, and agricultural district characteristics potentially affected by the Project, as stated in Ohio Administrative Code (OAC) Rule 4906-11-01(D)(1) and (2). These rules state:

> ***(D) Socioeconomic data. Describe the social and ecological impacts of the project. This description shall contain the following information:***
>
> ***(1) A brief, general description of land use within the vicinity of the proposed project, including: (a) a list of municipalities, townships, and counties affected; and (b) estimates of population density adjacent to rights-of-way within the study corridor (the U.S. census information may be used to meet this requirement).***
>
> ***(2) The location and general description of all agricultural land (including agricultural district land) existing at least sixty days prior to submission of the letter of notification within the proposed electric power transmission line right-of-way, or within the proposed electric power transmission substation fenced-in area, or within the construction site boundary of a proposed compressor station.***

AEP Ohio Transco retained URS to conduct a desktop review of socioeconomic, land use, and agricultural district land characteristics. A study area was established that extends 1,000 feet around the approximately 62-acre Project property where the station and associated interconnections will be situated, resulting in an approximately 300-acre study area. In conjunction with ecological field surveys for the Project, URS noted land uses within this study area. This report will be used to assist AEP Ohio Transco's efforts to avoid or minimize impacts to socioeconomic characteristics and land uses potentially present in the study area during construction activities.

2.0 GENERAL LAND USE DESCRIPTION

Land use within the study area is shown on Figure 2. Current land use characteristics were obtained through review of Microsoft Bing Maps aerial photography taken in 2013; the United States Geological

Survey (USGS) 7.5-minute topographic map of the Businessburg, Ohio quadrangle (1976 photorevised 1978); county property parcel data; and a field reconnaissance conducted in September 2013.

Land uses within the study area include wooded parcels with scattered residences and transportation and utility corridors. Approximately 80% of the land within the study area is wooded and undeveloped, including 65% of the Project property. Electric transmission rights-of-way make up approximately 13% of the total study area and 25% of the Project property. Residences and their corresponding yards account for approximately 5% of the total study area and 10% of the Project property. The Hawthorne Hill Road corridor accounts for approximately 2% of the total study area. Seven residences were identified within 1,000 feet of the Project property, two of which are on the property and will be removed as part of construction of Holloway Station. These residences were purchased along with the overall property. No industrial, commercial, or institutional facilities were identified within 1,000 feet of the proposed Project property.

Based on a review of the Belmont County website, no comprehensive plans or other future land use documents were identified for the county or Mead Township. Mead Township has not adopted zoning regulations.

3.0 POPULATION DENSITY ESTIMATE

The Project is located entirely within Mead Township of Belmont County. Population density estimates for land within the study area were calculated by direct estimation based on study area size, number of residences identified in the area, and the average number of persons per household in Belmont County. Seven homes were identified within the approximately 300-acre study area, which is entirely within Belmont County. Two of these residences have been purchased along with the overall Project property and will be removed as part of construction of Holloway Station. No planned residential developments within the study site were discovered as part of this study. According to the 2010 U.S. Census, the average household in Belmont County has 2.32 persons. This equates to a population density of 0.04 person per acre, which is less than the 0.21 person per acre average for all of Belmont County. The above estimates are limited by available statistics and generalizations across the county. Total populations for both Belmont County and Mead Township are summarized in Table 1.

TABLE 1
STUDY AREA CENSUS POPULATION ESTIMATES

Government Unit	2000 Census	2010 Census
Belmont County	70,266	70,400
Mead Township	6,023	5,967

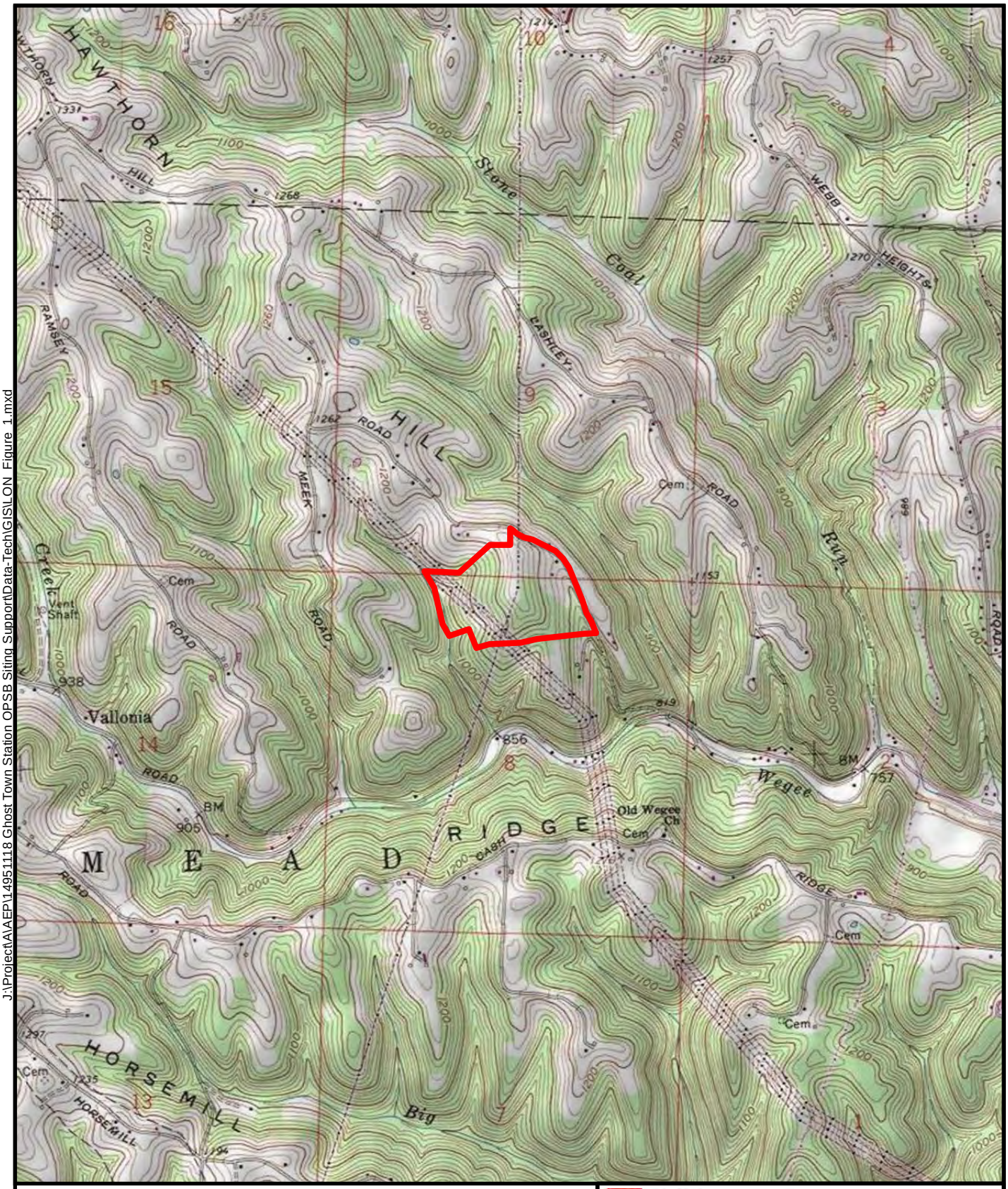
Sources: U.S. Census Bureau, Census 2010 Summary File 1
U.S. Census Bureau, Census 2000 Summary File 1

4.0 AGRICULTURAL DISTRICT LAND

URS contacted the Belmont County Auditor's office on January 2, 2014 regarding parcels registered in the agricultural district land program. There are reportedly no agricultural district land parcels in Mead Township.

5.0 CONCLUSION

The Project is not expected to significantly impact current socioeconomic characteristics, land use and agricultural district land in the vicinity. While two residences will be removed as a result of construction of Holloway Station, these landowners were compensated as part of the purchase of the overall Project property. The Project is not expected to impact any future land use plans for the area.



LEGEND:

Project Property

0 2,000 4,000

Scale in Feet

N

AEP OHIO TRANSMISSION COMPANY

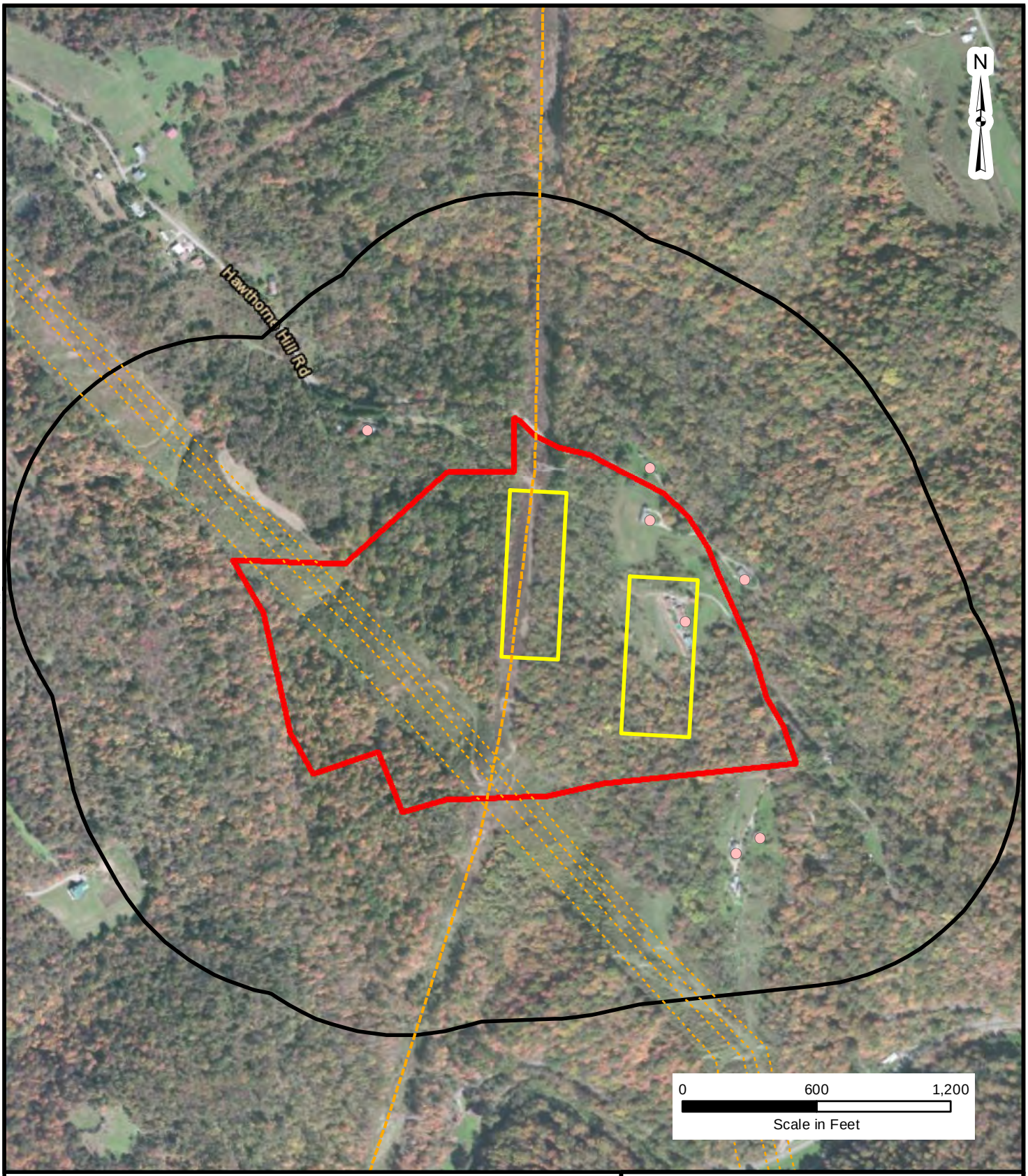
Holloway Station

FIGURE 1
PROJECT OVERVIEW

JOB NO.14951118

URS

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_Figure_1.mxd



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\Landuse.mxd

LEGEND:

- Project Property
- 1,000-foot Buffer of Project Property
- Preliminary Station Fence Line
- Residence
- Muskingum River - Tidd 345 kV Transmission Line
- FirstEnergy 138 kV Transmission Line

AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 2
LAND USE MAP

JOB NO.14951118

URS

APPENDIX B

PUBLIC OFFICIALS LETTERS SERVING COPY OF LETTER OF NOTIFICATION

AMERICAN ELECTRIC POWER

American Electric Power
700 Morrison Road
Gahanna, OH 43230
AEP.com

February 3, 2014

Ms. Lisa Millhouse, Branch Manager
Belmont County District Library
Shadyside Branch Library
4300 Central Avenue
Shadyside, OH 43947

RE: Letter of Notification
Muskingum River-Tidd 345 kV Transmission Line Extensions to and Installation of the Holloway Station Project

Dear Ms. Millhouse:

In accordance with Rules 4906 of the Ohio Administrative Code (OAC), AEP Ohio Transmission Company (AEP Transco) is required to submit a Letter of Notification to the State of Ohio Power Siting Board (OPSB) when certain changes are made to our transmission facilities.

PJM, the regional transmission organization that coordinates electric transmission in Ohio and several other states, mandated tying American Electric Power Ohio Transco's (AEP Ohio Transco) Muskingum River -Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to construct a new 345 kV transmission line extension from the Muskingum-Tidd 345 kV transmission line and a new 345/138 kV Holloway Station on property at the intersection of the lines in Mead Township of Belmont County, Ohio (OPSB Case Number 14-0141-EL-BLN). FirstEnergy will subsequently construct 138 kV extensions from their lines to the station. The project property is owned by AEP Ohio Transco.

In compliance with Rule 4906-11-02 of the OPSB Rules and Regulations, we have prepared and filed the attached Letter of Notification. This Notice contains details on the project location, project description and construction schedule, and is submitted for your information.

Please feel free to contact me at (614)-552-2004 and I would be happy to answer any questions concerning this project.

Sincerely,

Edward V. Gilabert

Edward V. Gilabert
Project Management

AMERICAN ELECTRIC POWER

American Electric Power
700 Morrison Road
Gahanna, OH 43230
AEP.com

February 3, 2014

Ms. Yvonne Myers, Director
Belmont County District Library
Martins Ferry Public Library
20 James Wright Place
P.O. Box 130
Martins Ferry, OH 43935

RE: Letter of Notification
Muskingum River-Tidd 345 kV Transmission Line Extensions to and Installation of the Holloway Station Project

Dear Ms. Myers:

In accordance with Rules 4906 of the Ohio Administrative Code (OAC), AEP Ohio Transmission Company (AEP Transco) is required to submit a Letter of Notification to the State of Ohio Power Siting Board (OPSB) when certain changes are made to our transmission facilities.

PJM, the regional transmission organization that coordinates electric transmission in Ohio and several other states, mandated tying American Electric Power Ohio Transco's (AEP Ohio Transco) Muskingum River -Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to construct a new 345 kV transmission line extension from the Muskingum-Tidd 345 kV transmission line and a new 345/138 kV Holloway Station on property at the intersection of the lines in Mead Township of Belmont County, Ohio (OPSB Case Number 14-0141-EL-BLN). FirstEnergy will subsequently construct 138 kV extensions from their lines to the station. The project property is owned by AEP Ohio Transco.

In compliance with Rule 4906-11-02 of the OPSB Rules and Regulations, we have prepared and filed the attached Letter of Notification. This Notice contains details on the project location, project description and construction schedule, and is submitted for your information.

Please feel free to contact me at (614)-552-2004 and I would be happy to answer any questions concerning this project.

Sincerely,

Edward V. Gilabert
Project Management

AMERICAN ELECTRIC POWER

American Electric Power
700 Morrison Road
Gahanna, OH 43230
AEP.com

February 3, 2014

Ms. Ginny Favede, President
Mr. Matt Coffland, Vice President
Mr. Mark Thomas
Belmont County Board of Commissioners
101 West Main Street
St. Clairsville, Ohio 43950

RE: Letter of Notification
Muskingum River-Tidd 345 kV Transmission Line Extensions and Installation of the Holloway Station Project

Dear Belmont County Commission:

In accordance with Rules 4906 of the Ohio Administrative Code (OAC), AEP Ohio Transmission Company (AEP Transco) is required to submit a Letter of Notification to the State of Ohio Power Siting Board (OPSB) when certain changes are made to our transmission facilities.

PJM, the regional transmission organization that coordinates electric transmission in Ohio and several other states, mandated tying American Electric Power Ohio Transco's (AEP Ohio Transco) Muskingum River -Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to construct a new 345 kV transmission line extension from the Muskingum-Tidd 345 kV transmission line and a new 345/138 kV Holloway Station on property at the intersection of the lines in Mead Township of Belmont County, Ohio (OPSB Case Number 14-0141-EL-BLN). FirstEnergy will subsequently construct 138 kV extensions from their lines to the station. The project property is owned by AEP Ohio Transco.

In compliance with Rule 4906-11-02 of the OPSB Rules and Regulations, we have prepared and filed the attached Letter of Notification. This Notice contains details on the project location, project description and construction schedule, and is submitted for your information.

Please feel free to contact me at (614)-552-2004 and I would be happy to answer any questions concerning this project.

Sincerely,

Edward V. Gilabert

Edward V. Gilabert
Project Management

AMERICAN ELECTRIC POWER

American Electric Power
700 Morrison Road
Gahanna, OH 43230
AEP.com

February 3, 2014

Mr. Charles Palmer
Mr. Roger Lewis
Mr. Ed Good
Mead Township Trustees
c/o Mr. David Montgomery, Clerk
59300 Lockwood Run Road
Shadyside, Ohio 43947

RE: Letter of Notification
Muskingum River-Tidd 345 kV Transmission Line Extensions and Installation of the Holloway Station Project

Dear Township Trustees:

In accordance with Rules 4906 of the Ohio Administrative Code (OAC), AEP Ohio Transmission Company (AEP Transco) is required to submit a Letter of Notification to the State of Ohio Power Siting Board (OPSB) when certain changes are made to our transmission facilities.

PJM, the regional transmission organization that coordinates electric transmission in Ohio and several other states, mandated tying American Electric Power Ohio Transco's (AEP Ohio Transco) Muskingum River -Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to construct a new 345 kV transmission line extension from the Muskingum-Tidd 345 kV transmission line and a new 345/138 kV Holloway Station on property at the intersection of the lines in Mead Township of Belmont County, Ohio (OPSB Case Number 14-0141-EL-BLN). FirstEnergy will subsequently construct 138 kV extensions from their lines to the station. The project property is owned by AEP Ohio Transco.

In compliance with Rule 4906-11-02 of the OPSB Rules and Regulations, we have prepared and filed the attached Letter of Notification. This Notice contains details on the project location, project description and construction schedule, and is submitted for your information.

Please feel free to contact me at (614)-552-2004 and I would be happy to answer any questions concerning this project.

Sincerely,

Edward V. Gilabert
Project Management

APPENDIX C

THREATENED AND ENDANGERED SPECIES SURVEY REPORT

MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INTALLATION OF HOLLOWAY STATION PROJECT

THREATENED AND ENDANGERED SPECIES SURVEY REPORT

Prepared for:

American Electric Power Service Corporation
700 Morrison Road
Gahanna, Ohio 43230

Prepared by:

URS
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

Project #: 14951118

January 2014

TABLE OF CONTENTS

TABLES

Number

FIGURES
(follow text)

Number

APPENDIX
(follows figures)

Number

1.0 PROJECT DESCRIPTION

This document presents the results of the threatened and endangered species assessment conducted by URS Corporation (URS) for American Electric Power Ohio Transco's (AEP Ohio Transco) proposed Muskingum River-Tidd 345 kV Transmission Line Relocation and Installation of Holloway Station Project (Project). PJM, the regional transmission organization that coordinates electric transmission in the Project area, mandated tying AEP Ohio Transco's Muskingum-Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to relocate the existing Muskingum River-Tidd 345 kV transmission through a new 345/138 kV Holloway Station on a property at the intersection of the lines in Belmont County, Ohio, as shown on Figure 1. FirstEnergy will subsequently construct 138 kV extensions from their lines to the station.

As part of the Ohio Power Siting Board (OPSB) Letter of Notification (LON) requirements, AEP Ohio Transco is required to assess and report the socioeconomic, land use, and agricultural district characteristics potentially affected by the Project, as stated in Ohio Administrative Code (OAC) Rule 4906-11-01(D)(1) and (2). This rule states:

> ***(E) Environmental data. Describe the environmental impacts of the proposed project. This description shall include the following information:***
>
> > ***(1) A description of the applicant's investigation concerning the presence or absence of federal and state designated species (including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest) that may be located within the area likely to be disturbed by the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.***

AEP retained URS to conduct threatened and endangered species review and field survey within areas crossed by the proposed Project. This report will be used to assist AEP Ohio Transco's efforts to avoid impacts to threatened and endangered species potentially present in the study area during construction activities.

2.0 METHODS

The first phase of the survey involved a review of online lists of federal and state species of concern. In addition to the review of available literature, URS submitted a request to Ohio Department of Natural Resources (ODNR) Biodiversity Database for GIS records of species of concern that were reported within close proximity to the Project. These GIS records were overlain on the Project GIS maps to identify designated species and other sensitive areas as reported by ODNR in relation to the Project. URS also submitted a coordination letter to the U.S. Fish and Wildlife Service (USFWS) and ODNR soliciting comments on the Project. Copies of the response letters provided by ODNR and USFWS are included as Appendix A. Agency identified species and available species-specific information was reviewed to determine the various habitat types that listed species are known to frequent. This information was used

during the field survey to assess the potential for these species of concern in, or near the Project study corridor.

3.0 RESULTS

URS field ecologists conducted a designated species habitat survey in conjunction with the stream and wetland field surveys on September 10-11, 2013.

3.1 State Species of Concern

ODNR provided a letter response dated January 15, 2014, indicating the ranges of several species that potentially occur within the vicinity of the proposed Project area. Table 1 lists the four species identified by the ODNR and comments regarding the Project's potential to impact the species is discussed below. ODNR indicated that no records of rare or endangered species were identified at the Project site. A copy of the ODNR response is included in Appendix A.

TABLE 1
STATE LISTED SPECIES THAT COULD INHABIT
BELMONT COUNTY, OHIO

Common Name	Scientific Name	State Status
Mammals		
Indiana bat	***Myotis sodalis***	Endangered
Bobcat	***Lynx rufus***	Threatened
Black bear	***Ursus americanus***	Endangered
Amphibians		
Eastern Hellbender	***Cryptobranchus alleganiensis***	Endangered

While much of the Project property is wooded, only a limited number of trees suitable for potential Indiana bat habitat were observed during the field reconnaissance. The presence of only ephemeral streams also suggests limited potential for this species to be on the Project property. However, ODNR requested that suitable habitat should be conserved or cut between October 1 and March 31. A net survey must be conducted between June 15 and July 31 prior to cutting, if clearing is necessary during summer months.

The ranges of the black bear and bobcat were identified to potentially be within the vicinity of the Project. ODNR stated that due to the mobility of these species, no impacts are likely.

No state species of concern or signs of these species, and no unique habitats beyond a limited number of bat habitat trees were observed during the field survey. No state species of concern are expected to be impacted by the proposed Project.

3.2 Federal Species of Concern

To address the Project's potential to impact federally protected species, URS conducted a web based literature review of USFWS ***Federally Listed Threatened, Endangered, Proposed, and Candidate Species' County Distribution, Revised 2013***, to identify what species potentially occur in Belmont County, Ohio. Table 2 lists the four species identified during the USFWS literature review. A copy of the USFWS response is included in Appendix A.

TABLE 2
FEDERALLY LISTED SPECIES THAT COULD INHABIT BELMONT COUNTY, OHIO

Common Name	Scientific Name	Federal Status	County
Mammals			
Indiana bat	***Myotis sodalis***	Endangered	Belmont
Northern long-eared bat	***Myotis septentrionalis***	Proposed Endangered	Belmont
Mussels			
Sheepnose	***Plethobasus cyphus***	Endangered	Belmont
Snuffbox	***Epioblasma triquetra***	Endangered	Belmont

Federally Listed Threatened, Endangered, Proposed, and Candidate Species' County Distribution, Revised 2013.
Accessed December 19, 2013: http://www.fws.gov/midwest/endangered/lists/pdf/OhioSppList2013.pdf

Two of the four federally identified species are mussels that are found in large streams. Only ephemeral streams were identified in the Project area. No in-water work is currently proposed for the Project. Due to the nature of the Project, it is unlikely this Project would affect mussel species. The remaining species are discussed below:

Indiana Bat: The federal government lists this species as endangered in Ohio. Winter Indiana bat hibernacula include caves and mines, while summer habitat typically includes tree species exhibiting exfoliating bark or cavities that can be used for roosting. The 8- to 10-inch diameter size classes of several species of hickory (***Carya*** spp.), oak (***Quercus*** spp.), ash (***Fraxinus*** spp.), birch (***Betula*** spp.), and elm (***Ulmus*** spp.) are utilized in live form by the Indiana bat. These tree species and many others may be used when dead, if there are adequately sized patches of loosely-adhering bark or open cavities. The structural configuration of forest stands favored for roosting includes a mixture of loose-barked trees with 60 to 80 percent canopy closure and a low density sub-canopy (less than 30 percent between about 6 feet high and the base canopy). The suitability of roosting habitat for foraging or the proximity to suitable foraging habitat is critical to the evaluation of a particular tree stand. An open subcanopy zone, under a moderately dense canopy, is important to allow maneuvering while catching insect prey. Proximity to water is critical, because insect prey density is greater over or near open water. While much of the Project property is wooded, only a limited number of trees suitable for potential Indiana bat habitat were

observed. The presence of only ephemeral streams also suggests limited potential for this species to be on the Project property.

Northern Long-Eared Bat: The federal government lists this species as proposed endangered in Ohio. As with the Indiana bat, the winter northern long-eared bat hibernacula include caves and mines, while summer habitat typically includes tree species exhibiting exfoliating bark or cavities that can be used for roosting. Northern long-eared bat has also been found, rarely, roosting in structures like barns and sheds. Similar to the Indiana bat, characteristics on the Project property suggest it is not likely to inhabit the property.

Sheepnose: The federal government lists this species as endangered in Ohio. Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel. As no large streams were identified in the Project area, the sheepnose is not expected to be impacted by the Project.

Snuffbox: The federal government lists this species as endangered in Ohio. Snuffbox mussels live in small to medium-sized creeks, inhabiting areas with a swift current, although they are also found in Lake Erie and some larger rivers. As only ephemeral streams were identified in the Project area, the snuffbox is not expected to be impacted by the Project.

In an email dated January 3, 2014, USFWS recommended that trees exhibiting characteristics suitable as habitat for the Indiana and northern long-eared bats, as well as any surrounding wooded areas, should be saved. However, if these areas cannot be avoided, they should only be cut from October 1 through March 31. If implementation of the seasonal tree cutting restriction is not possible, summer surveys should be conducted by an approved surveyor in coordination with USFWS to document the presence or likely absence of the species. Due to the project type, size, and location, USFWS indicated that they do not anticipate adverse effects to any other federally listed species.

4.0 SUMMARY

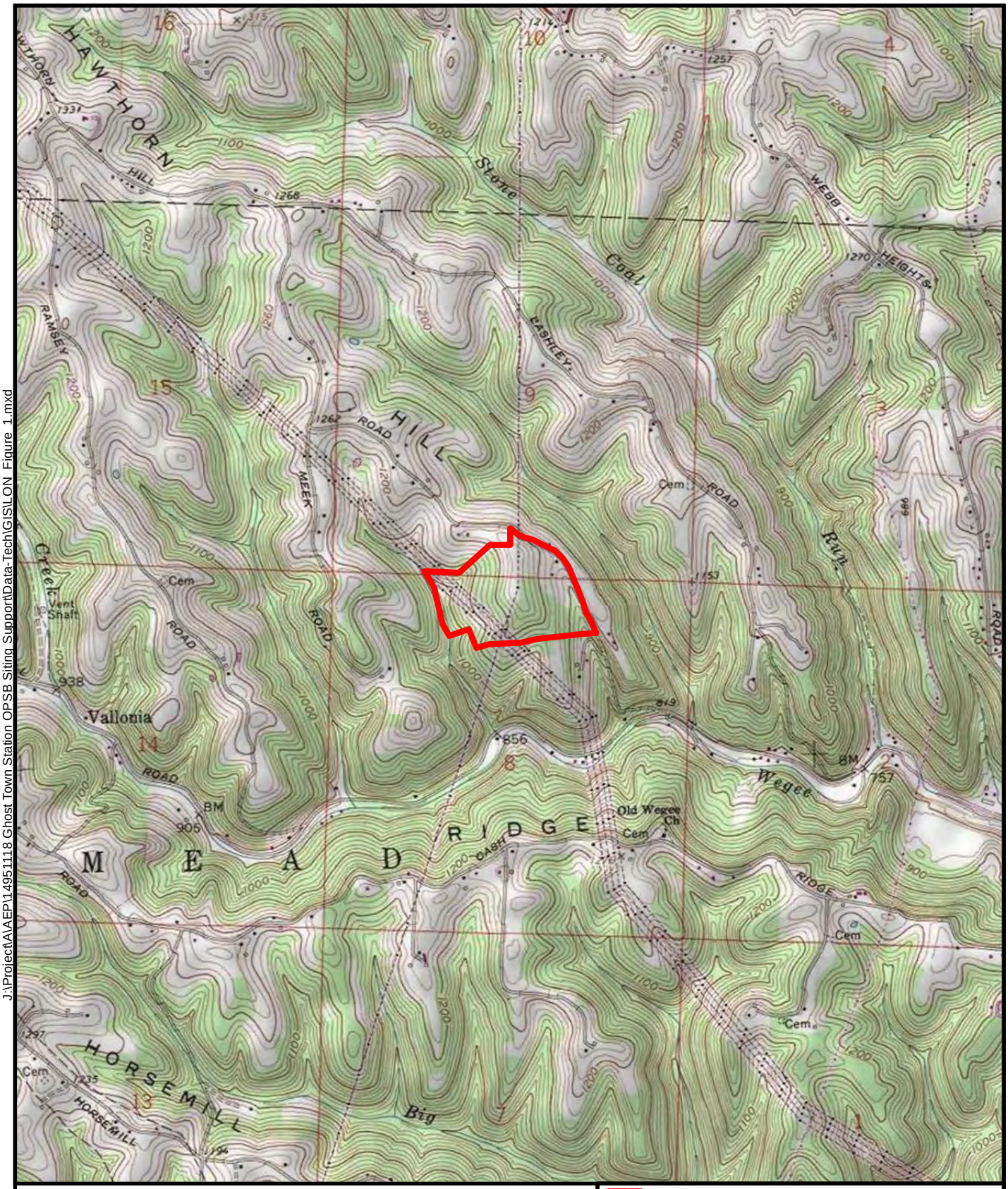
AEP retained URS to conduct threatened and endangered species review for areas located within 1,000 feet of the proposed Project and a field survey within the proposed Project location. This report will be used to assist AEP's efforts to avoid impacts to threatened and endangered species potentially present in the study area during construction activities. The field survey was conducted by URS field biologists in September, 2013. No species of concern or signs of these species, and no unique habitats beyond a limited number of bat habitat trees were observed during the field survey. No species of concern are expected to be impacted by the proposed Project.

ODNR and USFWS recommended that trees exhibiting characteristics suitable as habitat for the Indiana and northern long-eared bats, as well as any surrounding wooded areas should be saved. However, if these areas cannot be avoided, they should only be cut from October 1 through March 31. If implementation of the seasonal tree cutting restriction is not possible, summer surveys should be conducted by an approved surveyor in coordination with USFWS to document the presence or likely

absence of the species. Due to the project type, size, and location, USFWS indicated that they do not anticipate adverse effects to any other federally listed species.

5.0 CONCLUSION

Based upon the nature of the Project, review of available current literature, review of federal and state records of species of concern and the field survey conducted in September, 2013, it is not expected that federal or state species of concern will be impacted by the Project as currently planned. However, contact with the USFWS and the ODNR, indicates that seasonal tree clearing restrictions, or additional summer surveys, are required to limit potential impacts to the Indiana and northern long-eared bats. At this time, URS understands that AEP Ohio Transco intends to comply with the seasonal clearing restrictions.



LEGEND:

Project Property

0 2,000 4,000

Scale in Feet

N

AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 1
PROJECT OVERVIEW

JOB NO.14951118

URS

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_Figure_1.mxd

APPENDIX A

AGENCY RESPONSES

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

January 15, 2014

Aaron Geckle
URS Corporation
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

Re: 13-652; Holloway Station Project - AEP

Project: The project involves AEP's construction of a 345 kV/138 kV substation and associated electric transmission line interconnections due to the retirement of electric generating facilities in Ohio.

Location: The project is located in Mead Township, Belmont County, Ohio.

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

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

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

The project is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species. The following species of trees have relatively high value as potential Indiana bat roost trees: Shagbark hickory (*Carya ovata*), Shellbark hickory (*Carya laciniosa*), Bitternut hickory (*Carya cordiformis),* Black ash (*Fraxinus nigra*), Green ash (*Fraxinus pennsylvanica*), White ash (*Fraxinus americana*), Shingle oak (*Quercus imbricaria*), Northern red oak (*Quercus rubra*), Slippery elm (*Ulmus rubra*), American elm (*Ulmus americana*), Eastern cottonwood (*Populus deltoides*), Silver maple (*Acer saccharinum*), Sassafras (*Sassafras albidum*), Post oak (*Quercus stellata*), and White oak (*Quercus alba*). Indiana bat habitat consists of suitable trees that include dead and dying trees with exfoliating bark, crevices, or cavities in upland areas or riparian corridors and living trees with exfoliating bark, cavities, or hollow areas formed from broken branches or tops. If suitable trees occur within the project area, these trees should be conserved. If suitable habitat occurs on the project area and trees must be cut, cutting must occur between October 1 and March 31. If suitable trees must be cut during the summer months, a net

survey must be conducted between June 15 and July 31, prior to cutting. Net surveys shall incorporate either two net sites per square kilometer of project area with each net site containing a minimum of two nets used for two consecutive nights, or one net site per kilometer of stream within the project limits with each net site containing a minimum of two nets used for two consecutive nights. If no tree removal is proposed, the project is not likely to impact this species.

The project is within the range of the eastern hellbender (*Cryptobranchus alleganiensis alleganiensis*), a state endangered species and a federal species of concern. This long-lived, entirely aquatic salamander inhabits perennial streams with large flat rocks. Once present throughout much of the Ohio River watershed in Ohio, recent state-wide surveys revealed an almost 80% decline in hellbender abundance since the 1980's. In-water work in hellbender streams can reduce availability of large cover rocks and can destroy hellbender nests and/or kill adults and juveniles. The contribution of additional sediment to hellbender streams can smother large cover rocks and gravel/cobble substrate (used by juveniles), making them unsuitable for refuge and nesting. Projects that contribute to altered flow regimes (e.g., by increasing areas of impervious surfaces or modifying the floodplain) can also adversely affect hellbender habitat. Due to the location, this project is not likely to impact this species.

The project is within the range of the black bear (*Ursus americanus*), a state endangered species, and the bobcat (*Lynx rufus*), a state threatened species. Due to the mobility of these species, this project is not likely to impact these species.

The ODNR Natural Heritage Database has no records for rare or endangered species at this project site. We are unaware of any unique ecological sites, geologic features, animal assemblages, scenic rivers, state wildlife areas, nature preserves, parks or forests, national wildlife refuges or other protected natural areas within the project area. Our inventory program does not provide a complete survey of Ohio wildlife, and relies on information supplied by many individuals and organizations. Therefore, a lack of records for any particular area is not a statement that rare species or unique features are absent from that area.

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

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

Geckle, Aaron

From: susan_zimmermann@fws.gov on behalf of Ohio, FW3 <ohio@fws.gov>
Sent: Friday, January 03, 2014 10:03 AM
To: Geckle, Aaron
Subject: Holloway Station Project, Belmont County Ohio

TAILS# 03E15000-2014-TA-0370

Dear Mr. Geckle,
We have received your recent correspondence requesting information about the subject proposal. There are no Federal wilderness areas, wildlife refuges or designated critical habitat within the vicinity of the project area. The following comments and recommendations will assist you in fulfilling the requirements for consultation under section 7 of the Endangered Species Act of 1973, as amended (ESA).

The Service recommends that proposed developments avoid and minimize water quality impacts and impacts to high quality fish and wildlife habitat (e.g., forests, streams, wetlands). Additionally, natural buffers around streams and wetlands should be preserved to enhance beneficial functions. If streams or wetlands will be impacted, the Corps of Engineers should be contacted to determine whether a Clean Water Act section 404 permit is required. Best management practices should be used to minimize erosion, especially on slopes. All disturbed areas should be mulched and revegetated with native plant species. Prevention of non-native, invasive plant establishment is critical in maintaining high quality habitats.

ENDANGERED SPECIES COMMENTS: All projects in the State of Ohio lie within the range of the Indiana bat (Myotis sodalis), a federally listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During winter, Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

Should habitat exhibiting the characteristics described above be present at the proposed project site, we recommend that they, as well as surrounding trees, be saved wherever possible. However, if these trees cannot be avoided, they should only be cut between October 1 and March 31. If implementation of the seasonal tree cutting restriction is not possible, summer surveys should be conducted to document the presence or likely absence of the Indiana bat within the project area during the summer. The survey must be conducted by an approved surveyor and be designed and conducted in coordination with the Endangered Species Coordinator for this office.

The proposed project lies within the range of the northern long-eared bat (Myotis septentrionalis), a species that is currently proposed for listing as federally endangered. Recently white-nose syndrome (WNS), a novel fungal pathogen, has caused serious declines in the northern long-eared bat population in the northeastern U.S. WNS has also been documented in Ohio, but the full extent of the impacts from WNS in Ohio are not yet known.

During winter, northern long-eared bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) Roosting habitat in dead or live trees and snags with cavities, peeling or exfoliating bark, split tree trunk and/or branches, which may be used as maternity roost areas;
(2) Foraging habitat in upland and lowland woodlots and tree lined corridors;
(3) Occasionally they may roost in structures like barns and sheds.

It appears that habitat exhibiting the characteristics described above may be present at the proposed project site. We recommend that trees exhibiting any of the characteristics listed above, as well as any wooded areas or tree lined corridors be saved wherever possible. However, if these areas cannot be avoided, they should only be cut from October 1 through March 31.

If there is a Federal nexus for the project (e.g., Federal funding provided, Federal permits required to construct), no tree clearing on any portion of the parcel should occur until consultation under section 7 of the ESA, between the Service and the Federal action agency, is completed. We recommend that the Federal action agency submit a determination of effects to this office, relative to the Indiana bat, for our review and concurrence.

Due to the project type, size, and location, we do not anticipate adverse effects to any other federally endangered, threatened, proposed, or candidate species. Should the project design change, or during the term of this action, additional information on listed or proposed species or their critical habitat become available, or if new information reveals effects of the action that were not previously considered, consultation with the Service should be initiated to assess any potential impacts.

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973 (ESA), as amended, and are consistent with the intent of the National Environmental Policy Act of 1969 and the U. S. Fish and Wildlife Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document.

Sincerely,

Mary Knapp, PhD
Field Supervisor

APPENDIX D

AREAS OF ECOLOGICAL CONCERN, WETLAND DELIINATION, AND STREAM ASSESSMENT REPORT

MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INTALLATION OF HOLLOWAY STATION PROJECT

AREAS OF ECOLOGICAL CONCERN, WETLAND DELINEATION, AND STREAM ASSESSMENT REPORT

Prepared for:

American Electric Power Service Corporation
700 Morrison Road
Gahanna, Ohio 45230

Prepared by:

URS
525 Vine Street, Suite 1800
Cincinnati, Ohio 45202

Project #: 14951118

January 2014

TABLE OF CONTENTS

TABLES

Number

FIGURES
(follow text)

Number

APPENDICES
(follow figures)

Number

1.0 PROJECT DESCRIPTION

This document presents the results of the wetland and stream assessment conducted by URS Corporation (URS) for American Electric Power Ohio Transco's (AEP Ohio Transco) proposed Muskingum River-Tidd 345 kV Transmission Line Relocation and Installation of Holloway Station Project (Project). PJM, the regional transmission organization that coordinates electric transmission in the Project area, mandated tying AEP Ohio Transco's Muskingum-Tidd 345 kV transmission line and several parallel FirstEnergy 138 kV transmission lines due to retirement of electric generating facilities in Ohio. In response to PJM's mandate, AEP Ohio Transco is proposing to relocate the existing Muskingum River-Tidd 345 kV transmission through a new 345/138 kV Holloway Station on a property at the intersection of the lines in Belmont County, Ohio, as shown on Figure 1. FirstEnergy will subsequently construct 138 kV extensions from their lines to the station.

As part of the Ohio Power Siting Board (OPSB) Letter of Notification (LON) requirements, AEP Ohio Transco is required to describe the investigation concerning the presence or absence of areas of ecological concern as stated in Ohio Administrative Code (OAC) Rule 4906-15-11-01(E)(2). This rule states:

> ***(E) Environmental data. Describe the environmental impacts of the proposed project. This description shall include the following information:***
>
> > ***(2) A description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains, wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the areas likely to be disturbed by the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.***

AEP retained URS to review areas of ecological concern, as defined above, within the proposed Project vicinity and conduct a field survey of wetlands and streams within the limits of the proposed substation and associated interconnections. This report will be used to assist AEP Ohio Transco's efforts to avoid impacts to areas of ecological concern present in the study area during construction activities.

2.0 METHODS

2.1 Special Status Ecological Areas

URS reviewed maps and GIS data in order to identify national and state forests and parks, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries in the Project vicinity. GIS data sources included the ODNR Biodiversity Database and federal land and parks layers available from Environmental Systems Research Institute (ESRI). Property ownership within 1,000 feet of the Project was reviewed to identify parcels that may have special status. URS also noted land use during the field reconnaissance conducted on September 10-11, 2013.

Floodplains were evaluated based on the Federal Emergency Management Agency's (FEMA) Flood Map Viewer (https://hazards.fema.gov/wps/portal/mapviewer).

2.2 Wetland Assessment

The Project area was reviewed for the presence of wetlands using the procedures outlined in the United States Army Corps of Engineers (USACE) Wetlands Delineation Manual (1987 Manual) (Environmental Laboratory, 1987) in conjunction with the procedures outlined in the USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Regional Supplement) (2012).

The Regional Supplement was released in January 2012 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The 1987 Manual and Regional Supplement define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

URS utilized the routine delineation method described in the 1987 Manual and Regional Supplement that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance.

URS biologists identified wetlands through a pedestrian site reconnaissance of the site, including identifying the vegetation communities, soils identification where necessary, conducting a geomorphologic assessment of hydrology, and notation of disturbance. Determined wetland boundaries were noted where one or more of these criteria gave way to upland characteristics. The determined wetland boundaries were recorded with a handheld Trimble GeoXH GPS unit.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which URS is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may become invalidated, wholly or in part, by changes beyond the control of URS.

Wetland Classifications: Wetlands were classified based on the naming convention found in ***Classification of Wetlands and Deepwater Habitats of the United States*** (Cowardin ***et al***, 1979). No wetlands were identified on the site

Ohio Rapid Assessment Method v. 5.0: The Ohio Environmental Protection Agency (Ohio EPA) ORAM for Wetlands v 5.0 was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM

v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between “Categories 1 and 2” from 30 to 34.9 and between “Categories 2 and 3” from 60 to 64.9. However, according to the Ohio EPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001). As noted above, no wetlands were identified on the site.

2.3 Stream and River Crossings

Regulatory activities under the Clean Water Act provide authority for states to issue water quality standards and “designated uses” to all “Waters of the U.S.” upstream to the highest reaches of the tributary streams. In addition, the Federal Water Pollution Control Act (FWPCA) of 1972 and its 1977 and 1987 amendments require knowledge of the potential fish or biological communities that can be supported in a stream or river, including upstream headwaters. Streams were identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). URS stream assessments were limited to GPS recording of channels and basic classification based on flow regime (perennial, intermittent, or ephemeral).

3.0 RESULTS

3.1 Special Status Ecological Areas

URS conducted a review of published resources and agency consultations to identify national or state forests and parks designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, wildlife sanctuaries and floodplains crossed by and in the immediate vicinity of the Project. No national forests or parks designated or proposed wilderness areas, national wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, or wildlife sanctuaries were identified within 1,000 feet of the proposed Project.

According to the Federal Emergency Management Agency (FEMA) National Flood Hazard Layer (NFHL) (GIS shapefile), the Project is not located within any 100-year flood zones. The project is entirely located within Flood Zone X, an area with minimal flood hazard. No changes in flood elevations are anticipated as a result of the Project.

3.2 Wetland Assessment

No wetlands were identified within the Project survey area.

Preliminary Soils Evaluation: According to the ***Web Soil Survey*** for Belmont County, Ohio (USDA, 2012) and the Natural Resources Conservation Services Hydric Soils List of Ohio, 11 soil map units from six soil series are mapped within the Project area. None of these soil map units are considered hydric soils, but one soil map unit includes hydric inclusions in poorly drained soils (USDA, 2012). Soil series located within the Project area are shown on Figure 2. Table 1 provides a list of these soil map units along with their basic attributes.

TABLE 1

SOIL MAP UNITS AND DESCRIPTIONS WITHIN THE SURVEY AREA

Soil Series	Symbol	Map Unit Description	Percent of Survey Area by Series	Topographic Setting	Hydric	Hydric Component (%)
Brookside	BsD	Brookside silty clay loam, 15 to 25 percent slopes	0.4	Footslopes, benches, and hillsides	Inclusions	Poorly drained soils (10)
Culleoka	CuC	Culleoka silt loam, 8 to 15 percent slopes	0.3	Narrow ridgetops and crests of knolls	no	n/a
Dekalb	DkC	Dekalb loam, 8 to 15 percent slopes	8.7	Narrow and broad ridgetops, and knolls	no	n/a
Lowell	LoD	Lowell-Westmoreland silt loams, 15 to 25 percent slopes	6.9	Hillsides	no	n/a
	LoE	Lowell-Westmoreland silt loams, 25 to 40 percent slopes	5.4	Hillsides	no	n/a
	LpF	Lowell-Westmoreland silt loams, benched, 30 to 70 percent slopes	19.1	Hillsides	no	n/a
Richland	RcC	Richland loam, 8 to 15 percent slopes	14.0	Footslopes at the base of steep hillsides	no	n/a
Westmoreland	WmE	Westmoreland silt loam, 25 to 40 percent slopes	37.0	Hillsides	no	n/a
	WmF	Westmoreland silt loam, 40 to 70 percent slopes	0.01	Hillsides	no	n/a
	WoC	Westmoreland-Upshur complex, 8 to 15 percent slopes	3.8	Knolls and ridgetops	no	n/a
	WoD	Westmoreland-Upshur complex, 15 to 25 percent slopes	4.4	Hillsides and knolls on ridgetops	no	n/a

NOTES:

(1) Data sources include:

USDA, NRCS. 2011 Soil Survey Geographic (SSURGO) Database. Available online at: http://soildatamart.nrcs.usda.gov/

USDA, NRCS. April 2012. National Hydric Soils List by State. Available online at: ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/hydric_soils.xlsx

USDA, NRCS. 1978. Soil Survey of Belmont County, Ohio.

National Wetland Inventory Map Review: National Wetland Inventory (NWI) wetlands are areas of potential wetland that have been identified from U.S. Fish and Wildlife Service (USFWS) aerial photograph interpretation which have typically not been field verified. Forested and heavy scrub/shrub wetlands are often not shown on NWI maps, as foliage effectively hides the visual signature that indicates the presence of standing water and moist soils from an aerial view. As a result, NWI maps do not show all the wetlands found in a particular area nor do they necessarily provide accurate wetland boundaries. NWI maps are useful for providing indications of potential wetland areas, which are often supported by soil mapping and hydrologic predictions, based upon topographical analysis using USGS topographic maps.

According to the NWI map of the Businessburg, Ohio and West Virginia quadrangle, the Project area does not include any mapped NWI wetlands.

3.3 Stream and River Crossings

Streams within the survey corridor are summarized in Table 2. The locations of streams identified within the survey corridor are shown on Figure 2. All identified streams were assessed using the headwater habitat evaluation index (HHEI) methodology (drainage area less than one square mile (mi^2)) and none were assessed using the qualitative habitat evaluation index (QHEI) methodology (drainage area greater than 1 mi2). A total of eleven streams, totaling 3,197 linear feet, were identified within the survey area, all of which were ephemeral streams (Table 2). One stream (Stream 2) is located within the preliminary grading limits for a length of 275 feet. URS has preliminarily determined that the streams appear to be jurisdictional (i.e., "Waters of the U.S."), as they all appear to be tributaries that flow into or combine with other streams. All eleven streams are tributaries to Wegee Creek, which is located less than 1,500 feet south of the Project site. A representative sample of color photographs were taken of the streams during the field survey and are provided in Appendix B.

TABLE 2
STREAMS IDENTIFIED WITHIN THE HOLLOWAY STATION SURVEY AREA

Report Name	Waterbody	Flow Regime	Score	Class	Bankfull Width (feet)	Maximum Pool Depth (inches)	Length within Survey Area (feet)
Stream 1	Tributary to Wegee Creek	Ephemeral	50	Category 2	4	0	759
Stream 2	Tributary to Wegee Creek	Ephemeral	37	Category 2	2	0	388
Stream 3	Tributary to Wegee Creek	Ephemeral	13	Category 1	2.5	0	59
Stream 4	Tributary to Wegee Creek	Ephemeral	20.5	Category 1	2	0	85
Stream 5	Tributary to Wegee Creek	Ephemeral	19	Category 1	1.5	0	78

TABLE 2
STREAMS IDENTIFIED WITHIN THE HOLLOWAY STATION SURVEY AREA

Report Name	Waterbody	Flow Regime	Score	Class	Bankfull Width (feet)	Maximum Pool Depth (inches)	Length within Survey Area (feet)
Stream 6	Tributary to Wegee Creek	Ephemeral	35	Category 2	10	0	42
Stream 7	Tributary to Wegee Creek	Ephemeral	17	Category 1	2.5	0	219
Stream 8	Tributary to Wegee Creek	Ephemeral	30	Category 2	9	0	500
Stream 9	Tributary to Wegee Creek	Ephemeral	40	Category 2	6	0	850
Stream 10	Tributary to Wegee Creek	Ephemeral	26	Category 1	4	0	168
Stream 11	Tributary to Wegee Creek	Ephemeral	22	Category 1	3.5	0	50
Total: 11							**3,197**

4.0 PONDS

No ponds were identified within the Project survey area.

5.0 SUMMARY

No national forests or parks designated or proposed wilderness areas, National Wild and Scenic Rivers, wildlife areas, wildlife refuges, wildlife management areas, or wildlife sanctuaries were identified within 1,000 feet of the proposed Project.

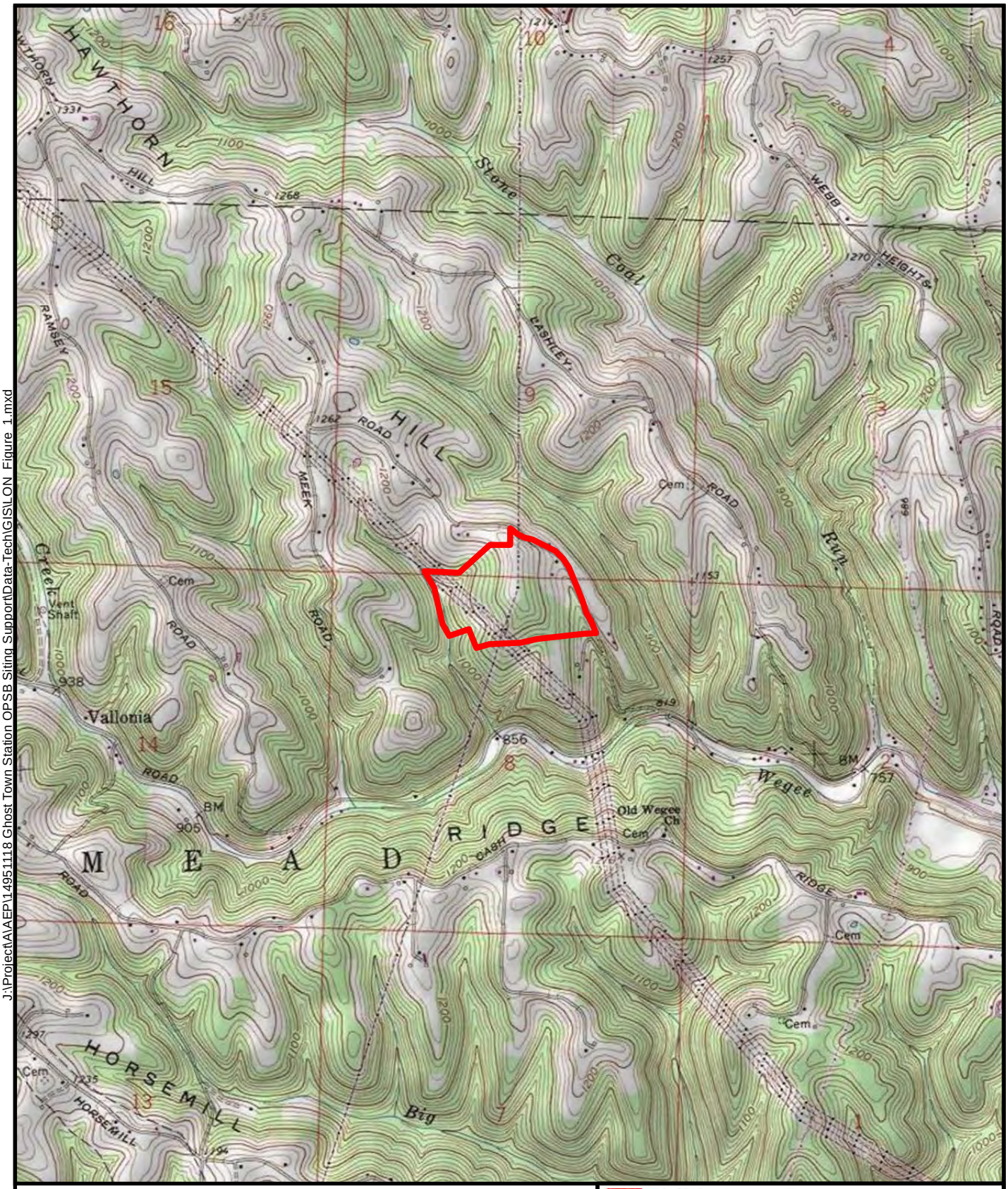
The Project is not located within any 100-year flood zones. The project is entirely located within Flood Zone X, an area with minimal flood hazard. No changes in flood elevations are anticipated as a result of the Project.

During the field survey, no wetlands or ponds were identified. Within the survey corridor, 11 ephemeral streams, totaling 3,197 feet, were assessed. Approximately 275 feet of Stream 2 is located within the preliminary grading limits and will be filled. This length represents the upstream headwater of the Stream 2.

6.0 CONCLUSION

This report will be used to assist AEP Ohio Transco's efforts to avoid special status ecological areas, wetlands, and streams to the extent possible during construction of the Project, thereby minimizing impacts to these features identified within the Project area. The 275-foot length of Stream 2 within the preliminary grading limits is under the 300-foot limitation, which can be waived to 500 feet, requiring a

USACE Nationwide 12 Permit. No wetlands were identified and no wetland impacts are anticipated. Erosion control methods including silt fencing are expected to be used where appropriate to minimize runoff related impacts to stream channels. As a consequence, significant impacts to these "Waters of the U.S." are not anticipated. Notification or permit applications under Sections 401 and/or 404 of the Clean Water Act are not expected to be required by either the Ohio EPA or the USACE for this project.



LEGEND:

Project Property

0 2,000 4,000

Scale in Feet

N

AEP OHIO TRANSMISSION COMPANY

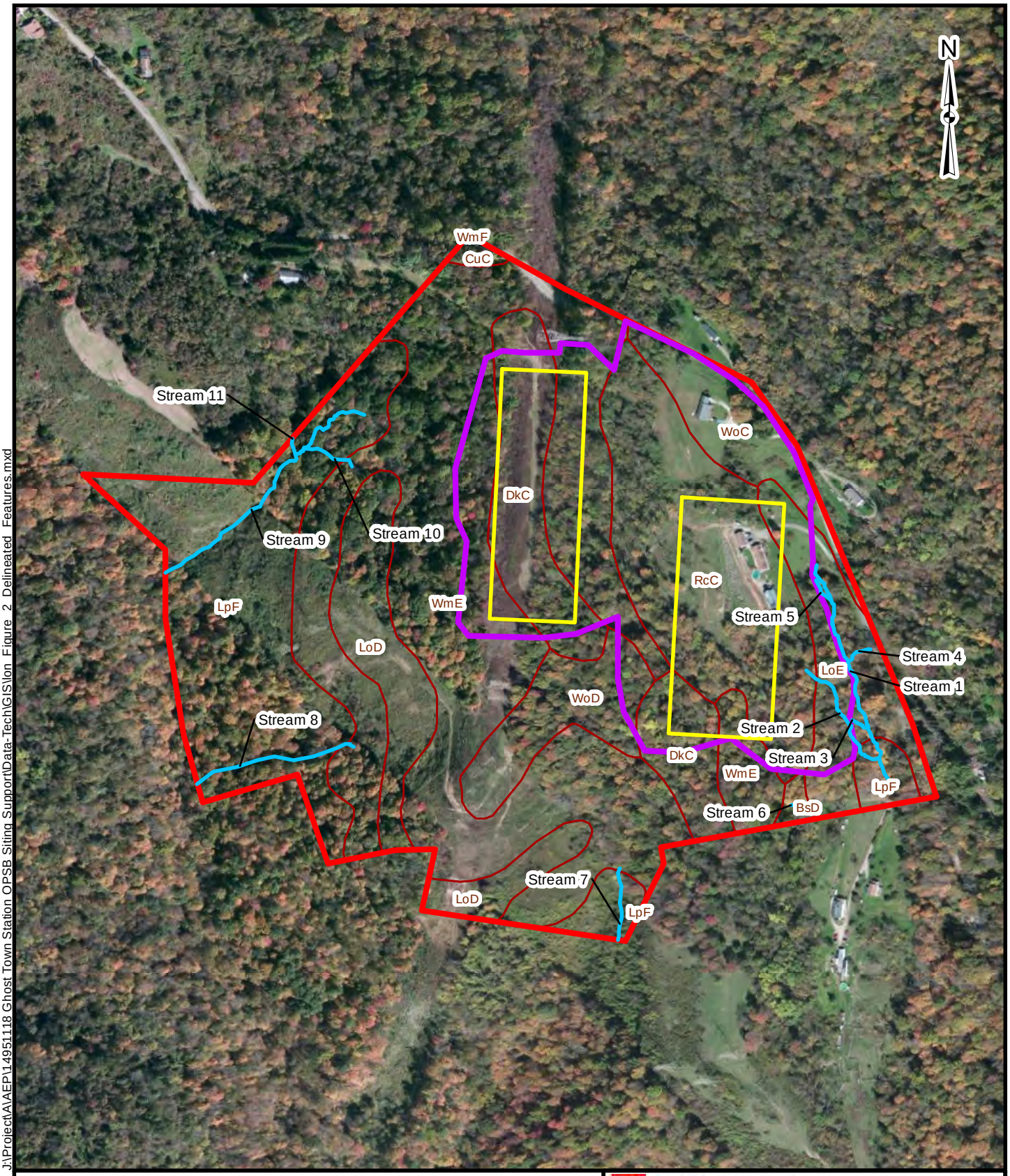
Holloway Station

FIGURE 1
PROJECT OVERVIEW

JOB NO.14951118

URS

J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\LON_Figure_1.mxd



J:\Project\A\AEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\Ion Figure 2 Delineated Features.mxd

LEGEND:

- Approximate Grading Limits
- Preliminary Station Fence Line
- Survey Boundary
- Delineated Stream
- Soil Map Unit

0 400 800

Scale In Feet

AEP OHIO TRANSMISSION COMPANY

Holloway Station

FIGURE 2
ECOLOGICAL SURVEY RESULTS

JOB NO.14951118

URS

APPENDIX A

STREAM FORMS

HH- 091013-BE-01

Stream 1

OhioEPA Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION AEP / Holloway Station

Wegee Creek SITE NUMBER 1 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091013 SCORER BE COMMENTS _____

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 40). 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]		☐ ☐	SILT [3 pt]	
☒ ☐	BOULDER (>256 mm) [16 pts]	20	☒ ☐	LEAF PACK/WOODY DEBRIS [3 pts]	15
☐ ☐	BEDROCK [16 pt]		☒ ☐	FINE DETRITUS [3 pts]	5
☒ ☐	COBBLE (65-256 mm) [12 pts]	20	☐ ☐	CLAY or HARDPAN [0 pt]	10
☒ ☐	GRAVEL (2-64 mm) [9 pts]	20	☐ ☐	MUCK [0 pts]	
☒ ☐	SAND (<2 mm) [6 pts]	10	☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 28

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 7

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 35

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS 4' AVERAGE BANKFULL WIDTH (meters) 1.9

Bankfull Width Max=30: 15

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		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☒	☒	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☒ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

HH- 071013 - BE-01

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 10

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

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

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)

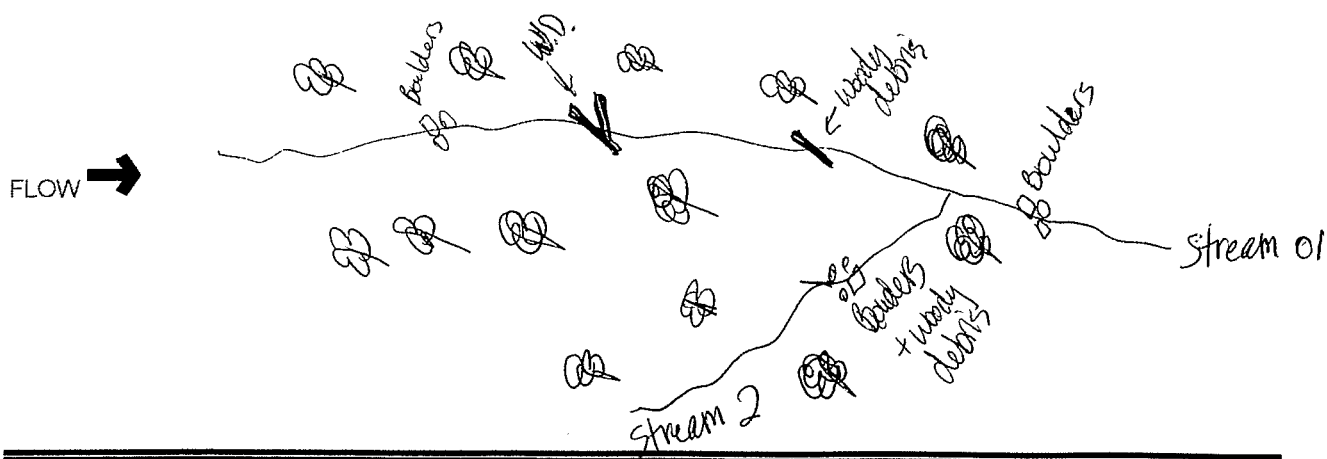
Fish Observed? (Y/N) N Voucher? (Y/N) ____ Salamanders Observed? (Y/N) ____ Voucher? (Y/N) ____

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



June 20, 2008 Revision

Stream 2 Ah-091013-BE-02

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 37

SITE NAME/LOCATION HEP / HOLLOWAY STATION
Wegee Creek SITE NUMBER 2 RIVER BASIN _____ DRAINAGE AREA (mi²) _____
LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____
DATE 09/013 SCORER BE COMMENTS _____

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 40). 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]	10	☒	SILT [3 pt]	10
☐	BOULDER (>256 mm) [16 pts]		☐	LEAF PACK/WOODY DEBRIS [3 pts]	5
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	15	☐	CLAY or HARDPAN [0 pt]	10
☒	GRAVEL (2-64 mm) [9 pts]	25	☐	MUCK [0 pts]	
☒	SAND (<2 mm) [6 pts]	20	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____ (A) 25

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 7

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 32

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): Ø

Pool Depth Max = 30: Ø

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 2' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 5

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

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 20

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

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

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)

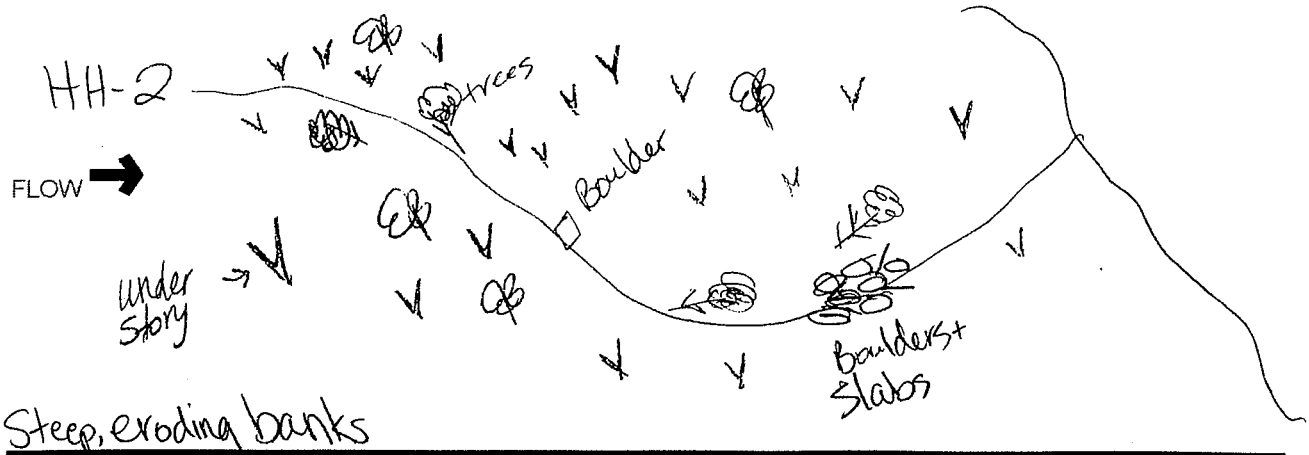
Fish Observed? (Y/N) N Voucher? (Y/N) — Salamanders Observed? (Y/N) — Voucher? (Y/N) —

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



1-HH

June 20, 2008 Revision

HH-091013-BE-03

Stream 3

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 13

SITE NAME/LOCATION AEP/HOLLOWAY STATION

Wegee Creek SITE NUMBER 3 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091013 SCORER BE COMMENTS _____

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 40). 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]		☒ ☐	SILT [3 pt]	60
☐ ☐	BOULDER (>256 mm) [16 pts]		☐ ☐	LEAF PACK/WOODY DEBRIS [3 pts]	10
☐ ☐	BEDROCK [16 pt]		☐ ☐	FINE DETRITUS [3 pts]	5
☐ ☐	COBBLE (65-256 mm) [12 pts]		☒ ☐	CLAY or HARDPAN [0 pt]	20
☐ ☐	GRAVEL (2-64 mm) [9 pts]		☐ ☐	MUCK [0 pts]	
☐ ☐	SAND (<2 mm) [6 pts]	5	☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 0 (A) 3 (B) 5

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

HHEI Metric Points

Substrate Max = 40: 8

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS 2.5' AVERAGE BANKFULL WIDTH (meters) 2

Bankfull Width Max=30: 5

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)		FLOODPLAIN QUALITY (Most Predominant per Bank)		
L R	Wide >10m	L R	Mature Forest, Wetland	L R Conservation Tillage
☐ ☐	Moderate 5-10m	☐ ☐	Immature Forest, Shrub or Old Field	☐ ☐ Urban or Industrial
☐ ☐	Narrow <5m	☐ ☐	Residential, Park, New Field	☐ ☐ Open Pasture, Row Crop
☐ ☐	None	☐ ☐	Fenced Pasture	☐ ☐ 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	☐ 1.0	☐ 2.0	☐ 3.0
☒ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____
☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 15

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

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

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

Additional comments/description of pollution impacts: _____

BIOTIC EVALUATION

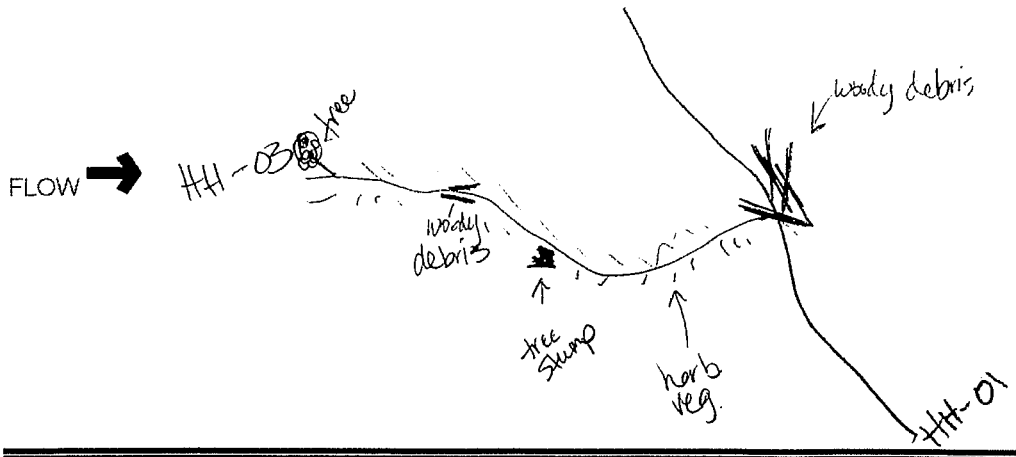
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



Stream 4

Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 20.5

SITE NAME/LOCATION AEP/HOLLOWAY STATION
Wegee Creek SITE NUMBER 4 RIVER BASIN _____ DRAINAGE AREA (mi²) _____
LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG. _____ RIVER CODE _____ RIVER MILE _____
DATE 09/10/13 SCORER BE COMMENTS _____

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 40). 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]	20	☐	SILT [3 pt]	
☐	BOULDER (>256 mm) [16 pts]		☒	LEAF PACK/WOODY DEBRIS [3 pts]	20
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☐	COBBLE (65-256 mm) [12 pts]	15	☒	CLAY or HARDPAN [0 pt]	30
☐	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]	5	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 35 (A) 9.5 (B) 6

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

HHEI Metric Points — Substrate Max = 40: 15.5 (A + B)

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]
☐ > 22.5 - 30 cm [30 pts]
☐ > 10 - 22.5 cm [25 pts]
☐ > 5 cm - 10 cm [15 pts]
☐ < 5 cm [5 pts]
☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters):

Pool Depth Max = 30: Ø

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

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☒ 1.0 m (3' 3") [5 pts]

COMMENTS _____ 2' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 5

This information must also be completed

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

RIPARIAN WIDTH L	R	(Per Bank)	FLOODPLAIN QUALITY L	R	(Most Predominant per Bank)	L	R	
☐	☐	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☒	☒	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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 ☐ 1.0 ☐ 2.0 ☐ 3.0
☒ 0.5 ☐ 1.5 ☐ 2.5 ☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 25

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

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

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)

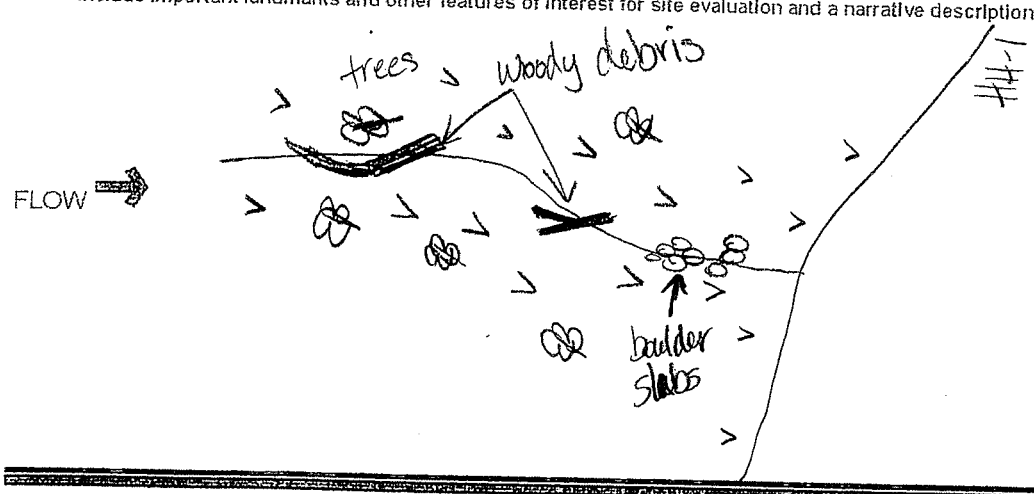
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Stream 5

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 19

SITE NAME/LOCATION AEP/HOLLOWAY STATION

Wegee Creek SITE NUMBER 5 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 09/10/13 SCORER BE COMMENTS _____

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 40). 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]		☐☐	SILT [3 pt]	
☐☐	BOULDER (>256 mm) [16 pts]		☐☐	LEAF PACK/WOODY DEBRIS [3 pts]	20
☐☐	BEDROCK [16 pt]		☐☐	FINE DETRITUS [3 pts]	
☐☐	COBBLE (65-256 mm) [12 pts]	5	☒☐	CLAY or HARDPAN [0 pt]	30
☒☐	GRAVEL (2-64 mm) [9 pts]	25	☐☐	MUCK [0 pts]	
☐☐	SAND (<2 mm) [6 pts]	20	☐☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5 (A) 9 (B) 5

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

HHEI Metric Points — Substrate Max = 40: 14 (A + B)

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]
☐ > 22.5 - 30 cm [30 pts]
☐ > 10 - 22.5 cm [25 pts]
☐ > 5 cm - 10 cm [15 pts]
☐ < 5 cm [5 pts]
☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ Ø MAXIMUM POOL DEPTH (centimeters):

Pool Depth Max = 30: _____

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

☐ > 4.0 meters (> 13') [30 pts]
☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☒ 1.0 m (3' 3") [5 pts]

COMMENTS _____ 1.5' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 5

This information must also be completed

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

RIPARIAN WIDTH L	R	(Per Bank)	FLOODPLAIN QUALITY L	R	(Most Predominant per Bank)	L	R	
☒	☒	Wide >10m	☐	☐	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☒	☒	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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 ☐ 1.0 ☐ 2.0 ☐ 3.0
☒ 0.5 ☐ 1.5 ☐ 2.5 ☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 40

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

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

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)

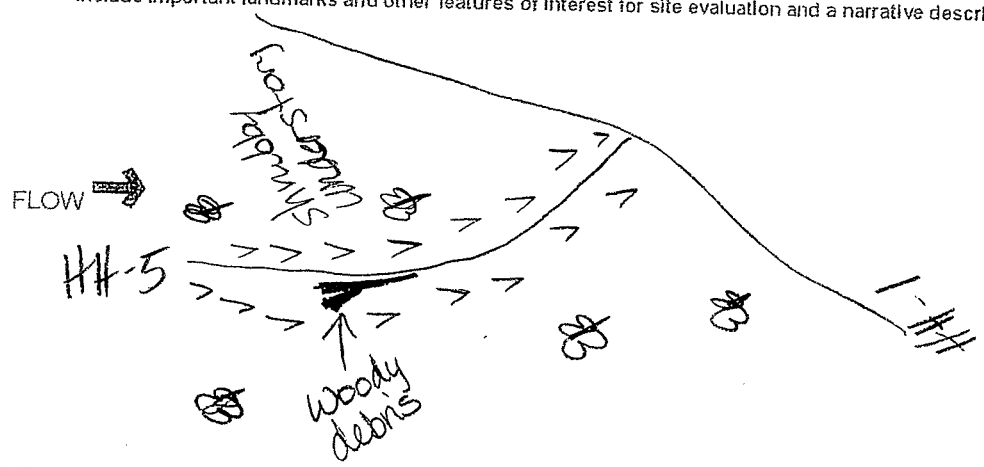
Fish Observed? (Y/N) N Voucher? (Y/N) ____ Salamanders Observed? (Y/N) ____ Voucher? (Y/N) ____

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



HH-091013-BE-06

Stream 6

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 35

SITE NAME/LOCATION AEP/HOLLOWAY STATION

Wegee Creek SITE NUMBER 6 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091013 SCORER BE COMMENTS _____

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 40). 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]		☒ ☐	SILT [3 pt]	75
☐ ☐	BOULDER (>256 mm) [16 pts]		☒ ☐	LEAF PACK/WOODY DEBRIS [3 pts]	15
☐ ☐	BEDROCK [16 pt]		☒ ☐	FINE DETRITUS [3 pts]	5
☒ ☐	COBBLE (65-256 mm) [12 pts]	5	☐ ☐	CLAY or HARDPAN [0 pt]	
☐ ☐	GRAVEL (2-64 mm) [9 pts]		☐ ☐	MUCK [0 pts]	
☐ ☐	SAND (<2 mm) [6 pts]		☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock _____

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 6

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 4

HHEI Metric Points — Substrate Max = 40: 10 (A + B)

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☒ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 10' AVERAGE BANKFULL WIDTH (meters) 3

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☆

L R	RIPARIAN WIDTH (Per Bank)	L R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L R	
☒ ☒	Wide >10m	☒ ☒	Mature Forest, Wetland	☐ ☐	Conservation Tillage
☐ ☐	Moderate 5-10m	☐ ☐	Immature Forest, Shrub or Old Field	☐ ☐	Urban or Industrial
☐ ☐	Narrow <5m	☐ ☐	Residential, Park, New Field	☐ ☐	Open Pasture, Row Crop
☐ ☐	None	☐ ☐	Fenced Pasture	☐ ☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

HH 08

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 30

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

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

Is the sampling reach representative of the stream (Y/N) _____ 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)

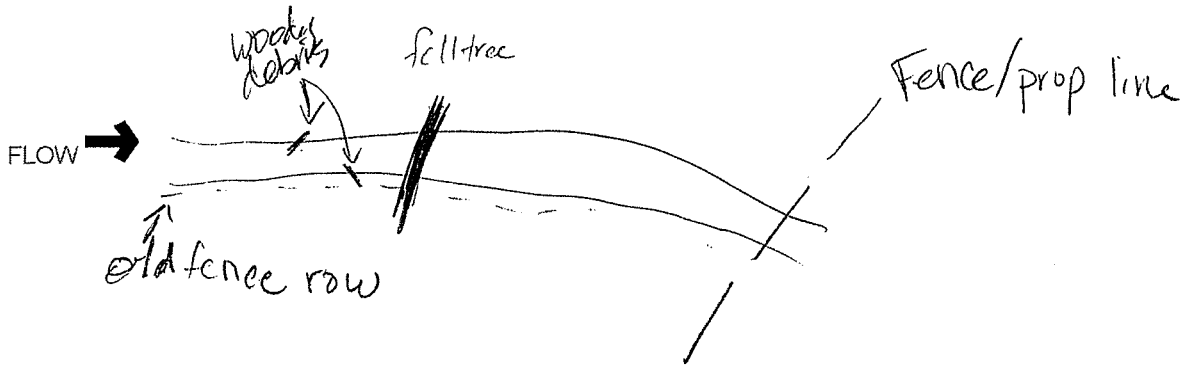
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



June 20, 2008 Revision

HH-091013-BE-07

Stream 7

OhioEPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 17

SITE NAME/LOCATION AEP/HOLLOWAY STATION

Wegee Creek SITE NUMBER 7 RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091013 SCORER BE COMMENTS _____

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 40). 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]		☒ ☐	SILT [3 pt]	10
☐ ☐	BOULDER (>256 mm) [16 pts]		☒ ☐	LEAF PACK/WOODY DEBRIS [3 pts]	20
☐ ☐	BEDROCK [16 pt]		☒ ☐	FINE DETRITUS [3 pts]	
☐ ☐	COBBLE (65-256 mm) [12 pts]	10	☐ ☐	CLAY or HARDPAN [0 pt]	30
☐ ☐	GRAVEL (2-64 mm) [9 pts]	20	☐ ☐	MUCK [0 pts]	
☐ ☐	SAND (<2 mm) [6 pts]	10	☐ ☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: (A) 6

TOTAL NUMBER OF SUBSTRATE TYPES: (B) 6

HHEI Metric Points — Substrate Max = 40: 12 (A + B)

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ Ø MAXIMUM POOL DEPTH (centimeters): Ø

Pool Depth Max = 30: Ø

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☒ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 2.5' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 5

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		FLOODPLAIN QUALITY (Most Predominant per Bank) L R		L R	
☒ ☒	Wide >10m	☒ ☒	Mature Forest, Wetland	☐ ☐	Conservation Tillage
☐ ☐	Moderate 5-10m	☐ ☐	Immature Forest, Shrub or Old Field	☐ ☐	Urban or Industrial
☐ ☐	Narrow <5m	☐ ☐	Residential, Park, New Field	☐ ☐	Open Pasture, Row Crop
☐ ☐	None	☐ ☐	Fenced Pasture	☐ ☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

hh-04

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: —

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 30 - (100 in Row)

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

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

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)

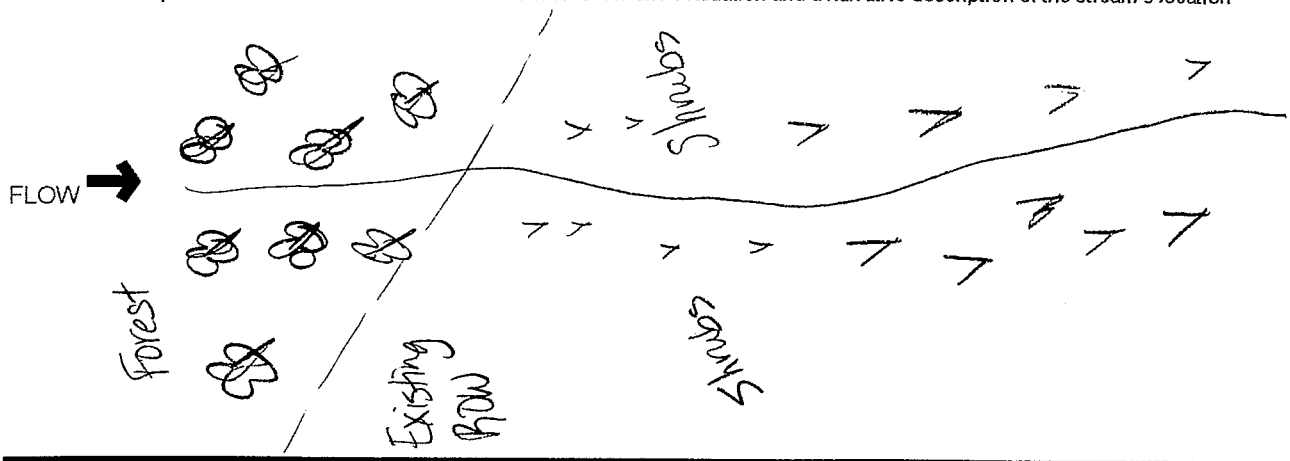
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



June 20, 2008 Revision

HH-091113-BE-04

Stream 8

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 30

SITE NAME/LOCATION Aep/Holloway Station

Wegee Creek SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091113 SCORER BE COMMENTS _____

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 40). 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]	15	☒	☐	SILT [3 pt]	30
☐	☐	BOULDER (>256 mm) [16 pts]		☒	☐	LEAF PACK/WOODY DEBRIS [3 pts]	40
☐	☐	BEDROCK [16 pt]		☐	☐	FINE DETRITUS [3 pts]	
☒	☐	COBBLE (65-256 mm) [12 pts]	15	☐	☐	CLAY or HARDPAN [0 pt]	
☐	☐	GRAVEL (2-64 mm) [9 pts]		☐	☐	MUCK [0 pts]	
☐	☐	SAND (<2 mm) [6 pts]		☐	☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 30 (A) 6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 4

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 10

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☒ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 9' AVERAGE BANKFULL WIDTH (meters)

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

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: _____

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 30

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

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

Is the sampling reach representative of the stream (Y/N) _____ 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)

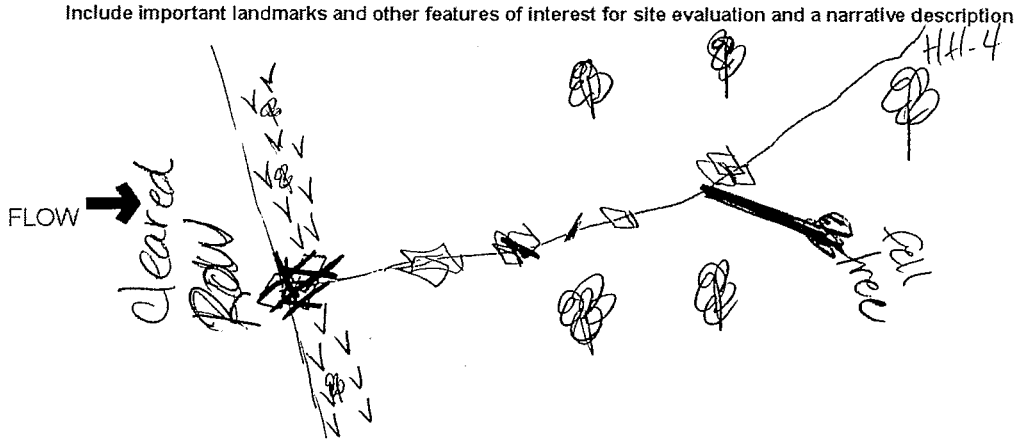
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



Stream 9 HH-091113-BE-01

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 40

SITE NAME/LOCATION HEP / HOLLOWAY STATION

Wegee Creek SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091113 SCORER BE COMMENTS _____

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 40). 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]	10	☒	SILT [3 pt]	30
☐	BOULDER (>256 mm) [16 pts]		☒	LEAF PACK/WOODY DEBRIS [3 pts]	20
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	20	☐	CLAY or HARDPAN [0 pt]	
☒	GRAVEL (2-64 mm) [9 pts]	20	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 30 (A) 15

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 5 TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 20

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): Ø

Pool Depth Max = 30: Ø

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☒ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 5-8' AVERAGE BANKFULL WIDTH (meters)

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 (Per Bank) L	R		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☒	☒	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☒ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: unk

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 15

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

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

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)_____ Salamanders Observed? (Y/N)_____ Voucher? (Y/N)_____

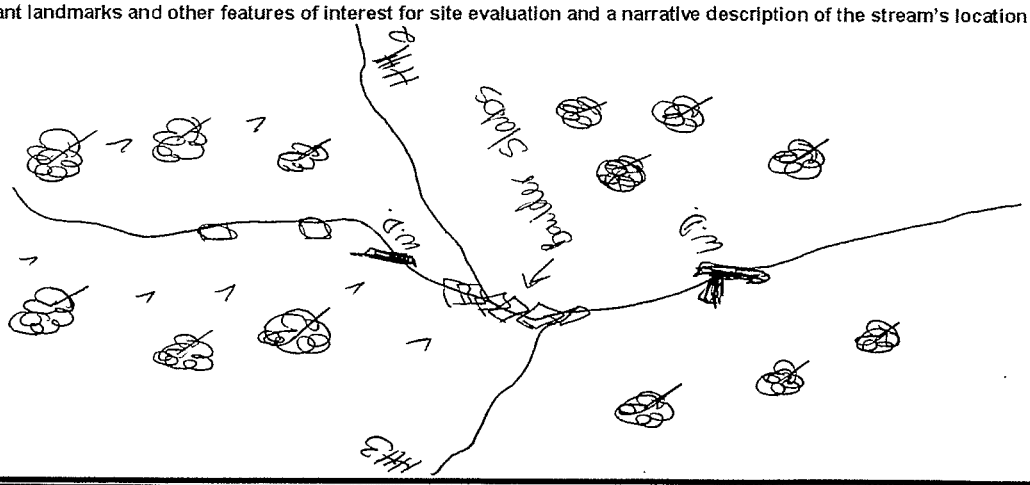
Frogs or Tadpoles Observed? (Y/N)____ Voucher? (Y/N)____ Aquatic Macroinvertebrates Observed? (Y/N)____ Voucher? (Y/N)____

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

FLOW



June 20, 2008 Revision

HH-091113-BE-02

Stream 10

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 26

SITE NAME/LOCATION AEP/ HOLLOWAY STATION

Wegee Creek SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091113 SCORER BE COMMENTS _____

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 40). 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]	20	☒	SILT [3 pt]	30
☐	BOULDER (>256 mm) [16 pts]		☒	LEAF PACK/WOODY DEBRIS [3 pts]	30
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	10	☐	CLAY or HARDPAN [0 pt]	
☒	GRAVEL (2-64 mm) [9 pts]	10	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 30 (A) 6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 5 TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points Substrate Max = 40: 11 (A + B)

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters):

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 3.54' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 15

This information must also be completed

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

L	R	RIPARIAN WIDTH (Per Bank)	L	R	FLOODPLAIN QUALITY (Most Predominant per Bank)	L	R	
☒	☒	Wide >10m	☒	☒	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: unk

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 20

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

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

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)

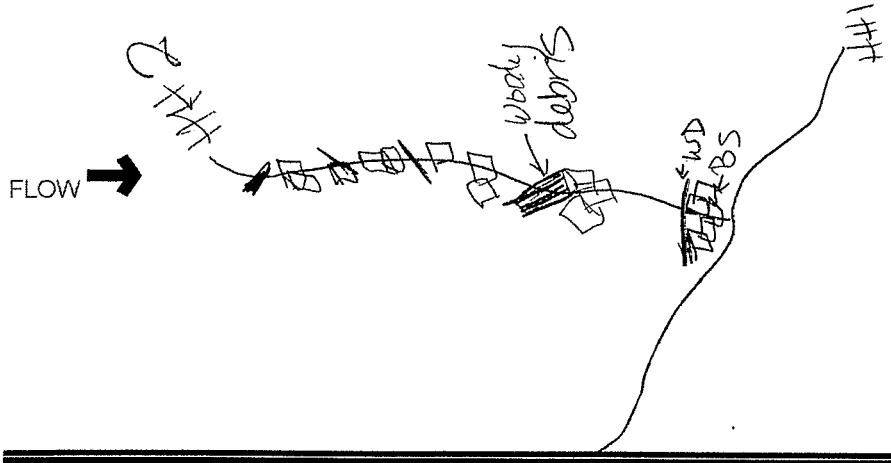
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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



June 20, 2008 Revision

HH-091113-BE-03

Stream 11

Ohio EPA Primary Headwater Habitat Evaluation Form

HHEI Score (sum of metrics 1, 2, 3) : 22

SITE NAME/LOCATION AEP/HOLLIDAY STATION

Wegee Creek SITE NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) _____

LENGTH OF STREAM REACH (ft) _____ LAT. _____ LONG. _____ RIVER CODE _____ RIVER MILE _____

DATE 091113 SCORER BE COMMENTS _____

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 40). 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]	10	☒	SILT [3 pt]	30
☐	BOULDER (>256 mm) [16 pts]		☒	LEAF PACK/WOODY DEBRIS [3 pts]	20
☐	BEDROCK [16 pt]		☐	FINE DETRITUS [3 pts]	
☒	COBBLE (65-256 mm) [12 pts]	15	☐	CLAY or HARDPAN [0 pt]	
☒	GRAVEL (2-64 mm) [9 pts]	25	☐	MUCK [0 pts]	
☐	SAND (<2 mm) [6 pts]		☐	ARTIFICIAL [3 pts]	

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 25 (A) 12

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

(B) 5 TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI Metric Points

Substrate Max = 40: 17

A + B

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]
- ☐ > 22.5 - 30 cm [30 pts]
- ☐ > 10 - 22.5 cm [25 pts]
- ☐ > 5 cm - 10 cm [15 pts]
- ☐ < 5 cm [5 pts]
- ☒ NO WATER OR MOIST CHANNEL [0 pts]

COMMENTS _____ MAXIMUM POOL DEPTH (centimeters): 0

Pool Depth Max = 30: 0

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

- ☐ > 4.0 meters (> 13') [30 pts]
- ☐ > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]
- ☐ > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 pts]
- ☒ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
- ☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

COMMENTS _____ 3.5' AVERAGE BANKFULL WIDTH (meters)

Bankfull Width Max=30: 15

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		FLOODPLAIN QUALITY (Most Predominant per Bank) L	R		L	R	
☒	☒	Wide >10m	☒	☒	Mature Forest, Wetland	☐	☐	Conservation Tillage
☐	☐	Moderate 5-10m	☐	☐	Immature Forest, Shrub or Old Field	☐	☐	Urban or Industrial
☐	☐	Narrow <5m	☐	☐	Residential, Park, New Field	☐	☐	Open Pasture, Row Crop
☐	☐	None	☐	☐	Fenced Pasture	☐	☐	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	☐ 1.0	☐ 2.0	☐ 3.0
☐ 0.5	☐ 1.5	☐ 2.5	☐ >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)

June 20, 2008 Revision

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: _____ Distance from Evaluated Stream _____

☐ 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: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: Belmont Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: unk Quantity: unk

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 20

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

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

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)

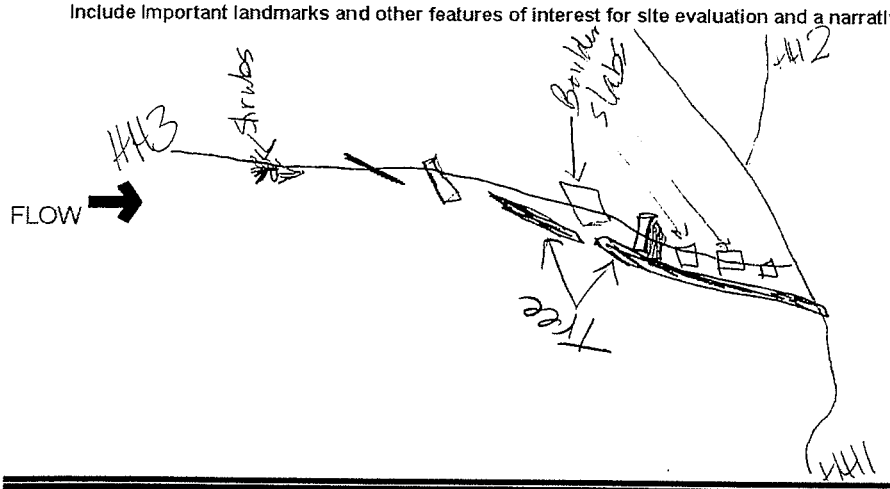
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) _____ Voucher? (Y/N) _____

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

PHOTOGRAPHS

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
AEP	Holloway Station Project	14951118

Photo No. 1 **Date:** September 10, 2013 **Description:** Stream 1 HHEI Stream Facing Downstream Ephemeral Stream	

Photo No. 2 **Date:** September 10, 2013 **Description:** Stream 2 HHEI Stream Facing Upstream Ephemeral Stream	

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
AEP	Holloway Station Project	14951118

Photo No. 3 **Date:** September 10, 2013 **Description:** Stream 3 HHEI Stream Facing Downstream Ephemeral Stream	

Photo No. 4 **Date:** September 10, 2013 **Description:** Stream 4 HHEI Stream Facing Downstream Ephemeral Stream	

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
AEP	Holloway Station Project	14951118

Photo No. 5 **Date:** September 10, 2013 **Description:** Stream 5 HHEI Stream Facing Downstream Ephemeral Stream	

Photo No. 6 **Date:** September 10, 2013 **Description:** Stream 6 HHEI Stream Facing Downstream Ephemeral Stream	

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
AEP	Holloway Station Project	14951118

Photo No. 7

Date:

September 11, 2013

Description:

Stream 8

HHEI Stream

Facing Downstream

Ephemeral Stream

Photo No. 8

Date:

September 11, 2013

Description:

Stream 9

HHEI Stream

Facing Upstream

Ephemeral Stream

PHOTOGRAPHIC RECORD
Streams

Client Name:	Site Location:	Project No.
AEP	Holloway Station Project	14951118

Photo No. 9 **Date:** September 11, 2013 **Description:** Stream 10 HHEI Stream Facing Upstream Ephemeral Stream	

Photo No. 10 **Date:** September 11, 2013 **Description:** Stream 11 HHEI Stream Facing Downstream Ephemeral Stream