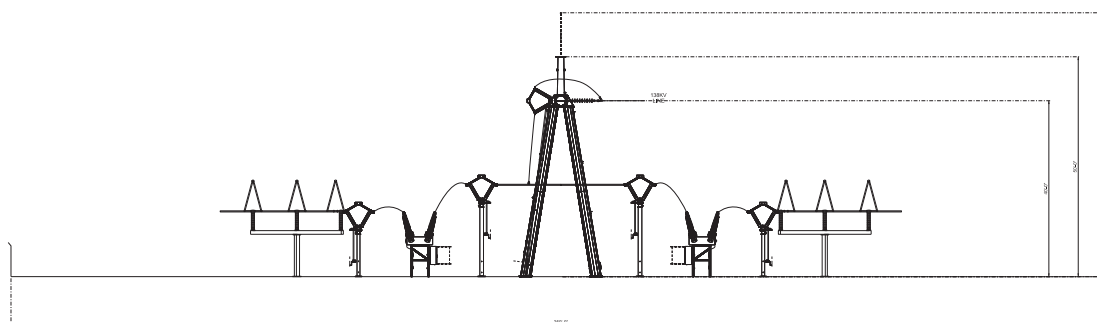


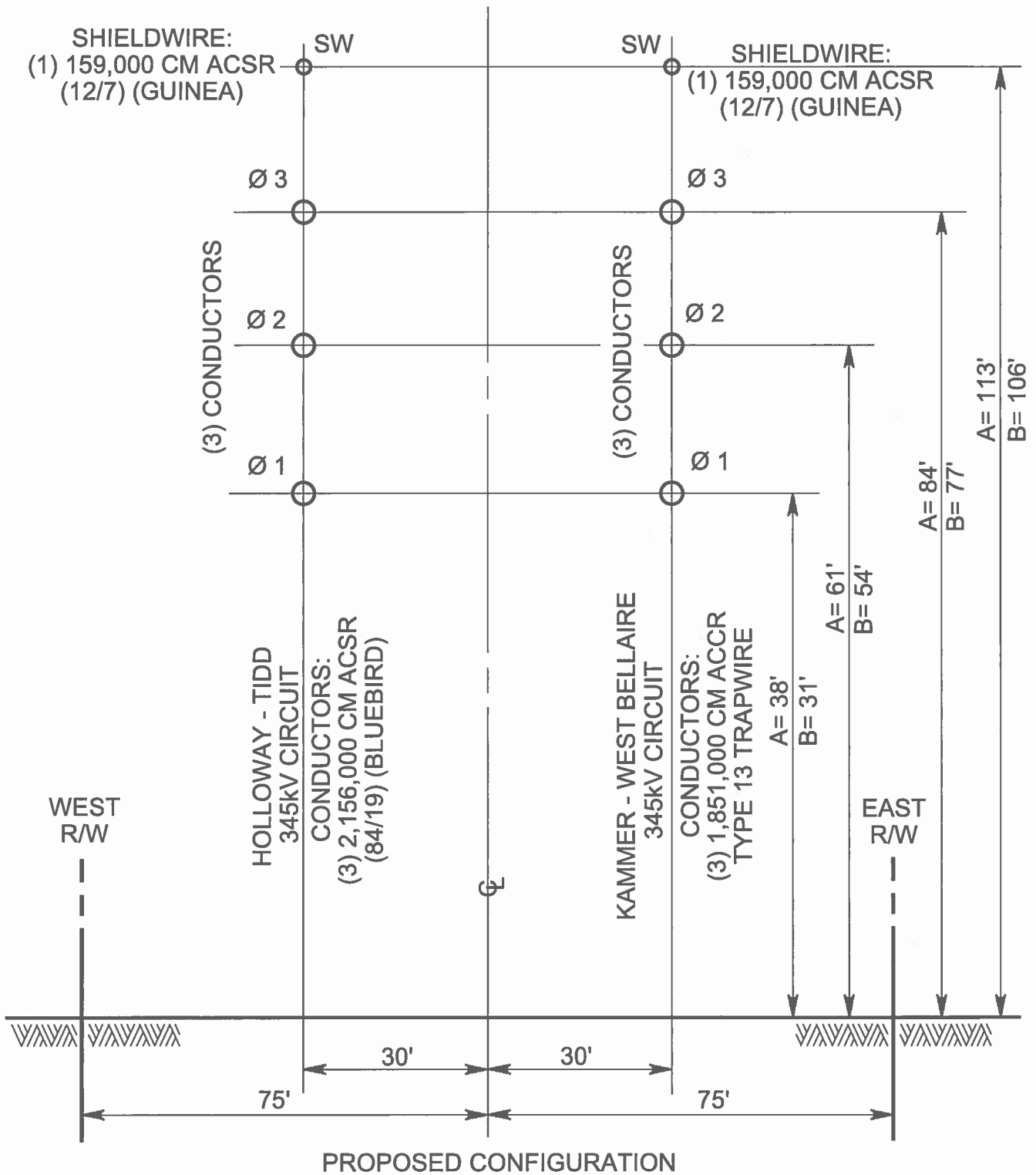
## 138KV STATION



OLD DWG NO.	25A00000 SPL C	STANDARD
<p>THIS DRAWING IS THE PROPERTY OF AMERICAN ELECTRIC CORPORATION. IT IS TO BE USED ONLY FOR THE PROJECT AND PURPOSE SPECIFIED HEREON. IT IS NOT TO BE REPRODUCED, COPIED, OR IN ANY MANNER USED FOR ANY OTHER PROJECT OR PURPOSE WITHOUT THE WRITTEN PERMISSION OF AMERICAN ELECTRIC CORPORATION. IT IS TO BE RETURNED TO AMERICAN ELECTRIC CORPORATION UPON COMPLETION OF THE PROJECT OR UPON DEMAND.</p>		
<p>OLD DRAWING NO. 25A00000 SPL C</p>		
<p>HOLLOWAY STATION</p>		
<p>FIGURE 8</p>		
<p>ELECTRICAL ASSEMBLY - SOUTH VIEW</p>		
SCALE: 1/8" = 1"	ENG. DESIGNED BY	ENG. CHECKED BY
	DATE	DATE
 <p>AMERICAN ELECTRIC</p>	<p>7 AVONDALE PLAZA COLUMBIA, MISSOURI 65201</p>	
	APP'D.	E-2101
		0







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

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



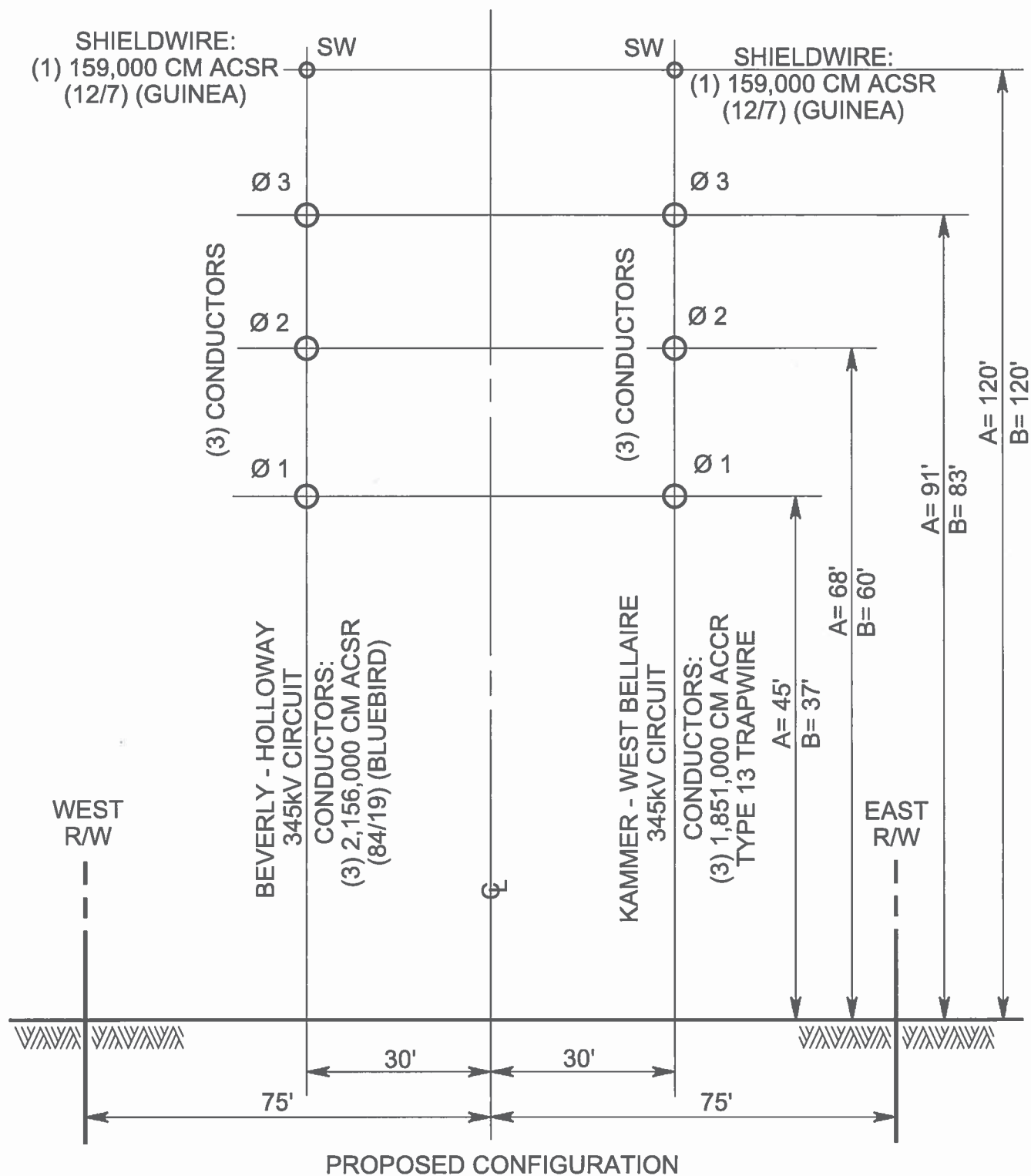
HOLLOWAY  
STATION

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

NOT TO SCALE

FIGURE 11





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

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

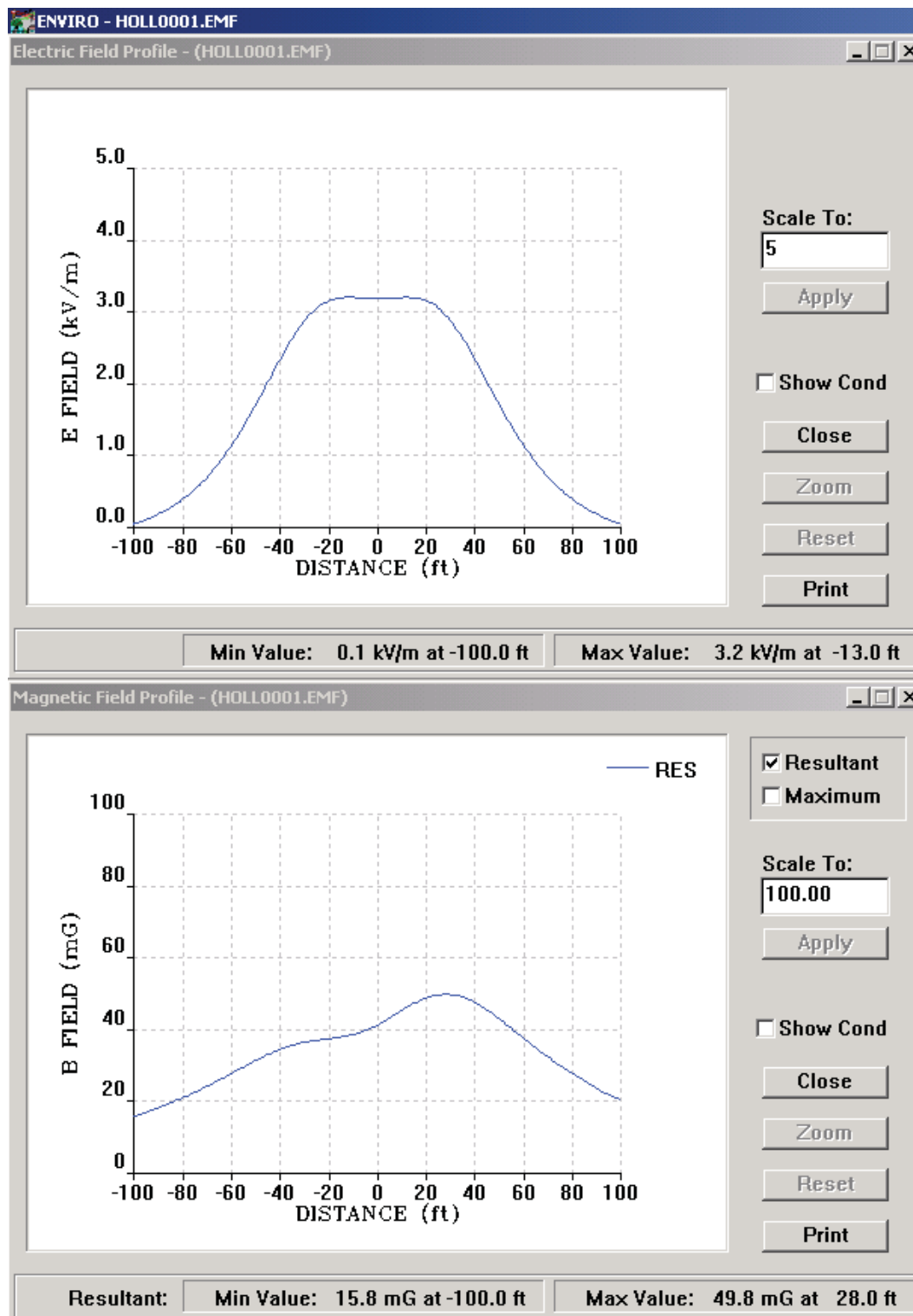


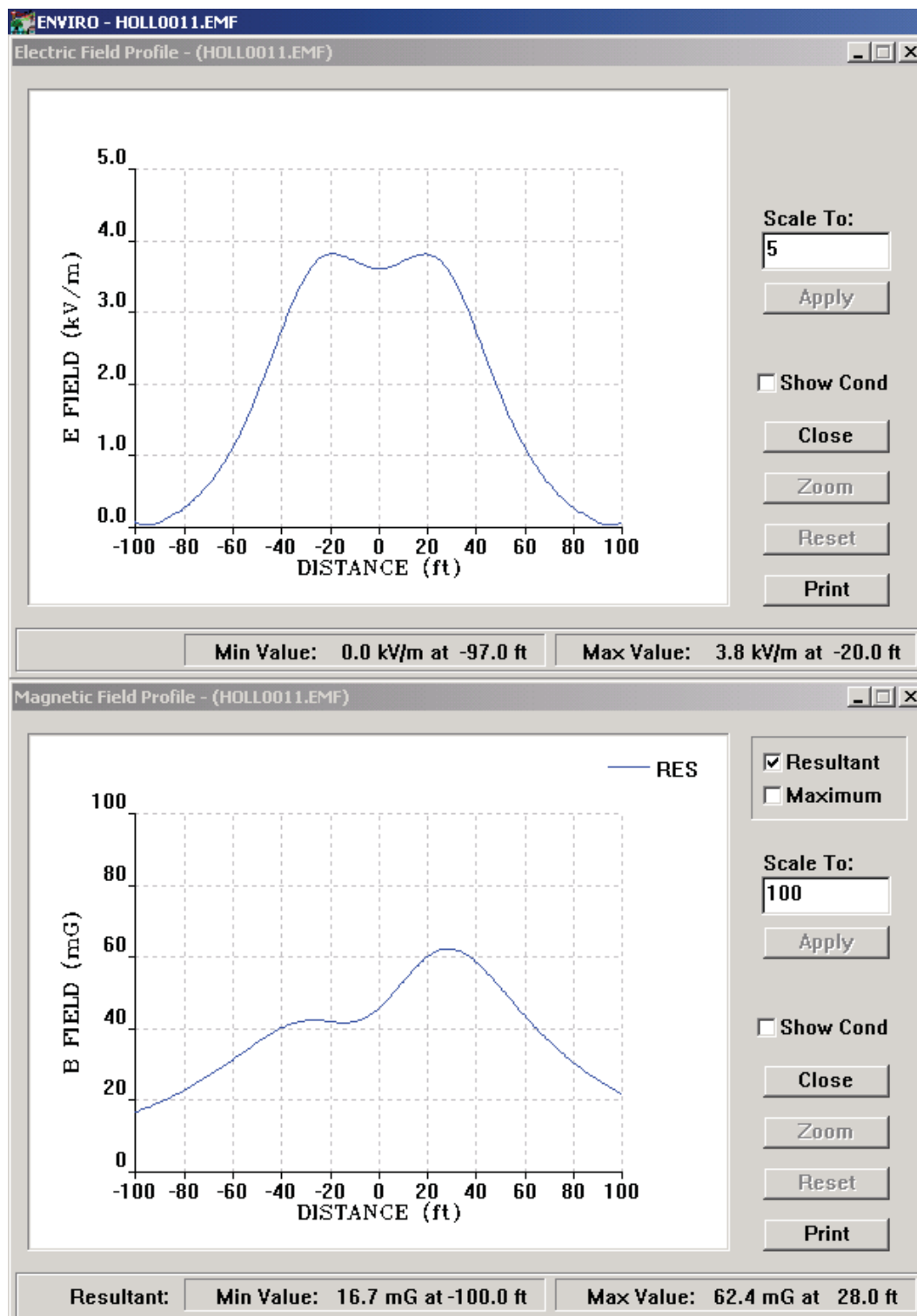
HOLLOWAY  
STATION

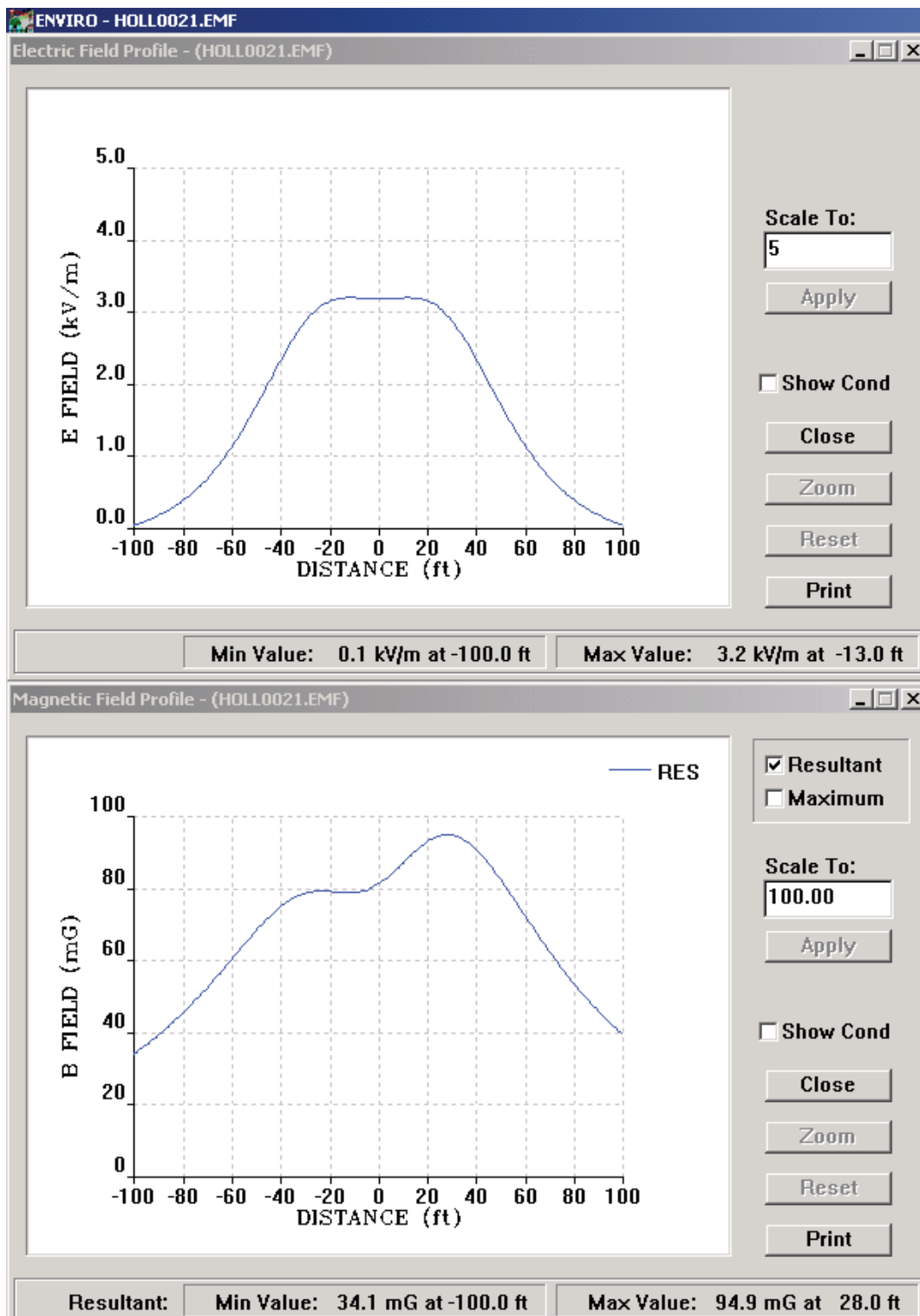
TYPICAL PHASE ARRANGEMENT  
MUSKINGUM - TIDD 345kV LINE  
TWO POLE DEADEND STRUCTURE

NOT TO SCALE

FIGURE 12

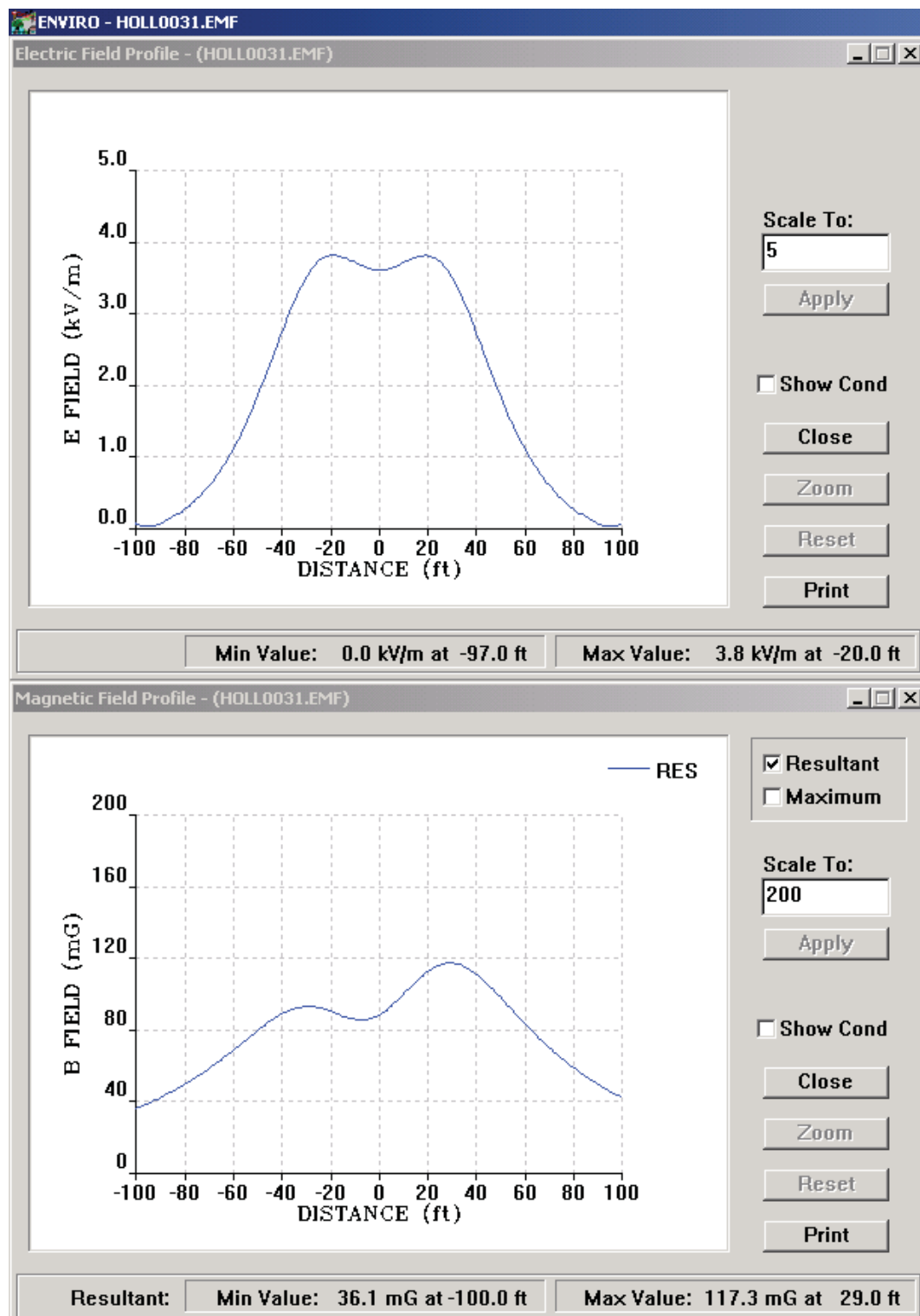






Holloway Station

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



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



## **APPENDIX A**

### **SOCIOECONOMIC, LAND USE, AND AGRICULTURAL DISTRICT REVIEW REPORT**



# **MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INSTALLATION 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

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5.0	CONCLUSION.....	3

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## FIGURES (follow text)

### Number

FIGURE 1	PROJECT OVERVIEW
FIGURE 2	LAND USE MAP

## 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
<b>Belmont County</b>	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

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#### **4.0 AGRICULTURAL DISTRICT LAND**

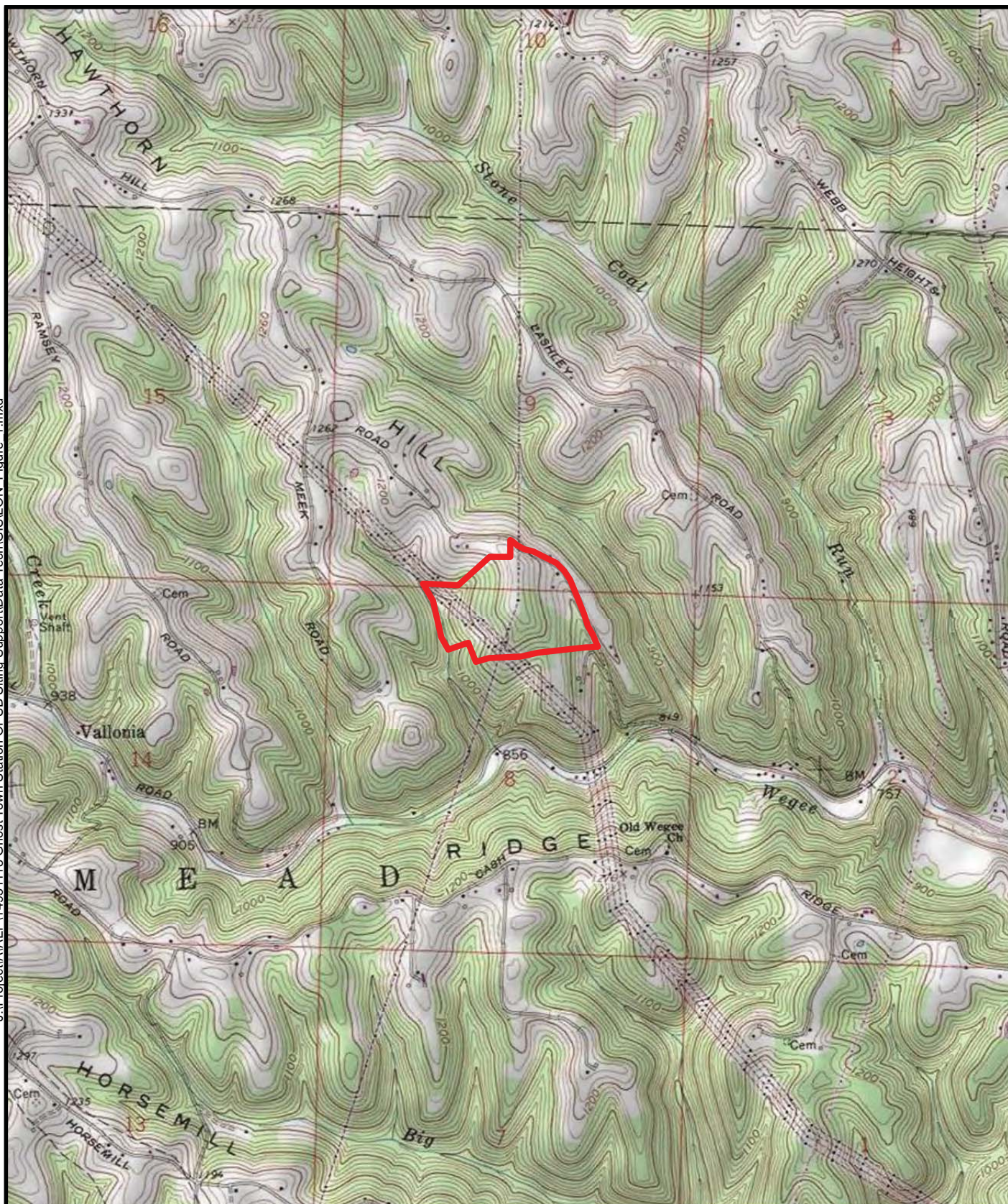
URS contacted the Belmont County Auditor's office on January 2, 2014 regarding parcels registered in the agricultural district land program. There are reportedly no agricultural district land parcels in Mead Township.

#### **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.



J:\Project\AAEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\SLON Figure 1.mxd



LEGEND:

 Project Property

0 2,000 4,000  
Scale in Feet



**AAEP** OHIO  
TRANSMISSION  
COMPANY

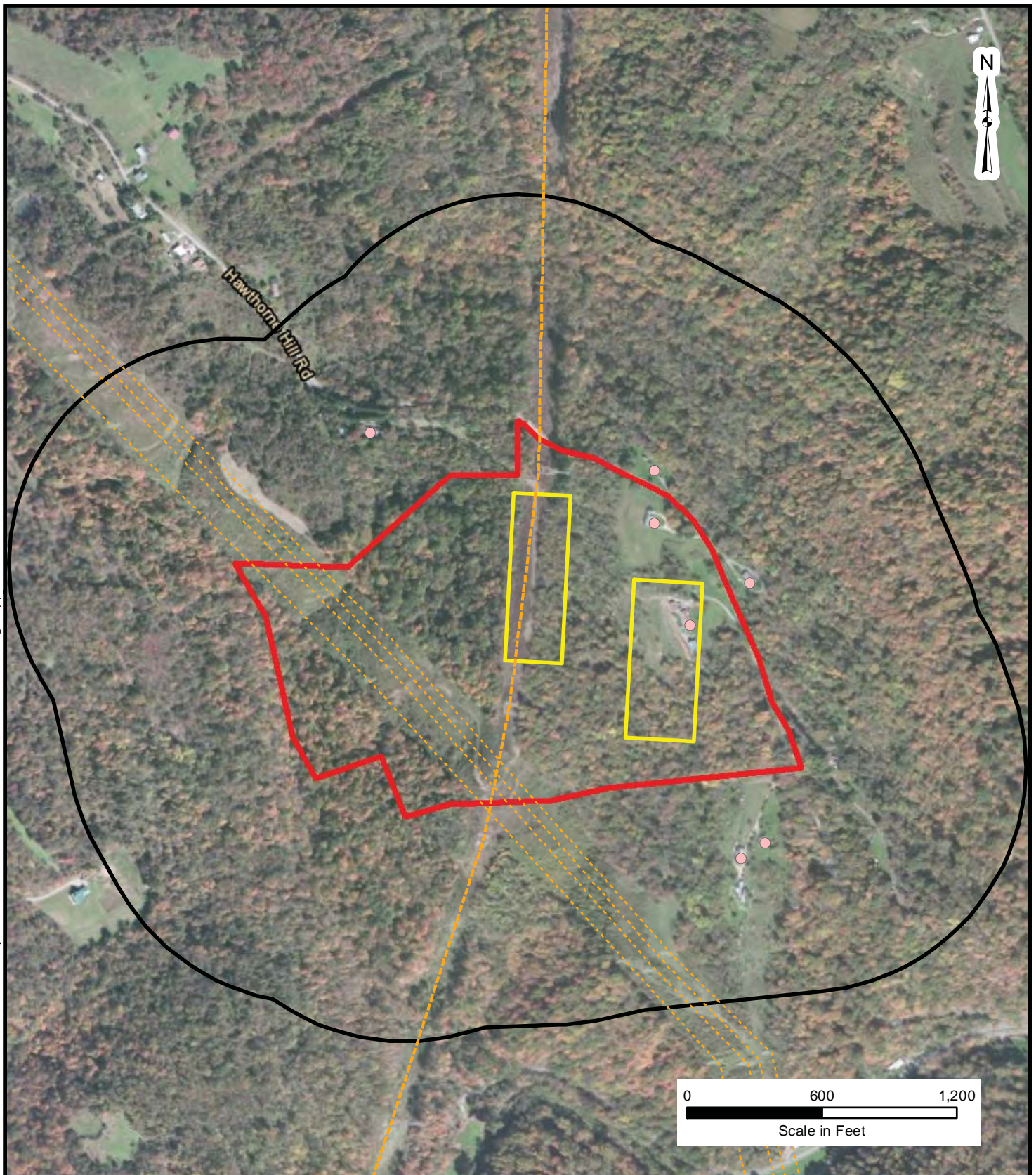
Holloway Station

FIGURE 1  
PROJECT OVERVIEW

JOB NO.14951118

**URS**





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  
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,

A handwritten signature in black ink, reading 'Edward V. Gilabert', with a long horizontal line extending to the right.

Edward V. Gilabert  
Project Management





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.

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Edward V. Gilabert  
Project Management



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.

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

Sincerely,

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Edward V. Gilabert  
Project Management



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.

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

Sincerely,

A handwritten signature in black ink, appearing to read 'Edward V. Gilabert', is written over a horizontal line.

Edward V. Gilabert  
Project Management



## **APPENDIX C**

### **THREATENED AND ENDANGERED SPECIES SURVEY REPORT**

# **MUSKINGUM RIVER-TIDD 345 KV TRANSMISSION LINE RELOCATION AND INSTALLATION 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

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TABLE 2	FEDERALLY LISTED SPECIES THAT COULD INHABIT BELMONT COUNTY, OHIO.....	3

## FIGURES (follow text)

### Number

FIGURE 1	PROJECT OVERVIEW
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## APPENDIX (follows figures)

### Number

APPENDIX A	AGENCY RESPONSES
------------	------------------

## 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
<b>Mammals</b>		
Indiana bat	<i>Myotis sodalis</i>	Endangered
Bobcat	<i>Lynx rufus</i>	Threatened
Black bear	<i>Ursus americanus</i>	Endangered
<b>Amphibians</b>		
Eastern Hellbender	<i>Cryptobranchus alleganiensis</i>	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
<b>Mammals</b>			
Indiana bat	<i>Myotis sodalis</i>	Endangered	Belmont
Northern long-eared bat	<i>Myotis septentrionalis</i>	Proposed Endangered	Belmont
<b>Mussels</b>			
Sheepnose	<i>Plethobasus cyphus</i>	Endangered	Belmont
Snuffbox	<i>Epioblasma triquetra</i>	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

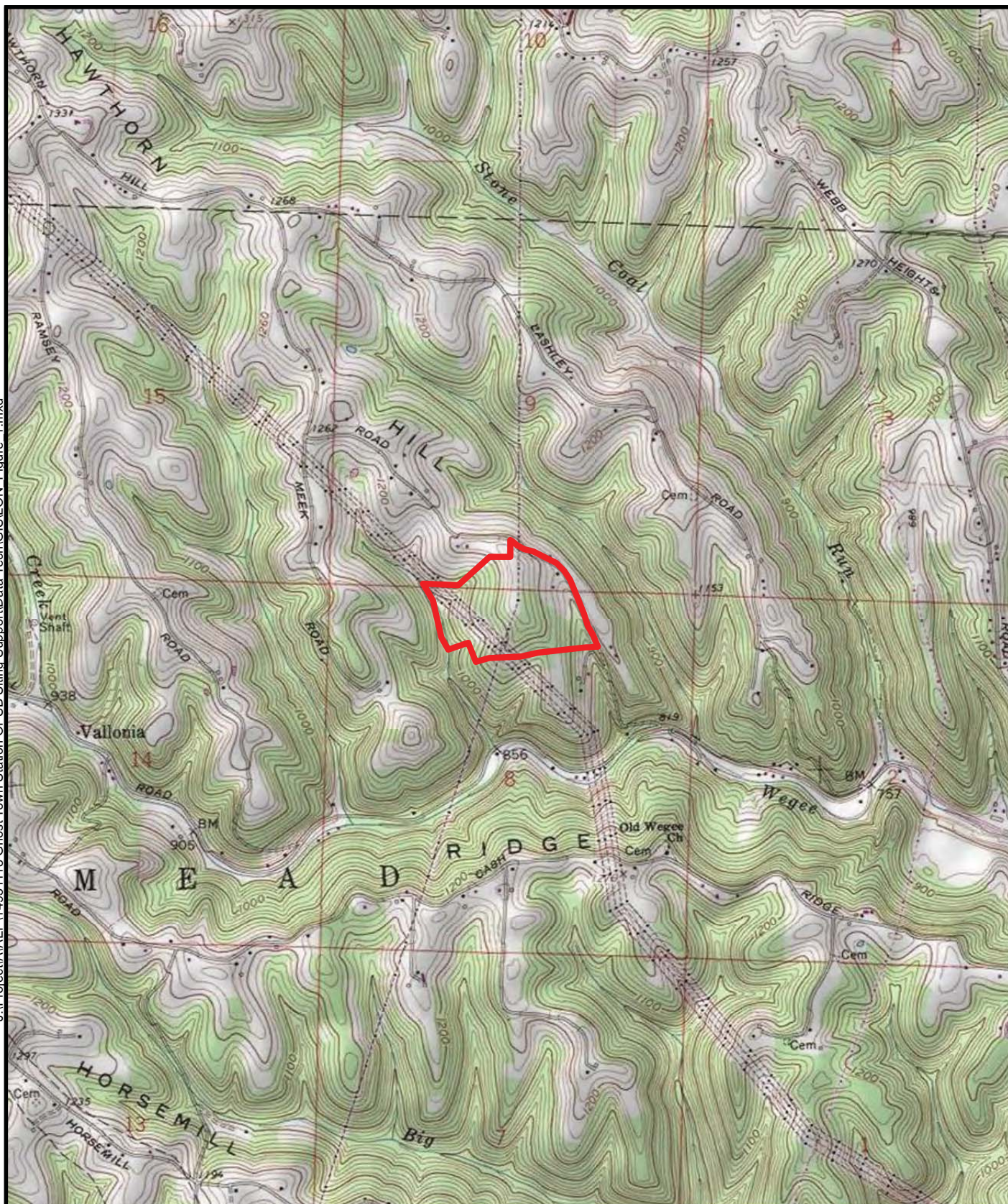
absence of the species. Due to the project type, size, and location, USFWS indicated that they do not anticipate adverse effects to any other federally listed species.

## **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.



J:\Project\AAEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\SLON Figure 1.mxd



LEGEND:

 Project Property

0 2,000 4,000  
Scale in Feet



**AAEP** OHIO  
TRANSMISSION  
COMPANY

Holloway Station

FIGURE 1  
PROJECT OVERVIEW

JOB NO.14951118

**URS**



## **APPENDIX A**

### **AGENCY RESPONSES**



# Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

## 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 laciniata*), 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,

A handwritten signature in blue ink that reads "Mary Knapp". The signature is written in a cursive style with a large, stylized "M" and "K".

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 INSTALLATION 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

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### Number

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## APPENDICES (follow figures)

### Number

APPENDIX A	STREAM FORMS
APPENDIX B	PHOTOGRAPHS



## 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](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<sup>2</sup>)) and none were assessed using the qualitative habitat evaluation index (QHEI) methodology (drainage area greater than 1 mi<sup>2</sup>). 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
<b>Total: 11</b>							<b>3,197</b>

#### **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**

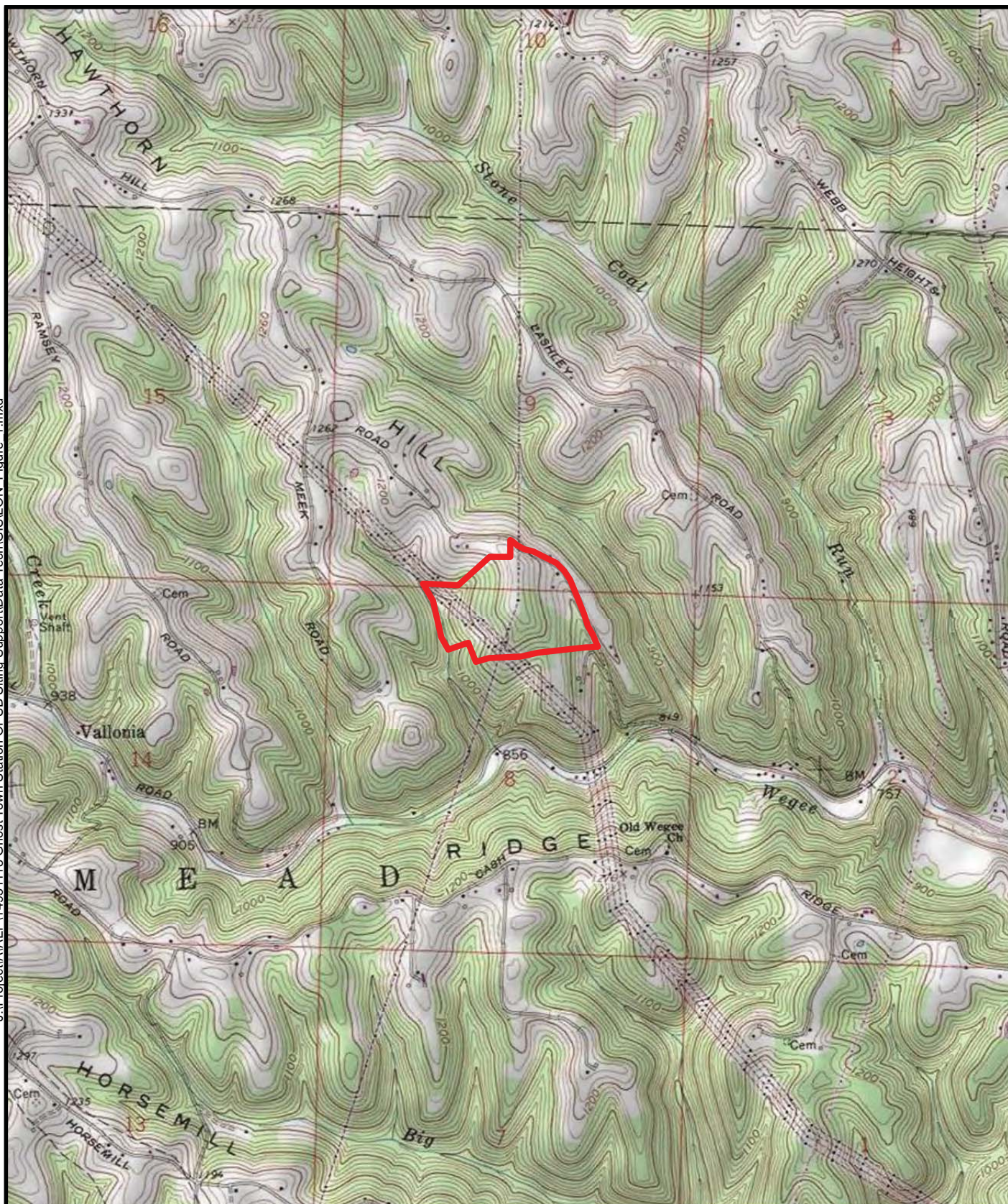
This report will be used to assist AEP Ohio Transco's efforts to avoid special status ecological areas, wetlands, and streams to the extent possible during construction of the Project, thereby minimizing impacts to these features identified within the Project area. The 275-foot length of Stream 2 within 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.



J:\Project\AAEP\14951118 Ghost Town Station OPSB Siting Support\Data-Tech\GIS\SLON Figure 1.mxd



LEGEND:

 Project Property

0 2,000 4,000  
Scale in Feet



**AAEP** OHIO  
TRANSMISSION  
COMPANY

Holloway Station

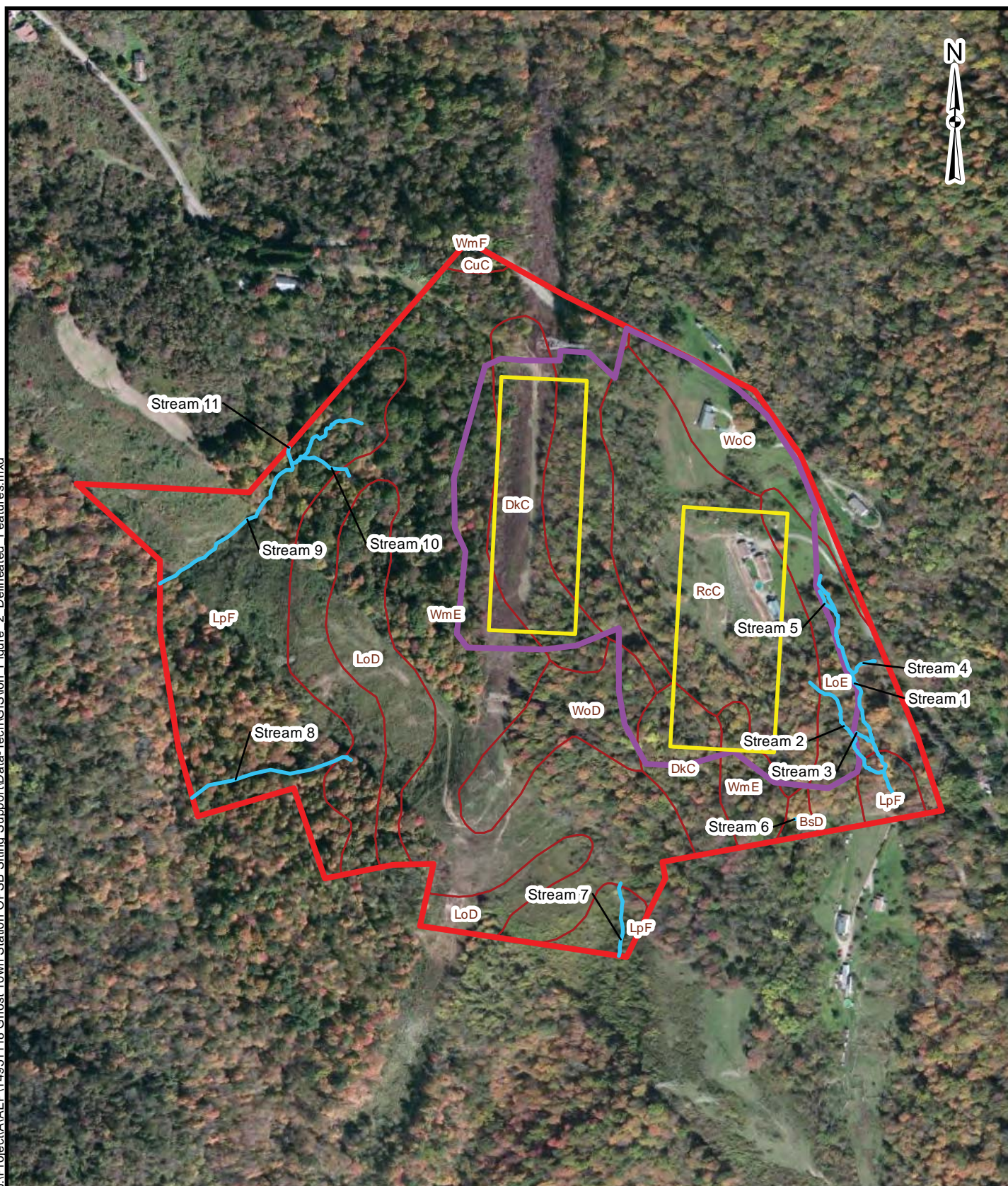
FIGURE 1  
PROJECT OVERVIEW

JOB NO.14951118

**URS**



J:\Project\AEP\14951118 Ghost Town Station OPSB Siting Support\GIS\on 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



Holloway Station

FIGURE 2  
ECOLOGICAL SURVEY RESULTS

JOB NO.14951118



## **APPENDIX A**

### **STREAM FORMS**





# Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION AEP / Holloway StationNegee CreekSITE NUMBER 1

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/01/13SCORER BE

COMMENTS \_\_\_\_\_

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

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS:

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
<input type="checkbox"/>	BLDR SLABS [16 pts]		<input type="checkbox"/>	SILT [3 pt]	
<input checked="" type="checkbox"/>	BOULDER (>256 mm) [16 pts]	<u>20</u>	<input checked="" type="checkbox"/>	LEAF PACK/WOODY DEBRIS [3 pts]	<u>15</u>
<input type="checkbox"/>	BEDROCK [16 pt]		<input checked="" type="checkbox"/>	FINE DETRITUS [3 pts]	<u>5</u>
<input checked="" type="checkbox"/>	COBBLE (65-256 mm) [12 pts]	<u>20</u>	<input type="checkbox"/>	CLAY or HARDPAN [0 pt]	<u>10</u>
<input checked="" type="checkbox"/>	GRAVEL (2-64 mm) [9 pts]	<u>20</u>	<input type="checkbox"/>	MUCK [0 pts]	
<input checked="" type="checkbox"/>	SAND (<2 mm) [6 pts]	<u>10</u>	<input type="checkbox"/>	ARTIFICIAL [3 pts]	

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_(A) 28(B) 7

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
Max = 4035

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):

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

Pool Depth  
Max = 300

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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

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

Bankfull  
Width  
Max=3015

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

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

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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): 10Were 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)

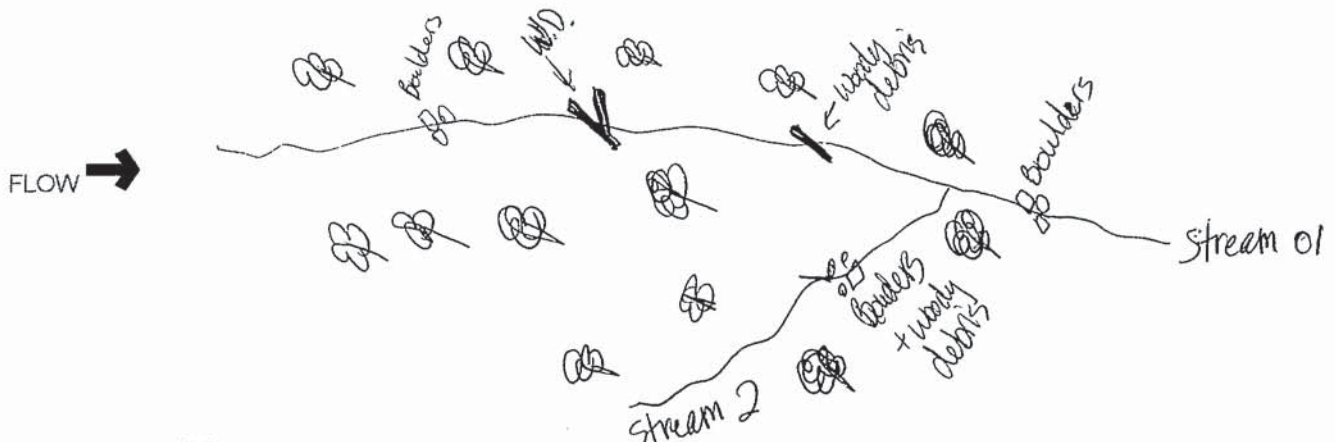
Fish Observed? (Y/N): N Voucher? (Y/N): \_\_\_\_\_ Salamanders Observed? (Y/N): \_\_\_\_\_ Voucher? (Y/N): \_\_\_\_\_

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







## Primary Headwater Habitat Evaluation Form

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

37

SITE NAME/LOCATION HEP / Holloway StationWegge CreekSITE NUMBER 2

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/10/13SCORER BE

COMMENTS \_\_\_\_\_

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

## STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

## MODIFICATIONS:

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
<input checked="" type="checkbox"/>	Bldr Slabs [16 pts]	<u>10</u>	<input checked="" type="checkbox"/>	SILT [3 pt]	<u>10</u>
<input type="checkbox"/>	Boulder (>256 mm) [16 pts]		<input type="checkbox"/>	Leaf Pack/Woody Debris [3 pts]	<u>5</u>
<input type="checkbox"/>	Bedrock [16 pt]		<input type="checkbox"/>	Fine Detritus [3 pts]	
<input checked="" type="checkbox"/>	Cobble (65-256 mm) [12 pts]	<u>15</u>	<input type="checkbox"/>	Clay or Hardpan [0 pt]	<u>10</u>
<input checked="" type="checkbox"/>	Gravel (2-64 mm) [9 pts]	<u>25</u>	<input type="checkbox"/>	Muck [0 pts]	
<input checked="" type="checkbox"/>	Sand (<2 mm) [6 pts]	<u>20</u>	<input type="checkbox"/>	Artificial [3 pts]	

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

25

(B)

7

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
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):

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

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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

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

COMMENTS \_\_\_\_\_

2'

AVERAGE BANKFULL WIDTH (meters)

Pool Depth  
Max = 30

0

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)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

## STREAM GRADIENT ESTIMATE

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

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

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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**

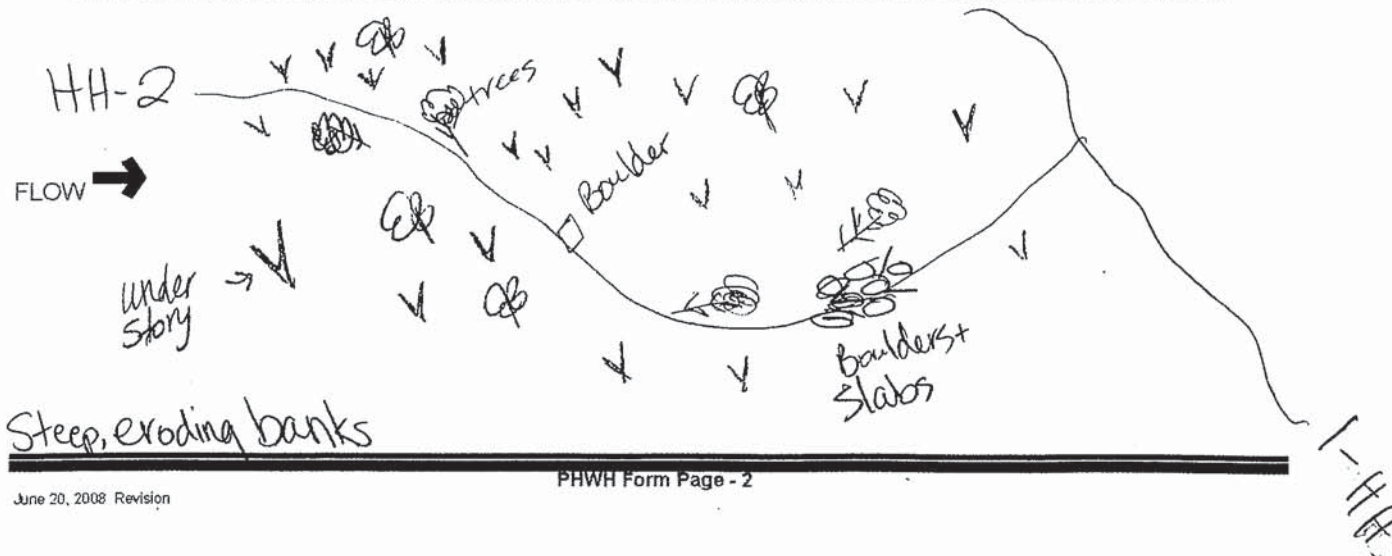
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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







# Stream 3

## Primary Headwater Habitat Evaluation Form

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

13

SITE NAME/LOCATION REP/HOLLOWAY STATIONWegee CreekSITE NUMBER 3

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/10/13SCORER BE

COMMENTS \_\_\_\_\_

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

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS

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
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pts]	<u>60</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>10</u>
<input type="checkbox"/> BEDROCK [16 pts]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	<u>5</u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	_____	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>20</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>5</u>	<input type="checkbox"/> 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:

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

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

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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

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

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
PointsSubstrate  
Max = 40

8

A + B

Pool Depth  
Max = 30

0

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)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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): 15Were 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)

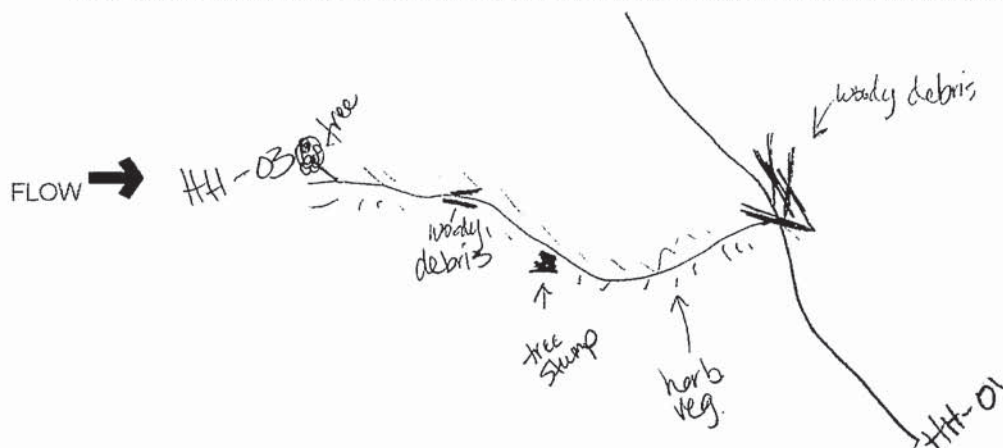
Fish Observed? (Y/N): N Voucher? (Y/N): / Salamanders Observed? (Y/N): / Voucher? (Y/N): /

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







# Primary Headwater Habitat Evaluation Form

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

20.5

SITE NAME/LOCATION WEEGE CREEK STATION  
 SITE NUMBER 4 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_  
 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 ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS:

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
<input checked="" type="checkbox"/> BLDR SLABS [16 pts]	<u>20</u>	<input type="checkbox"/> SILT [3 pt]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]		<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>20</u>
<input type="checkbox"/> BEDROCK [16 pt]		<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>15</u>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30</u>
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>10</u>	<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>5</u>	<input type="checkbox"/> 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):

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

Pool Depth  
Max = 30

0

COMMENTS \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters):

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

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

Bankfull  
Width  
Max=30

5

COMMENTS \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

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

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

COMMENTS \_\_\_\_\_

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (1 ft/100 ft)

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

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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**

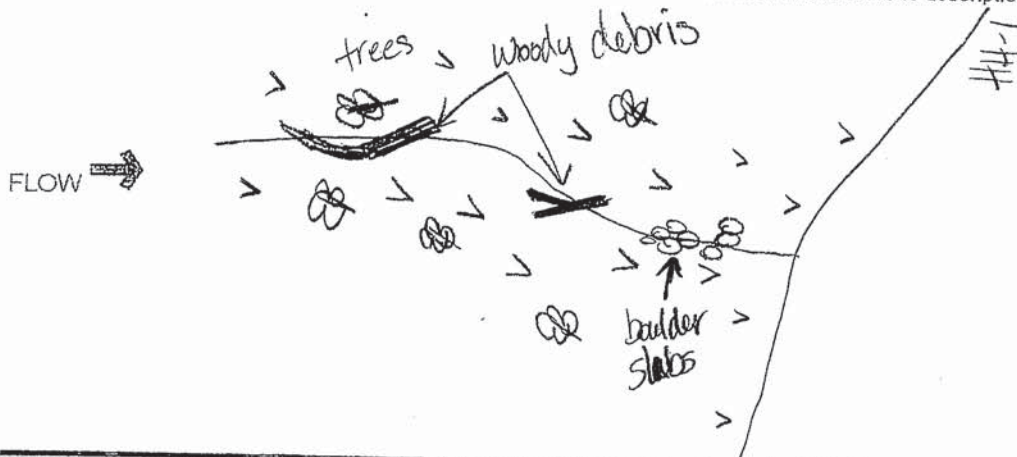
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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







# 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 (mi<sup>2</sup>) \_\_\_\_\_  
 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 PWH Streams" for Instructions

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

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
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input type="checkbox"/> SILT [3 pt]	_____
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>20</u>
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input checked="" type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>30</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>25</u>	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<u>20</u>	<input type="checkbox"/> 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):

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

COMMENTS \_\_\_\_\_

0 MAXIMUM POOL DEPTH (centimeters):

Pool Depth  
Max = 30

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

<input type="checkbox"/> > 4.0 meters (> 13') [30 pts]	<input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
<input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]	<input checked="" type="checkbox"/> 1.0 m ( 3' 3") [5 pts]
<input type="checkbox"/> > 1.5 m - 3.0 m (> 4' 8" - 9' 7") [20 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)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

## STREAM GRADIENT ESTIMATE

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

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

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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**

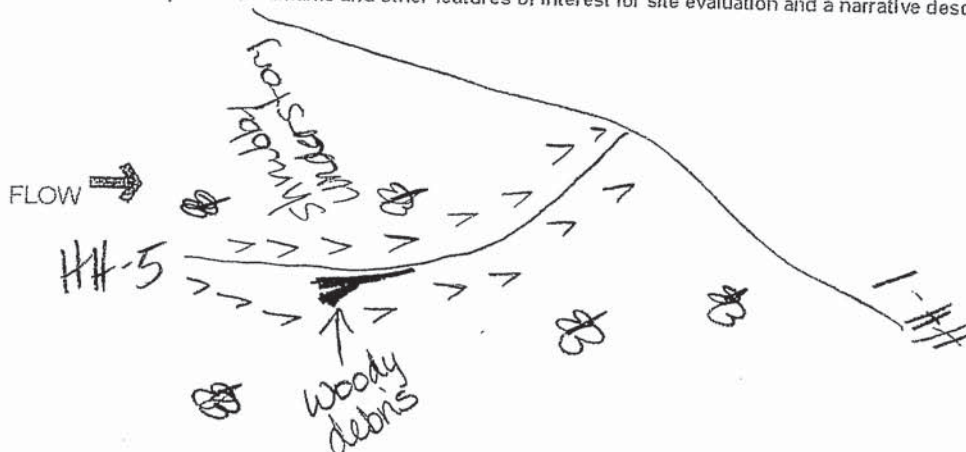
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_  
Frogs or Tadpoles Observed? (Y/N) 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 6

## Primary Headwater Habitat Evaluation Form

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

35

SITE NAME/LOCATION HEP/HOLLOWAY STATIONWegee CreekSITE NUMBER 6

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/01/3SCORER BE

COMMENTS \_\_\_\_\_

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

STREAM CHANNEL

☐ NONE/NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS: \_\_\_\_\_

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
<input type="checkbox"/> BLDR SLABS [16 pts]	_____	<input checked="" type="checkbox"/> SILT [3 pt]	<u>75</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>15</u>
<input type="checkbox"/> BEDROCK [16 pts]	_____	<input checked="" type="checkbox"/> FINE DETRITUS [3 pts]	<u>5</u>
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>5</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [6 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock \_\_\_\_\_

(A)

6

(B)

4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI  
Metric  
PointsSubstrate  
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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> 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):

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

COMMENTS \_\_\_\_\_

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

4406

**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







# Stream 7

## Primary Headwater Habitat Evaluation Form

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

17

SITE NAME/LOCATION BEF/HOLLOWAY STATION  
Wedge Creek SITE NUMBER 7 RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_  
 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 ☐ NONE/NATURAL CHANNEL ☐ RECOVERED ☒ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS \_\_\_\_\_

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

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

(A)

6

(B)

6

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> 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):

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

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

## FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

## STREAM GRADIENT ESTIMATE

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

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

QHEI PERFORMED? ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☐ WWH Name: \_\_\_\_\_ 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

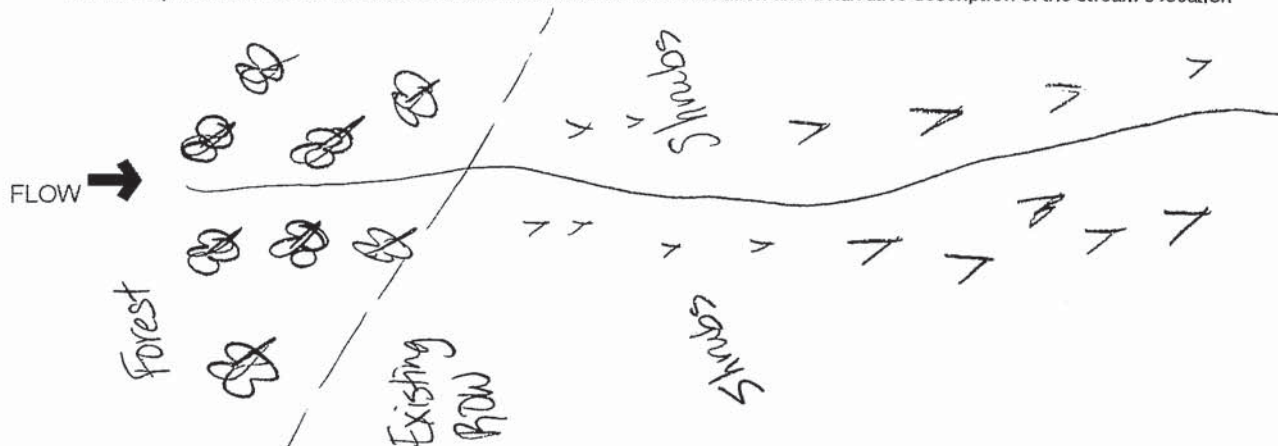
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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







# Stream 8

## Primary Headwater Habitat Evaluation Form

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

30

SITE NAME/LOCATION App/Holloway Station
Wegee Creek SITE NUMBER \_\_\_\_\_ RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

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

 DATE 09/11/13 SCORER BE COMMENTS \_\_\_\_\_

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

 STREAM CHANNEL ☐ NONE / NATURAL CHANNEL ☒ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY  
 MODIFICATIONS: \_\_\_\_\_

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
<input checked="" type="checkbox"/> BLDR SLABS [16 pts]	<u>15</u>	<input checked="" type="checkbox"/> SILT [3 pt]	<u>30</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	_____	<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>40</u>
<input type="checkbox"/> BEDROCK [16 pt]	_____	<input type="checkbox"/> FINE DETRITUS [3 pts]	_____
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>15</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	_____
<input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	_____	<input type="checkbox"/> MUCK [0 pts]	_____
<input type="checkbox"/> SAND (<2 mm) [8 pts]	_____	<input type="checkbox"/> ARTIFICIAL [3 pts]	_____

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 30(A) 6(B) 4

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

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):

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

Pool Depth Max = 30

0

COMMENTS \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters):

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

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

Bankfull Width Max=30

20

COMMENTS \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

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

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

COMMENTS \_\_\_\_\_

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

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

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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**

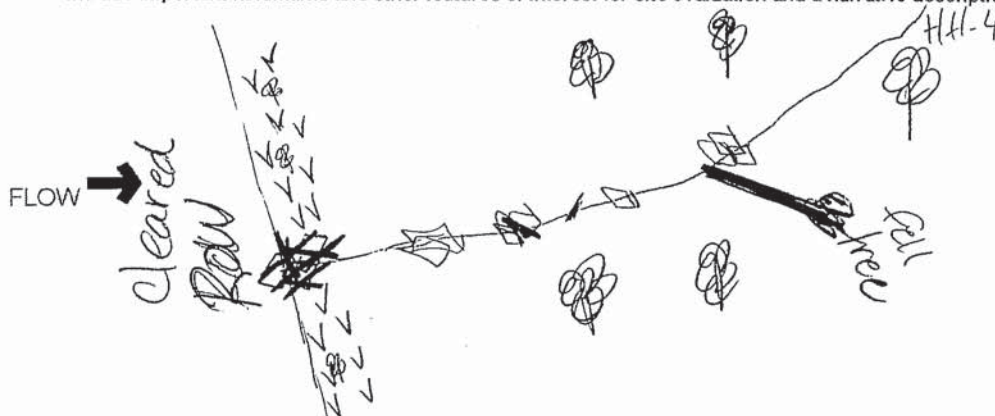
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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



## Primary Headwater Habitat Evaluation Form

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

40

SITE NAME/LOCATION HEP/HOLLOWAY STATIONWegee Creek

SITE NUMBER \_\_\_\_\_

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/11/13SCORER BE

COMMENTS \_\_\_\_\_

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

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS:

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 30(A) 15(B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

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):

<input type="checkbox"/> > 30 centimeters [20 pts]	<input type="checkbox"/> > 5 cm - 10 cm [15 pts]
<input type="checkbox"/> > 22.5 - 30 cm [30 pts]	<input type="checkbox"/> < 5 cm [5 pts]
<input type="checkbox"/> > 10 - 22.5 cm [25 pts]	<input checked="" type="checkbox"/> 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):

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

COMMENTS \_\_\_\_\_

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

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input type="checkbox"/>	<input type="checkbox"/>	Narrow <5m
<input type="checkbox"/>	<input type="checkbox"/>	None

COMMENTS \_\_\_\_\_

FLOODPLAIN QUALITY

L	R	(Most Predominant per Bank)
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Mature Forest, Wetland
<input type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input type="checkbox"/>	Open Pasture, Row Crop
<input type="checkbox"/>	<input type="checkbox"/>	Mining or Construction

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

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

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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: wrk Quantity: wrk

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**

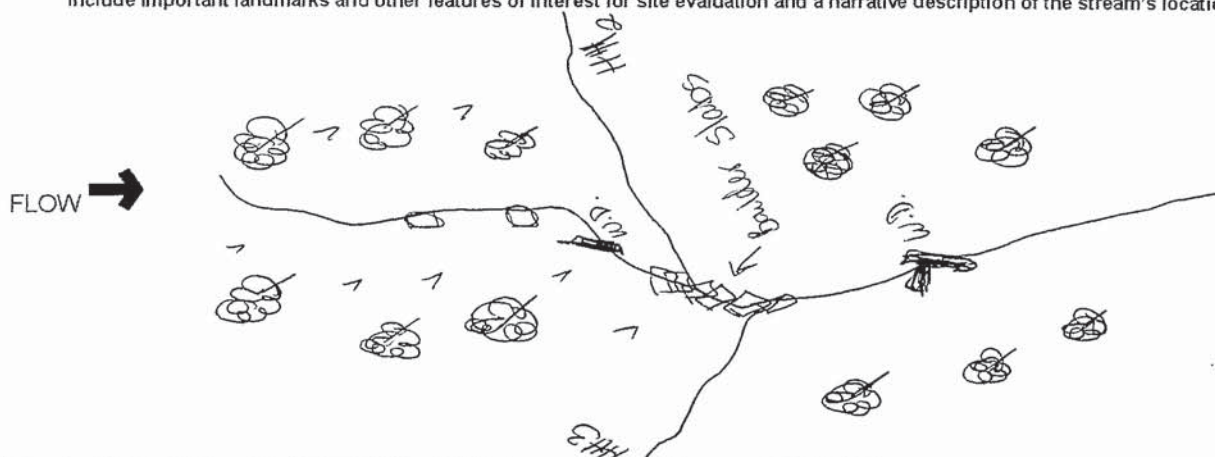
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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 10

## Primary Headwater Habitat Evaluation Form

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

26

SITE NAME/LOCATION AEV HOLLOWAY STATIONWedge Creek

SITE NUMBER \_\_\_\_\_

RIVER BASIN \_\_\_\_\_

DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_

LENGTH OF STREAM REACH (ft) \_\_\_\_\_

LAT. \_\_\_\_\_

LONG. \_\_\_\_\_

RIVER CODE \_\_\_\_\_

RIVER MILE \_\_\_\_\_

DATE 09/11/13SCORER BE

COMMENTS \_\_\_\_\_

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

STREAM CHANNEL

☐ NONE / NATURAL CHANNEL☒ RECOVERED☐ RECOVERING☐ RECENT OR NO RECOVERY

MODIFICATIONS:

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

Total of Percentages of  
Bldr Slabs, Boulder, Cobble, Bedrock 30

(A)

6

(B)

5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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

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

COMMENTS \_\_\_\_\_

MAXIMUM POOL DEPTH (centimeters):

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

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

COMMENTS \_\_\_\_\_

AVERAGE BANKFULL WIDTH (meters)

HHEI  
Metric  
PointsSubstrate  
Max = 40

11

A + B

Pool Depth  
Max = 30

0

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

FLOODPLAIN QUALITY

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

COMMENTS \_\_\_\_\_

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

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

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

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ 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





Stream 11



# Primary Headwater Habitat Evaluation Form

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

22

SITE NAME/LOCATION APP/HOLLYDAY STATION

Wedge Creek

SITE NUMBER

RIVER BASIN

DRAINAGE AREA (mi<sup>2</sup>)

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

☐ NONE/NATURAL CHANNEL

☒ RECOVERED

☐ RECOVERING

☐ RECENT OR NO RECOVERY

MODIFICATIONS:

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
<input checked="" type="checkbox"/> BLDR SLABS [16 pts]		<u>10</u>	<input checked="" type="checkbox"/> SILT [3 pt]		<u>30</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]			<input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]		<u>20</u>
<input type="checkbox"/> BEDROCK [16 pt]			<input type="checkbox"/> FINE DETRITUS [3 pts]		
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]		<u>15</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]		
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]		<u>25</u>	<input type="checkbox"/> MUCK [0 pts]		
<input type="checkbox"/> SAND (<2 mm) [6 pts]			<input type="checkbox"/> ARTIFICIAL [3 pts]		

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 25

(A) 12

(B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

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):

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

Pool Depth Max = 30

0

COMMENTS \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters):

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

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

Bankfull Width Max=30

15

COMMENTS \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters)

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L R (Per Bank)

L R (Most Predominant per Bank)

L R

- ☒ Wide >10m
- ☐ Moderate 5-10m
- ☐ Narrow <5m
- ☐ None

- ☒ Mature Forest, Wetland
- ☐ Immature Forest, Shrub or Old Field
- ☐ Residential, Park, New Field
- ☐ Fenced Pasture

- ☐ Conservation Tillage
- ☐ Urban or Industrial
- ☐ Open Pasture, Row Crop
- ☐ Mining or Construction

COMMENTS \_\_\_\_\_

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

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

COMMENTS \_\_\_\_\_

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

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

STREAM GRADIENT ESTIMATE

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

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

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

**DOWNSTREAM DESIGNATED USE(S)**

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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)

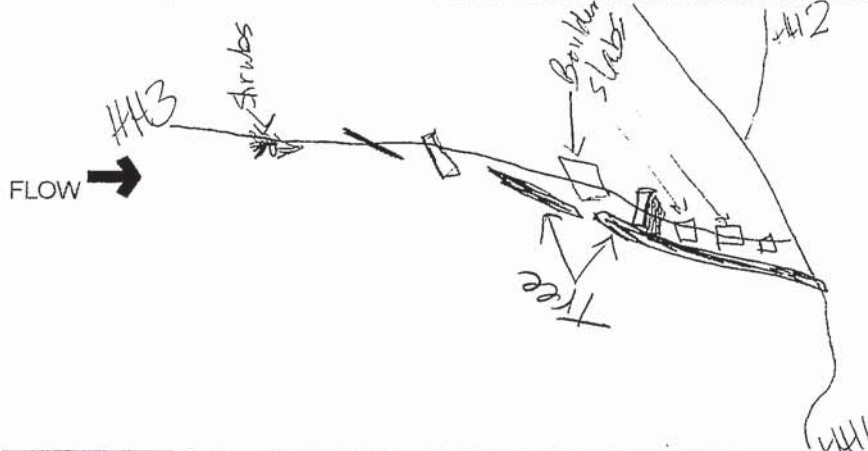
Fish Observed? (Y/N) N Voucher? (Y/N) \_\_\_\_\_ Salamanders Observed? (Y/N) \_\_\_\_\_ Voucher? (Y/N) \_\_\_\_\_

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:**

AEP

**Site Location:**

Holloway Station Project

**Project No.**

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:**

AEP

**Site Location:**

Holloway Station Project

**Project No.**

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

<b>Client Name:</b> AEP	<b>Site Location:</b> Holloway Station Project	<b>Project No.</b> 14951118
----------------------------	---	--------------------------------

<b>Photo No. 5</b>	
<b>Date:</b> September 10, 2013	
<b>Description:</b>  Stream 5 HHEI Stream Facing Downstream Ephemeral Stream	

<b>Photo No. 6</b>	
<b>Date:</b> September 10, 2013	
<b>Description:</b>  Stream 6 HHEI Stream Facing Downstream Ephemeral Stream	





## PHOTOGRAPHIC RECORD

### Streams

**Client Name:**

AEP

**Site Location:**

Holloway Station Project

**Project No.**

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

<b>Client Name:</b> AEP	<b>Site Location:</b> Holloway Station Project	<b>Project No.</b> 14951118
----------------------------	---	--------------------------------

<b>Photo No. 9</b>	
<b>Date:</b> September 11, 2013	
<b>Description:</b>  Stream 10 HHEI Stream Facing Upstream Ephemeral Stream	

<b>Photo No. 10</b>	
<b>Date:</b> September 11, 2013	
<b>Description:</b>  Stream 11 HHEI Stream Facing Downstream Ephemeral Stream	

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**2/3/2014 2:16:52 PM**

**in**

**Case No(s). 14-0141-EL-BLN**

Summary: Letter of Notification Muskingum River-Tidd 345 kV Relocation and Installation of the Holloway Station Project (Part 2 of 2) electronically filed by Mr. Yazen Alami on behalf of AEP Ohio Transmission Company