

# Letter of Notification East Lima-Maddox Creek 345 kV Transmission Line Reconductoring Project



An **AEP** Company

BOUNDLESS ENERGY™

PUCO Case No. 19-1781-EL-BLN

Submitted to:  
The Ohio Power Siting Board  
Pursuant to Ohio Administrative Code Section  
4906-6-05

Submitted by:  
AEP Ohio Transmission Company, Inc.

October 2, 2019

Letter of Notification for East Lima-Maddox Creek 345 kV Transmission Line Reconductoring Project

Letter of Notification

**AEP Ohio Transmission Company, Inc. (AEP Ohio Transco)  
East Lima-Maddox Creek 345 kV Transmission Line Reconductoring Project**

4906-6-05

AEP Ohio Transmission Company, Inc. (“AEP Ohio Transco”) provides the following information in accordance with the requirements of Ohio Administrative Code Section 4906-6-05.

**4906-6-5(B) General Information**

**B(1) Project Description**

**The name of the project and applicant's reference number, names and reference number(s) of resulting circuits, a brief description of the project, and why the project meets the requirements for a Letter of Notification.**

AEP Ohio Transco proposes the East Lima-Maddox Creek 345 kV Transmission Line Reconductoring Project (“Project”), which is located in Allen, Putnam, and Van Wert Counties, Ohio. The Project involves reconductoring approximately 30 miles of 345 kV transmission line between East Lima Station and Maddox Creek Station, on the East Lima-Sorenson 345kV Transmission Line. This Project also requires replacing three existing structures and installing one new structure to support the reconducted line. The proposed Project location is illustrated in Map 1.

The Project meets the requirements for a LON because it is within the types of projects defined by item 2(a) of Ohio Administrative Code Section 4906-1-01 Appendix A of the Application Requirement Matrix For Electric Power Transmission Lines:

- (2) *Adding new circuits on existing structures designed for multiple circuit use, replacing conductors on existing structures with larger or bundled conductors, adding structures to an existing transmission line, or replacing structures with a different type of structure, for a distance of:*
  - a. *More than two miles*

The Project has been assigned PUCO Case No. 19-1781-EL-BLN

**B(2) Statement of Need**

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

This Project is a baseline project necessary to resolve a reliability criteria violation along the East Lima-Maddox Creek 345 kV circuit. In PJM’s 2016 and 2017 Winter Generation Deliverability analysis, the East Lima-Maddox Creek 345 kV circuit was found to be overloaded beyond its capability for the single contingency loss of the Marysville – Sorenson 765 kV circuit during winter conditions. The recommended

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solution is to reconductor the Maddox Creek – East Lima 345 kV circuit with 2-954 ACSS Cardinal conductor, as the reconductoring resolves the reliability criteria violation and is the most cost effective long-term solution.

The East Lima-Maddox Creek 345kV project area is north of the Marysville-Sorenson 765kV line, and parallels the Marysville-Sorenson 765kV circuit. In evaluating the East Lima-Maddox Creek circuit for reconductoring, it was determined there was a need to replace three existing structures and install one additional structure. The locations of the replacement structures and the additional structure are provided in Appendix A.

The PJM baseline project identification numbers are b2833 and b2969. This Project was included in the Company's 2019 Long-Term Forecast on page 47.

### **B(3) Project Location**

**The applicant shall provide the location of the project in relation to existing or proposed lines and substations shown on an area system map of sufficient scale and size to show existing and proposed transmission facilities in the Project area.**

Maps 2A-2R show the location of the Project area in relation to the existing East Lima-Maddox Creek transmission line. The Project area includes proposed access roads, work pads (including helicopter pads), and steel lattice tower replacement structures.

### **B(4) Alternatives Considered**

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

This Project is to reconductor an existing 345kV transmission line with helicopters. This offers minimal impact relative to other alternatives such as reroutes and rebuild. Further, PJM identified this Project as the most cost effective long-term solution to resolve the reliability criteria violations on the line.

Therefore, no significant alternatives were considered. The structure replacement of three structures, installation of one structure will be completed by traditional construction methods. Socioeconomic, land use, and ecological information is presented in Section B(10).

**B(5) Public Information Program**

**The applicant shall describe its public information program to inform affected property owners and tenants of the nature of the project and the proposed timeframe for project construction and restoration activities.**

Within seven days of filing this LON, AEP Ohio Transco will issue a public notice in a newspaper of general circulation in the Project area. The notice will comply with all requirements under O.A.C. Section 4906-6-08(A)(1-6). Further, AEP Ohio Transco mailed a letter, via first class mail, to affected landowners, tenants, contiguous owners, and any other landowner AEP Ohio Transco approached for an easement necessary for the construction, operation, or maintenance of the facility. The letter complies with all the requirements of O.A.C. Section 4906-6-08(B). AEP Ohio Transco also maintains a website (<http://aeptransmission.com/ohio/>) which provides the public access to an electronic copy of this LON and the public notice for this LON. A paper copy of the LON will be served to the public library in each political subdivision affected by this proposed Project. Lastly, AEP Ohio Transco retains ROW land agents who discuss project timelines, construction and restoration activities with affected owners and tenants.

**B(6) Construction Schedule**

**The applicant shall provide an anticipated construction schedule and proposed in-service date of the project.**

Construction of the Project is planned to begin in first quarter of 2020, and the anticipated in-service date will be November 2021.

**B(7) Area Map**

**The applicant shall provide a map of at least 1:24,000 scale clearly depicting the facility with clearly marked streets, roads, and highways, and an aerial image.**

Map 1 in Appendix A provides the proposed Project area on a map of 1:190,080-scale (1 inch equals 3 miles), and provides the locations of the approximately 30-mile long existing East Lima-Maddox Creek 345 kV transmission line, and the East Lima and Maddox Creek substations on the United States Geological Survey (USGS) 7.5-minute topographic map of the Scott, Ohio, Wetsel, Ohio, Ottoville, Ohio, Delphos, Ohio, Elida, Ohio, and Cairo, Ohio quadrangles. Maps 2A-2R in Appendix A show the Project area on recent aerial photography, as provided by Bing Maps at a scale of 1:12,000-scale (1 inch equals 1,000 feet).

To visit the Project site from Columbus, Ohio, take I-70 West to I-270 North towards Cleveland for approximately 9 miles. Take Exit 17B to merge onto Ohio State Route 161 West/U.S. 33 West. Follow U.S. 33 for approximately 46.5 miles. Exit onto OH-117 West towards OH-366/Huntsville/Lima and follow OH-117 West for 12.7 miles. Turn right onto Holden County Line Road and proceed for 1.4 miles before turning left onto Gossard East Road. Proceed on Gossard East Road for approximately 1.5 miles and then turn right onto OH-117 West and proceed for approximately 12 miles, then turn left onto OH-117 West/OH-309 West and take the on-ramp to I-75 North on the right. After following I-75 North for 4.4 miles, take exit 130 for Bluelick Road and turn left onto East Bluelick Road to proceed for one-third mile, then turn right onto Wolfe Road. The approximate address of the East Lima Station site is 4390 Wolf Road, Elida, Ohio 45807, at latitude 40.800663, longitude -84.032244.



**B(8) Property Agreements**

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

The Project area is located within existing right-of-way (ROW). No new permanent ROW is necessary.

**B(9) Technical Features**

**The applicant shall describe the following information regarding the technical features of the project:**

**B(9)(a) Operating characteristics, estimated number and types of structures required, and right-of-way and/or land requirements.**

The East Lima-Maddox Creek 345 kV transmission line construction will include the following:

Voltage:	345kV
Conductors:	2- 954 kcmil 54/7 ACSS Cardinal (double bundled conductor)
Static Wire:	OPGW, 0.646in Diameter
Insulators:	Ceramic/Glass
ROW Width:	150 Feet
Structure types to reconductor	Double Circuit Lattice Tower (only one circuit on tower currently)
Structures to be replaced/added:	Str 52 & 102 – Remove existing double circuit lattice tower (only 1 circuit installed). Install single circuit steel monopole dead-end structure.  Str 127A - Remove existing steel monopole dead-end structure. Install single circuit steel monopole dead-end structure.  Str A – Install single circuit steel monopole dead-end structure.

**B(9)(b) Electric and Magnetic Fields**

**For electric power transmission lines that are within one hundred feet of an occupied residence or institution, the production of electric and magnetic fields during the operation of the proposed electric power transmission line.**

**B(9)(b)(i) Calculated Electric and Magnetic Field Strength Levels**

**i) Calculated Electric and Magnetic Field Levels**

Three loading conditions were examined: (1) Normal Maximum Loading, (2) Emergency Loading, and (3) Winter Normal Conductor Rating, consistent with the OPSB requirements. Normal Maximum Loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter Normal (WN) Conductor Rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. It is not anticipated that either circuit of this line would operate at its WN rating in the foreseeable future. Loading levels and the calculated electric and magnetic fields (EMF) are summarized below.

<b>EAST LIMA-MADDOX CREEK 345 KV EMF CALCULATIONS</b>				
<b>Condition</b>	<b>Circuit Load (A)</b>	<b>Ground Clearance (feet)</b>	<b>Electric Field (kV/m)*</b>	<b>Magnetic Field (mG)*</b>
(1) Normal Maximum Loading <sup>^</sup>	818.36	25.4	1.54/8.22/.98	39.79/185.90/47.41
(2) Emergency Line Loading <sup>^^</sup>	876.93	25.4	1.54/8.22/0.98	42.64/199.20/50.80
(3) Winter Normal Conductor Rating <sup>^^^</sup>	4680.86	35	1.4/5.07/1.02	201.35/673.56/239.07

\* EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and 1.0 P.U. Voltages. ROW width is 75 feet (left) and 75 feet (right) of centerline, respectively.

<sup>^</sup> Peak line flow expected with all system facilities in service

<sup>^^</sup> Maximum flow during a critical system contingency

<sup>^^^</sup> Maximum continuous flow that the line, including its terminal equipment, can withstand during winter conditions

The above EMF levels are well within the limits of the specified IEEE Standard C95.6tm-2002. Those limits have been established to “prevent harmful effects in human beings exposed to electromagnetic fields in the frequency range of 0-3kHz”.

**B(9)(b)(ii) Design Alternatives**

**A discussion of the applicant's consideration of design alternatives with respect to electric and magnetic fields and their strength levels, including alternate conductor configuration and phasing, tower height, corridor location, and right-of-way width.**

Design alternatives were not considered due to EMF strength levels. Transmission lines, when energized, generate EMF. Laboratory studies have failed to establish a strong correlation between exposure to EMF and effects on human health. However, some people are concerned that EMF have impacts on human health. Due to these concerns, EMF associated with the new circuits was calculated and set forth in the table above. The EMF was computed assuming the highest possible EMF values that could exist along the proposed transmission line rebuild. Normal daily EMF levels will operate below these maximum load conditions. Based on studies from the National Institutes of Health, the magnetic field (measured in milliGauss, or mG) associated with emergency loading at the highest EMF value for this transmission line is lower than those associated with normal household appliances like microwaves, electric shavers and hair dryers, shavers and hair dryers. For additional information regarding EMF, the National Institutes of Health has posted information on their website: <http://www.niehs.nih.gov/health/topics/agents/emf/>. Additionally, information on electric and magnetic fields is available on AEP Ohio's website: <https://www.aepohio.com/info/projects/emf/OurPosition.aspx>. The information found on AEP Ohio's website describes the basics of electromagnetic field theory, scientific research activities, and EMF exposures encountered in everyday life. Similar material will be made available for those affected by the construction activities for this Project.

**B(9)(c) Project Cost**

**The estimated capital cost of the project.**

The capital cost estimate for the proposed Project, which is comprised of applicable tangible and capital costs, is approximately \$37,000,000, from Class 3 and 4 estimates.

**B(10) Social and Economic Impacts**

**The applicant shall describe the social and ecological impacts of the project:**

**B(10)(a) Land Use Characteristics**

**Provide a brief, general description of land use within the vicinity of the proposed project, including a list of municipalities, townships, and counties affected.**

The Project consists of reconductoring approximately 30-miles of East Lima-Maddox Creek 345 kV transmission line, which will be performed by helicopter. The structure replacement of three structures, installation of one structure will be completed by traditional construction methods. The Project does not cross any municipality boundaries within Allen, Putnam, and Van Wert, Ohio Counties. The Project crosses Bath, Monroe, and Sugar Creek Townships in Allen County; Sugar Creek, Jennings, and Monterey Townships in Putnam County, and Washington, Jackson, and Hoaglin Townships in Van Wert County. The Project vicinity is rural in nature and is comprised primarily of maintained agricultural land used for row

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crops, and lesser amounts of old fields, forested land, landscaped areas, and scattered residences (See Maps 2A-2R). Tree clearing is not anticipated and in-water work is not planned for the Project.

The Delphos Country Club Golf Course is crossed by a portion of the project. There are no other churches, schools, parks, preserves, or wildlife management areas located within 1,000 feet of the project.

### **B(10)(b) Agricultural Land Information**

**Provide the acreage and a general description of all agricultural land, and separately all agricultural district land, existing at least sixty days prior to submission of the application within the potential disturbance area of the project.**

The Allen, Putnam, and Van Wert County Auditors provided a list of parcels registered as Agricultural District Land in September 2019. The proposed East Lima-Maddox Creek transmission line intersects 39 parcels in Allen County, 11 parcels in Putnam County, and 8 parcels in Van Wert County that were identified as Agricultural District Land parcels for a total of 58 Agricultural District Land parcels crossed. Approximately 12.1 miles of the proposed East Lima-Maddox Creek 345 kV transmission line crosses agricultural district land. Overall, the proposed East Lima-Maddox Creek 345 kV transmission line crosses approximately 27.6 miles of agricultural land. As a reconductoring project, no farmland conversion is anticipated.

### **B(10)(c) Archaeological and Cultural Resources**

**Provide a description of the applicant's investigation concerning the presence or absence of significant archaeological or cultural resources that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

A cultural report was completed and will be coordinated directly with the OPSB.

### **B(10)(d) Local, State, and Federal Agency Correspondence**

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

A Notice of Intent will be filed with the Ohio Environmental Protection Agency for authorization of construction storm water discharges under General Permit OHCD000005. AEP Ohio Transco will also coordinate storm water permitting needs with local government agencies, as necessary. AEP Ohio Transco will implement and maintain best management practices as outlined in the Project-specific Storm Water Pollution Prevention Plan to minimize erosion control sediment to protect surface water quality during storm events.

There are no other known local, state, or federal requirements that must be met prior to commencement of the proposed Project.

**B(10)(e) Threatened, Endangered, and Rare Species**

**Provide 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 potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

The United States Fish and Wildlife Service (USFWS) *Ohio County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species* (available at <https://www.fws.gov/midwest/Endangered/lists/pdf/OhioCtyList29Jan2018.pdf>) was reviewed to identify the threatened and endangered species known to occur in the Project counties. This USFWS publication lists the Indiana bat (*Myotis sodalis*; federally endangered) and northern long-eared bat (*Myotis septentrionalis*; federally threatened). On March 7, 2019, coordination letters were sent to USFWS and the Ohio Department of Natural Resources (ODNR) soliciting responses. Responses were received from the USFWS on March 18, 2019 and from the ODNR on April 19, 2019.

The ODNR indicated that the Project area is within the range of the Indiana bat (*Myotis sodalis*), a state and federally endangered species; similarly, the USFWS stated that the Project area is within the range of the Indiana bat, in addition to the Northern long-eared bat (*Myotis septentrionalis*), a state and federally threatened species. The USFWS recommended that if no caves or abandoned mines are present and trees  $\geq 3$  inches diameter at breast height (dbh) cannot be avoided, seasonal tree cutting (clearing of trees  $\geq 3$  inches dbh between October 1 and March 31) should be implemented to avoid impacts to Indiana bats and Northern long-eared bats, if suitable habitat occurs within the Project area. The ODNR similarly recommended seasonal tree cutting (clearing of trees  $\geq 3$  inches dbh between October 1 and March 31) for the Indiana bat.

The ODNR identified several mussel and fish species with known ranges within the Project area: the state and federally endangered Northern riffle (*Epioblasma torulosa rangiana*), the state and federally endangered clubshell (*Pleurobema clava*), the state and federally endangered rayed bean (*Villosa fabalis*), the state and federally endangered white catspaw (*Epioblasma obliquata perobliqua*), the state endangered wartyback (*Quadrula nodulata*), the state endangered purple Lilliput (*Toxolasma lividus*), the state endangered rabbitsfoot (*Quadrula cylindrica cylindrica*), the state threatened pondhorn (*Uniomorus tetralasmus*), the pugnose minnow (*Opsopoeodus emiliae*), and the greater redhorse (*Moxostoma valenciennesi*). The ODNR indicated that the mussel and fish may be impacted if in-water work is planned as part of the Project; however, no in-water work is planned as part of the Project. No impacts to these aquatic species and their habitat are anticipated for the Project.

The ODNR identified the state endangered upland sandpiper (*Bartramia longicauda*), the state endangered Northern harrier (*Circus cyaneus*) and the federally recovering bald eagle (*Haliaeetus leucocephalus*), which have known ranges within the Project area. The upland sandpiper most utilizes dry grasslands (both native and seeded), grazed and ungrazed pasture, and hayfields. The Northern harrier is a common migrant and winter species in Ohio. Nesters are much rarer, although they occasionally breed in large marshes and grasslands, usually in loose colonies and often on top of a mound. Northern harriers hunt over grasslands.

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Much of the Project area consists of maintained agricultural fields with scattered residences. No habitat suitable for the upland sandpiper was observed.

The ODNR indicated that there are Natural Heritage Database records of the federally recovered bald eagle (*Haliaeetus leucocephalus*) within a one-mile radius of the Project area. The bald eagle requires a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, bald eagles congregate near open water in tall trees for hunting and roosting. The Project area does not include potentially suitable habitat for the bald eagle and no impacts to the bald eagle and its habitat are anticipated for the Project.

Based on the primarily agricultural nature of the Project area and no anticipated requirement of tree clearing or in-water work, no impacts to state or federally listed species are anticipated. Additional details regarding species are provided in Appendix B.

### **B(10)(f) Areas of Ecological Concern**

**Provide 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 potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.**

An AEP Ohio Transco consultant prepared a Wetland Delineation and Stream Assessment Report. No impacts to wetlands or streams are anticipated. Copies of the Wetland Delineation and Stream Assessment Reports for the Project are included as Appendix B. A stormwater pollution prevention plan (SWPPP) will also be prepared prior to construction.

### **B(10)(g) Unusual Conditions**

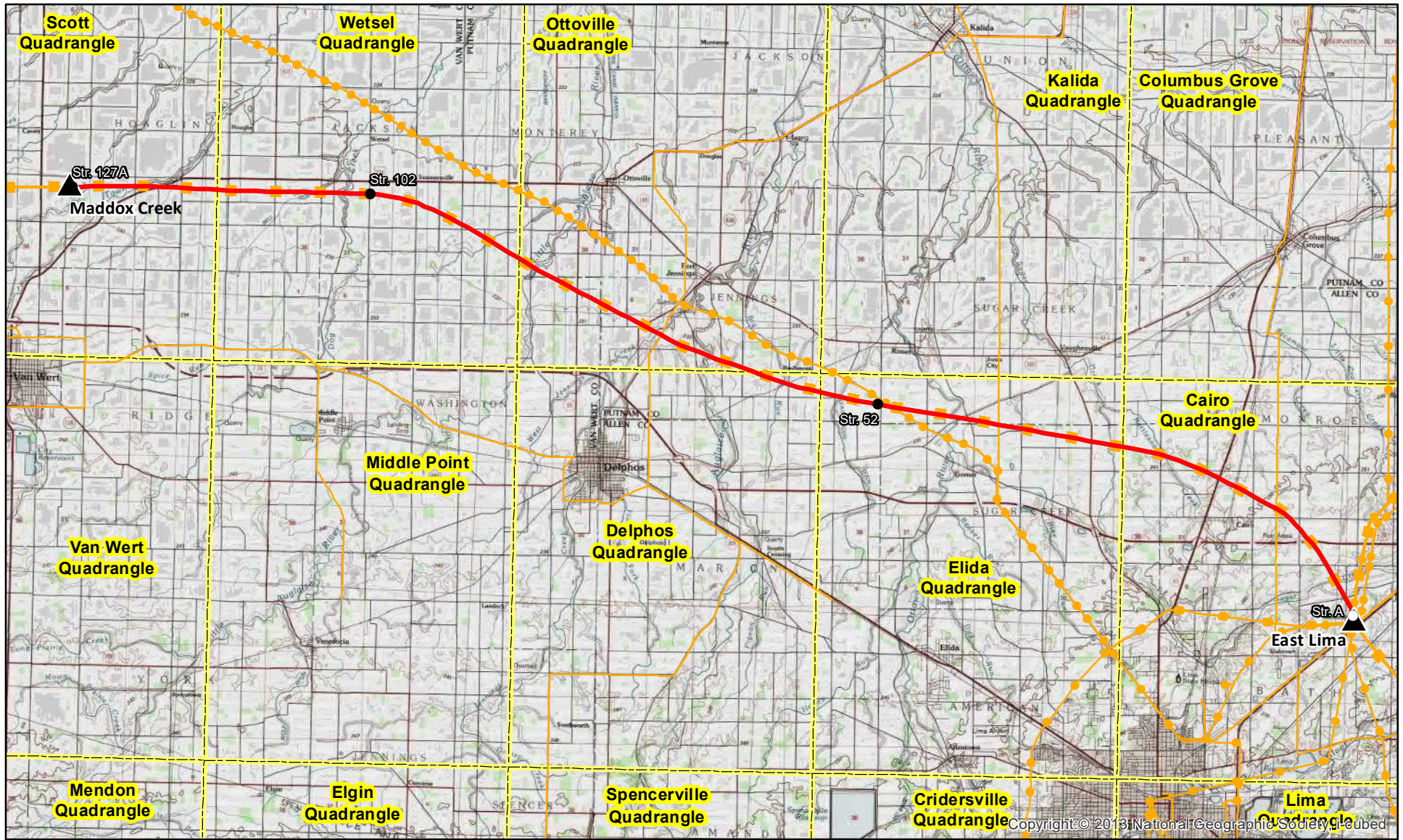
**Provide any known additional information that will describe any unusual conditions resulting in significant environmental, social, health, or safety impacts.**

To the best of AEP Ohio Transco's knowledge, no unusual conditions exist that would result in significant environmental, social, health, or safety impacts.

**APPENDIX A**

**PROJECT MAPS**





▲ Station

— East Lima-Maddox Creek Proposed 345kV Transmission

○ Proposed New Structure

● Structure to be Replaced

— Existing Transmission Line (69 kV and below)

— Existing Transmission Line (115 kV - 230 kV)

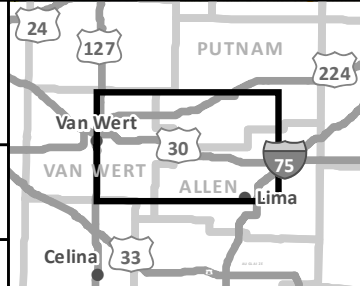
— Existing Transmission Line (345 kV +)

— USGS 7.5' Topographical Quadrangle

Data Sources: AEP (2019), USGS (2018), ESRI (2013)

Coordinate System: State Plane Ohio North NAD 83

September 30, 2019



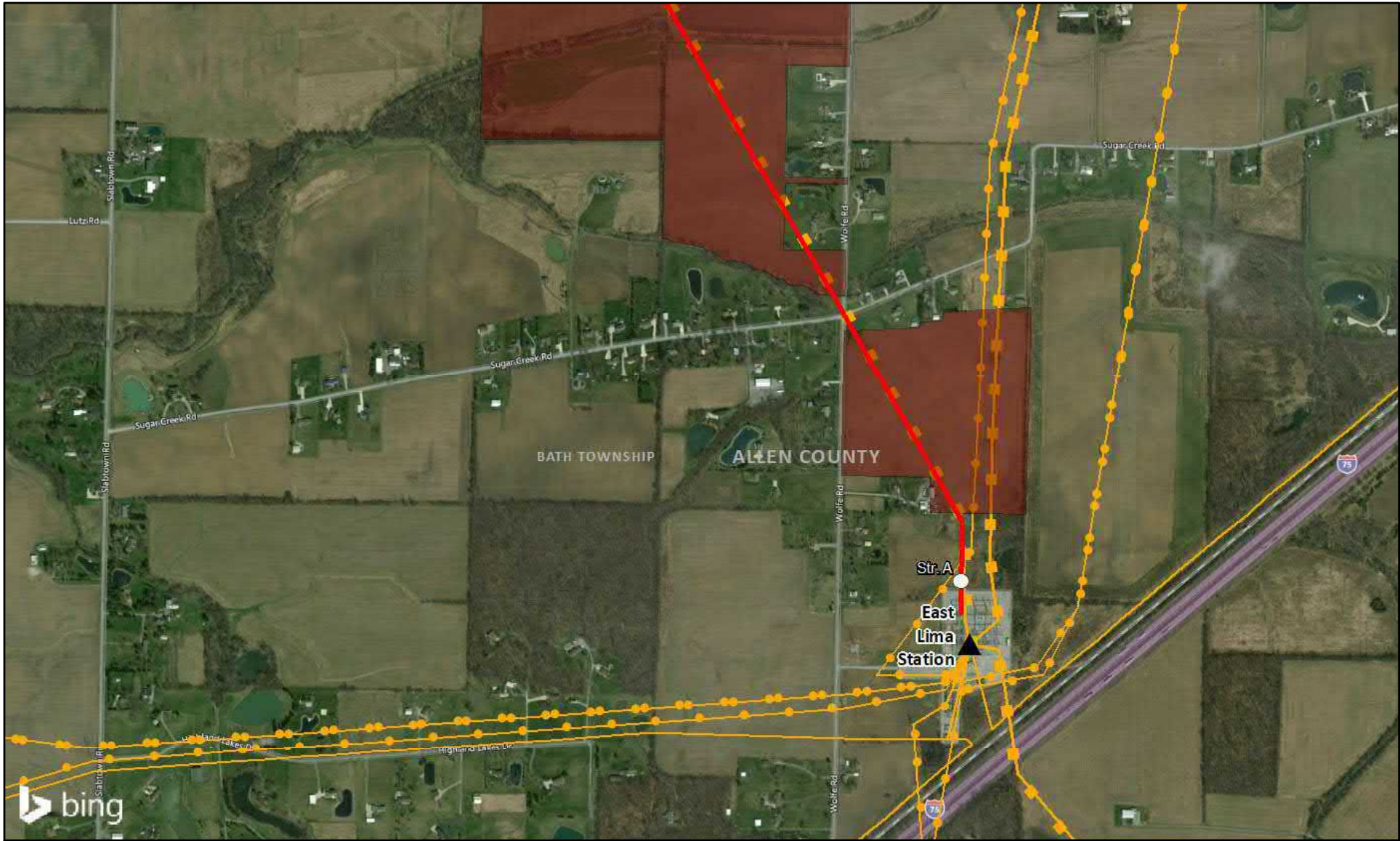
**Map 1**  
**Project Overview**

East Lima-Maddox Creek 345kV Transmission Line Rebuild Project

**AEP AMERICAN ELECTRIC POWER**

0 3 6  
Miles





**▲ Station**

**— Proposed New Structure**

**— Existing Transmission Line (69 kV and below)**

**— Existing Transmission Line (115 kV - 230 kV)**

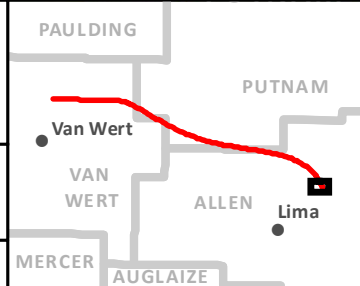
**— Existing Transmission Line (345 kV +)**

**■ Agricultural District Land Parcel**

Data Sources: AEP (2019), USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

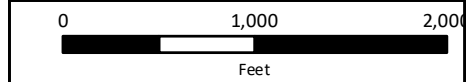
September 30, 2019



### Map 2A Aerial Imagery of Project Area

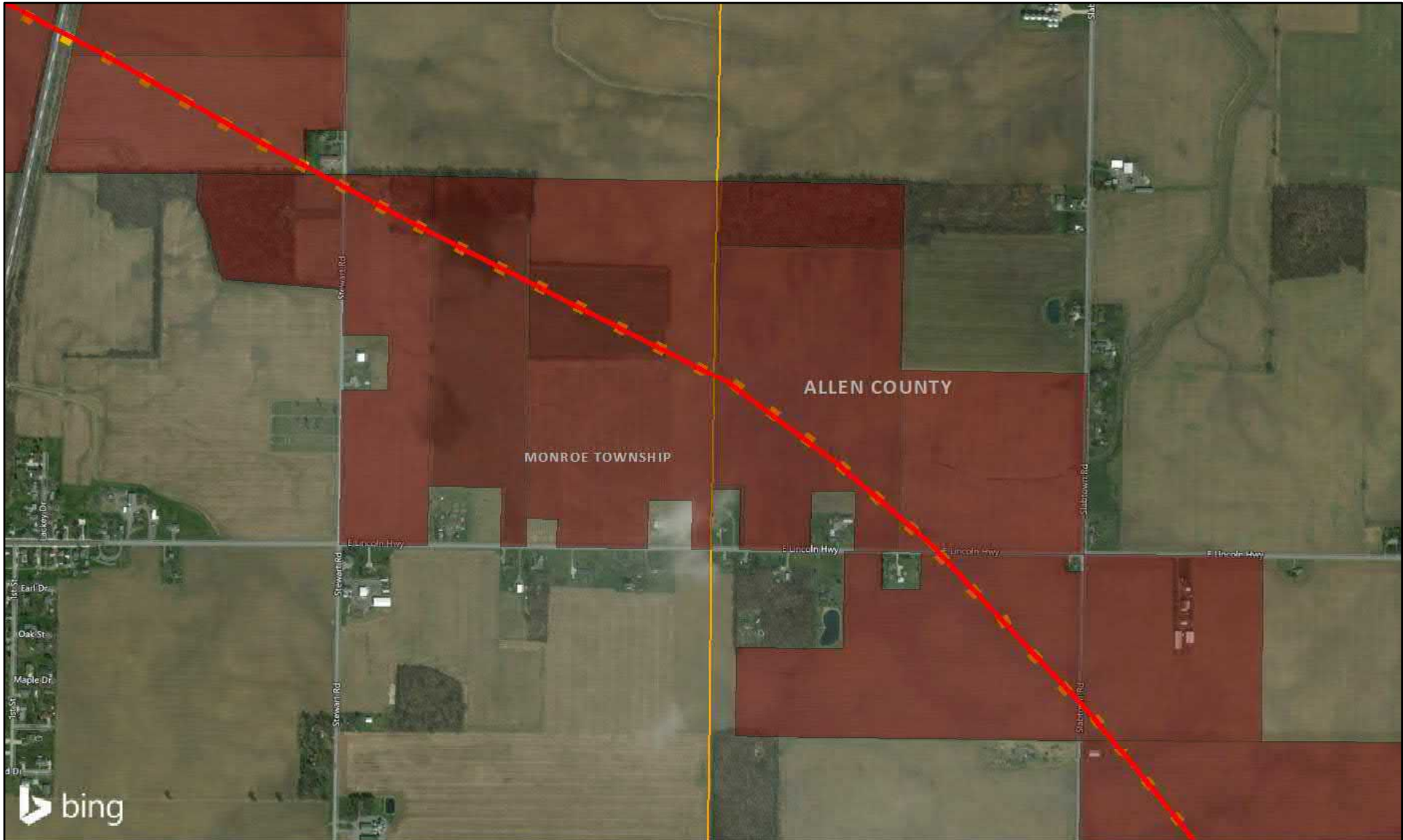
**AEP AMERICAN ELECTRIC POWER**

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project









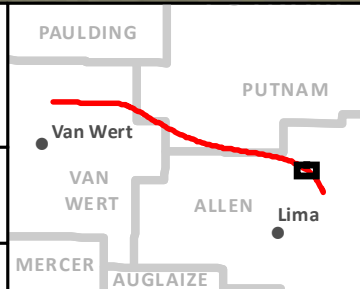
- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (69 kV and below)
- Existing Transmission Line (345 kV +)
- Agricultural District Land Parcel

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Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

September 30, 2019



**Map 2C**  
**Aerial Imagery of Project Area**

**AEP AMERICAN ELECTRIC POWER**

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project

0      1,000      2,000  
Feet



<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission</li> <li><span style="color: yellow;">—</span> Line Existing Transmission Line (345 kV +)</li> <li><span style="background-color: #8B4513; width: 15px; height: 10px; display: inline-block;"></span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<h3>Map 2D</h3> <h4>Aerial Imagery of Project Area</h4>
<p>Coordinate System: State Plane Ohio North NAD 83</p>			<p>East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p>
<p>September 30, 2019</p>			

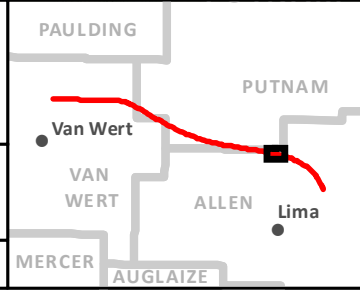


- East Lima-Maddox Creek Proposed 345kV Transmission
- - - Line Existing Transmission Line (345 kV +)
- Agricultural District Land Parcel

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

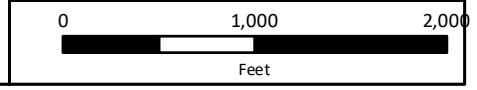
September 30, 2019



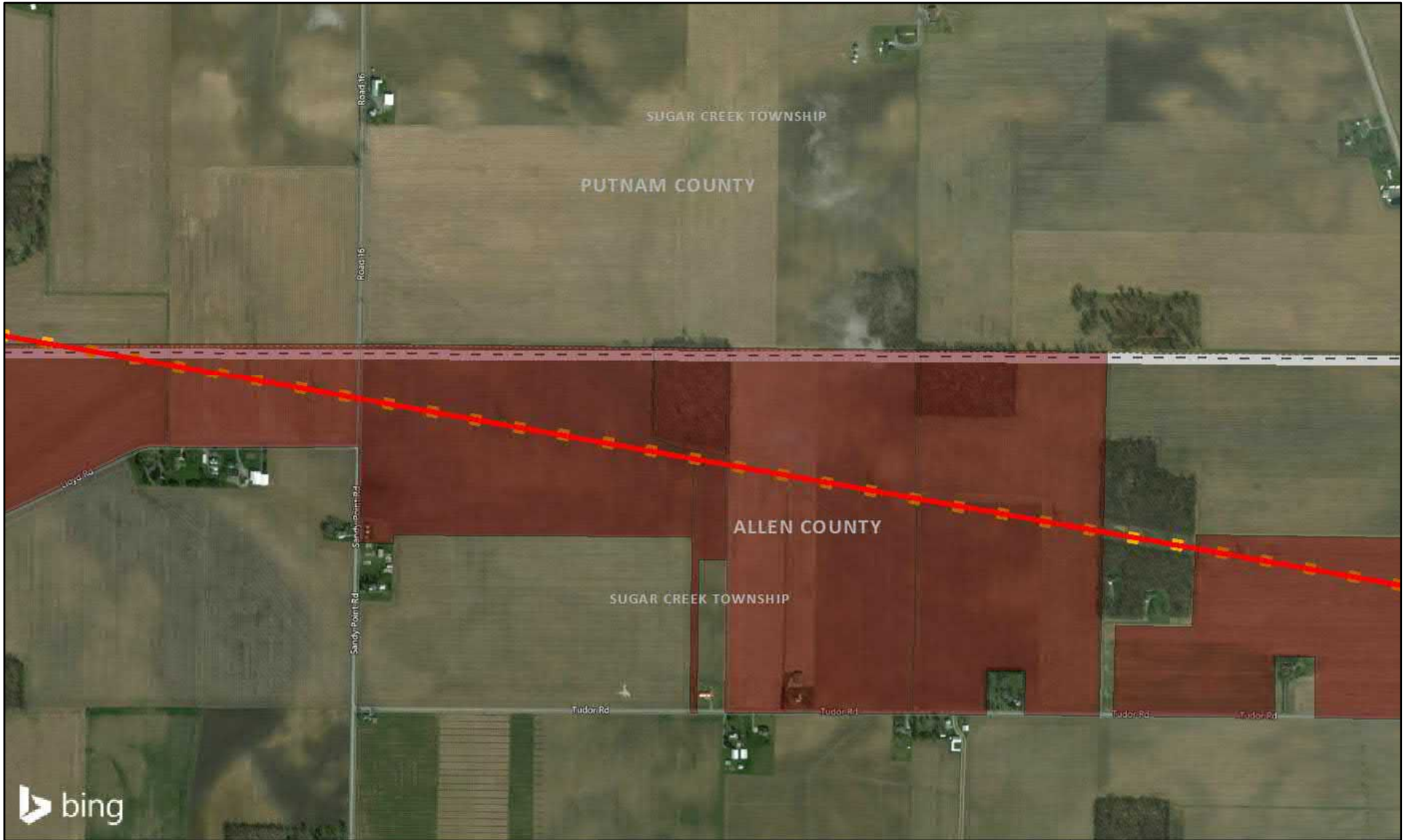
## Map 2E Aerial Imagery of Project Area


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POWER**

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project







<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission</li> <li><span style="color: yellow;">—</span> Line Existing Transmission Line (345 kV +)</li> <li><span style="background-color: #d8bfd8; border: 1px solid black; display: inline-block; width: 15px; height: 10px;"></span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<p align="center"><b>Map 2F</b> <b>Aerial Imagery of Project Area</b></p>
<p>Coordinate System: State Plane Ohio North NAD 83</p>  <p align="center">September 30, 2019</p>			<p align="center"><b>AEP AMERICAN ELECTRIC POWER</b></p> <p align="center">East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p> <p align="center">0                      1,000                      2,000 Feet</p>



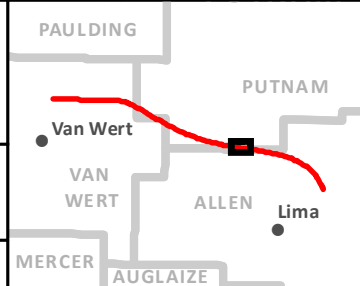
- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (69 kV and below)
- Existing Transmission Line (115 kV - 230 kV)
- Existing Transmission Line (345 kV +)
- Agricultural District Land Parcel
- Agricultural District Land Parcel

Data Sources: AEP (2019), USGS (2018), ESRI (2013)

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Coordinate System:  
State Plane Ohio North  
NAD 83

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### Map 2G

#### Aerial Imagery of Project Area

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project

0                      1,000                      2,000

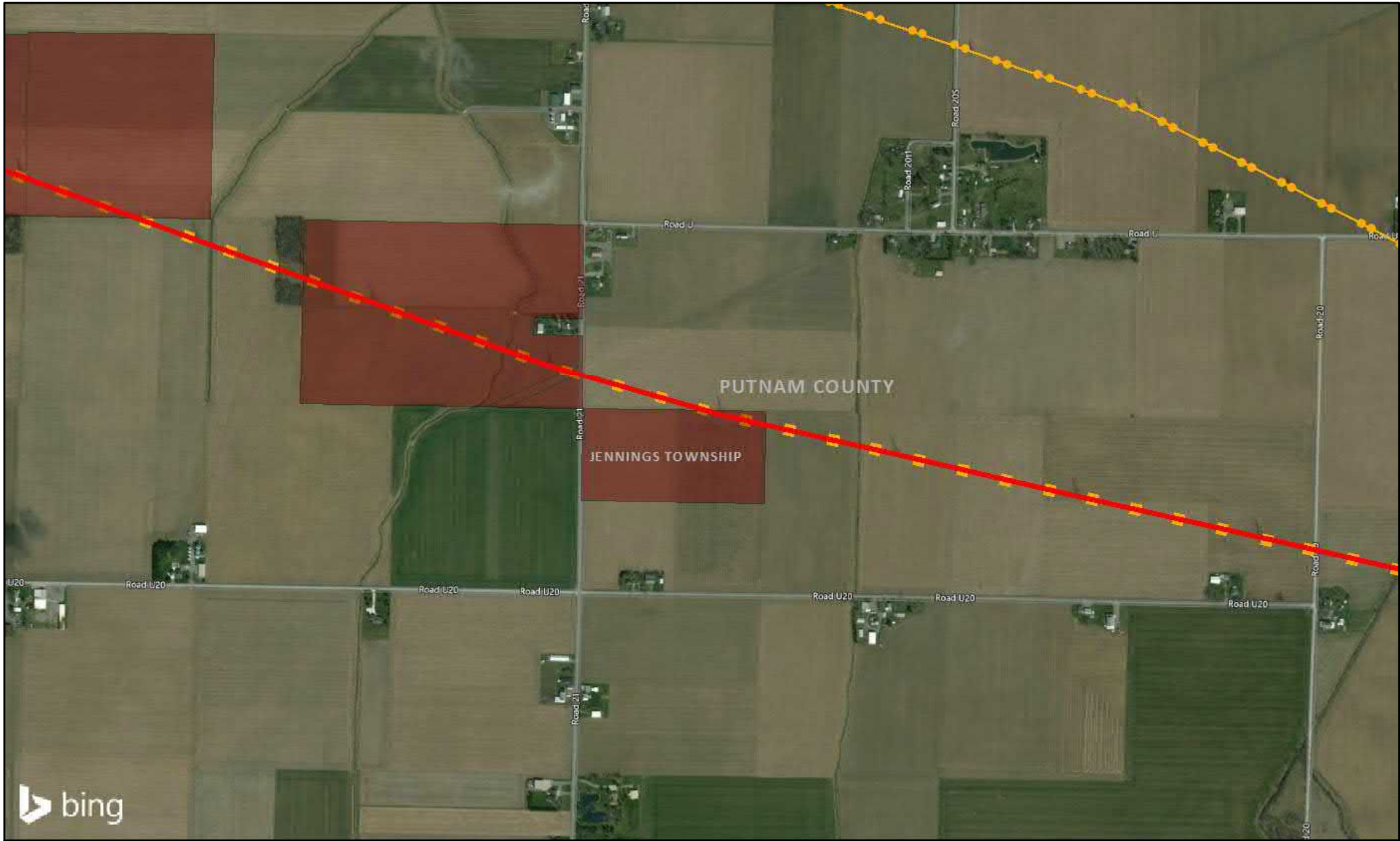
Feet





<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission Line</li> <li><span style="color: black;">●</span> Structure to be Replaced</li> <li><span style="color: orange;">—</span> Existing Transmission Line (115 kV - 230 kV)</li> <li><span style="color: yellow;">—</span> Existing Transmission Line (345 kV +)</li> <li><span style="color: red;">■</span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<h3 style="text-align: center;">Map 2H</h3> <h4 style="text-align: center;">Aerial Imagery of Project Area</h4>
<p>Coordinate System: State Plane Ohio North NAD 83</p> <p style="text-align: center;">September 30, 2019</p>	<p style="text-align: right;">East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p>		<p style="text-align: center;">Feet</p>





<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission Line</li> <li><span style="color: yellow;">- - -</span> Existing Transmission Line (115 kV - 230 kV)</li> <li><span style="color: yellow;">—</span> Existing Transmission Line (345 kV +)</li> <li><span style="background-color: #a52a2a; border: 1px solid black; display: inline-block; width: 15px; height: 10px; vertical-align: middle;"></span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<h3>Map 21</h3> <h4>Aerial Imagery of Project Area</h4>
	<p>Coordinate System: State Plane Ohio North NAD 83</p>		<p>East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p>
	<p>September 30, 2019</p>		<p>0 1,000 2,000 Feet</p>







- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (69 kV and below)
- Existing Transmission Line (115 kV - 230 kV)
- Existing Transmission Line (345 kV +)

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83



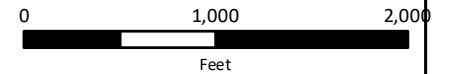
September 30, 2019



## Map 2K Aerial Imagery of Project Area



East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project



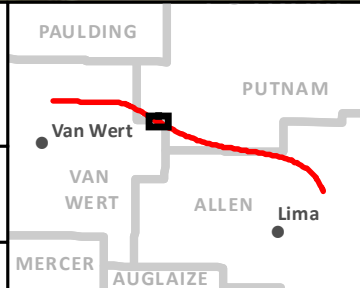


- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (345 kV +)

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

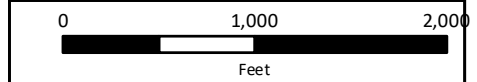
September 30, 2019



### Map 2L Aerial Imagery of Project Area

**AEP AMERICAN ELECTRIC POWER**

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project







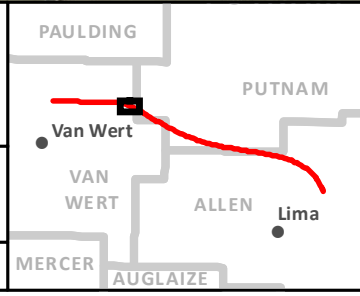


- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (345 kV +)
- Agricultural District Land Parcel

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

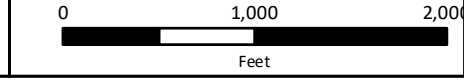
September 30, 2019



## Map 2N Aerial Imagery of Project Area

**AEP AMERICAN  
ELECTRIC  
POWER**

East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project







<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission Line</li> <li><span style="color: black;">●</span> Structure to be Replaced</li> <li><span style="color: yellow; border-bottom: 1px dashed yellow;">—</span> Existing Transmission Line (345 kV +)</li> <li><span style="background-color: #c00000; width: 15px; height: 10px; display: inline-block;"></span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<h3 style="text-align: center;">Map 20</h3> <h4 style="text-align: center;">Aerial Imagery of Project Area</h4>
<p>Coordinate System: State Plane Ohio North NAD 83</p>	<p>September 30, 2019</p>		<p style="text-align: right;"><b>AEP AMERICAN ELECTRIC POWER</b></p> <p style="text-align: right;">East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p>
<p style="text-align: center;">Feet</p>			



<ul style="list-style-type: none"> <li><span style="color: red;">—</span> East Lima-Maddox Creek Proposed 345kV Transmission</li> <li><span style="border-bottom: 1px dashed yellow; width: 20px; display: inline-block;"></span> Line Existing Transmission Line (345 kV +)</li> <li><span style="background-color: #c00000; width: 20px; height: 10px; display: inline-block;"></span> Agricultural District Land Parcel</li> </ul>	<p>Data Sources: AEP (2019), USGS (2018), ESRI (2013)</p>		<h3>Map 2P</h3> <h4>Aerial Imagery of Project Area</h4>
<p>Coordinate System: State Plane Ohio North NAD 83</p>	<p>September 30, 2019</p>		<p><b>AEP AMERICAN ELECTRIC POWER</b></p> <p>East Lima-Maddox Creek 345kV Transmission Line Rebuild Project</p>
<p>0 1,000 2,000 Feet</p>			



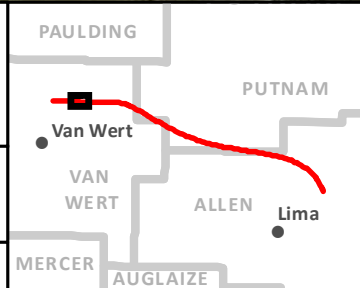


- East Lima-Maddox Creek Proposed 345kV Transmission
- Line Existing Transmission Line (345 kV +)

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)

Coordinate System:  
State Plane Ohio North  
NAD 83

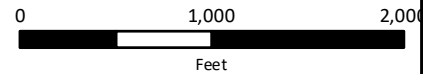
September 30, 2019







### Map 2Q Aerial Imagery of Project Area



East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project



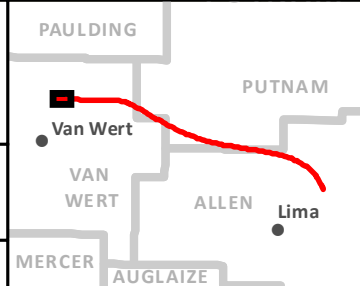


-  Station
-  East Lima-Maddox Creek Proposed 345kV Transmission Line
-  Structure to be Replaced
-  Existing Transmission Line (345 kV +)

Data Sources: AEP (2019),  
USGS (2018), ESRI (2013)


Coordinate System:  
State Plane Ohio North  
NAD 83

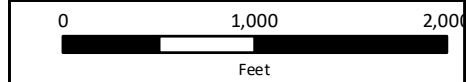
September 30, 2019



## Map 2R

### Aerial Imagery of Project Area

 East Lima-Maddox Creek 345kV  
Transmission Line Rebuild Project



**APPENDIX B**

**WETLAND DELINEATION AND STREAM ASSESSMENT REPORT**

# **EAST LIMA-MADDOX 345KV RE- CONDUCTORING PROJECT, ALLEN, PUTNAM, AND VAN WERT COUNTIES, OHIO**

## **WETLAND DELINEATION AND STREAM ASSESSMENT REPORT**

*Prepared for:*

American Electric Power Ohio Transmission Company  
700 Morrison Road  
Gahanna, Ohio 45230



*Prepared by:*



525 Vine Street, Suite 1800  
Cincinnati, Ohio 45202

Project #: 60601386

September 2019



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**LIST OF ACRONYMS and ABBREVIATIONS**

AECOM	AECOM Technical Services, Inc.
AEP Ohio Transco	American Electric Power Ohio Transmission Company
DBH	Diameter at Breast Height
DOW	Division of Wildlife
DWR	Division of Water Resources
FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
GIS	Geographic Information System
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
IBI	Index of Biotic Integrity
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
OBL	Obligate wetland
ODNR	Ohio Department of Natural Resources
OEPA	Ohio Environmental Protection Agency
OHWM	Ordinary High Water Mark
ONHD	Ohio Natural Heritage Database
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PFO	Palustrine forested
PSS	Palustrine scrub/shrub
PUB	Palustrine unconsolidated bottom
PHWH	Primary Headwater Habitat
QHEI	Qualitative Habitat Evaluation Index
ROW	Right-of-way
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WOTUS	Waters of the U.S.

## 1.0 INTRODUCTION

American Electric Power Ohio Transmission Company (AEP Ohio Transco) is re-conducting approximately 30 miles of 345 kV line between East Lima Station to Maddox Station through Allen, Putnam, and Van Wert Counties, Ohio (Project). AECOM understands that AEP intends to replace only nine non-consecutive steel lattice towers of the 127 total structures. Approximately 3.2 miles of access roads to these nine steel lattice towers will also be required. The remaining portion of the Project will be re-conducted utilizing helicopters. In addition to work areas for structure replacements, AEP requires additional work pad areas ranging in size from 50'x50' to 50'x100' in the vicinity of approximately 18 other structures. Also, 100'x100' helipads will be required about every two miles along the project. The proposed Project location is illustrated on Figure 1.

The purpose of the field survey was to assess whether wetlands and other “waters of the United States (U.S.)” exist within the Project survey area. Secondly, land uses were recorded to classify and characterize potential habitat for rare, threatened, and endangered species. This report will be used to assist AEP Ohio Transco’s efforts to identify potential waters of the U.S. and rare, threatened and endangered species habitat potentially present within the Project survey area and methods to avoid or minimize impacts to the resources during construction activities.

## 2.0 METHODOLOGY

Prior to conducting field surveys, digital and published county U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed to identify the occurrence and location of potential wetland areas.

In September 2019, AECOM ecologists walked the Project survey area to conduct a wetland delineation and stream assessment. The Project survey area includes a 25-foot corridor around access roads and work pads in addition to a 100-foot radius area around replacement structures. During the field survey, the physical boundaries of observed water features were recorded using sub-decimeter capable Trimble Global Positioning System (GPS) units. The GPS data was imported into ArcMap Geographic Information System (GIS) software, where the data was then reviewed and edited for accuracy. Land uses observed within the Project survey area were assigned a general classification based upon the principal land characteristics of the location as observed through aerial photography review and observations during the field surveys.

### 2.1 WETLAND DELINEATION

The Project survey area was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers (USACE) *1987 Wetland Delineation Manual (1987 Manual)* (Environmental Laboratory, 1987)



as well as the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (MW Regional Supplement)* (USACE, 2010), or the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (NCNE Regional Supplement)*, whichever was applicable. The *Regional Supplements* were released by the USACE in August 2010 and January 2012, respectively, to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The *1987 Manual* and *Regional Supplements* 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.

Since quantitative data were not available for any of the identified wetlands, AECOM utilized the routine delineation method described in the *1987 Manual* and *Regional Supplement* that consisted of a pedestrian site reconnaissance, including soils identification, geomorphologic assessment of hydrology, identification of vegetative communities, and notation of disturbance. The methodology used to examine each parameter is described in the following sections.

### 2.1.1 SOILS

Soils were examined for hydric soil characteristics using a spade shovel to extract soil samples. A *Munsell Soil Color Chart* (Kollmorgen Corporation, 2010) was used to identify the hue, value, and chroma of the matrix and mottles of the soils. Generally, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less are considered to exhibit hydric soil characteristics (Environmental Laboratory, 1987). In sandy soils, mottled soils with a matrix chroma of three or less, or unmottled soils with a matrix chroma of two or less are considered to be hydric soils.

### 2.1.2 HYDROLOGY

The *1987 Manual* requires that an area be inundated or saturated to the surface for an absolute minimum of five percent of the growing season (areas saturated between five percent and 12.5 percent of the growing season may or may not be wetlands, while areas saturated over 12.5 percent of the growing season fulfill the hydrology requirements for wetlands). The *Regional Supplements* state that the growing season dates are determined through onsite observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature (12-in. depth) is 41-degree Fahrenheit (°F) or higher as an indicator of soil microbial activity. Therefore, the beginning of the growing season in a given year is indicated by whichever condition occurs earlier, and the end of the growing season by whichever persists later.

The *Regional Supplements* also state that if onsite data gathering is not practical, the growing season can be approximated by the number of days between the average (five years out of 10, or 50 percent probability) date of the last and first 28° F air temperature in the spring and fall, respectively. The National Weather

Service WETS data obtained from the NRCS National Water and Climate Center reveals for Allen County that in an average year, this period lasts from April 10 to November 3, or 207 days. In Putnam County, in an average year, this period lasts from April 15 to October 27, or 195 days. In Van Wert County, in an average year, this period lasts from April 10 to October 31, or 205 days. In the Project area, five percent of the growing season equates to approximately ten days.

The soils and ground surface were examined for evidence of wetland hydrology in lieu of detailed hydrological data. This is an acceptable approach according to the *1987 Manual* and the *Regional Supplements*. Evidence indicating wetland hydrology typically includes primary indicators such as surface water, saturation, water marks, drift deposits, water-stained leaves, sediment deposits and oxidized rhizospheres on living roots; and secondary indicators such as drainage patterns, geomorphic position, micro-topographic relief, and a positive Facultative (FAC)-neutral test (USACE, 2012).

### 2.1.3 VEGETATION

Dominant vegetation was visually assessed for each stratum (tree, sapling/shrub, herb and woody vine) and an indicator status of obligate wetland (OBL), facultative wetland (FACW), FAC, facultative upland (FACU), and/or upland (UPL) was assigned to each plant species based on the U.S. Army Corps of Engineers *2016 National Wetland Plant List: Midwest Region* (Lichvar et al, 2016) and the *2016 National Wetland Plant List: Northcentral and Northeast Region* (Lichvar et al, 2016), which encompass the area of the Project survey area. An area is determined to have hydrophytic vegetation when, under normal circumstances, more than 50 percent of the composition of the dominant species are OBL, FACW and/or FAC species. Vegetation of an area was determined to be non-hydrophytic when 50 percent or more of the composition of the dominant species was FACU and/or UPL species. In addition to the dominance test, the FAC-Neutral test and prevalence tests are used to determine if a wetland has a predominance of hydrophytic vegetation. Recent USACE guidance indicates that to the extent possible, the hydrophytic vegetation decision should be based on the plant community that is normally present during the wet portion of the growing season in a normal rainfall year (USACE, 2010 and USACE, 2012).

### 2.1.4 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). There are five main classes of wetlands and deepwater habitats. They include: marine, estuarine, riverine, lacustrine, and palustrine. Marine and estuarine wetlands are not found in this area of the U.S. Freshwater, Palustrine systems, which includes non-tidal wetlands dominated by trees, shrubs, or emergent vegetation, are potential wetland types which may be identified within the Project area. The possible palustrine wetland classification types are as follows:

**PEM** – Palustrine emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

**PSS** – Palustrine scrub/shrub wetlands are characterized by woody vegetation that is less than three inches diameter at breast height (DBH), and greater than 3.28 feet tall. The woody angiosperms (i.e. small trees or shrubs) in this broad-leaved deciduous community have relatively wide, flat leaves that are shed annually during the cold or dry season.

**PFO** – Palustrine forested wetlands are characterized by woody vegetation that is three inches or more DBH, regardless of total height. These wetlands generally include an overstory of broad-leaved and needle-leaved trees, an understory of young saplings and shrubs, and an herbaceous layer.

**PUB** – Palustrine unconsolidated bottom wetlands includes all open water wetlands and deepwater habitats with at least 25 percent cover of particles smaller than stones, and a vegetative cover less than 30 percent. Palustrine open water wetlands are characterized by the lack of large stable surfaces for plant and animal attachment.

For some wetlands, multiple Cowardin classifications may be present where more than one classification's vegetation is dominant (vegetation covers 30 percent or more of the substrate). Where multiple Cowardin classifications are present, the Cowardin classification of the plants that constitute the uppermost layer of vegetation is listed.

#### **2.1.5 OHIO RAPID ASSESSMENT METHOD v. 5.0**

The Ohio Environmental Protection Agency (OEPA) *Ohio Rapid Assessment Method for Wetlands v. 5.0* (ORAM) was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under the Clean Water Act Section 401 Certification. 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 the ORAM 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 OEPA, 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).

***Category 1 Wetlands***

Category 1 wetlands support minimal wildlife habitat, hydrological and recreational functions, and do not provide for or contain critical habitats for threatened or endangered species. In addition, Category 1 wetlands are often hydrologically isolated and have some or all of the following characteristics: low species diversity, no significant habitat for wildlife use, limited potential to achieve wetland functions, and/or a predominance of non-native species. These limited quality wetlands are considered to be a resource that has been severely degraded or has a limited potential for restoration, or, is of low ecological functionality.

***Category 2 Wetlands***

Category 2 wetlands "...support moderate wildlife habitat, or hydrological or recreational functions," and as wetlands which are "...dominated by native species but generally without the presence of, or habitat for, rare, threatened or endangered species; and wetlands which are degraded but have a reasonable potential for reestablishing lost wetland functions." Category 2 wetlands constitute the broad middle category of "good" quality wetlands, and can be considered a functioning, diverse, healthy water resource that has ecological integrity and human value. Some Category 2 wetlands are lacking in human disturbance and considered to be naturally of moderate quality; others may have been Category 3 wetlands in the past but have been degraded to Category 2 status.

***Category 3 Wetlands***

Wetlands that are assigned to Category 3 have "...superior habitat, or superior hydrological or recreational functions." They are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands which contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide. A wetland may be a Category 3 wetland because it exhibits one or all of the above characteristics. For example, a forested wetland located in the flood plain of a river may exhibit "superior" hydrologic functions (e.g., flood retention, nutrient removal), but not contain mature trees or high levels of plant species diversity.

**2.2 STREAM ASSESSMENT**

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 Clean Water Act requires 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). The USACE defines OHWM as "that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of

soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" (USACE, 2005).

Stream assessments were performed using one of two methods:

- OEPA's Methods for Assessing Habitat in Flowing Waters: Using OEPA's *Qualitative Habitat Evaluation Index* (Rankin, 2006), or
- OEPA's *Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams* (OEPA, 2012).

### 2.2.1 OEPA QUALITATIVE HABITAT EVALUATION INDEX

The Qualitative Habitat Evaluation Index (QHEI) is designed to provide a rapid determination of habitat features that correspond to those physical factors that most affect fish communities and which are generally important to other aquatic life (e.g., macroinvertebrates). The quantitative measure of habitat used to calibrate the QHEI score are Indices (or Index) of Biotic Integrity (IBI) for fish. In most instances the QHEI is sufficient to give an indication of habitat quality, and the intensive quantitative analysis used to measure the IBI is not necessary. It is the IBI, rather than the QHEI, that is directly correlated with the aquatic life use designation for a particular surface water, per OEPA regulations.

The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one mile<sup>2</sup>, if natural pools are greater than 40 cm, or if the water feature is shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps. In order to convey general stream habitat quality to the regulated public, the OEPA has assigned narrative ratings to QHEI scores. The ranges vary slightly for headwater streams (H are those with a watershed area less than or equal to 20 mile<sup>2</sup>) versus larger streams (L are those with a watershed area greater than 20 mile<sup>2</sup>). The Narrative Rating System includes: Very Poor (<30 H and L), Poor (30 to 42 H, 30 to 44 L), Fair (43 to 54 H, 45 to 59 L), Good (55 to 69 H, 60 to 74 L) and Excellent (70+ H, 75+ L).

### 2.2.2 OEPA PRIMARY HEADWATER HABITAT EVALUATION INDEX

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or "branches") and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment

method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a "defined bed and bank, with either continuous or periodically flowing water, with watershed area less than or equal to 1.0 mile<sup>2</sup>, and a maximum depth of water pools equal to or less than 15.75 inches" (OEPA, 2012).

Headwater streams are scored on the basis of channel substrate composition, bankfull width, and maximum pool depth. Assessments result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class 1 PHWH Streams", 30 to 69.9 are "Class 2 PHWH Streams", and 70 to 100 are "Class 3 PHWH Streams". Technically, a stream can score relatively high, but actually belong in a lower class, and vice-versa. According to the OEPA, if the stream score falls into a class and the scorer feels that based on site observations that score does not reflect the actual stream class, a decision-making flow chart can be used to determine appropriate PHWH stream class using the HHEI protocol (OEPA, 2012). Evidence of anthropogenic alterations to the natural channel will result in a "Modified" qualifier for the stream.

**Class 1 PHWH Streams:** Class 1 PHWH Streams are those that have "normally dry channels with little or no aquatic life present" (OEPA, 2012). These waterways are usually ephemeral, with water present for short periods of time due to infiltration from snowmelts or rainwater runoff.

**Class 2 PHWH Streams:** Class 2 PHWH Streams are equivalent to "warm-water habitat" streams. This stream class has a "moderately diverse community of warm-water adapted native fauna either present seasonally or on an annual basis" (OEPA, 2012). These species communities are composed of vertebrates (fish and salamanders) and/or benthic macroinvertebrates that are considered pioneering, headwater temporary, and/or temperature facultative species.

**Class 3 PHWH Streams:** Class 3 PHWH Streams usually have perennial water flow with cool-cold water adapted native fauna. The community of Class 3 PHWH Streams is comprised of vertebrates (either cold water adapted species of headwater fish and or obligate aquatic species of salamanders, with larval stages present), and/or a diverse community of benthic cool water adapted macroinvertebrates present in the stream continuously (on an annual basis).

### 2.3 RARE, THREATENED AND ENDANGERED SPECIES

AECOM conducted a rare, threatened, and endangered species review and general field habitat surveys within areas within the Project survey area. The first phase of the review involved a review of online lists of federally and state-listed species. In addition to the review of available lists, AECOM submitted a request to Ohio Department of Natural Resources (ODNR) Office of Real Estate – Environmental Review Section soliciting comments on the Project. AECOM also submitted a coordination letter to the USFWS soliciting



technical assistance on the Project. Agency-identified species and available species-specific information was reviewed to identify the various habitat types that listed species are known to inhabit.

AECOM field ecologists conducted a general habitat survey in conjunction with the stream and wetland field surveys as part of the second phase of assessing rare, threatened, and endangered species. Land uses observed by the Project survey area were assigned a general classification based upon the principal land characteristics of the location as observed through aerial photography review and observations during the field surveys.

**3.0 RESULTS**

Within the Project survey area, AECOM delineated one wetland, five streams and no ponds. These features are discussed in detail in the following sections.

**3.1 WETLAND DELINEATION**

**3.1.1 Preliminary Soils Evaluation**

Soils in the delineated wetland were observed and documented as part of the delineation methodology. According to the USDA NRCS Web Soil Survey of Allen, Putnam, and Van Wert Counties, Ohio (USDA NRCS, 2017), and the USDA NRCS Hydric Soils Lists of Ohio, 14 soil series are mapped within the Project survey area (USDA NRCS 2017). Of these 214 soil series, six units are listed as hydric. Table 1 provides a detailed overview of all soil series and soil map units within the Project survey area. Soil map units located within the Project survey area are shown on Figure 2.

**TABLE 1  
SOIL MAP UNITS AND DESCRIPTIONS WITHIN THE EAST LIMA-MADDOX 345 KV TRANSMISSION LINE  
RE-CONDUCTORING PROJECT SURVEY AREA**

Soil Series	Symbol	Map Unit Description	Topographic Setting	Hydric	Hydric Component (%)
Belmore	BIB	Belmore sandy loam, 2 to 6 percent slopes	Outwash terraces, outwash plains	Not Hydric	NA
Blount	Ble1A1	Blount silt loam, end moraine, 0 to 2 percent slopes	End moraines, till plains	Not Hydric	Pewamo, end moraines (6)
	Ble1B1	Blount silt loam, end moraine, 2 to 4 percent slopes	End moraines, till plains	Not Hydric	Pewamo, end moraines (6)
	Blg1A1	Blount silt loam, ground moraine, 0 to 2 percent slopes	Ground moraines, till plains	Not Hydric	Pewamo, end moraines (9)
	BrA	Blount-Jenera complex, 0 to 3 percent slopes	Rises on ground moraines	Not Hydric	Pewamo (5)
Digby	DnA	Digby loam, 0 to 2 percent slopes	Outwash terraces, outwash plains	Not Hydric	Millgrove and Mermill (5)

**TABLE 1**  
**SOIL MAP UNITS AND DESCRIPTIONS WITHIN THE EAST LIMA-MADDOX 345 KV TRANSMISSION LINE**  
**RE-CONDUCTORING PROJECT SURVEY AREA**

Soil Series	Symbol	Map Unit Description	Topographic Setting	Hydric	Hydric Component (%)
	DnB	Digby loam, 2 to 6 percent slopes	Outwash terraces, outwash plains	Not Hydric	Millgrove, Mermill (5)
Glynwood	Gwe1B1	Glynwood silt loam, end moraine, 2 to 6 percent slopes	End moraines, till plains	Not Hydric	Pewamo (6)
Hoytville	HcA	Hoytville silty clay loam, 0 to 1 percent slopes	Wave-worked till plains	Hydric	Hoytville (90)
	HtA	Hoytville silty clay, 0 to 1 percent slopes	Wave-worked till plains	Hydric	Hoytville (90)
Haskins	HnA	Haskins loam, 0 to 2 percent slopes	Depressions	Not Hydric	Mermill, Hoytville (3)
Houcktown	HpB	Houcktown sandy loam, 2 to 4 percent slopes	Depressions, ground moraines	Not Hydric	Alvada (5)
Mermill	Me	Mermill silty clay loam	Flats and drainages on lake plains	Hydric	Mermill (95)
Nappanee	NaA	Nappanee loam, 0 to 2 percent slopes	Lake plains	Not Hydric	Hoytville, Latty (5)
	NpA	Nappanee silt loam, 0 to 2 percent slopes	Lake plains	Not Hydric	Hoytville, Latty (5)
	NpB	Nappanee silt loam, 2 to 6 percent slopes	Lake plains	Not Hydric	Hoytville, Latty (5)
	NtA	Nappanee silty clay loam, 0 to 2 percent slopes	Lake plains	Not Hydric	Hoytville, Latty (5)
	NtB2	Nappanee silty clay loam, 2 to 6 percent slopes, moderately eroded	Lake plains	Not Hydric	Hoytville, Latty (1)
Pewamo	PmA	Pewamo silty clay loam, 0 to 1 percent slopes	Depressions, till plains	Hydric	Pewamo, Minster (91)
St. Clair	ScB	St. Clair silt loam, 2 to 6 percent slopes	Ground moraines, end moraines, lake plains	Not Hydric	NA
Shawtown	SfB	Shawtown loam, 2 to 6 percent slopes	Knolls on lake plains	Not Hydric	NA
Sloan	SrA	Sloan silty clay loam, till substratum, 0 to 1 percent slopes, frequently flooded	Backswamps and flats on flood plains	Hydric	Sloan (90)
Wabasha	Wh	Wabasha silty clay	Flood plains	Hydric	Wabasha (100)

[USDA NRCS. 2017. Soil Survey Geographic \(SSURGO\) Database. Available online at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm](https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm)  
[USDA NRCS. 2017. National Hydric Soils List by State. Available online at: http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/)

### 3.1.2 National Wetland Inventory Map Review

National Wetland Inventory wetlands are areas of potential wetland that have been identified from 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. Additionally, small wetlands are typically not identified on the NWI maps due to the scale of the aerial photography. The USFWS website states that the NWI maps are not intended or designed for jurisdictional wetland

identification or location. 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 maps of the Scott, Wetsel, Ottoville, Delphos, Elida, and Cairo, Ohio quadrangles, the Project survey area contains five mapped NWI wetlands. The NWI wetlands were identified as follows: five riverine, intermittent, stream bed, seasonally flooded wetlands (R4SBC). The location of the NWI mapped wetlands are shown on Figure 2.

**3.1.3 Delineated Wetlands**

During the field survey, AECOM identified one PEM wetland, approximately 0.006 acre (268 square feet) in area within the Project survey area, along the proposed access to Structure 01. The wetland boundaries extend beyond the Project survey corridor, but only what was identified within the Project survey area was assessed.

The location and approximate extent of the wetland identified within the Project survey area is shown on Figure 3A. Completed USACE and ORAM wetland delineation forms are provided in Appendix A and B, respectively. Color photographs taken of the wetlands are provided in Appendix D.

**TABLE 2  
DELINEATED WETLANDS WITHIN THE EAST LIMA-MADDOX 345 KV RE-CONDUCTORING PROJECT  
SURVEY AREA**

Wetland Name	Project Component	Latitude	Longitude	Cowardin Wetland Type <sup>a</sup>	ORAM Score	ORAM Category	Acreage within Project Survey Area
Wetland 01	Access Road	40.802090	-84.029804	PEM	18	Category 1	0.006
<b>Totals:</b>							<b>0.006</b>

<sup>a</sup>Cowardin Wetland Type: PEM = palustrine emergent

**3.1.4 Delineated Wetlands ORAM V5.0 Results**

Wetland 01 is a Category 1 wetland. No Category 2 or Category 3 wetlands were observed during the field surveys. A summary of the delineated wetland can be found in Table 2 and Table 3. The completed ORAM form is provided in Appendix B

**Category 1 Wetlands**

The Category 1 wetland delineated within the Project survey area (Wetland 01) consisted of a PEM wetland that received a score of 18. This wetland exhibited medium upland buffers and a range of moderately high (residential) to high intensive surrounding land use (agricultural and industrial). The wetland also exhibited poor to fair plant community development with a sparse percentage of invasive species, with habitat and hydrology recovering from previous manipulation due to clear cutting, selective cutting, toxic pollutants, shrub/sapling removal, sedimentation, and farming.

**TABLE 3  
SUMMARY OF DELINEATED WETLANDS WITHIN THE EAST LIMA-MADDOX 345 KV RE-CONDUCTORING  
PROJECT SURVEY AREA**

Cowardin Wetland Type <sup>a</sup>	ORAM Category 1	ORAM Category 2	ORAM Category 3	Number of Wetlands	Acreage within Project Survey Area
PEM	1	0	0	1	0.006
<b>Totals:</b>	1	0	0	1	0.006

<sup>a</sup>Cowardin Wetland Type: PEM = palustrine emergent

**3.2 STREAM CROSSINGS**

AECOM identified four ephemeral streams, totaling 232 linear feet, along the proposed access roads within the Project survey area, as listed in Table 4. The locations of the streams identified within the survey Area are shown on Figures 3K, 3Q, 3R, 3T, and 3V.

HHEI evaluations conducted on all four ephemeral streams determined them to be Modified Class 1 streams. No Class 2 or Class 3 streams were identified within the Project survey area. These streams were identified using USGS topographic maps, aerial photography, and field reconnaissance.

AECOM has preliminarily determined that all assessed streams within the Project survey area 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 (waters of the U.S).

**TABLE 4  
STREAMS IDENTIFIED IN THE EAST LIMA-MADDOX 345 KV RE-CONDUCTORING PROJECT SURVEY AREA**

Stream Report Name	Project Component	Latitude	Longitude	Flow Regime	Average Bankfull Width (feet)	Maximum Pool Depth (in)	Form <sup>a</sup>	Score	Class/ Narrative Rating	Length (feet) within Project Survey Area
Stream 01	Access Road	40.876020	-84.282083	Ephemeral	0.5	0.5	HHEI	18	Modified Class 1	91
Stream 02	Access Road	40.910592	-84.379517	Ephemeral	0.5	0.5	HHEI	19	Modified Class 1	26
Stream 03	Access Road	40.923241	-84.408115	Ephemeral	1	0.5	HHEI	19	Modified Class 1	50
Stream 04	Access Road	40.927688	-84.436729	Ephemeral	1	0.5	HHEI	18	Modified Class 1	65
<b>Totals:</b>										<b>232</b>

<sup>a</sup> Form Used: HHEI = Headwater Habitat Evaluation Index



**3.2.1 Primary Headwater Habitat Evaluation Index**

A total of four headwater streams, totaling 232 linear feet, were identified along the Project survey area. All four watercourses were identified as Modified Class 1 streams. Completed HHEI forms for each stream are provided in Appendix C. Color photographs of each stream are provided in Appendix D.

**Modified Class 1 Headwater Streams** – Four Modified Class 1 headwater streams, totaling 232 linear feet, with scores ranging from 18 to 19, were identified during the field investigations. All four of the streams were identified as ephemeral. The substrates of the streams generally consisted of leaf pack and woody debris, with lesser amounts of silt. The streams showed evidence of stream channel modification (e.g., channelization, vehicle crossings, culverting, etc.) that resulted in all three streams receiving a Modified designation. The maximum pool depth recorded for all streams was one-half inch and the average bankfull width ranged from 6 inches to one foot.

**3.3 PONDS**

During the field survey, AECOM delineated no ponds within the Project survey area.

**3.4 VEGETATIVE COMMUNITIES WITHIN THE PROJECT SURVEY AREA**

AECOM field ecologists conducted a general habitat survey in conjunction with the stream and wetland field surveys in September 2019. Portions of the Project survey area were identified as agricultural land, old field areas, landscaped areas, roadside stream and wetland areas, and urban areas. Habitat descriptions applicable to the Project and details on the expected impacts of construction are provided below. Vegetated land cover can be seen visually from aerial imagery provided on Figure 4.

**TABLE 5  
VEGETATIVE COMMUNITIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA**

Vegetative Community	Description	Approximate Acreage Within the Project Survey Area	Approximate Percentage within the Project Survey Area
Agricultural Land	Agricultural land consisting of soybean and corn fields was present in much of the Project survey area. Some of this land had been recently tilled with no crops planted. The agricultural land contains row crops and is not used for pasture or hay fields.	31.1	82%

**TABLE 5  
VEGETATIVE COMMUNITIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT  
SURVEY AREA**

Vegetative Community	Description	Approximate Acreage Within the Project Survey Area	Approximate Percentage within the Project Survey Area
Old Field	Herbaceous cover exists alongside roads, field borders, and abandoned fields within the Project survey area in the form of successional old-field communities. These communities are the earliest stages of recolonization by plants following disturbance. This community type is typically short-lived, giving way progressively to shrub and forest communities unless periodically re-disturbed, in which case they remain as old fields. The old-field areas within the study areas and adjacent areas are infrequently mowed areas of grasses, forbs, and occasional shrubs.	1.65	4%
Landscaped Area	Landscaped areas, including residential properties and commercial properties, were observed within the Project study area. These areas are maintained grass and/or herbaceous cover and were devoid of significant woody vegetation.	0.5	1%
Streams/Wetlands	Wetlands and roadside streams were observed both within and beyond the Project survey area.	0.1	1%
Urban	Urban areas observed within the Project study area contained paved, impervious roadways that were generally devoid of significant woody or herbaceous vegetation.	4.6	12%
<b>Totals:</b>		<b>38</b>	<b>100%</b>

**3.5 RARE, THREATENED AND ENDANGERED SPECIES AGENCY COORDINATION**

***Protected Species Agency Consultation –***

AECOM conducted a rare, threatened, and endangered species review for areas within the Project survey area. A summary of the agency coordination is provided below. Correspondence letters from the USFWS and ODNR are included as Appendix E. Table 6 provides a list of these species of concern identified in the Project area during the rare, threatened, and endangered species review.

**TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA**

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
<b>Mammals</b>						
Indiana Bat ( <i>Myotis sodalis</i> )	Endangered	Endangered	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 ( <i>Carya</i> spp.), oak ( <i>Quercus</i> spp.), ash ( <i>Fraxinus</i> spp.), birch ( <i>Betula</i> spp.), and elm ( <i>Ulmus</i> spp.) have been found to be utilized 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.	No	No tree clearing is planned as part of the Project. No impacts to the Indiana bat are anticipated.	USFWS commented that if no caves or abandoned mines are present and trees >3 inches dbh cannot be avoided, USFWS recommends that any cutting of trees ≥3 inches DBH occur between October 1 and March 31. ODNR similarly requested that suitable Indiana bat habitat should be conserved or cut between October 1 and March 31.
Northern Long-eared Bat ( <i>Myotis septentrionalis</i> )	Threatened	Threatened	Winter 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 ( <i>Carya</i> spp.), oak ( <i>Quercus</i> spp.), ash ( <i>Fraxinus</i> spp.), birch ( <i>Betula</i> spp.), and elm ( <i>Ulmus</i> spp.) have been found to be utilized by northern long-eared bats. 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. Northern long-eared bats have also been found, albeit rarely, roosting in structures like barns and sheds.	No	No tree clearing is planned as part of the Project. No impacts to the Northern long eared bat are anticipated.	USFWS commented that if no caves or abandoned mines are present and trees >3 inches dbh cannot be avoided, USFWS recommends that any cutting of trees ≥3 inches DBH occur between October 1 and March 31. ODNR did not comment on this species.
<b>Mussels</b>						

TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
Northern Riffleshell ( <i>Epioblasma torulosa rangiana</i> )	Endangered	Endangered	This mussel species prefers packed sand and gravel substrates in swift current riffles and runs.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
Clubshell ( <i>Pleurobema clava</i> )	Endangered	Endangered	This mussel species prefers clean, loose sand and gravel in medium to small rivers.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
Rayed Bean ( <i>Villosa fabalis</i> )	Endangered	Endangered	This mussel species prefers gravel or sand substrates and is often found in and around roots of aquatic vegetation in smaller, headwater creeks.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.



**TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA**

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
White Catspaw ( <i>Epioblasma obliquata perobliqua</i> )	Endangered	Endangered	This mussel species prefers coarse and stable substrates, consisting of gravel and pebble, in riffles and runs of high-gradient headwater streams, small to medium in size.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
Wartyback ( <i>Quadrula nodulata</i> )	Endangered	None	This mussel species prefers medium to large rivers and reservoirs with a mud, sand, or gravel bottom.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR indicated that this project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. If in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area.

TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
Purple Lilliput ( <i>Toxolasma lividus</i> )	Endangered	None	This mussel species most often occurs in small to medium streams with well packed sand or gravel substrate, in depths less than 1 meter	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
Rabbitsfoot ( <i>Quadrula cylindrica cylindrica</i> )	Endangered	None	This mussel species most often occurs in small to medium sized streams and some larger rivers, with gravel and sand substrates. The mussel usually occurs in shallower water areas along the bank and adjacent runs and shoals with reduced water velocity, but some specimens have been recorded in up to 2.7 to 3.7 meters of water.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
Pondhorn ( <i>Unio merus tetralasmus</i> )	Threatened	None	This mussel species occurs in standing water in ponds, creeks, and headwaters of streams with mud and sand bottoms.	No	No in-water work is planned as part of the Project. No impacts to mussel species and their habitat are anticipated.	The ODNR-DOW indicated that if in-water work is planned, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. The DOW stated if no in-water work is proposed in a perennial stream, this project is not likely to impact this or other aquatic species.
<b>Fish</b>						

TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
Pugnose Minnow ( <i>Opsopoeodus emiliae</i> )	Endangered	None	This fish prefers sluggish rivers with lots of woody debris with moderately turbidity and aquatic vegetation, where the bottom is composed of organic debris or sand. The fish are often found in oxbows or floodplain pools of slow meandering rivers, but also occur in natural lakes along with harbors and coastal marshes of Lake Erie.	No	No suitable habitat is located within the Project survey area.	The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.
Greater Redhorse ( <i>Moxostoma valenciennesi</i> )	Threatened	None	This fish is found in medium to large rivers in the Lake Erie drainage system of Ohio, only found in limited portions of the Sandusky, Maumee, and Grand River systems. The fish are most often found in pools with clean sand or gravel substrate and clear water, as they are intolerant of pollution and turbidity.	No	No suitable habitat is located within the Project survey area.	The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.
<b>Birds</b>						
Upland Sandpiper ( <i>Bartramia longicauda</i> )	Endangered	None	This species utilizes dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and sometimes the grassy extensions of airports.	No	No suitable habitat was observed within the Project survey area	The DOW recommends if suitable habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this habitat will not be impacted, this project is not likely to impact this species.

**TABLE 6  
ODNR AND USFWS LISTED SPECIES WITHIN THE EAST LIMA-MADDOX 345 KV RECONDUCTORING PROJECT SURVEY AREA**

Common Name (Scientific Name)	State Status	Federal Status	Habitat Description	Potential Habitat Observed in the Project Survey Area	Impact Assessment	Agency Comments
Northern Harrier ( <i>Circus cyaneus</i> )	Endangered	None	This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds nests out of sticks on the ground, often on top of a mound. This species hunts over grasslands.	No	No suitable habitat was observed within the Project survey area.	The DOW recommends if suitable habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	None	Recovered	Bald eagles require a good food base, perching areas, and nesting sites. Their habitat includes estuaries, large lakes, reservoirs, rivers, and some seacoasts. In winter, the birds congregate near open water in tall trees for spotting prey and night roosts for sheltering.	No	No potentially suitable habitat was observed within the Project area.	ODNR indicated that there are Natural Heritage Database records of bald eagles within a one-mile radius of the project area. USFWS did not comment on this species.



**ODNR Coordination –**

On April 19, 2019, the ODNR Office of Real Estate Environmental Review Section provided comments on the Project based on an inter-disciplinary review. The Ohio Natural Heritage Database (ONHD), Division of Wildlife (DOW), and the Division of Water Resources (DWR) provided comments regarding their respective regulatory authorities.

ONHD indicated that records of four state species of concern (Purple wartyback (*Cyclonaias tuberculata*), Wavy-rayed lampmussel (*Lampsilis fasciola*), Creek heelsplitter (*Lasmigona compressa*), and Deertoe (*Truncilla truncata*)), two state endangered species (Clubshell (*Pleurobema clava*) and Purple lilliput (*Toxolasma lividus*)), one state threatened species (Greater redhorse (*Moxostoma valenciennesi*)), and one federal species of concern (Bald eagle (*Haliaeetus leucocephalus*)) were found within a one-mile radius of the Project survey area.

The DOW noted that the Project is within the range of the Indiana bat, a state endangered species and federally endangered species. If suitable habitat occurs within the Project area and the trees must be cut, the DOW recommends cutting occur between October 1 to March 31. If no tree removal is proposed, this project is not likely to impact this species.

The DOW noted that the Project is within the range of several state endangered and threatened aquatic species; including eight mussel species and two fish species. The DOW stated that this project must not have an impact on freshwater native mussel species at the project site. The DOW stated that if no in-water work is proposed within perennial streams, this project is not likely to impact the mussels, fish or other aquatic species.

The DOW noted that the Project is within the range of the upland sandpiper and the northern harrier, which are state endangered birds. ODNR indicated that construction should be avoided during the upland sandpiper's nesting period (April 15 to July 31) to avoid impacts to grasslands, pasture, and hayfield habitats, and construction should be avoided during the northern harrier's nesting period (May 15 to August 1) to avoid impacts to grasslands and marshes. ODNR-DOW has also indicated that the potential habitat ground cover types smaller than one acre in size and commercial or residential landscaped areas do not constitute adequate nesting habitat for these two species. Landscaped areas are frequently mechanically maintained and, therefore, do not provide suitable grassland habitat for nesting. These areas within the Project survey area were observed to be disturbed and devoid of grasses or maintained such that grasses were too short to provide nesting habitat. Based on general observations during the ecological survey, no suitable nesting habitat was observed within the Project survey area for the upland sandpiper nor the northern harrier.

**USFWS Coordination –**

Coordination with the USFWS was initiated during the planning stages of the Project to obtain technical assistance in regard to federally listed species that may occur within the project vicinity. In a letter dated March 18, 2019, the USFWS indicated that there are no Federal wildlife refuges, wilderness areas, or critical habitat within the vicinity of the Project.

The USFWS noted that the Project lies within the range of the federally endangered Indiana bat, and the federally threatened Northern long-eared bat. USFWS recommends that should the proposed site contain trees  $\geq 3$  inches dbh, that trees be saved wherever possible. If tree clearing cannot be avoided, USFWS recommends that tree removal occur between October 1 and March 31 to avoid adverse effects to Indiana bats and Northern long-eared bats during the brood-rearing months. No tree clearing is planned as part of the Project.

#### 4.0 SUMMARY

The ecological survey of the Project survey area identified a total of four ephemeral, Modified Class 1 streams and one palustrine emergent, Category 1 wetland.

No ponds were delineated within the Project survey corridor.

With regard to state and/or federally-listed threatened and endangered species that may occur within the Project vicinity, 14 species of concern with ranges located within the Project survey area were listed by the ODNR-DOW or USFWS, include the following: Indiana bat, Northern long-eared bat, northern riffleshell, white cat's paw, clubshell, rabbitsfoot, rayed bean, purple lilliput, wartyback, pondhorn, pugnose minnow, greater redhorse upland sandpiper, and northern harrier. No in-stream work and no tree clearing are anticipated as part of the Project.

Based on general observations during the ecology survey, the Project survey area does not contain successional woodland habitat which could be potential summer habitat for the Indiana bat and the Northern long-eared bat. No tree is clearing is planned as part of the Project.

ODNR indicated that if no in-water work is proposed within perennial streams, this project is not likely to impact mussels, fish or other aquatic species. No in-stream work is proposed as part of the Project.

ODNR indicated that construction should be avoided during the upland sandpiper's nesting period between April 15 to July 31 to avoid impacts to grasslands, pasture, and hayfield. Based on general observations during the ecology survey, no upland sandpiper nesting habitat is expected to be impacted as a result of the Project.

ODNR indicated that construction should be avoided during the Northern harrier's nesting period between May 15 to August 1 to avoid impacts to marshes and grasslands. Based on general observations during the ecology survey, no Northern harrier nesting habitat is expected to be impacted as a result of the Project.

The reported results of the ecological survey conducted by AECOM on this Project are limited to the areas within the Project survey boundary provided in Figure 3: Wetland Delineation and Stream Assessment Map. Areas that fall outside of the Project survey boundary were not evaluated in the field and are not included in the reporting of this survey.

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 AECOM 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 be invalidated, wholly or in part, by changes beyond the control of AECOM. Final jurisdictional determination of WOTUS can only be verified by the USACE.

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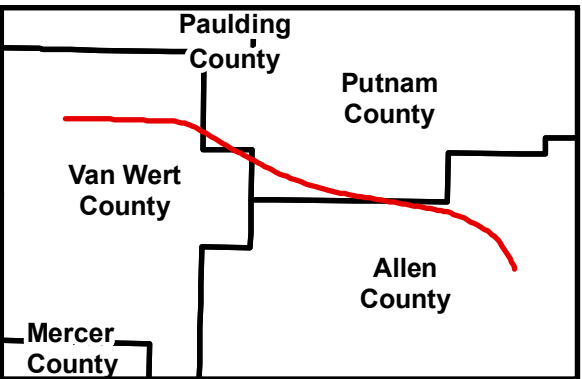
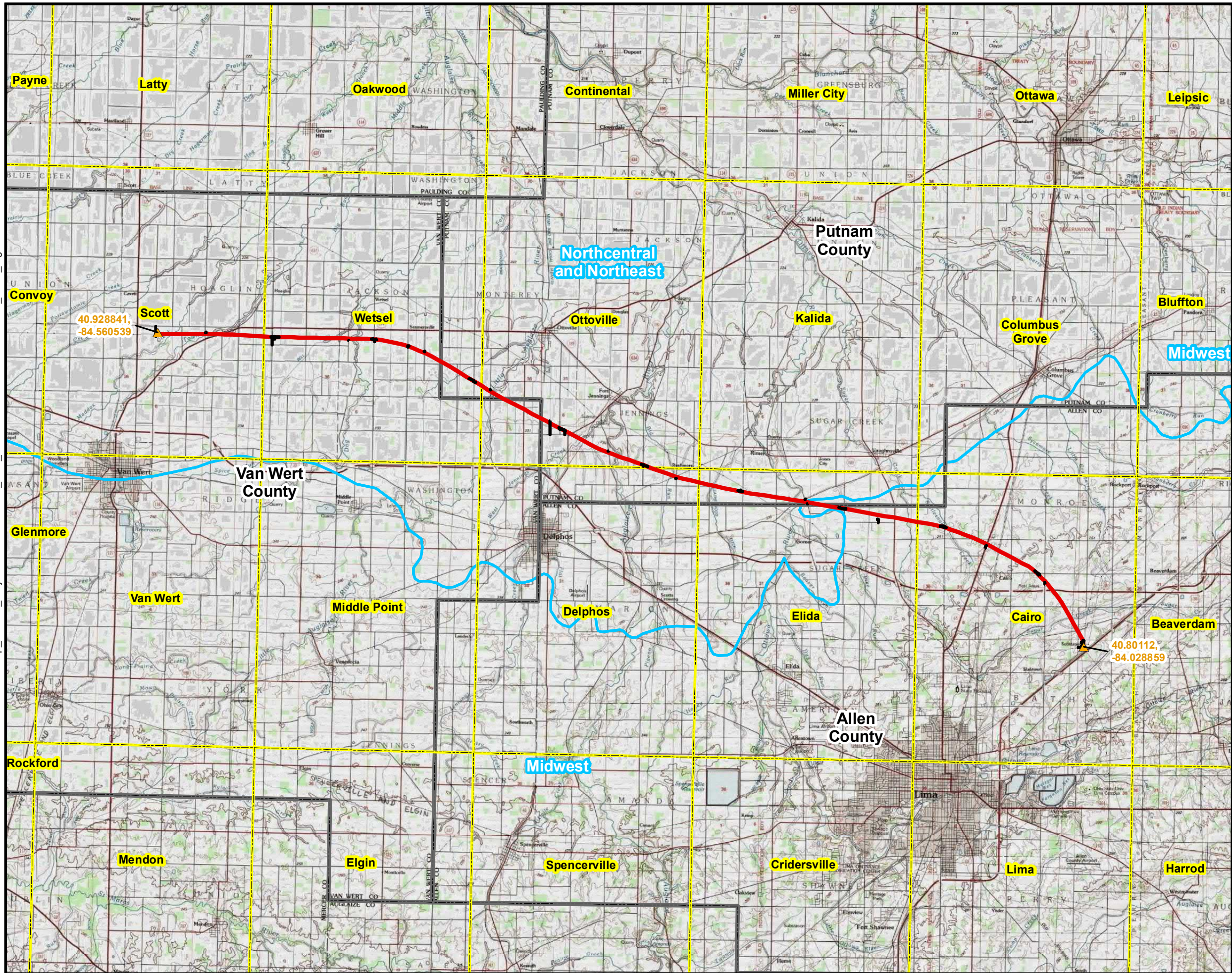


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**LEGEND:**

- Station
- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- USGS 7.5" Topographical Quadrangle
- County
- USACE Wetland Region

N

0      10,000      20,000  
Feet

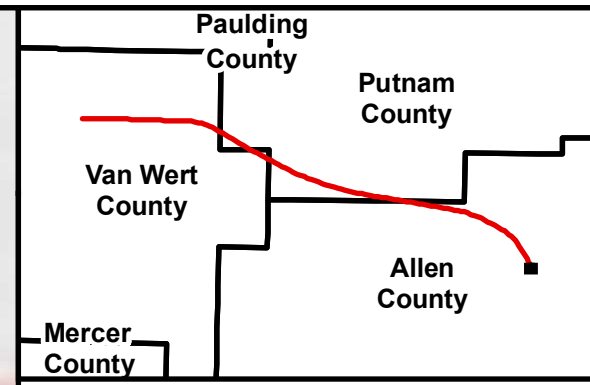
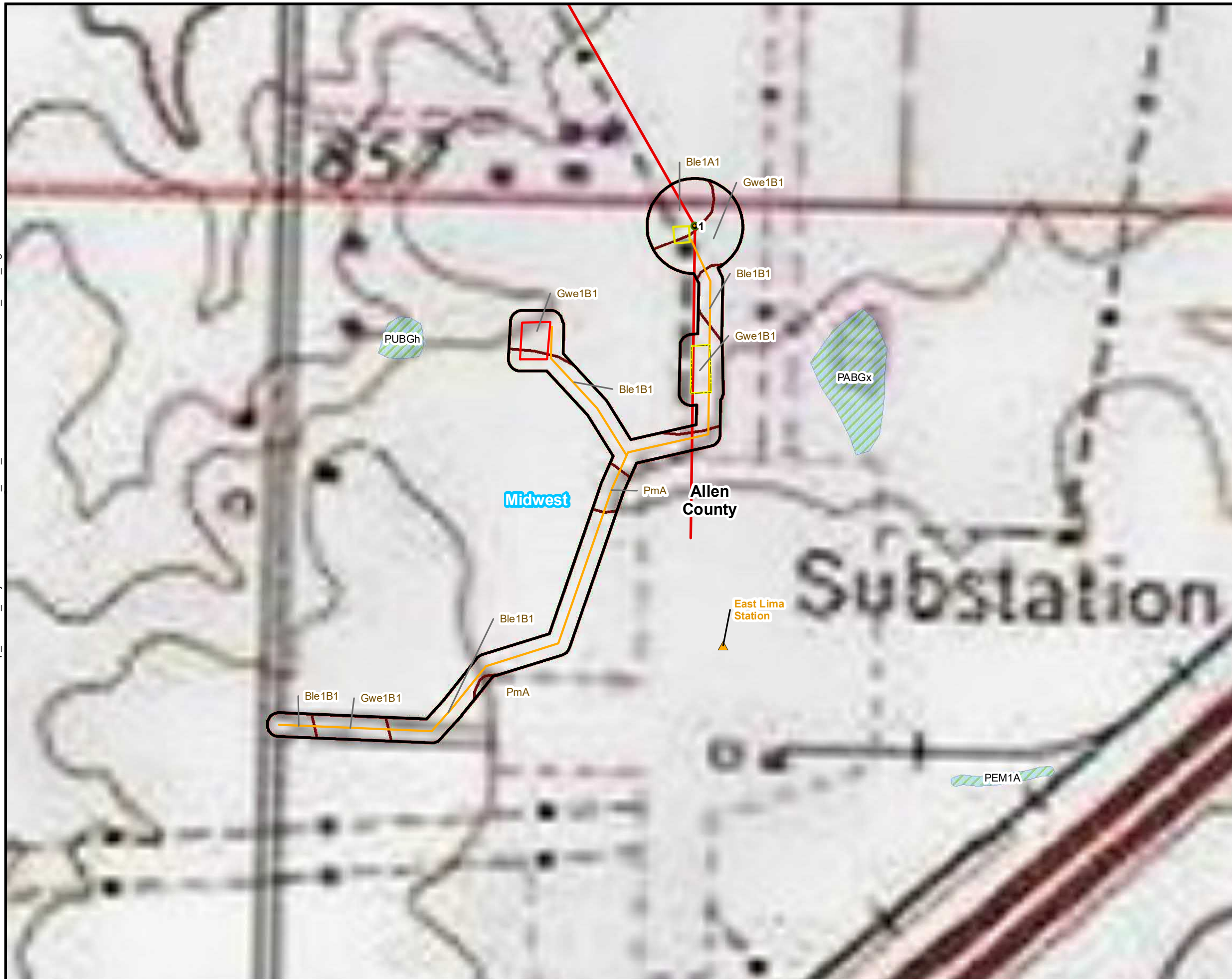
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

**FIGURE 1  
OVERVIEW MAP**

JOB NO. 60601386





- LEGEND:**
- Station
  - Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Pull Pad
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - NWI Wetland
  - Soil Map Unit

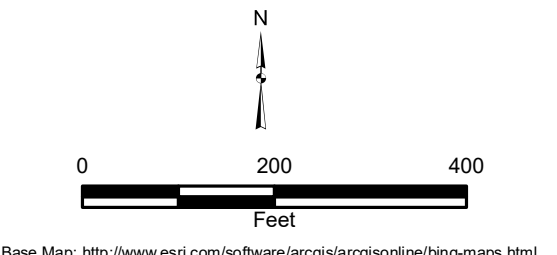
**Soil Map Unit Symbol**

Ble1A1, Blount silt loam, end moraine, 0 to 2 percent slopes

Ble1B1, Blount silt loam, end moraine, 2 to 4 percent slopes

Gwe1B1, Glynwood silt loam, end moraine, 2 to 6 percent slopes

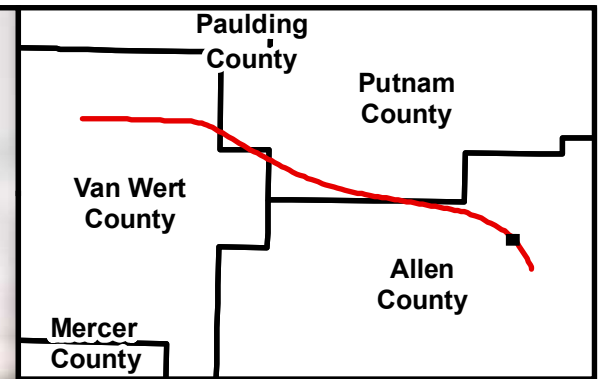
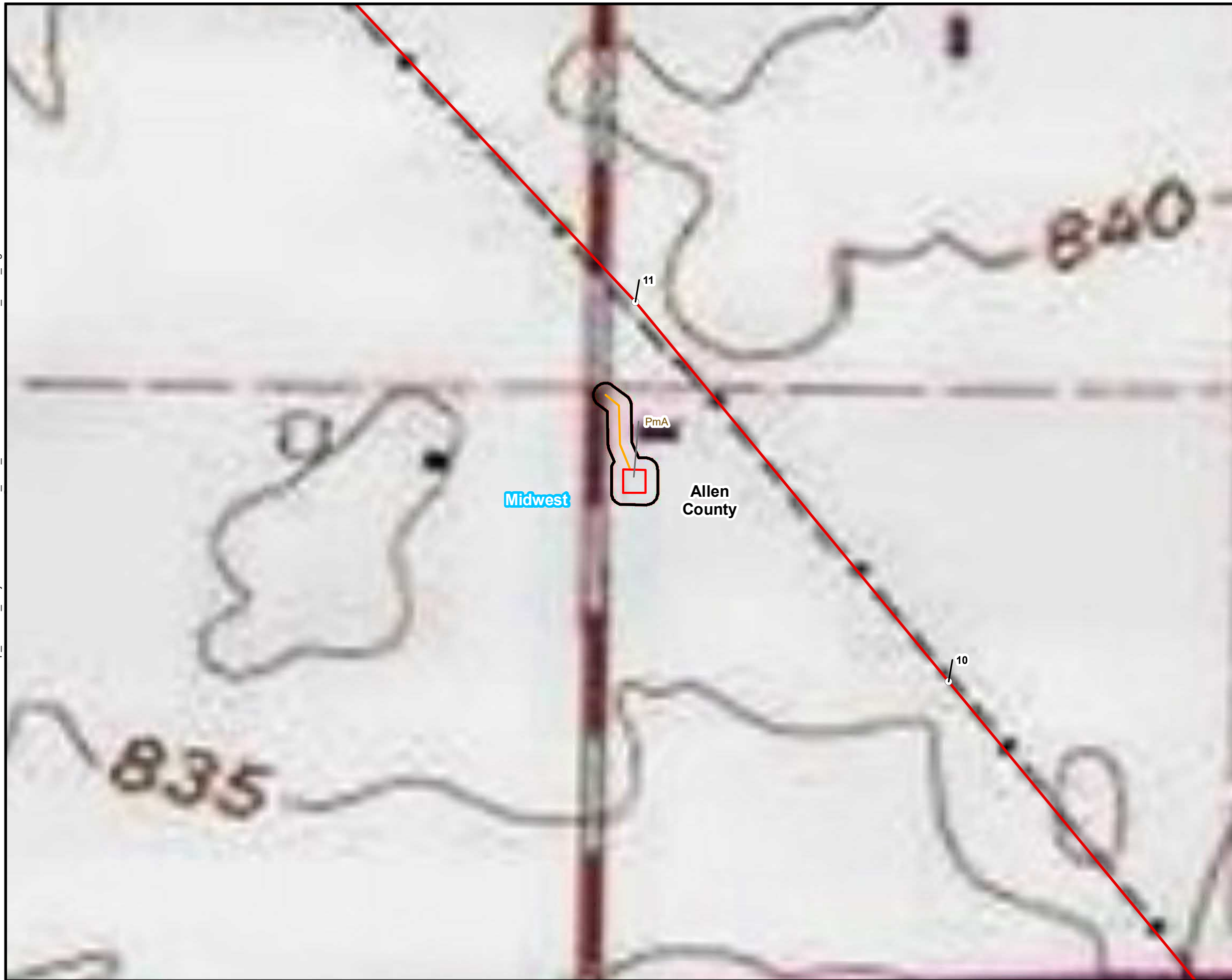
PmA, Pewamo silty clay loam, 0 to 1 percent slopes











Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

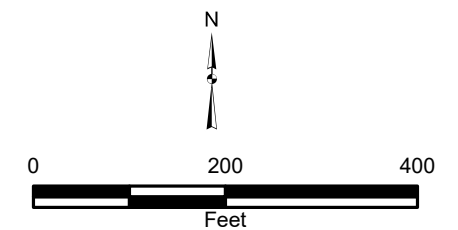
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2A**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



LEGEND:

-  Project Survey Corridor
  -  East Lima-Maddox 345 kV Transmission Line
  -  County
  -  USACE Wetland Region
  -  Helipad
  -  Proposed Access
  -  Existing Structure
  -  Soil Map Unit
- Soil Map Unit Symbol**
- PmA, Pewamo silty clay loam, 0 to 1 percent slopes

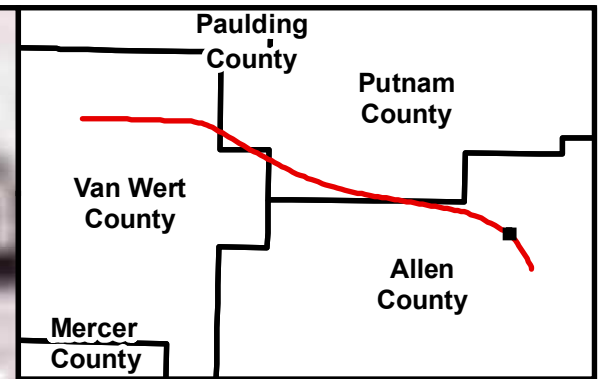
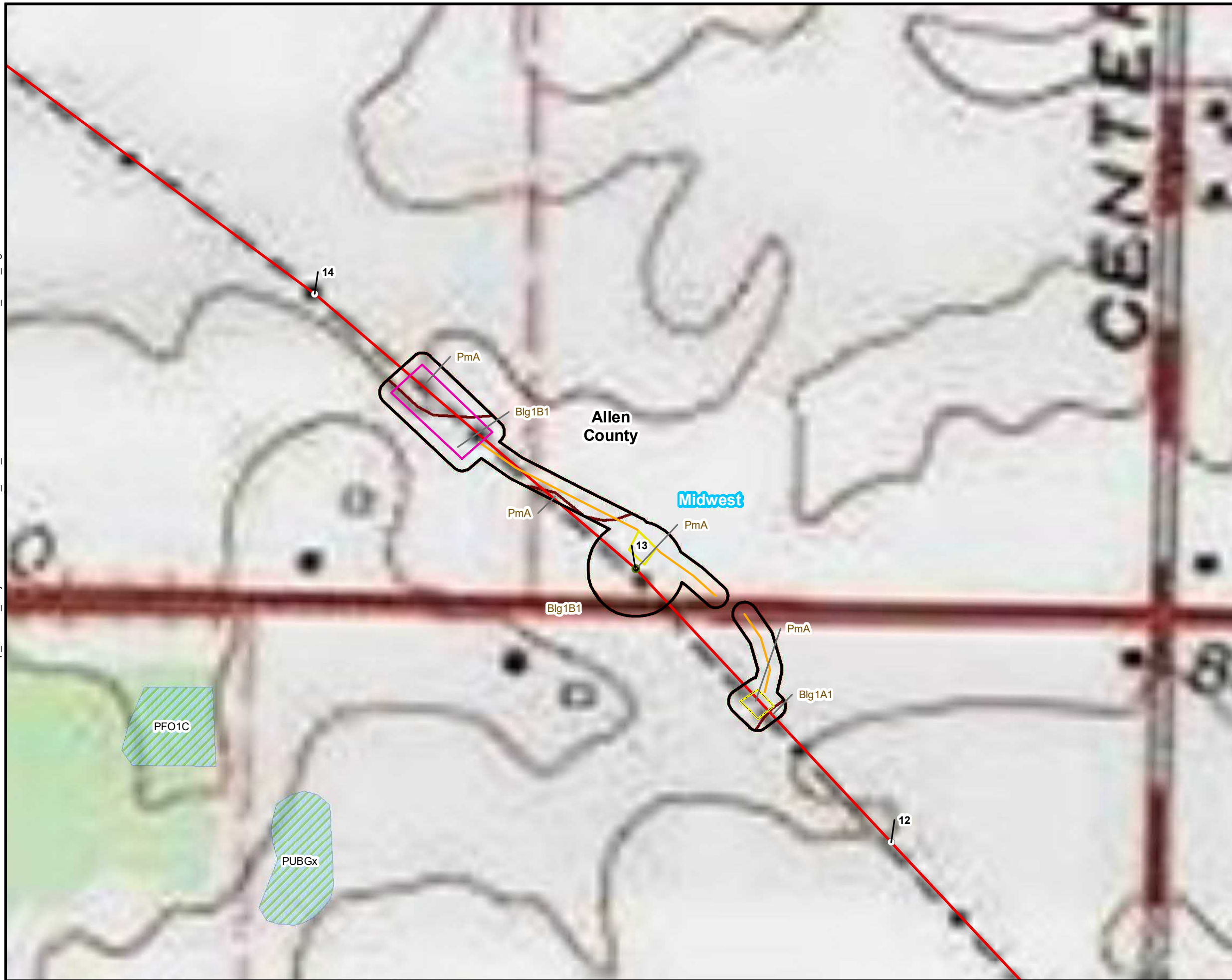


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

 *East Lima-Maddox  
345 kV Transmission  
Line Project*

FIGURE 2B  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



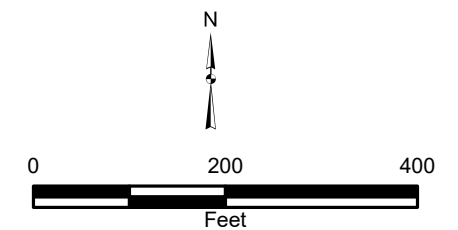


LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access
- Proposed Structure
- Existing Structure
- NWI Wetland
- Soil Map Unit

Soil Map Unit Symbol

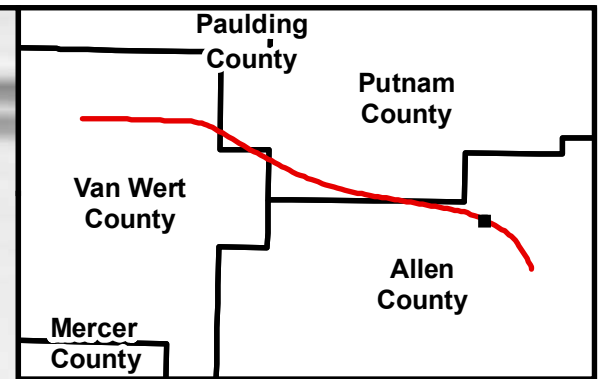
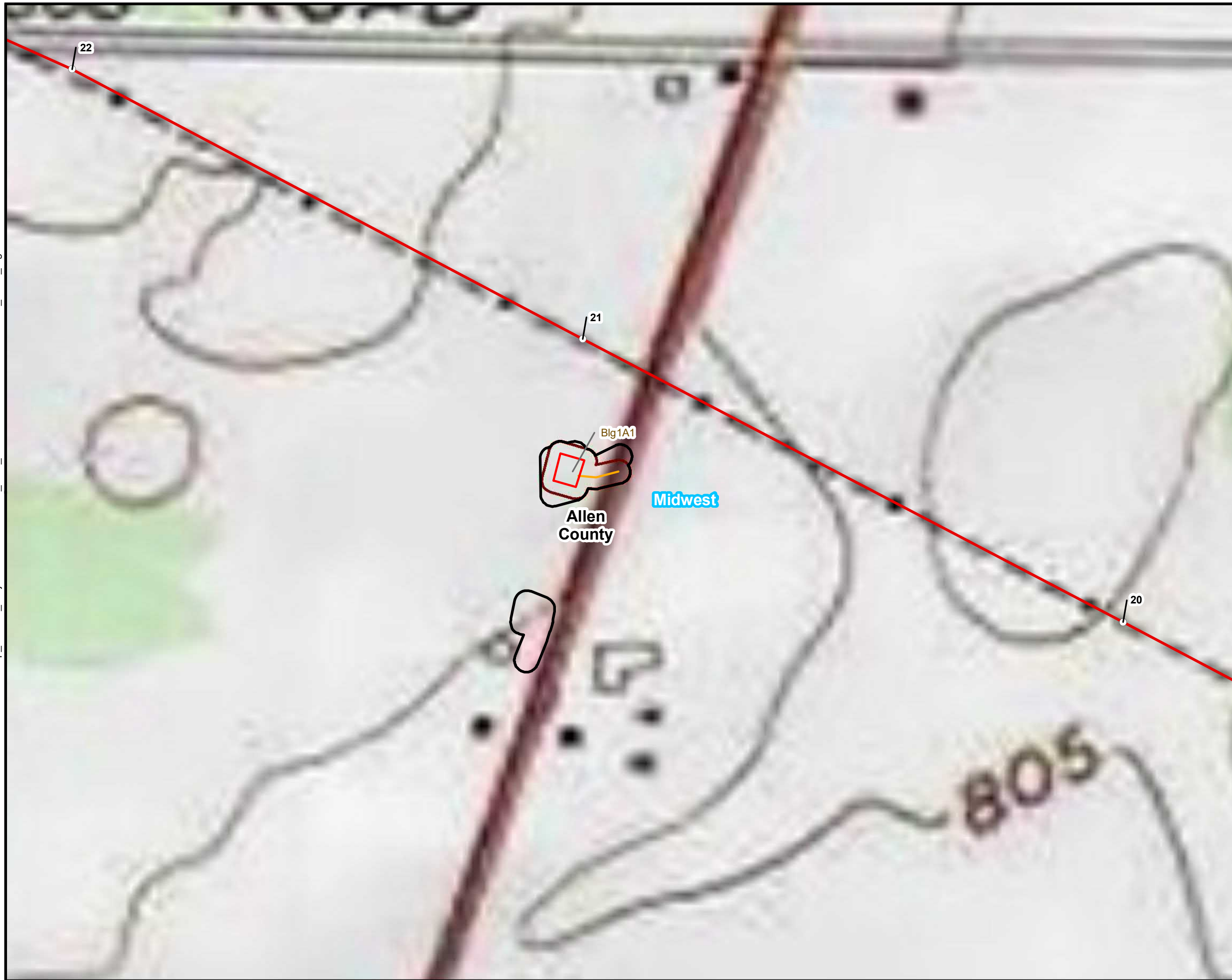
Blg1A1, Blount silt loam, ground moraine, 0 to 2 percent slopes  
 Blg1B1, Blount silt loam, ground moraine, 2 to 4 percent slopes  
 PmA, Pewamo silty clay loam, 0 to 1 percent slopes



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

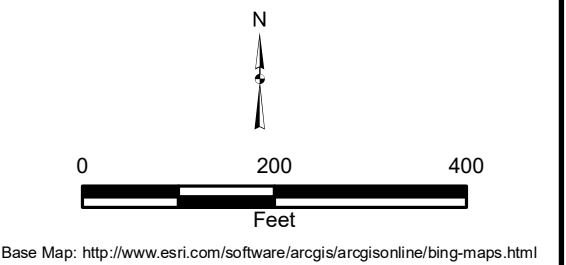
FIGURE 2C  
 SOIL MAP UNIT AND  
 NATIONAL WETLAND INVENTORY MAP



LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access
- Existing Structure
- Soil Map Unit

**Soil Map Unit Symbol**  
 Blg1A1, Blount silt loam, ground moraine, 0 to 2 percent slopes



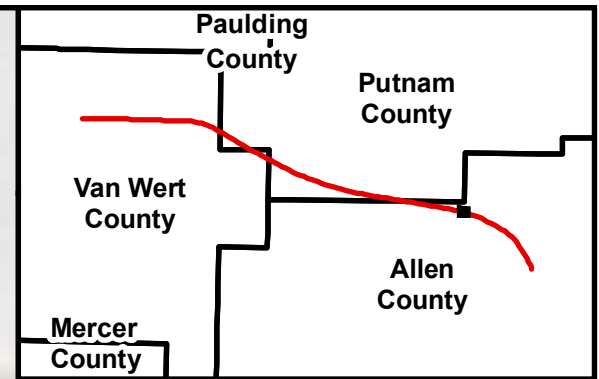
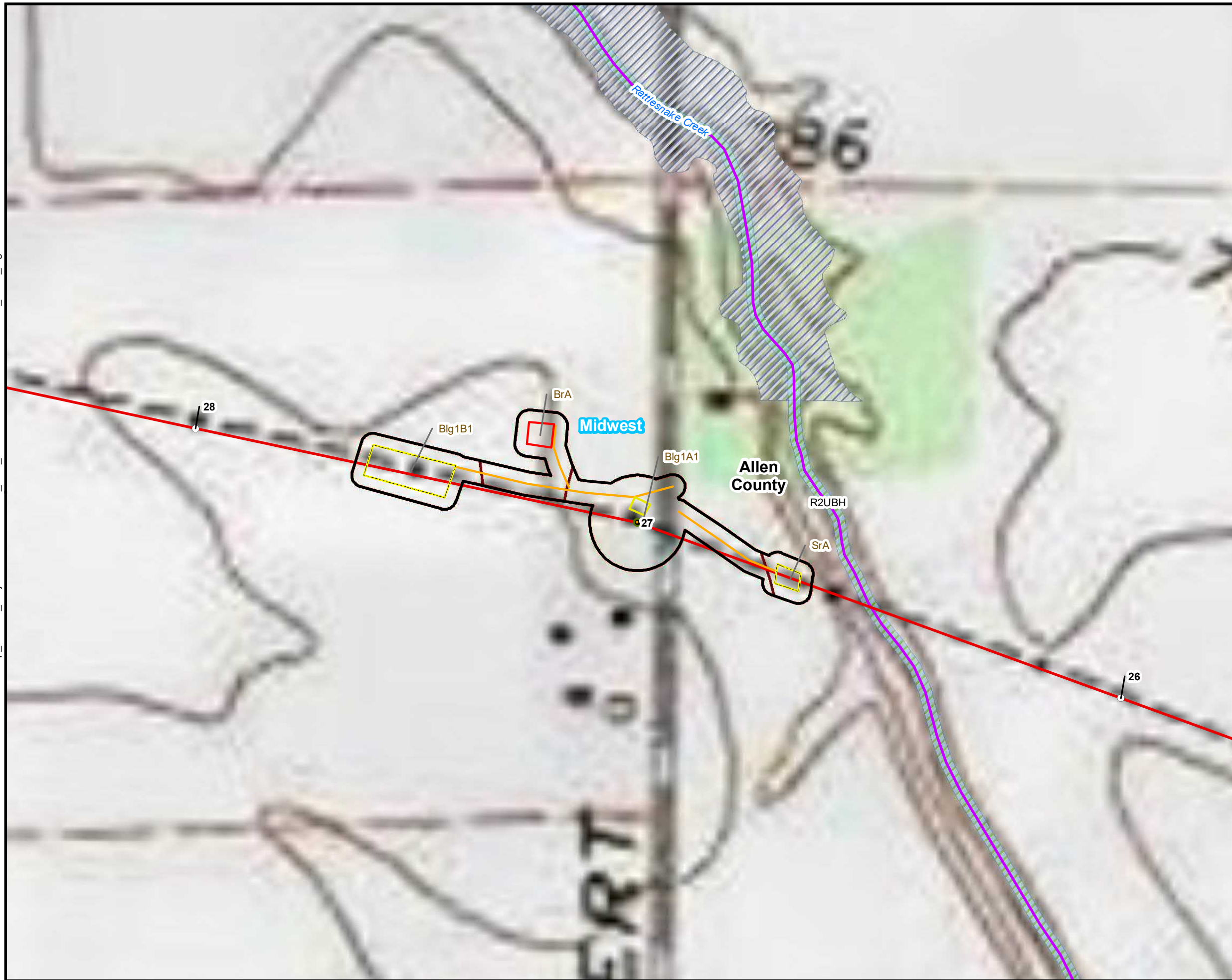
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**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

FIGURE 2D  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Pull Pad
- Work Pad
- Proposed Access
- Proposed Structure
- Existing Structure
- NHD Stream
- NWI Wetland
- 100-yr Floodplain
- Soil Map Unit

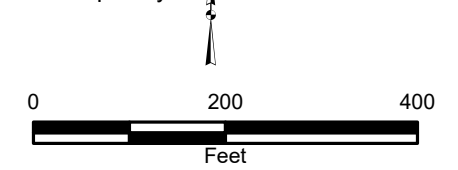
**Soil Map Unit Symbol**

Blg1A1, Blount silt loam, ground moraine, 0 to 2 percent slopes

Blg1B1, Blount silt loam, ground moraine, 2 to 4 percent slopes

BrA, Blount-Jenera complex, 0 to 3 percent slopes

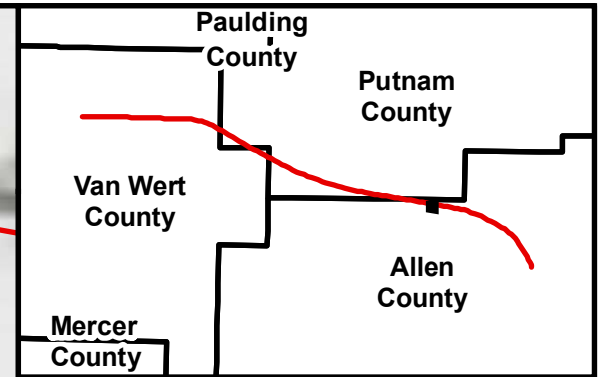
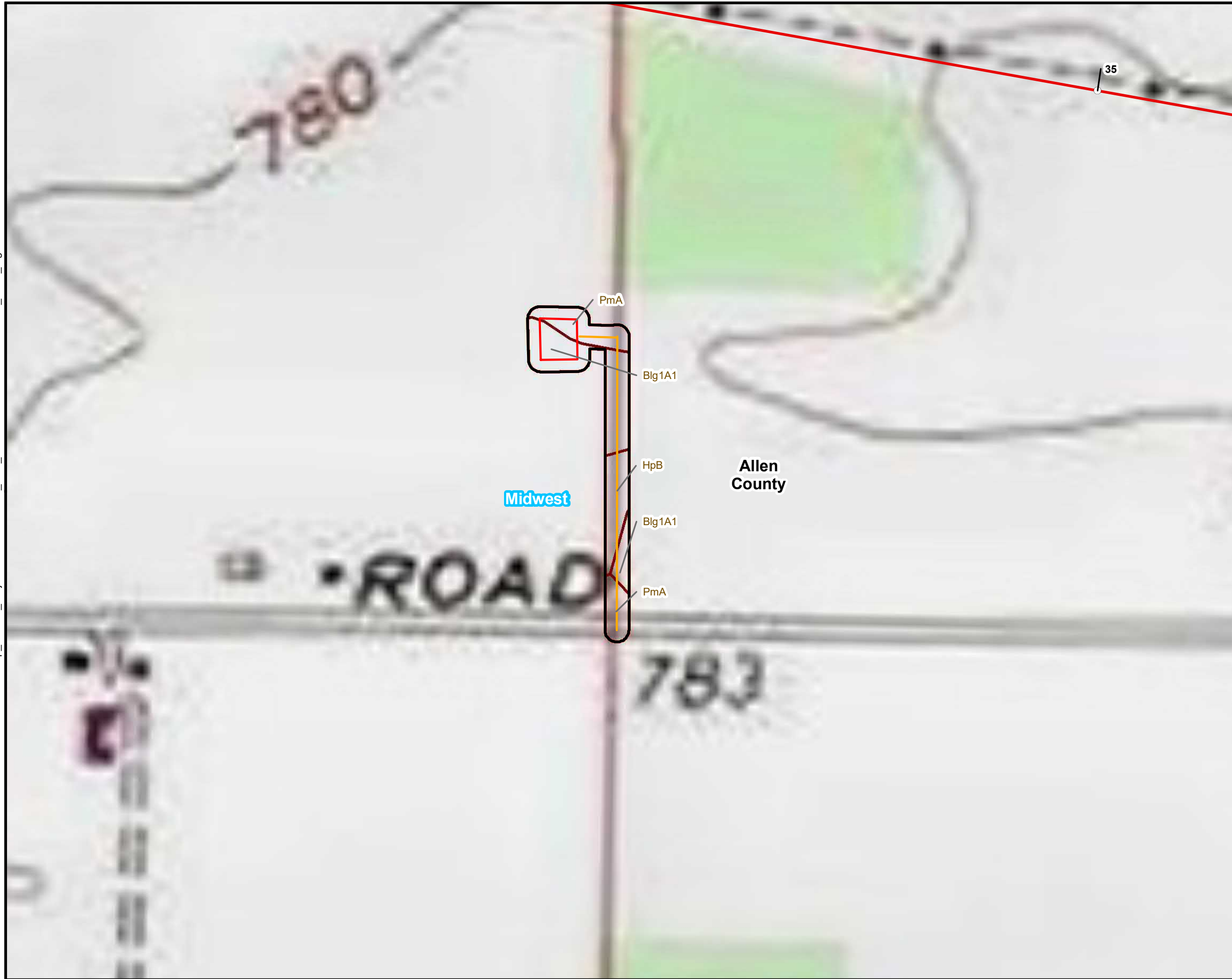
SrA, Sloan silty clay loam, till substratum, 0 to 1 percent slopes, frequently flooded



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 2E  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

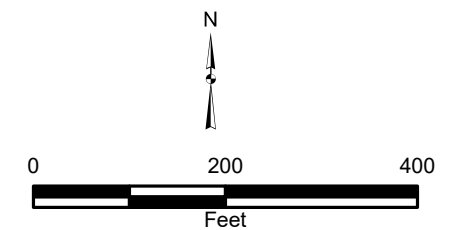


LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access
- Existing Structure
- Soil Map Unit

Soil Map Unit Symbol

- Blg1A1, Blount silt loam, ground moraine, 0 to 2 percent slopes
- HpB, Houcktown loam, 2 to 4 percent slopes
- PmA, Pewamo silty clay loam, 0 to 1 percent slopes



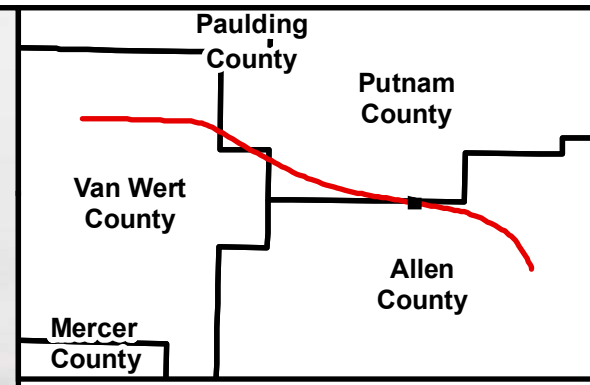
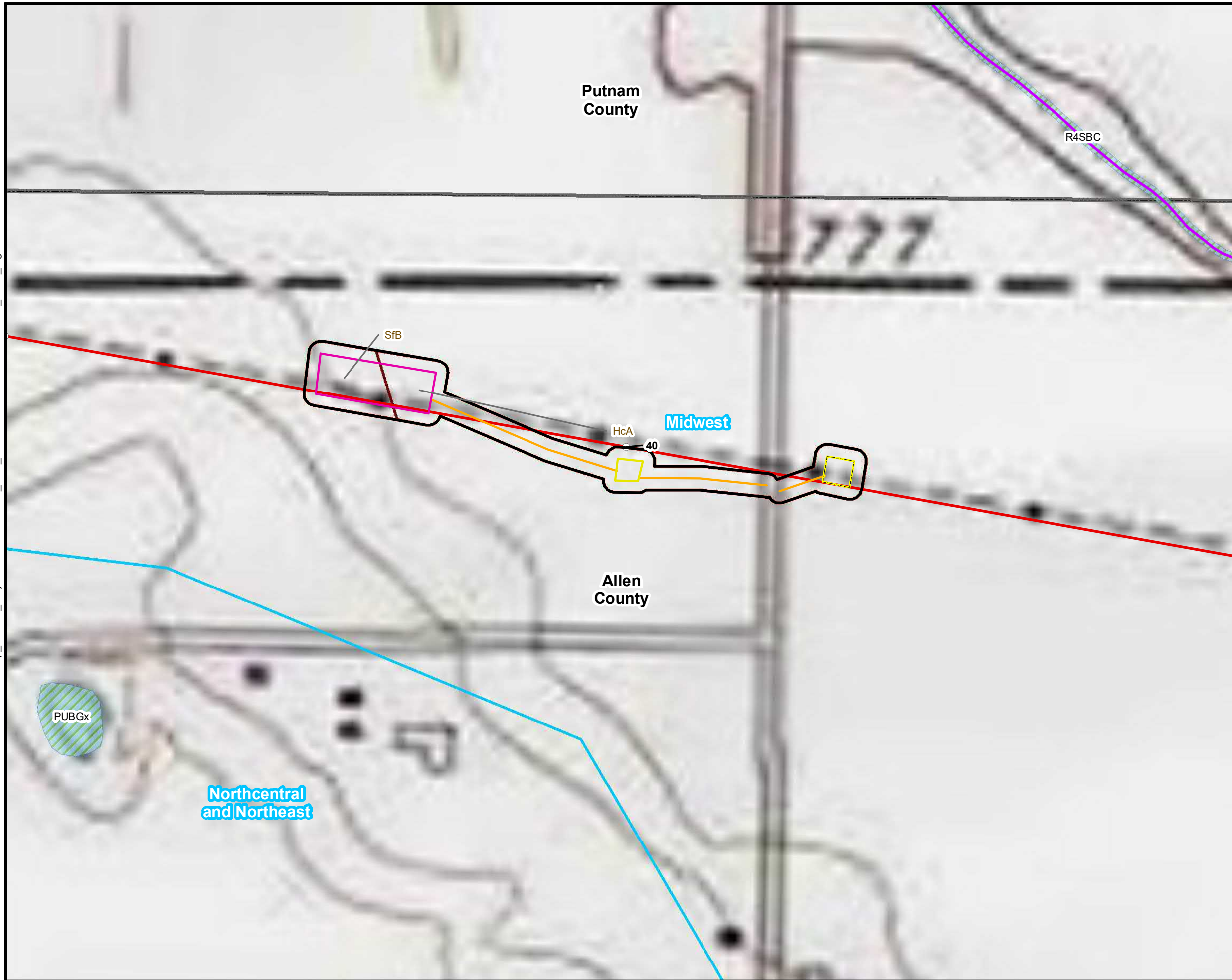
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**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

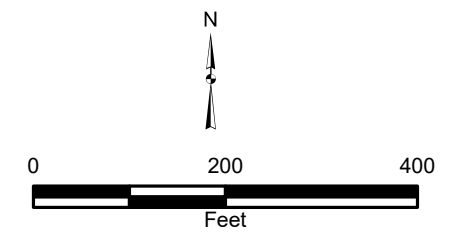
FIGURE 2F  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HcA, Hoytville silty clay loam, 0 to 1 percent slopes
  - SfB, Shawtown loam, 2 to 6 percent slopes



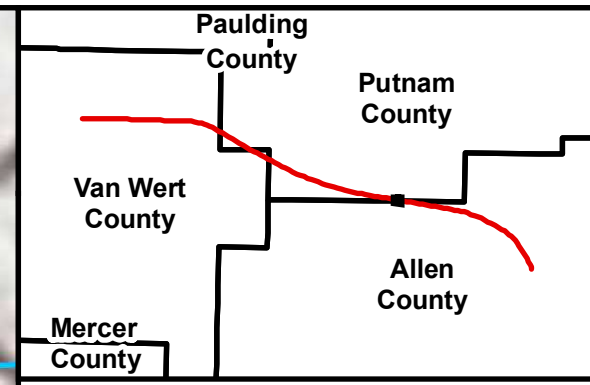
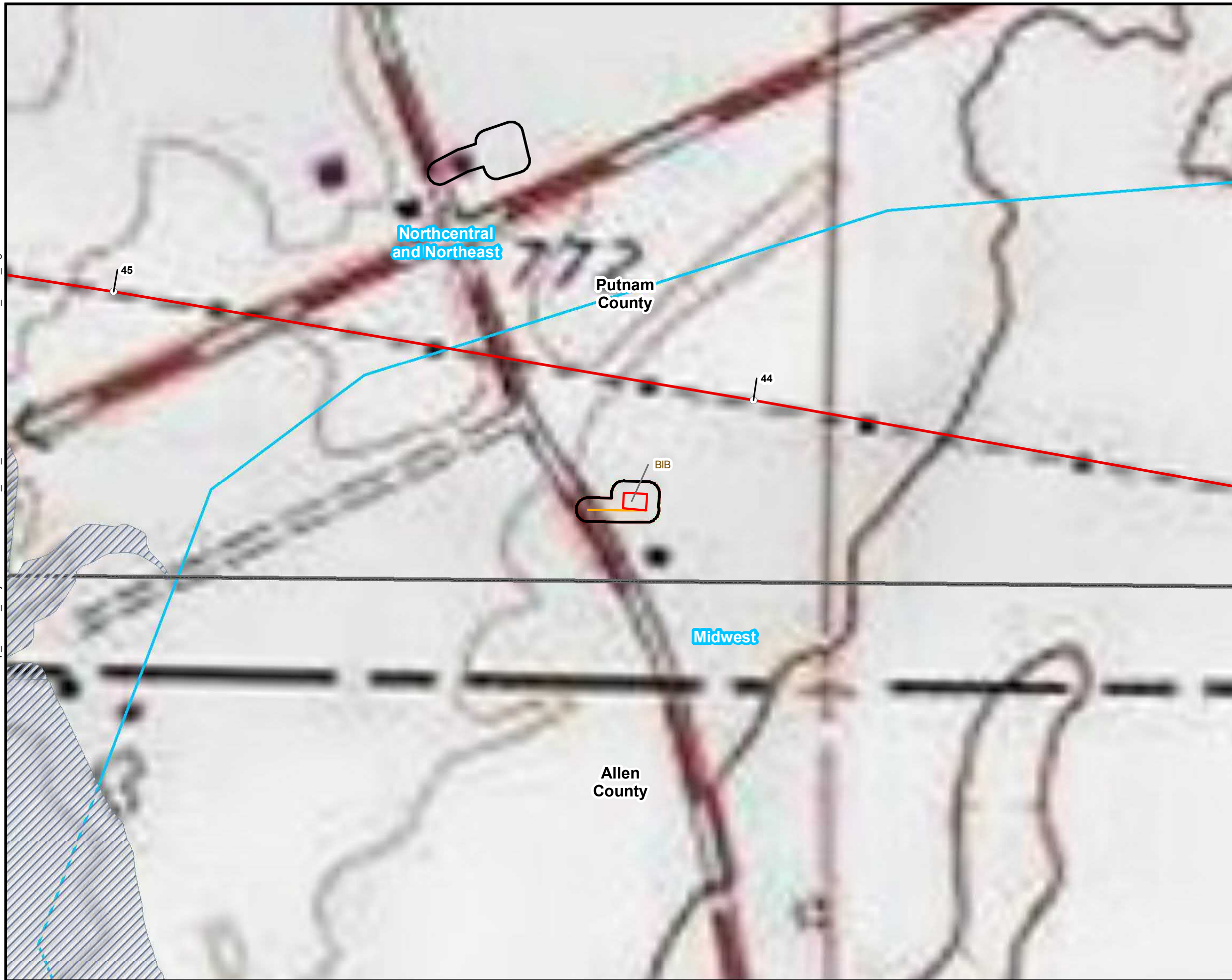
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**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

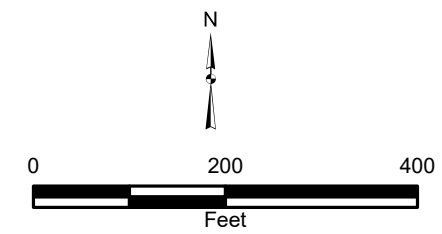
**FIGURE 2G**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access
  - Existing Structure
  - 100-yr Floodplain
  - Soil Map Unit
- Soil Map Unit Symbol**
- BIB, Belmore sandy loam, 2 to 6 slopes



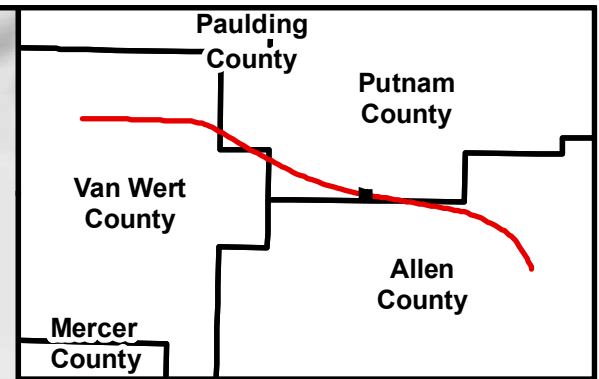
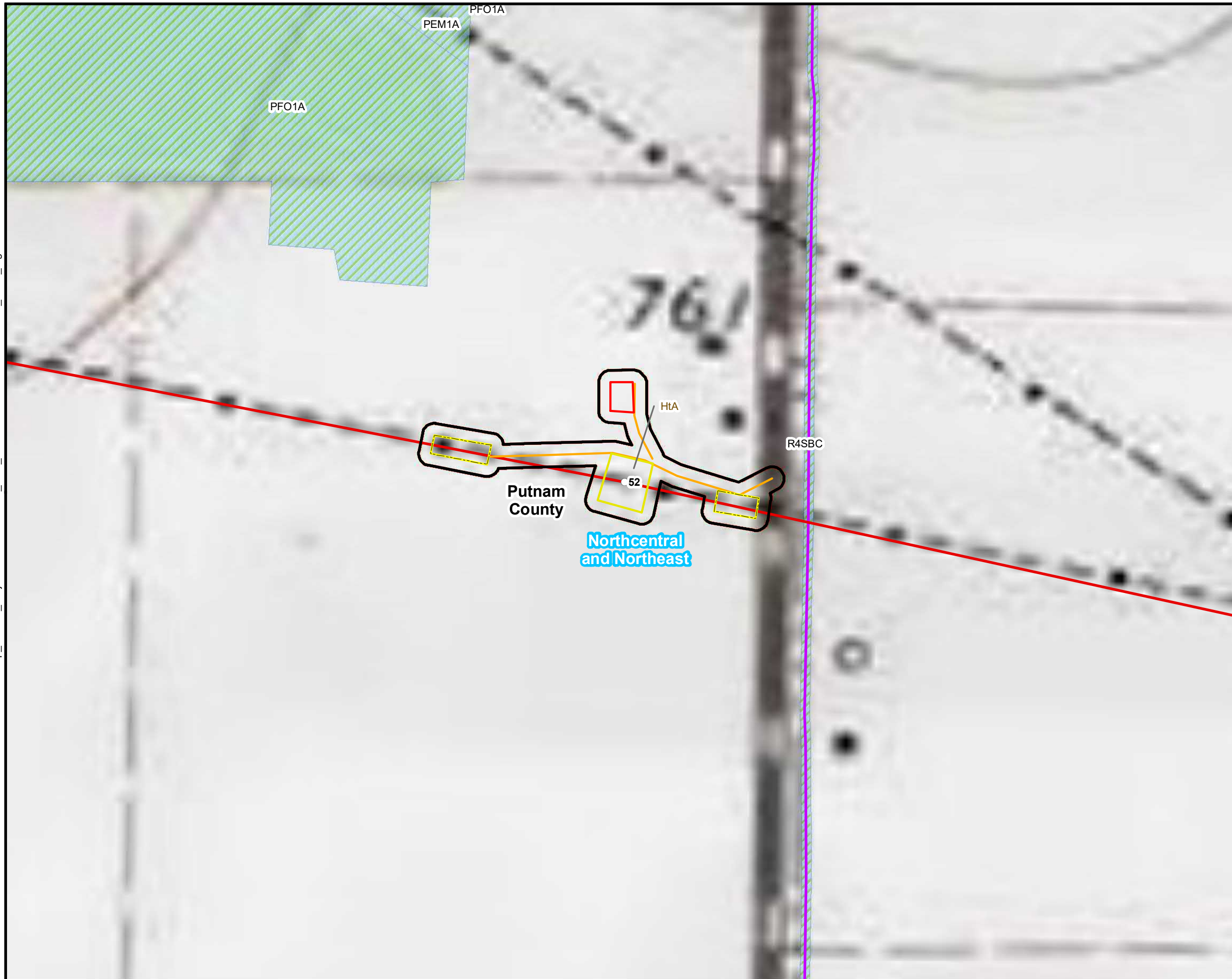
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2H**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

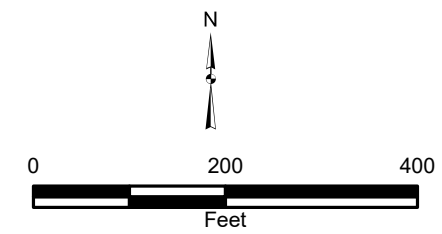


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LEGEND:

- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Pull Pad
  - Work Pad
  - Proposed Access
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**  
HtA, Hoytville silty clay, 0 to 1 percent slopes

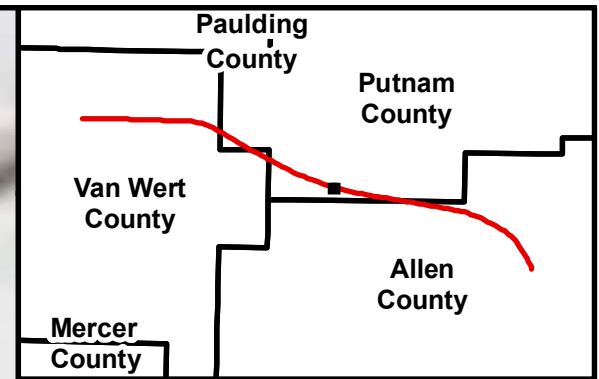
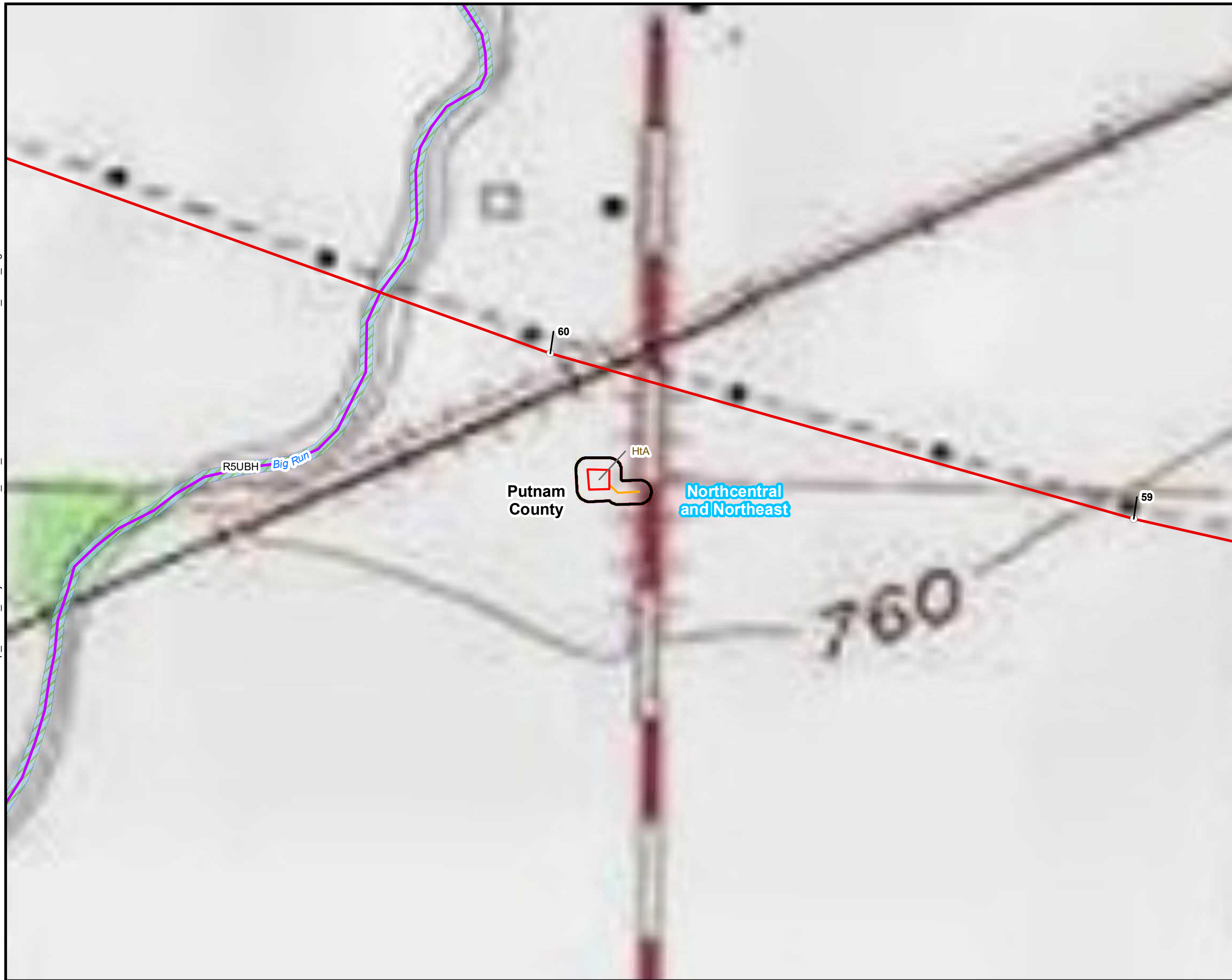


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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

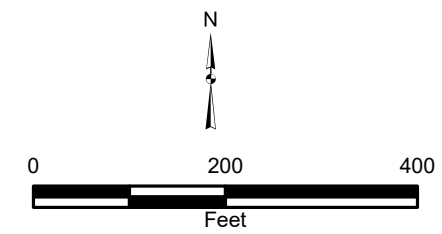
FIGURE 21  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

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LEGEND:

- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**  
HtA, Hoytville silty clay, 0 to 1 percent slopes



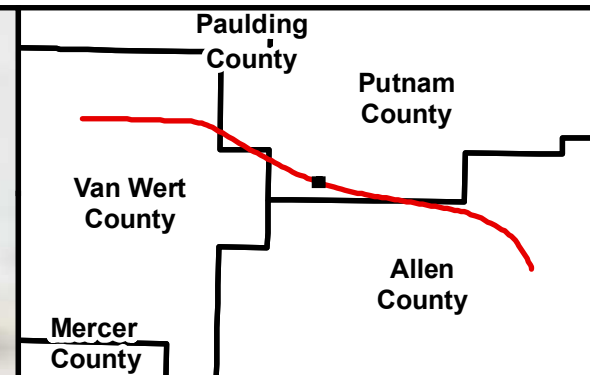
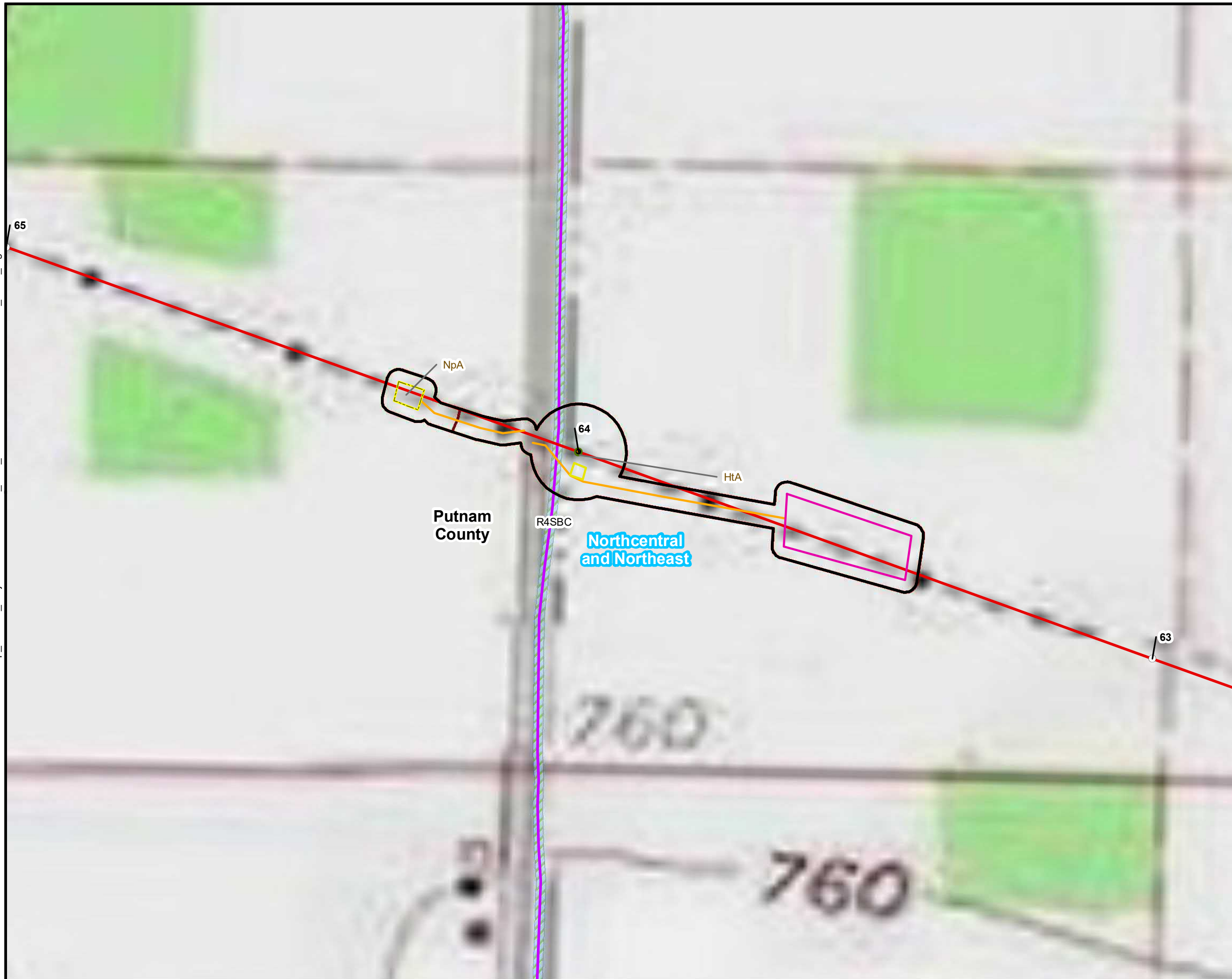
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

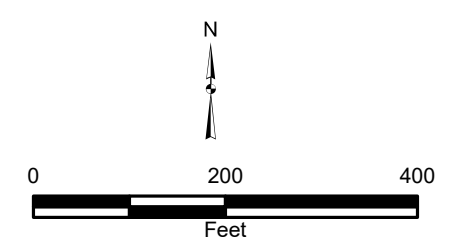
FIGURE 2J  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes
  - NpA, Nappanee silt loam, 0 to 2 percent slopes

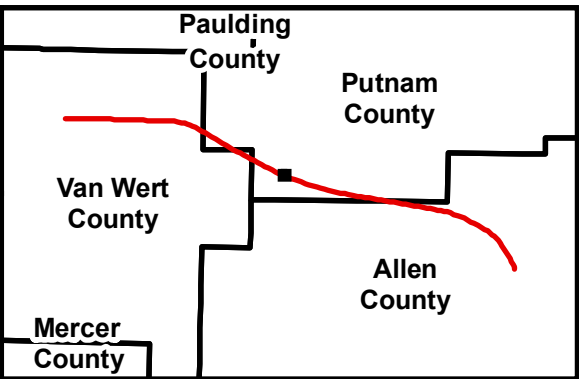
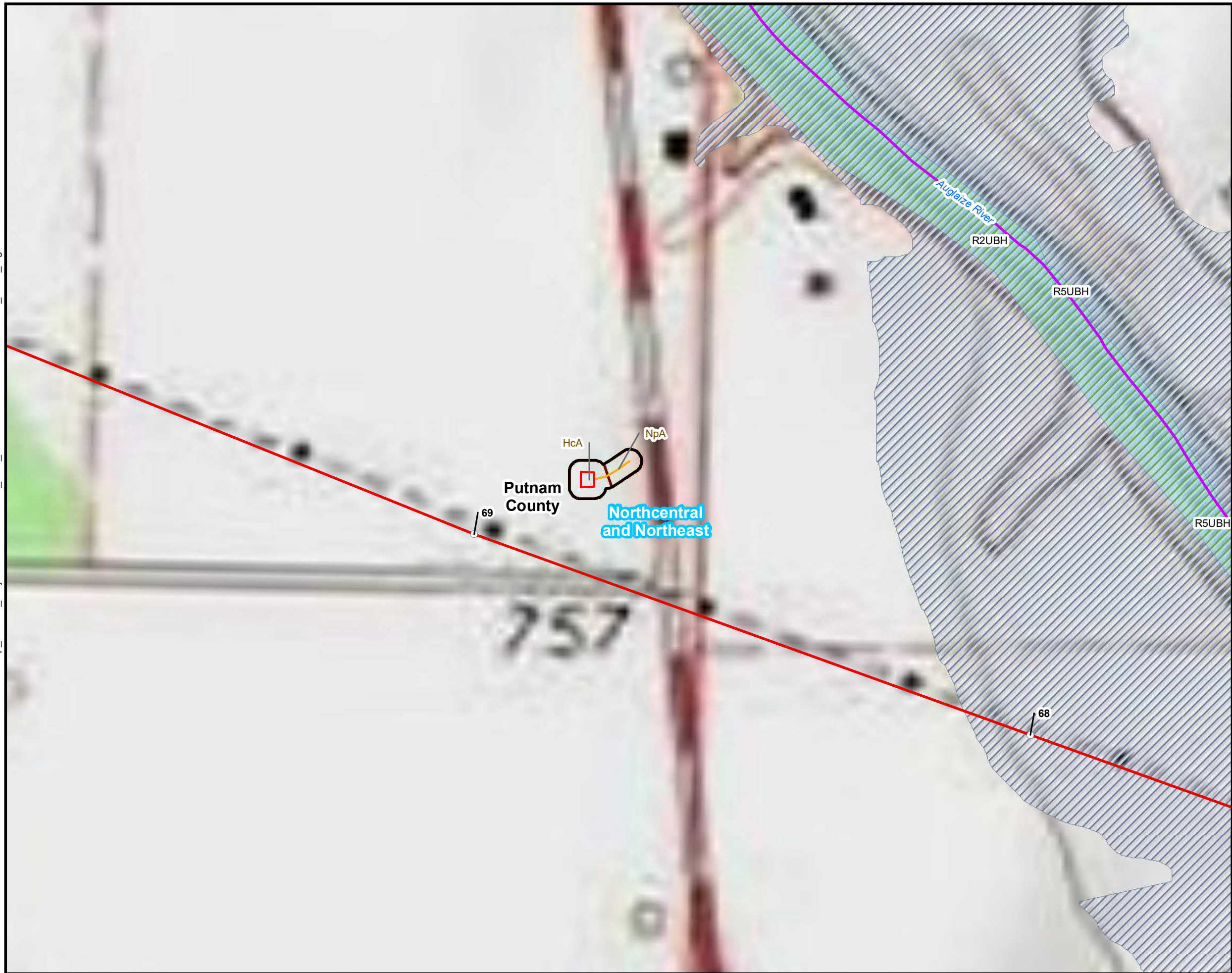


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2K**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



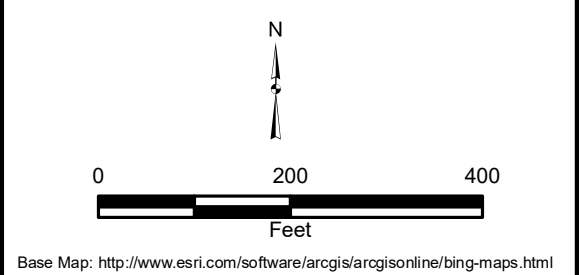


**LEGEND:**

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access
- Existing Structure
- NHD Stream
- NWI Wetland
- 100-yr Floodplain
- Soil Map Unit

**Soil Map Unit Symbol**

- HcA, Hoytville silty clay loam, 0 to 1 percent slopes
- NpA, Nappanee silt loam, 0 to 2 percent slopes



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

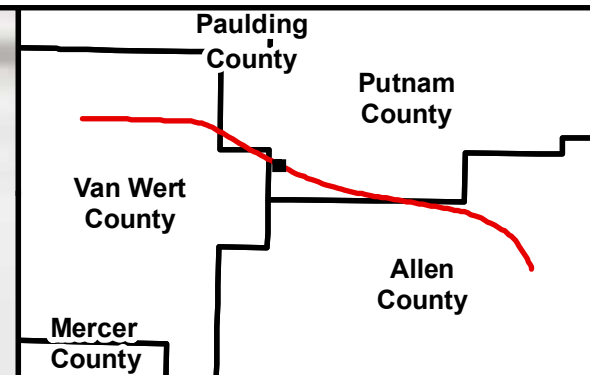
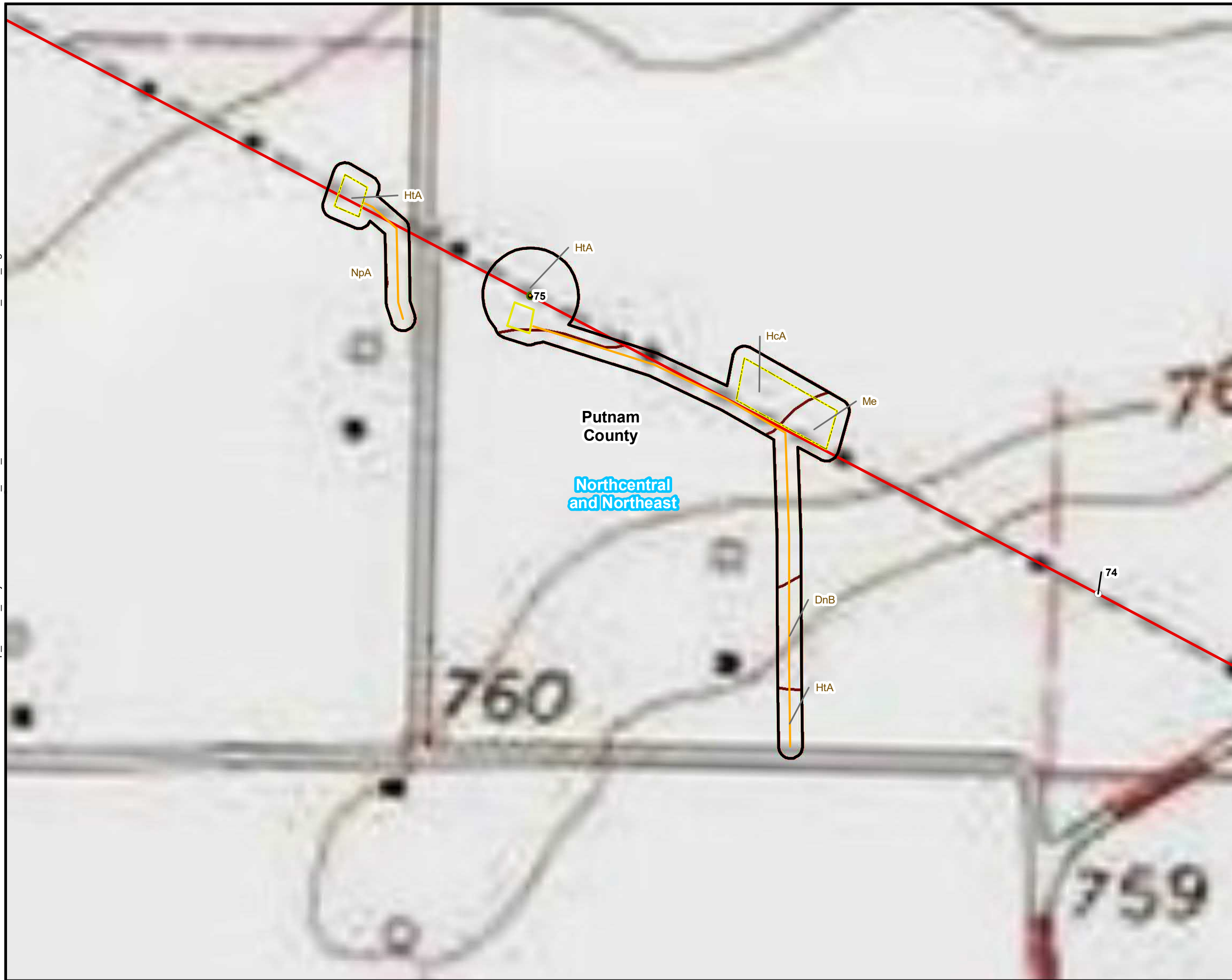
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2L**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

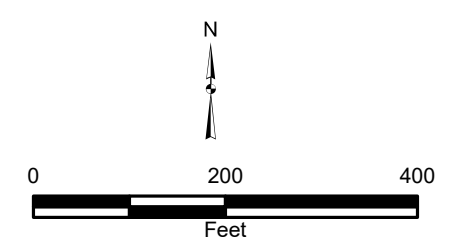
JOB NO. 60601386 **AECOM**



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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - Soil Map Unit
- Soil Map Unit Symbol**
- DnB, Digby loam, 2 to 6 percent slopes
  - HcA, Hoytville silty clay loam, 0 to 1 percent slopes
  - HtA, Hoytville silty clay, 0 to 1 percent slopes
  - Me, Mermill silty clay loam
  - NpA, Nappanee silt loam, 0 to 2 percent slopes

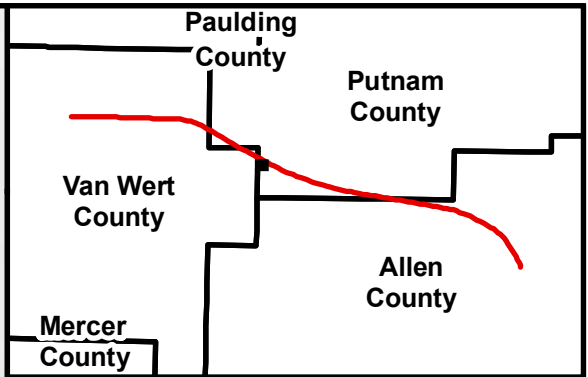


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

**FIGURE 2M**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

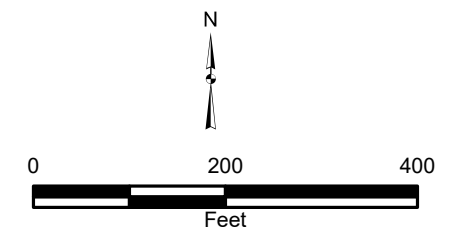
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LEGEND:

- Project Survey Corridor
- County
- USACE Wetland Region
- Proposed Access
- NHD Stream
- NWI Wetland
- Soil Map Unit

**Soil Map Unit Symbol**  
 HtA, Hoytville silty clay, 0 to 1 percent slopes

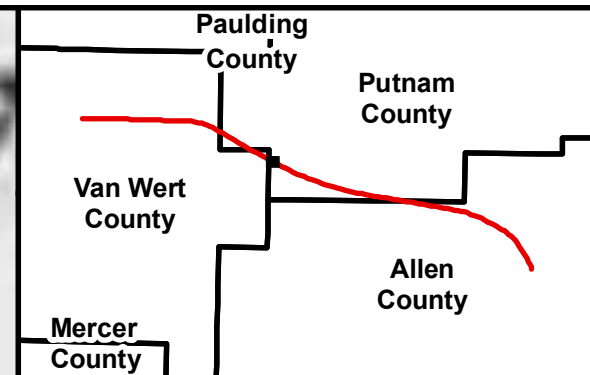


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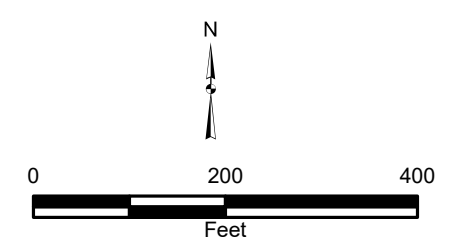
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 2N  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP





- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes

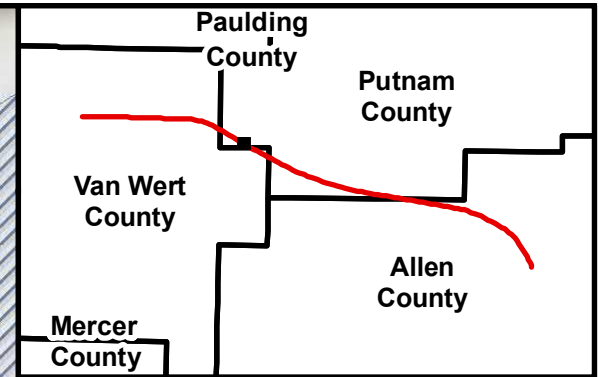
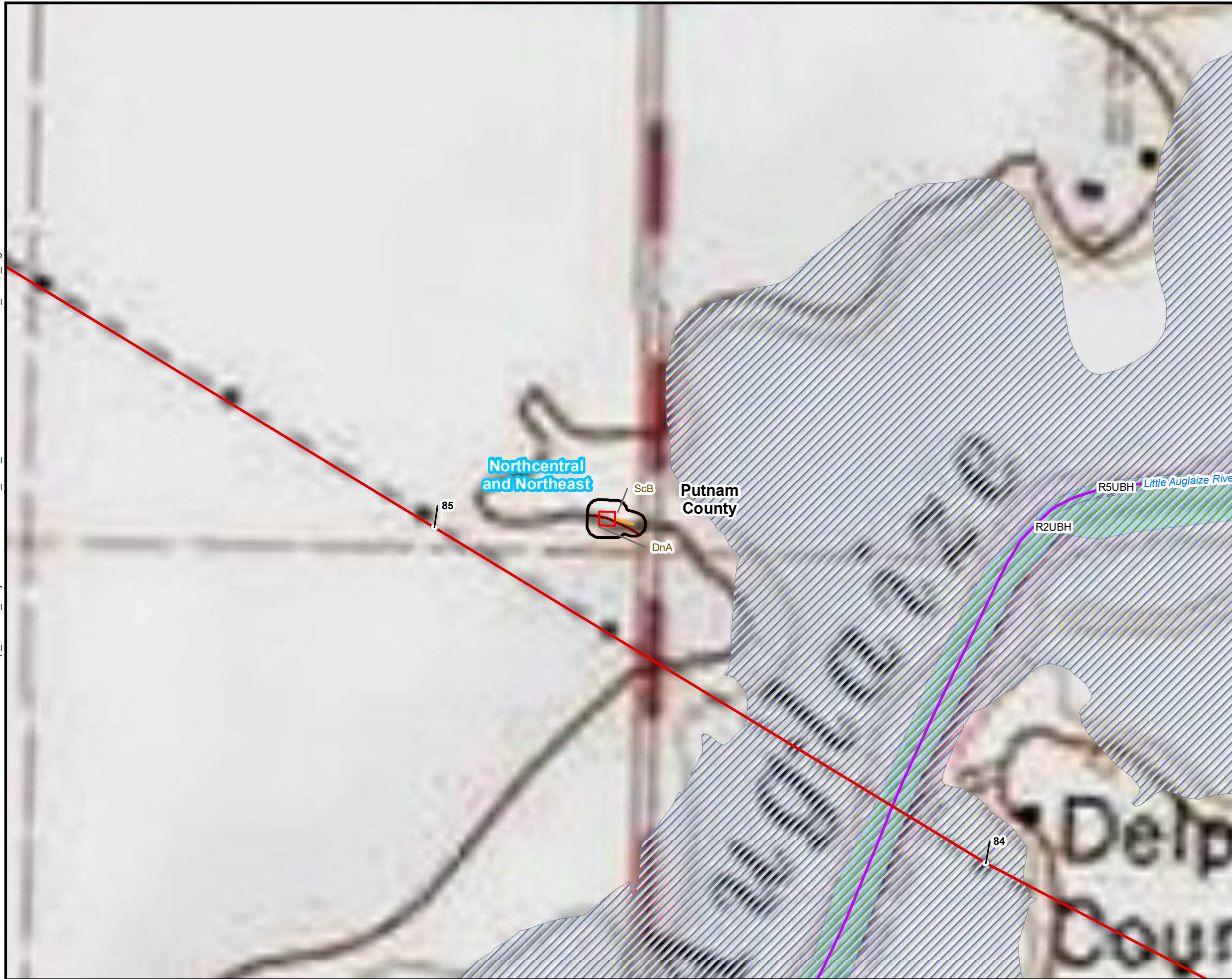


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

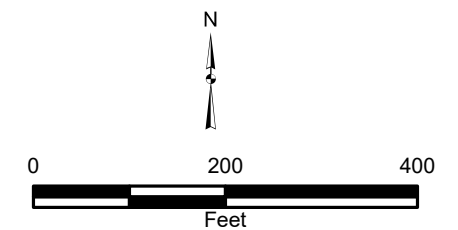
**FIGURE 20**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP





LEGEND:

- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - 100-yr Floodplain
  - Soil Map Unit
- Soil Map Unit Symbol**
- DnA, Digby loam, 0 to 2 percent slopes
  - ScB, St. Clair silt loam, 2 to 6 percent slopes



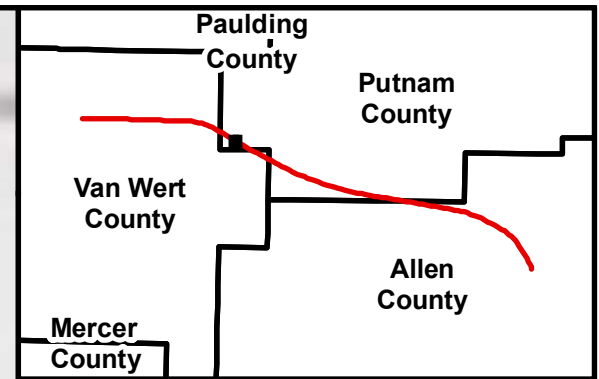
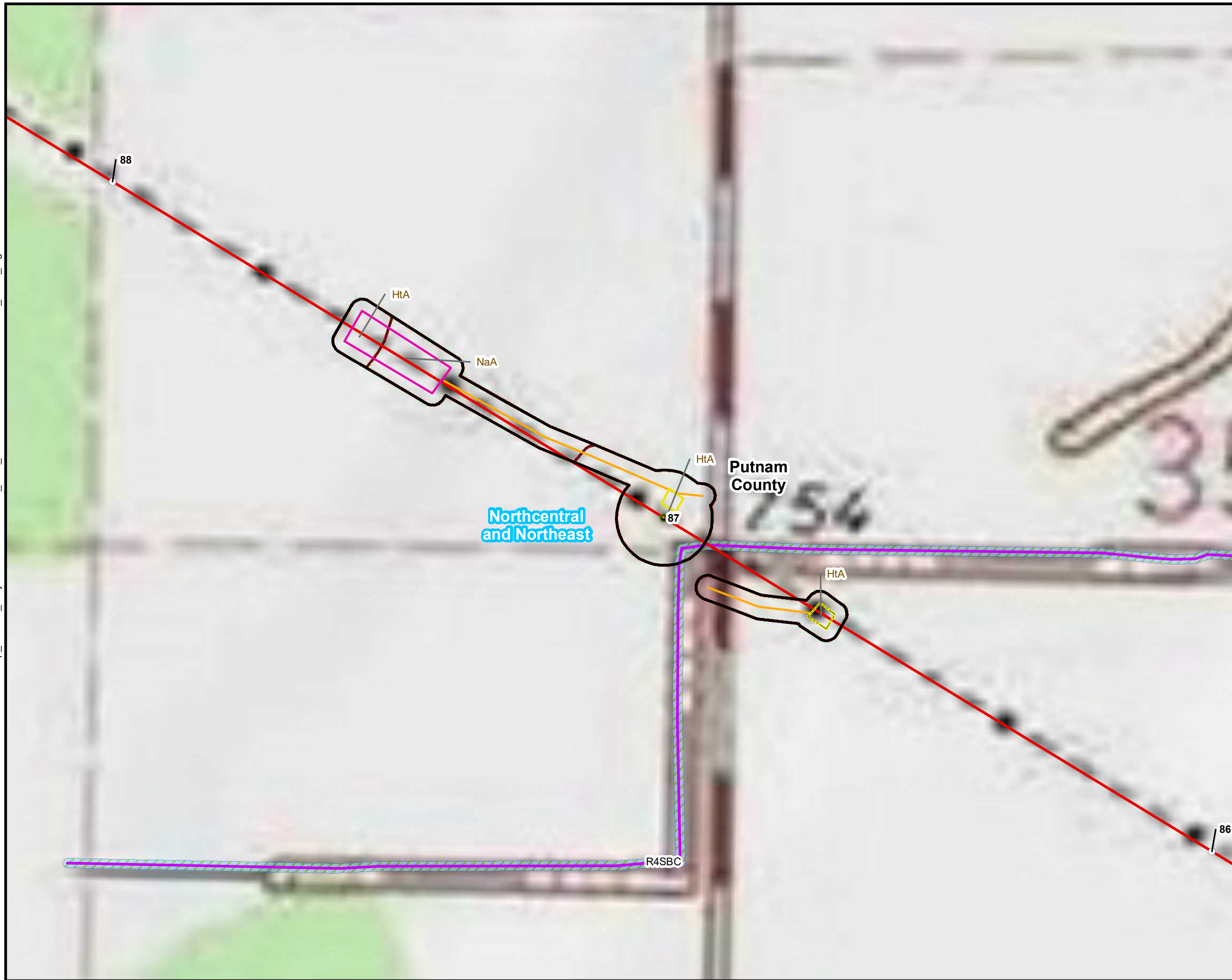
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**OHIO TRANSMISSION COMPANY**

*East Lima-Maddox  
345 kV Transmission  
Line Project*

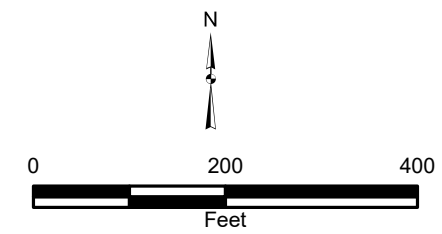
FIGURE 2P  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP





LEGEND:

- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes
  - NaA, Nappanee loam, 0 to 2 percent slopes



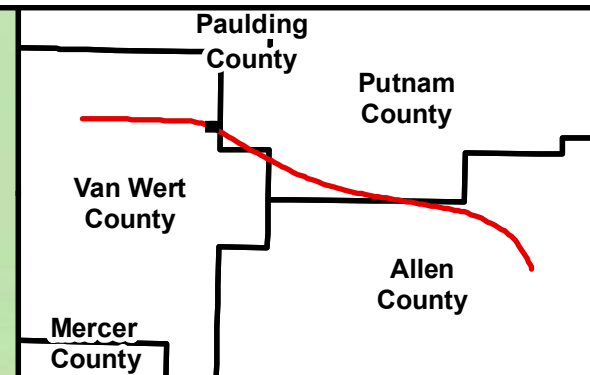
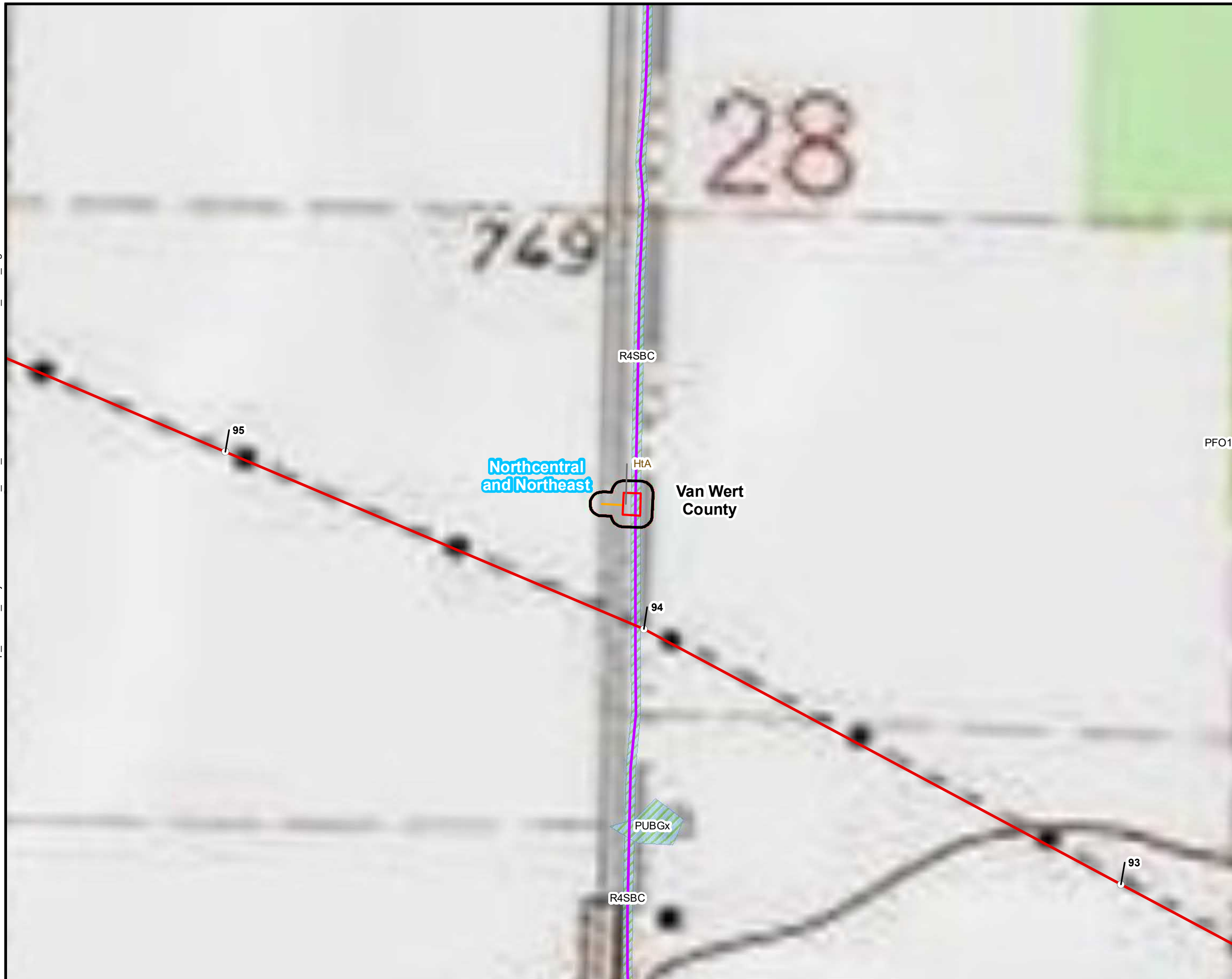
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**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

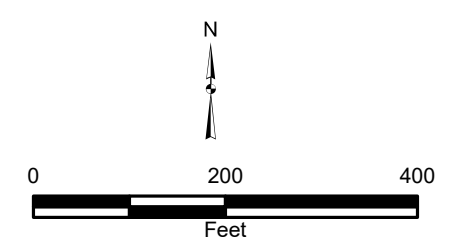
FIGURE 2Q  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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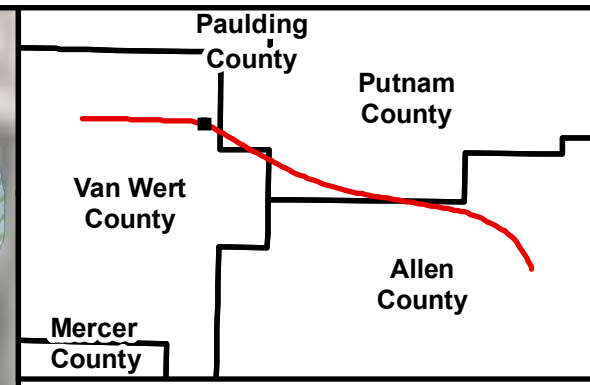
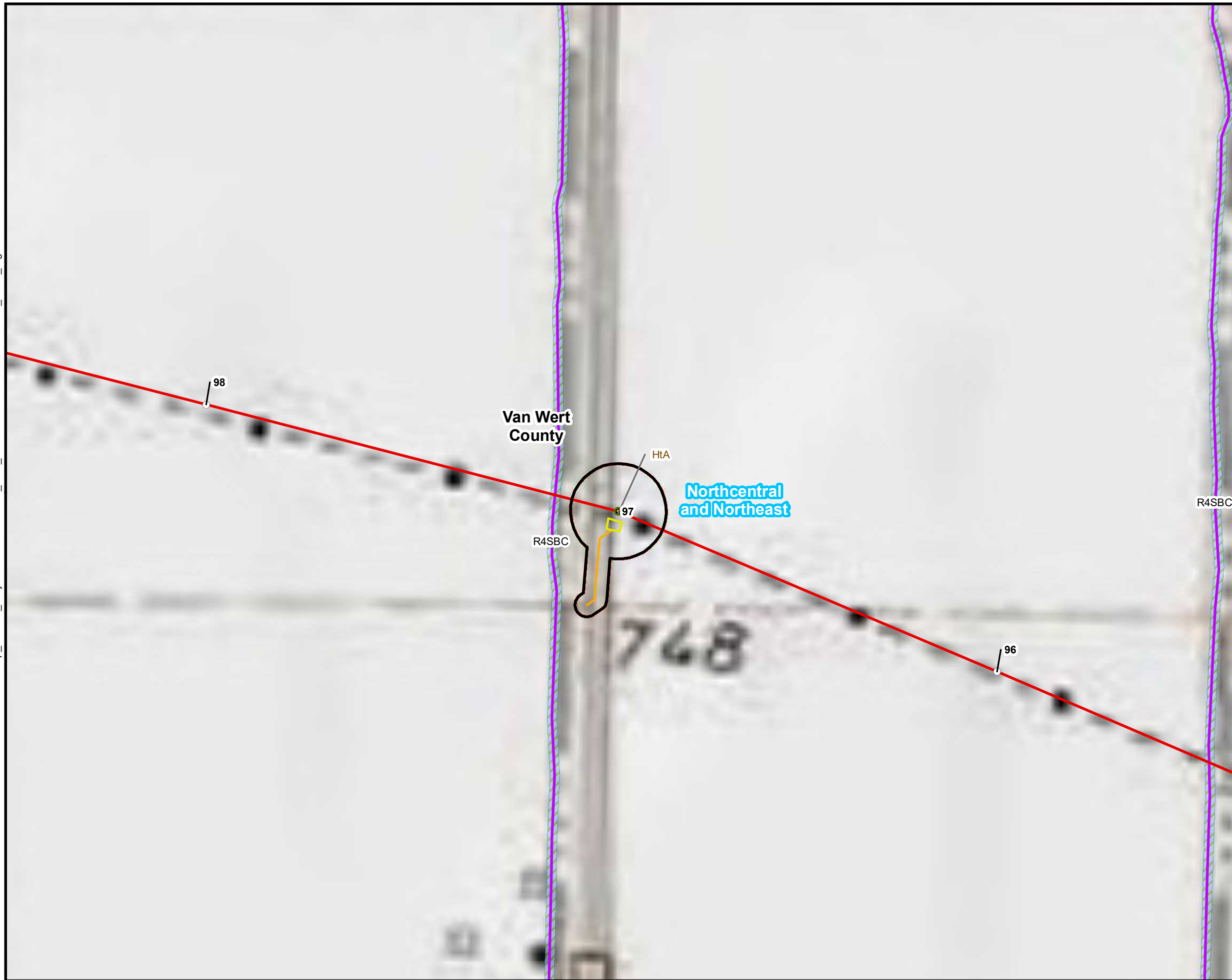
- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes



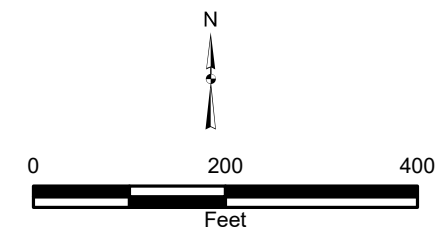
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

**FIGURE 2R**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**  
HtA, Hoytville silty clay, 0 to 1 percent slopes

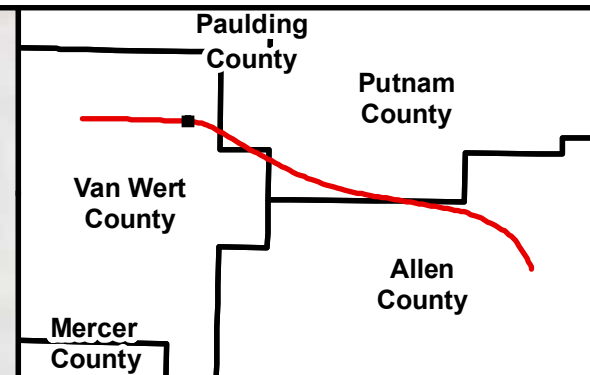
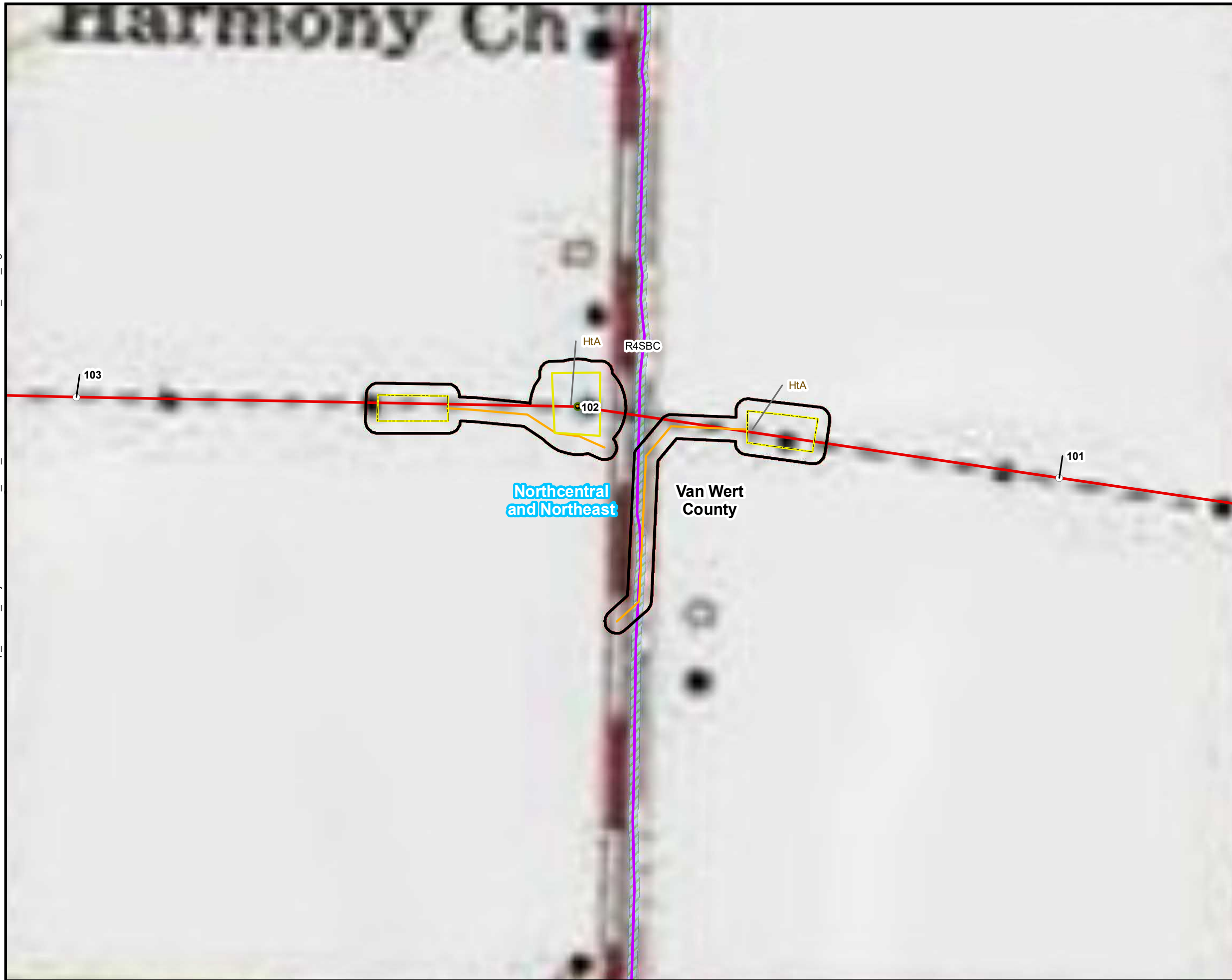


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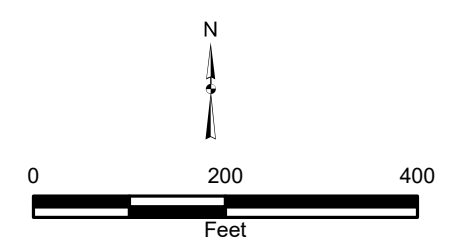
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

FIGURE 2S  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP

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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Work Pad
  - Proposed Access Road
  - Proposed Structure
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes



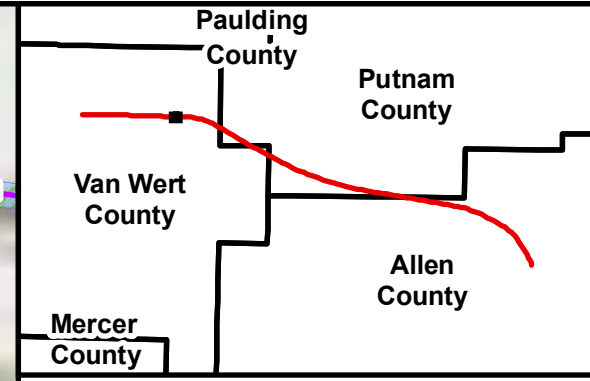
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

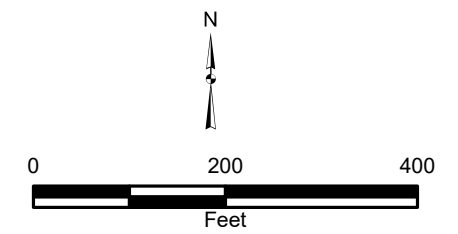
**FIGURE 2T**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes
  - NtB2, Nappanee silty clay loam, 2 to 6 percent slopes, moderately eroded

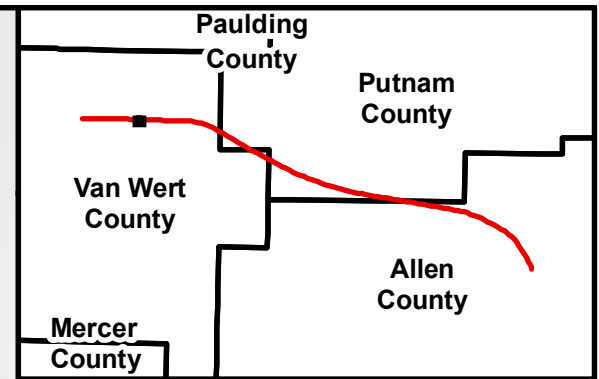
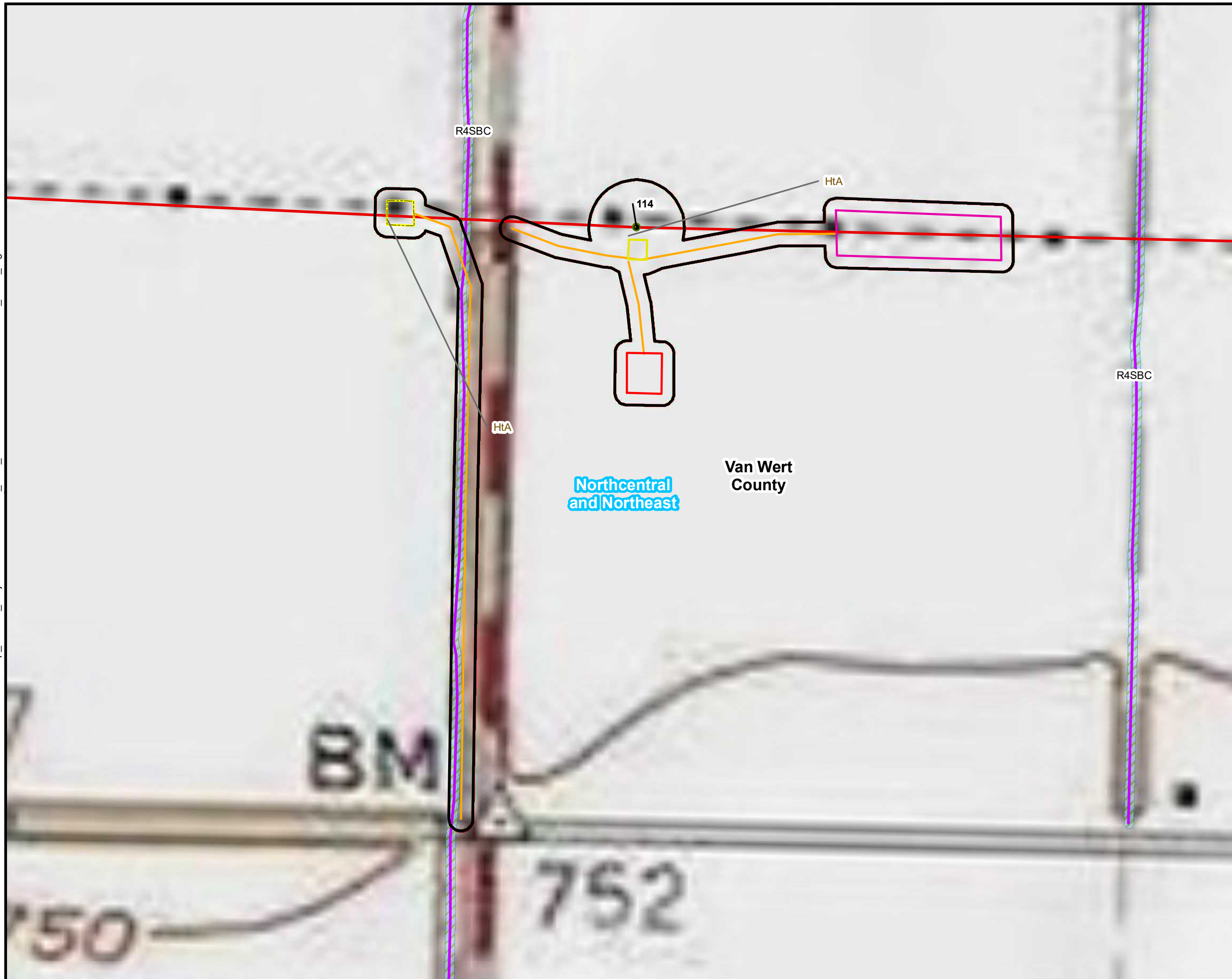


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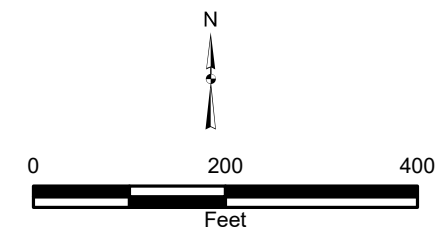
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2U**  
SOIL MAP UNIT AND NATIONAL WETLAND INVENTORY MAP

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- LEGEND:**
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access
  - Proposed Structure
  - Existing Structure
  - NHD Stream
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HtA, Hoytville silty clay, 0 to 1 percent slopes



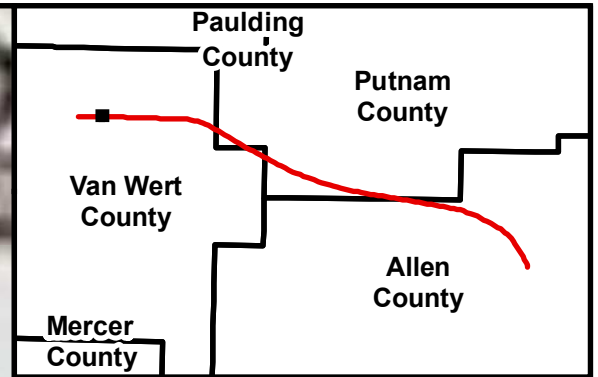
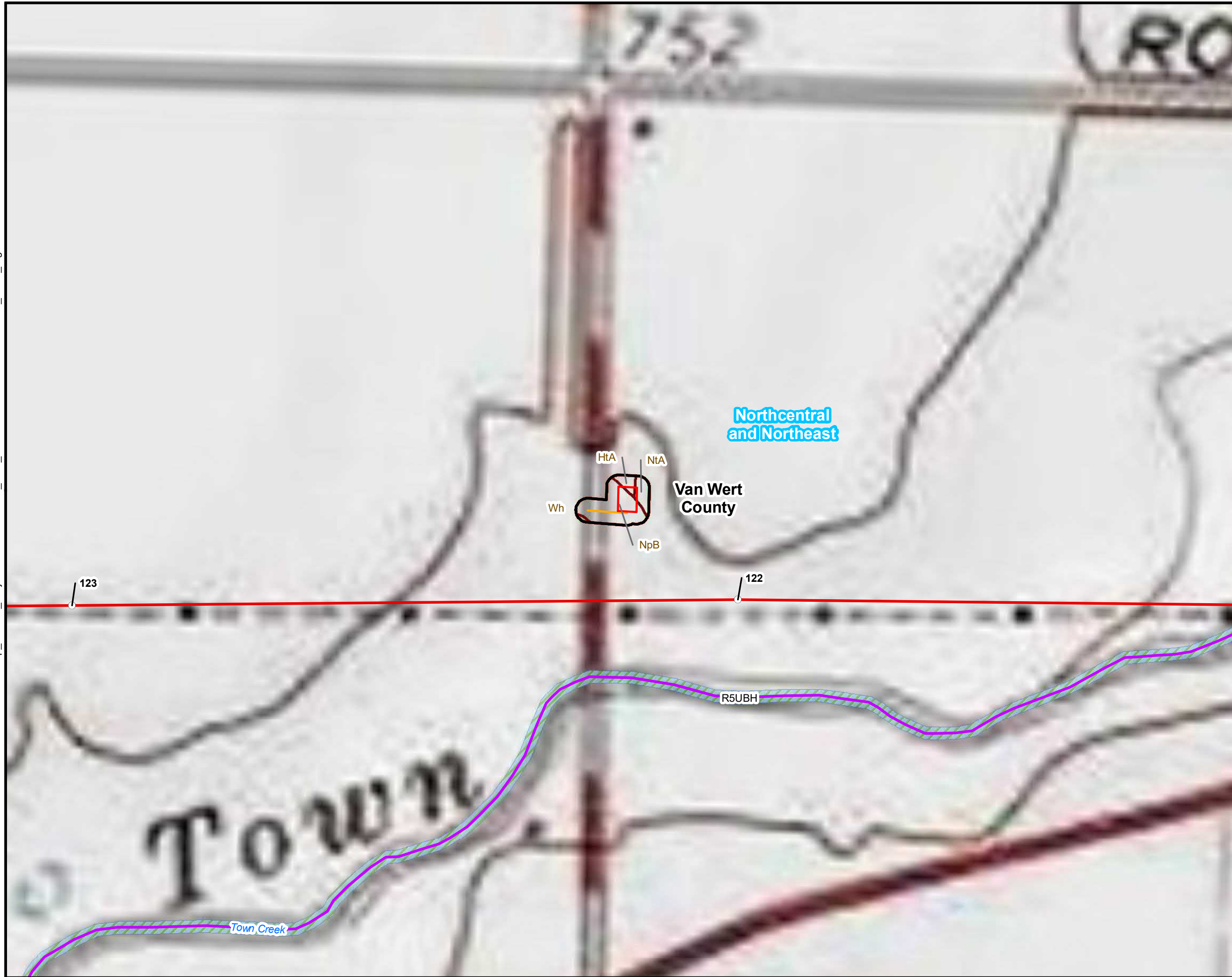
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 2V**  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



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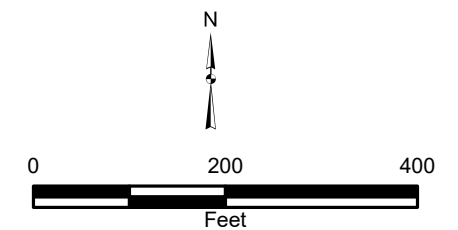


LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access
- Existing Structure
- NHD Stream
- NWI Wetland
- Soil Map Unit

Soil Map Unit Symbol

- HtA, Hoytville silty clay, 0 to 1 percent slopes
- NpB, Nappanee silt loam, 2 to 6 percent slopes
- NtA, Nappanee silty clay loam, 0 to 2 percent slopes
- Wh, Wabasha silty clay

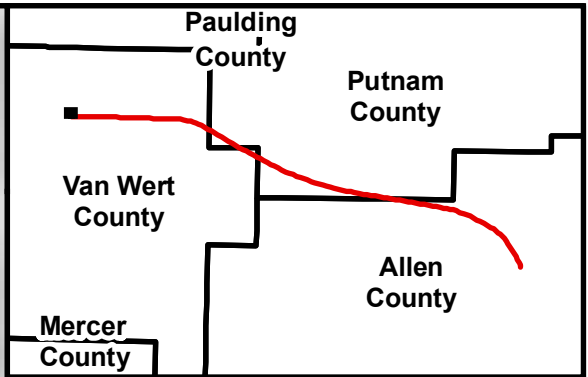
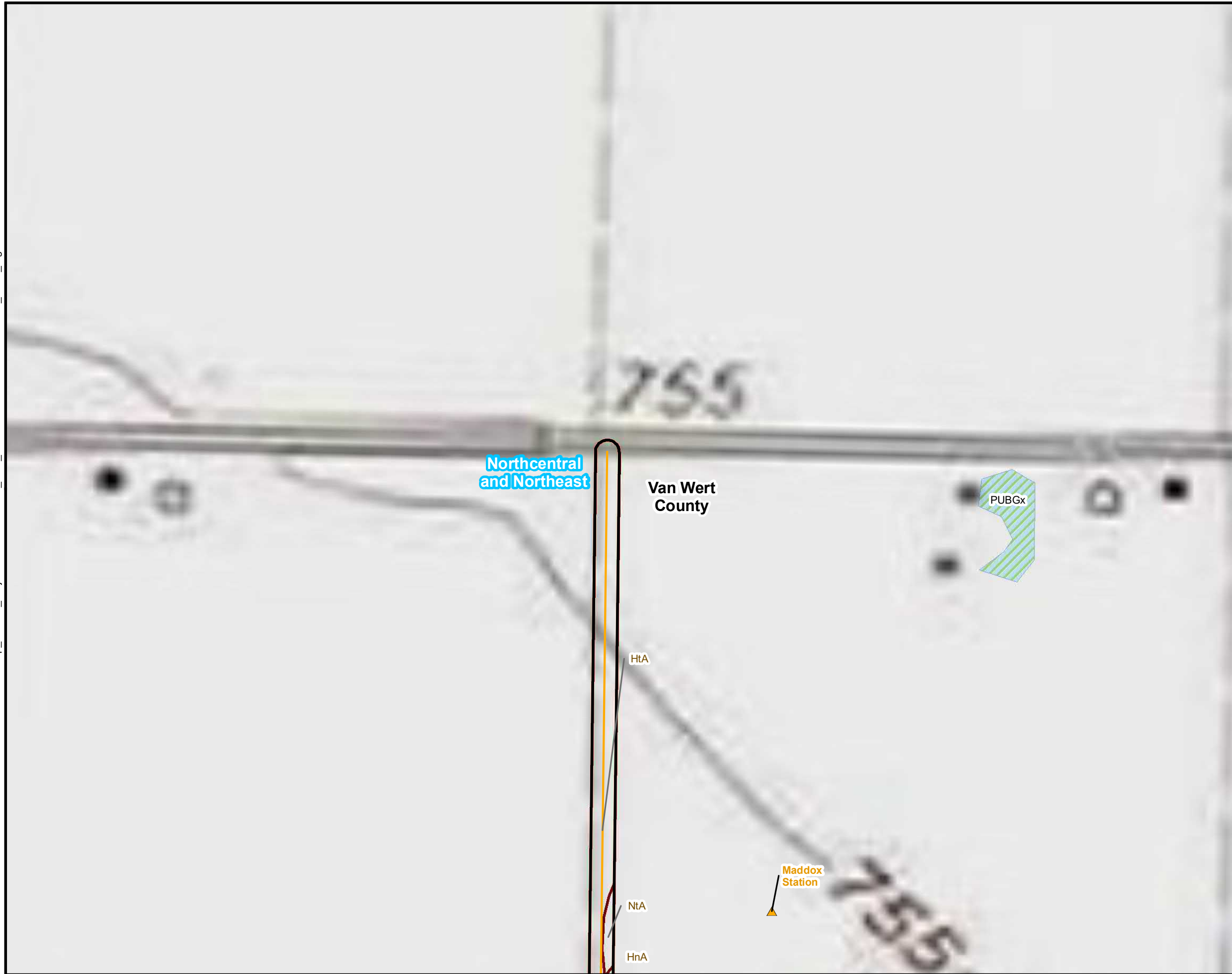


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

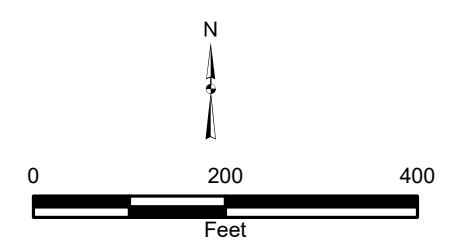
FIGURE 2V  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP





LEGEND:

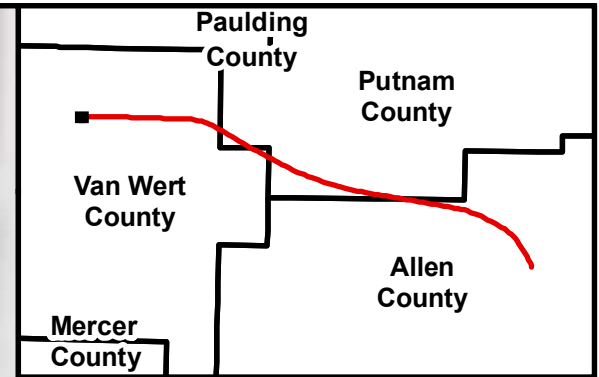
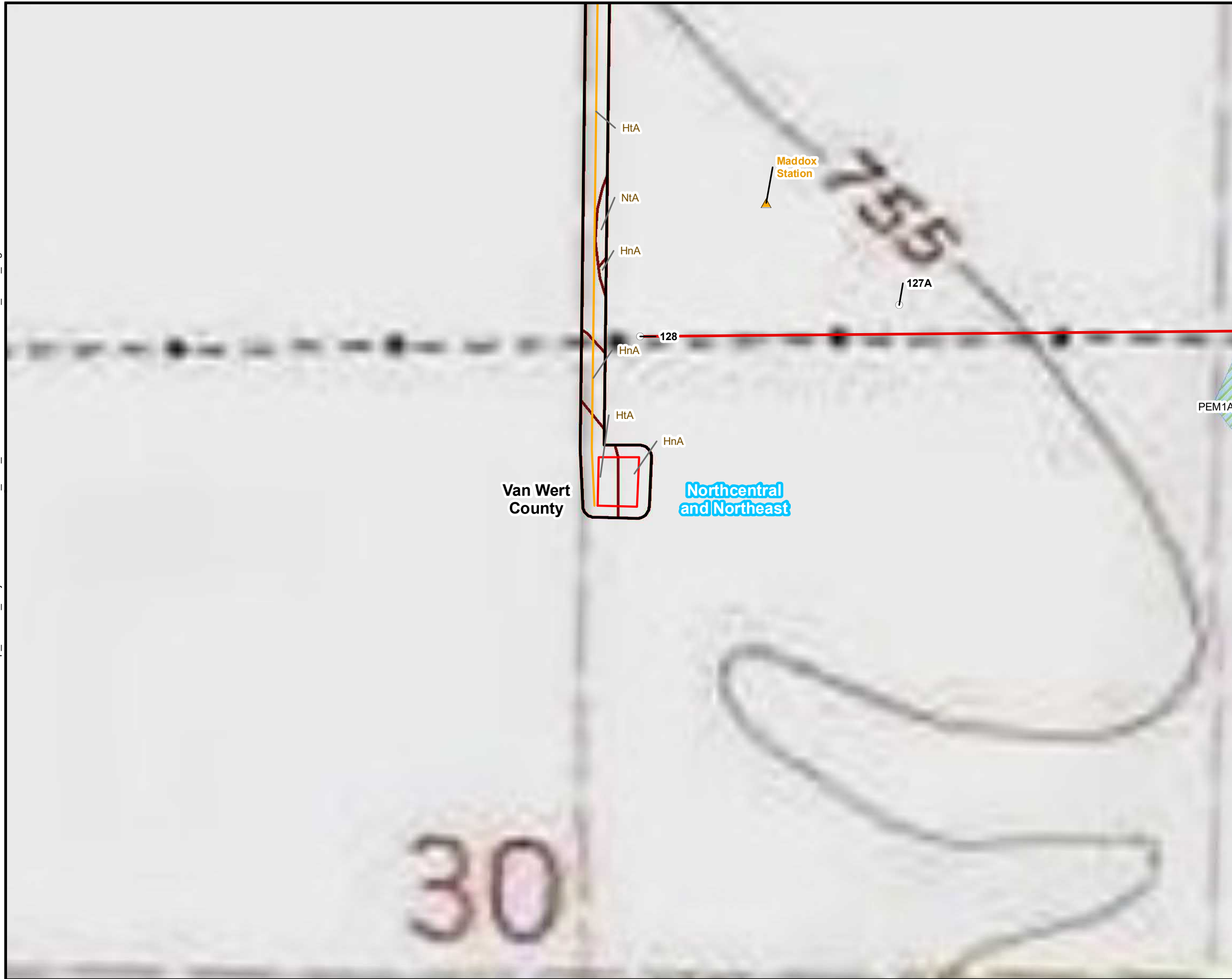
- Station
  - Project Survey Corridor
  - County
  - USACE Wetland Region
  - Proposed Access
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HnA, Haskins loam, 0 to 2 percent slopes
  - HtA, Hoytville silty clay, 0 to 1 percent slopes
  - NtA, Nappanee silty clay loam, 0 to 2 percent slopes



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

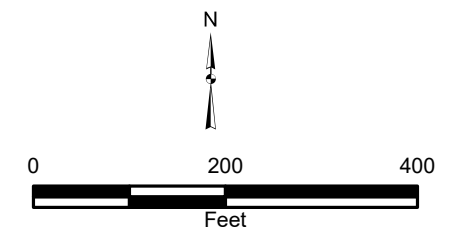
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 2W  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP



LEGEND:

- Station
  - Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - NWI Wetland
  - Soil Map Unit
- Soil Map Unit Symbol**
- HnA, Haskins loam, 0 to 2 percent slopes
  - HtA, Hoytville silty clay, 0 to 1 percent slopes
  - NtA, Nappanee silty clay loam, 0 to 2 percent slopes

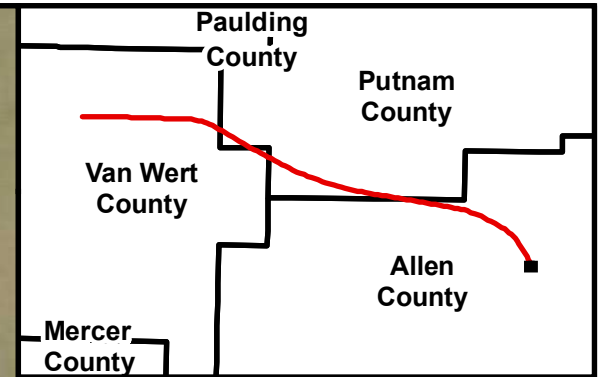
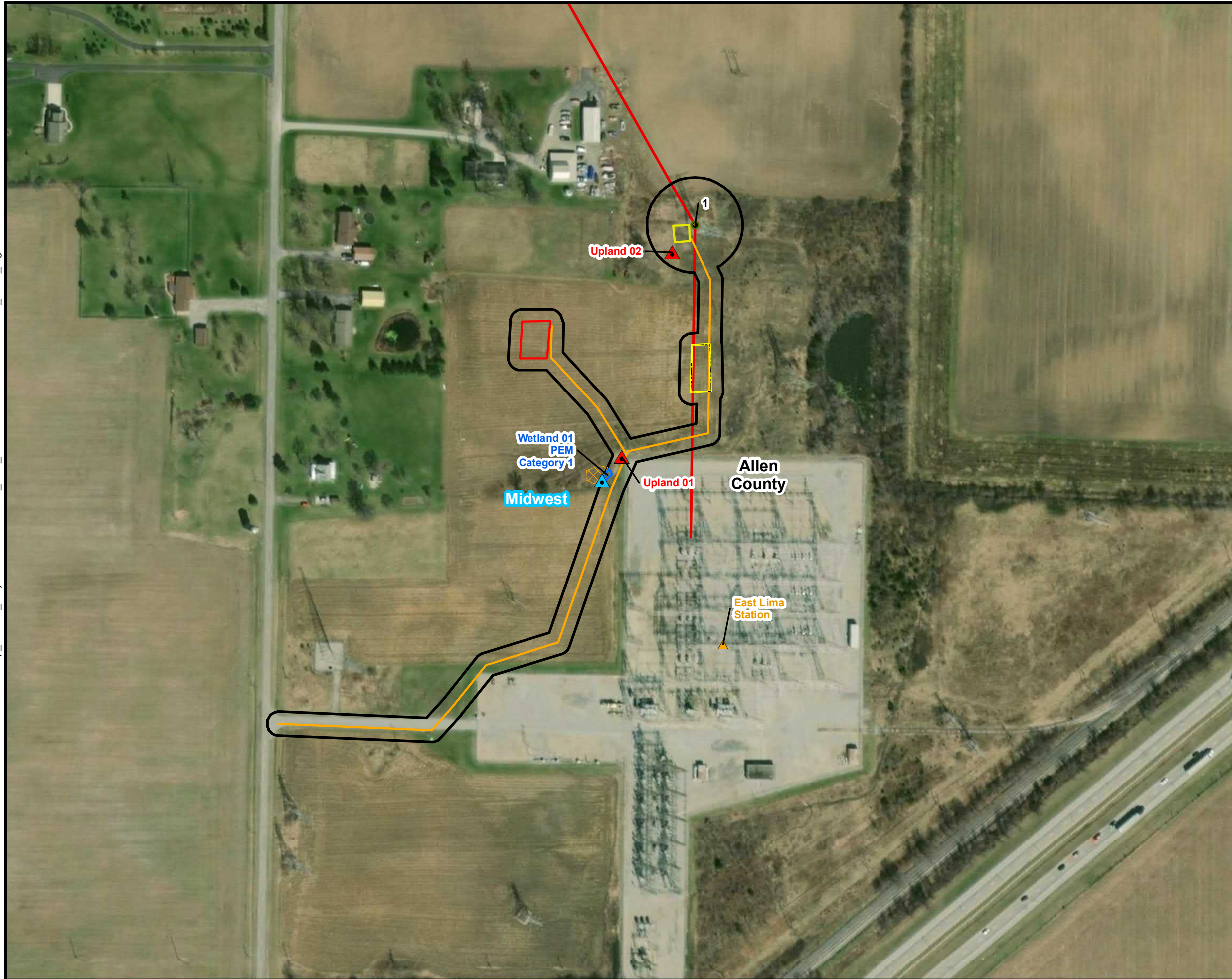


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

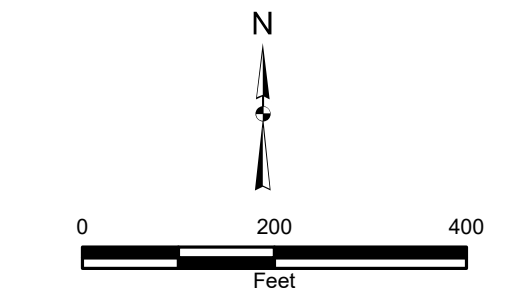
FIGURE 2X  
SOIL MAP UNIT AND  
NATIONAL WETLAND INVENTORY MAP





LEGEND:

- Station
- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Proposed Structure
- Existing Structure
- Helipad
- Pull Pad
- Work Pad
- Proposed Access Road
- Upland Data Point
- Wetland Data Point
- Delineated Wetland
- Approximate Wetland Location

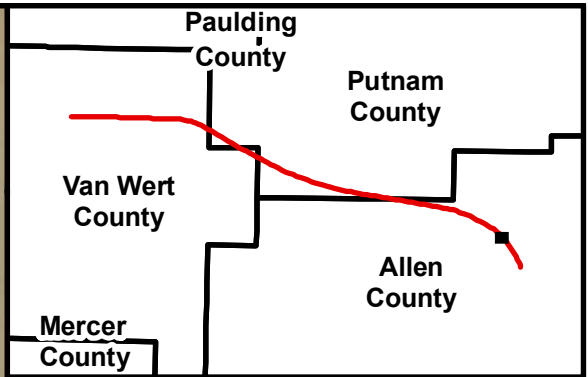
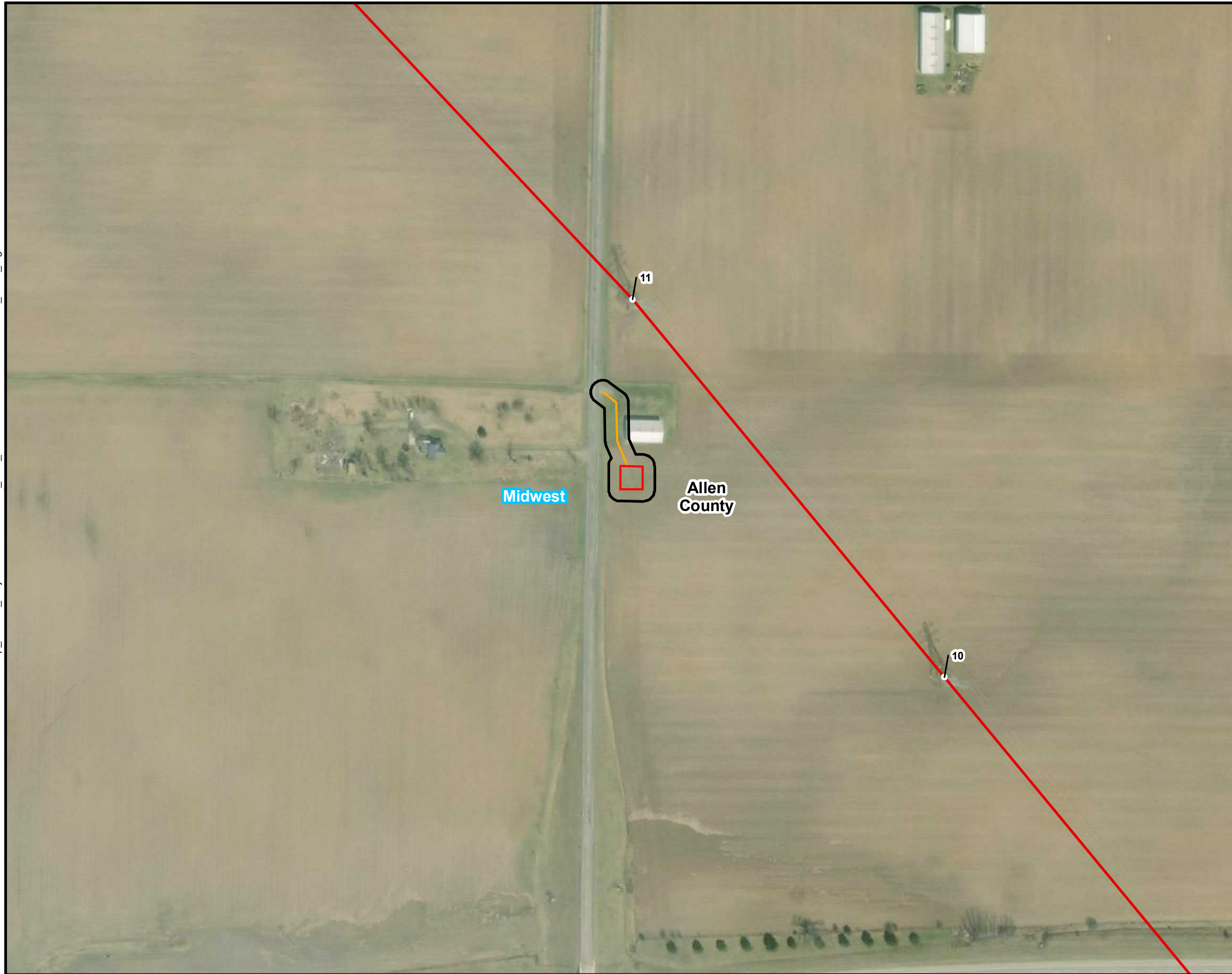


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>








**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

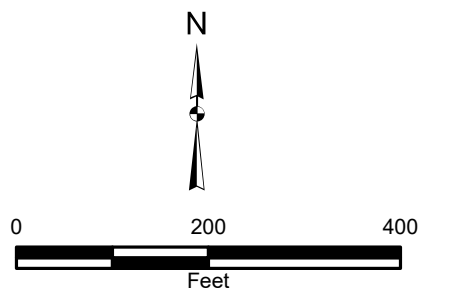
**FIGURE 3A  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP**





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road

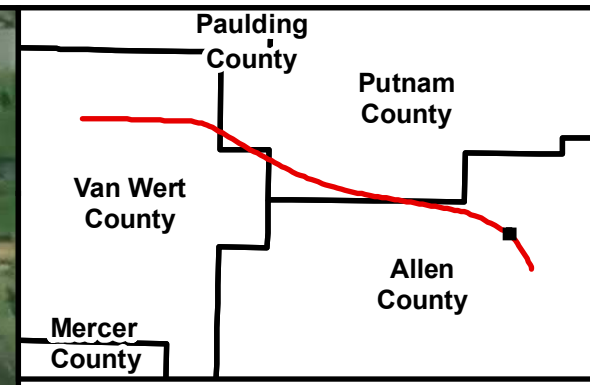
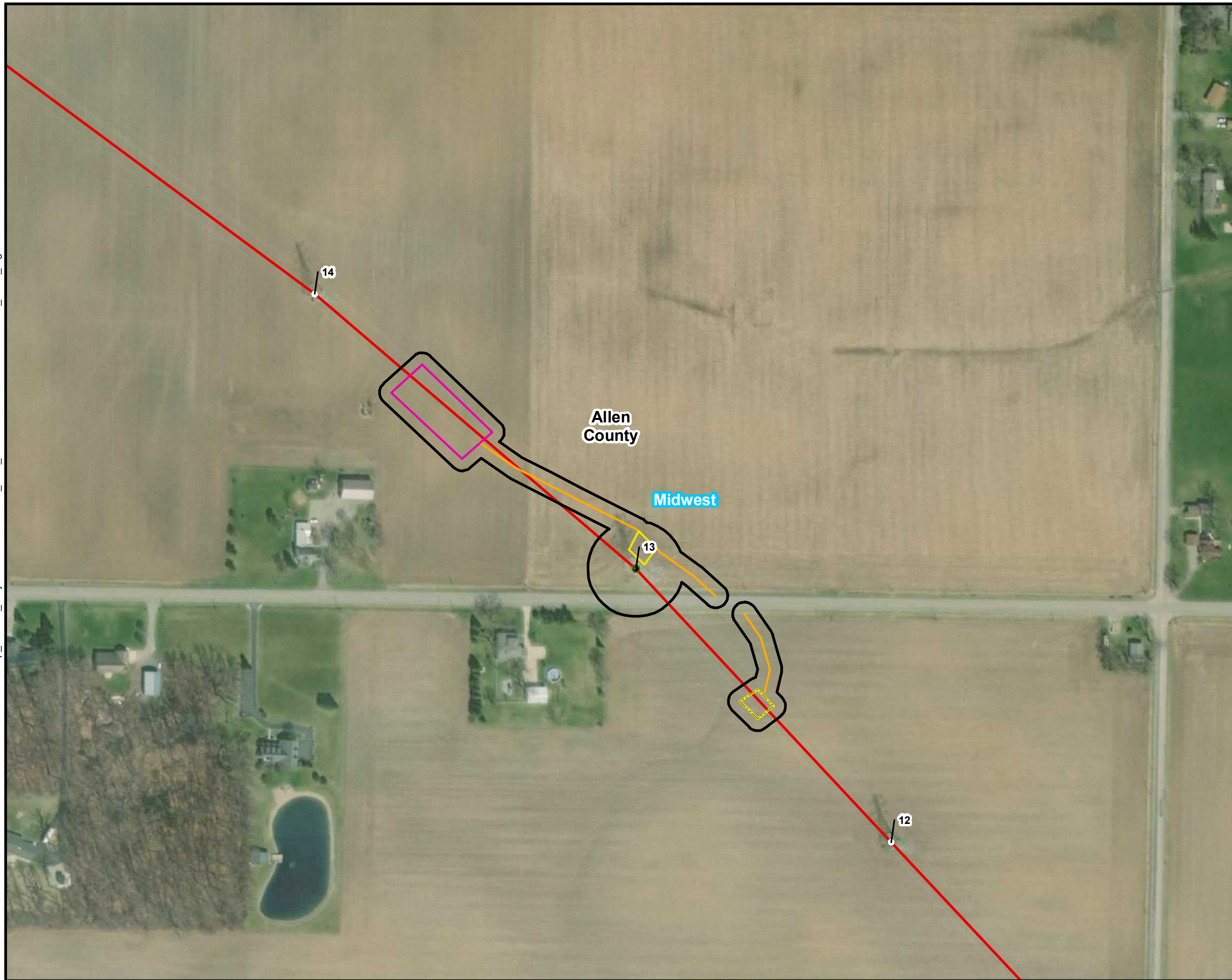


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

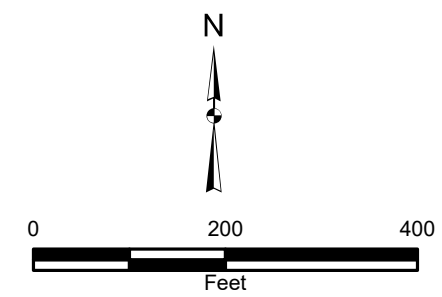
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3B  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

G:\Cincinnati\DCS\GIS\ArcMap\_GeoDB\_Projects\ENVI\60601386\_AEP\_EL\Map\GIS\East Lima-Maddox\_WDR\_Figures3.mxd Date: 9/17/2019



- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Proposed Structure
  - Existing Structure
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access



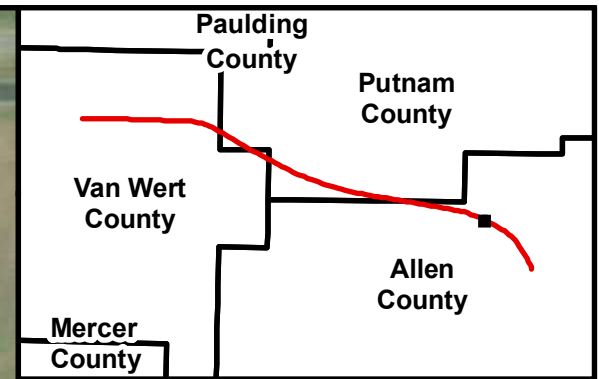
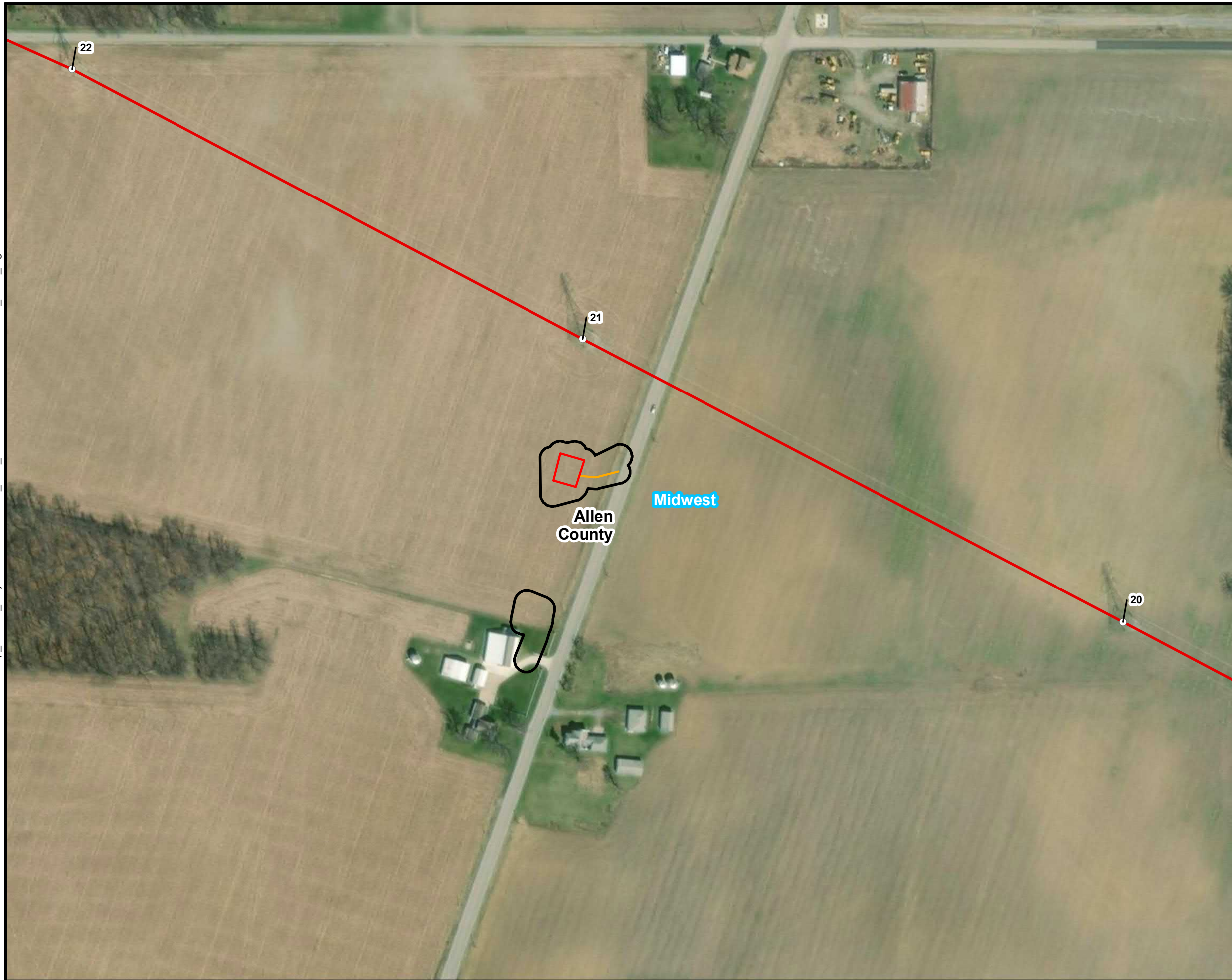
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project








FIGURE 3C  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

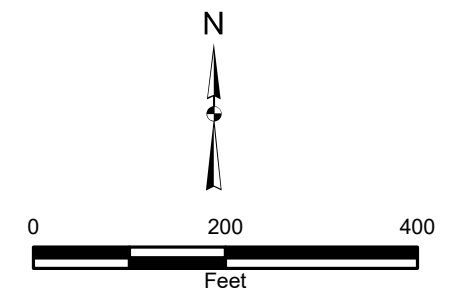


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LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

 *East Lima-Maddox  
345 kV Transmission  
Line Project*

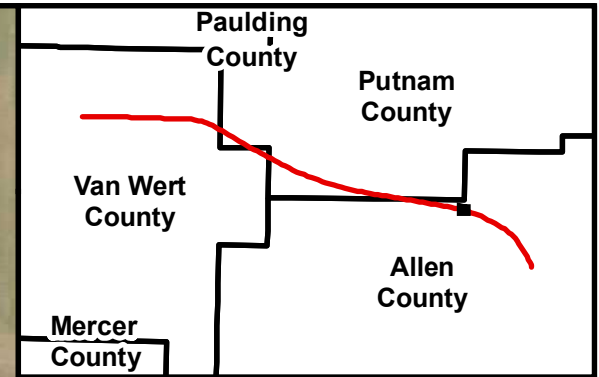
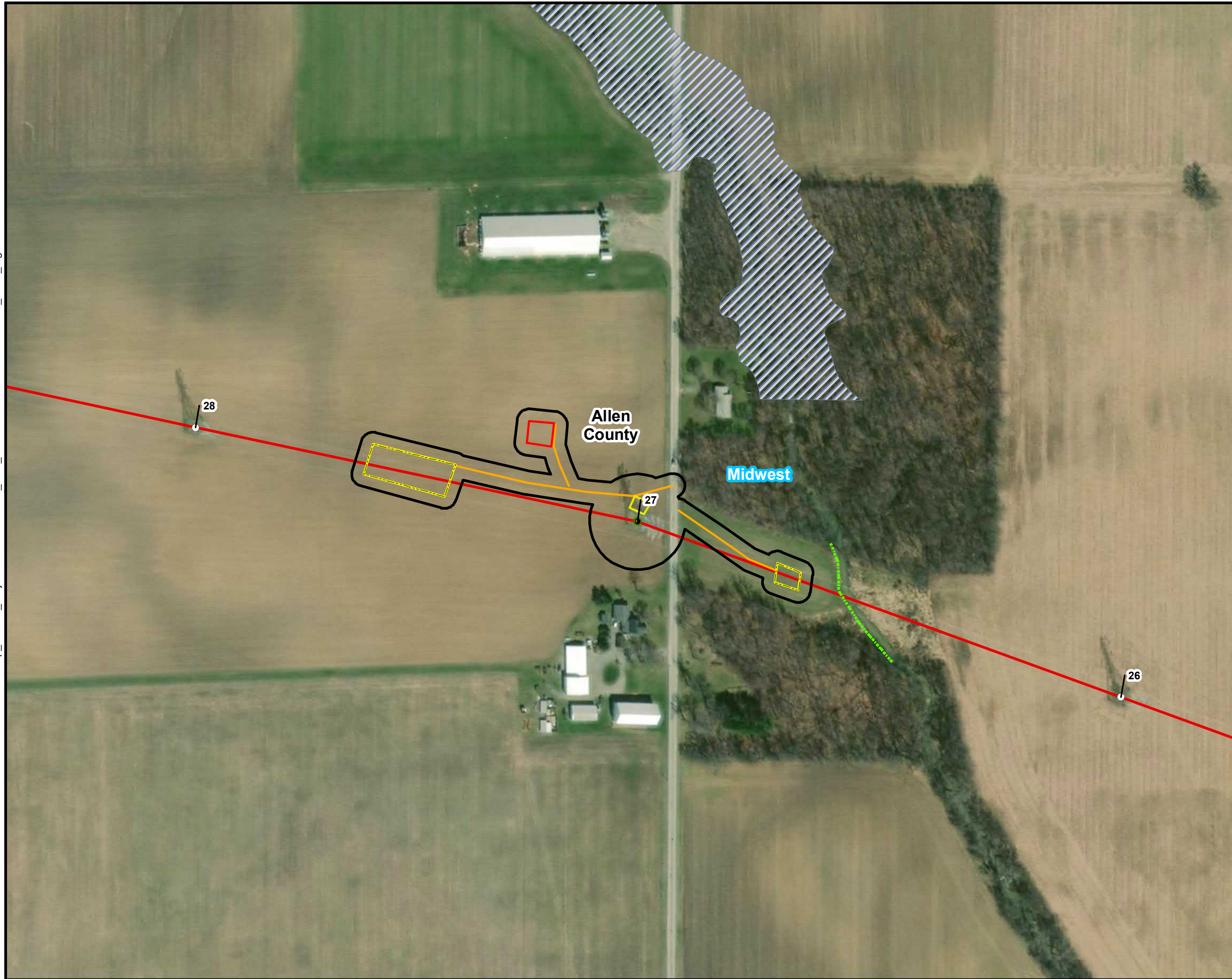
FIGURE 3D  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

JOB NO. 60601386



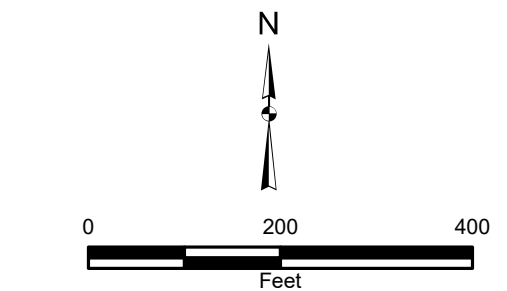


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Proposed Structure
- Existing Structure
- Helipad
- Pull Pad
- Work Pad
- Proposed Access Road
- 100-yr Floodplain
- Approximate Stream Location



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY**

East Lima-Maddox  
345 kV Transmission  
Line Project

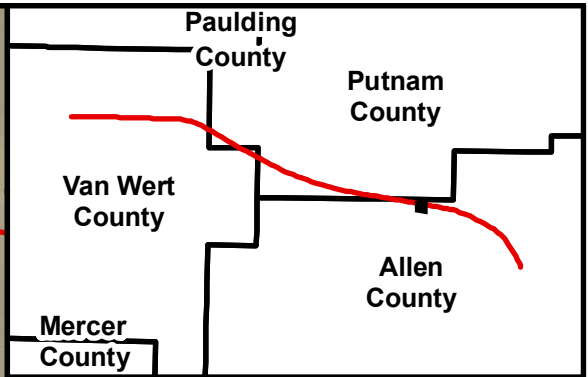
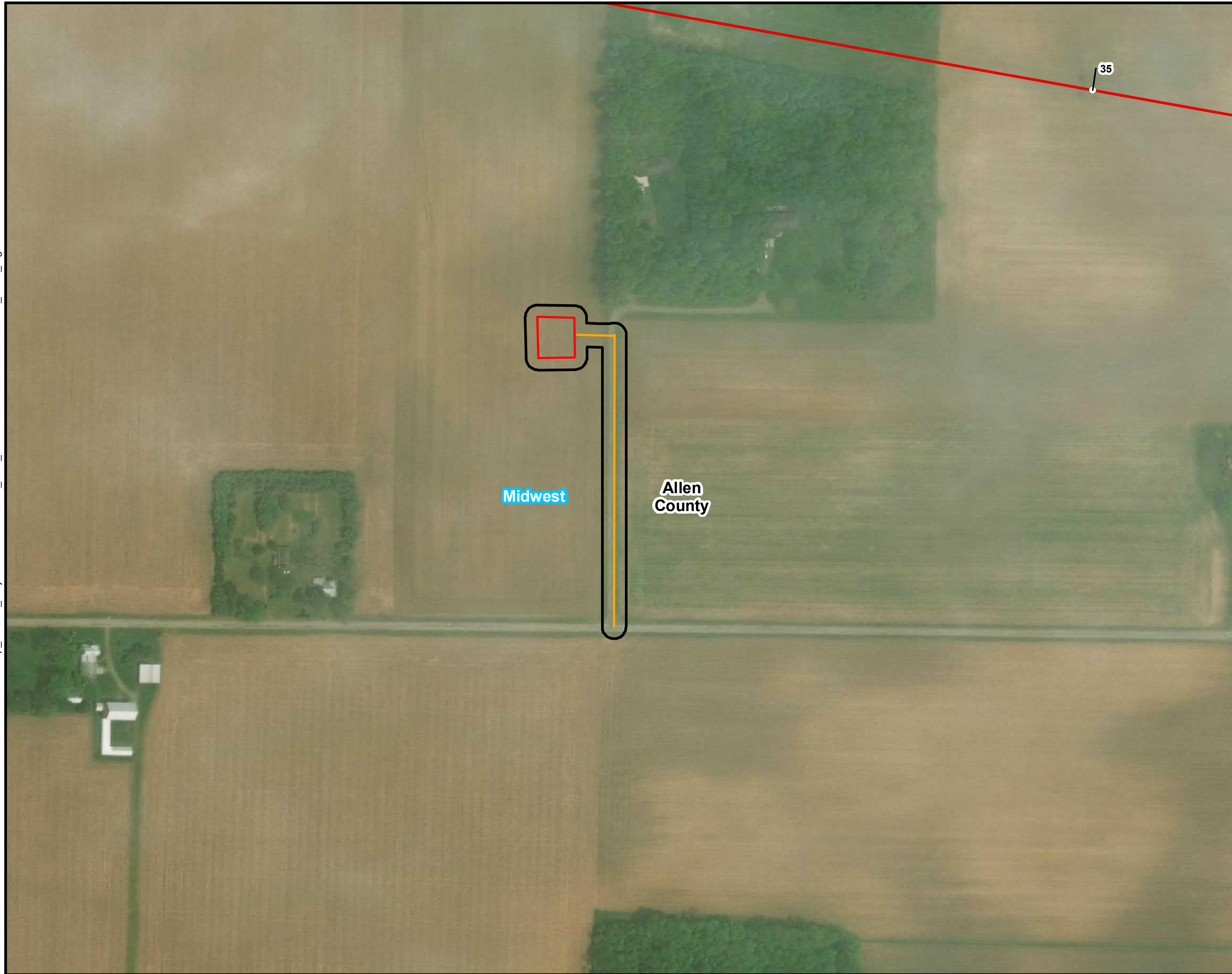
FIGURE 3E  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

JOB NO. 60601386








**AECOM**

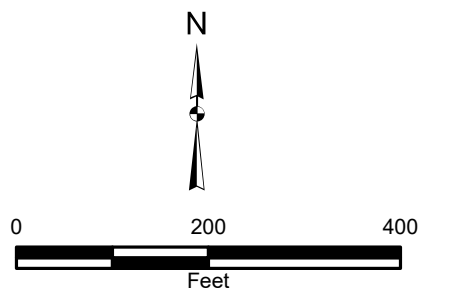


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LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

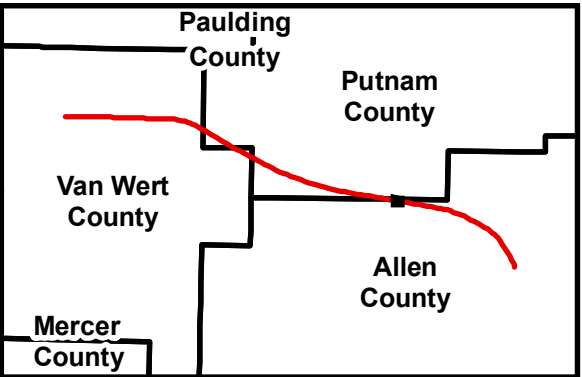
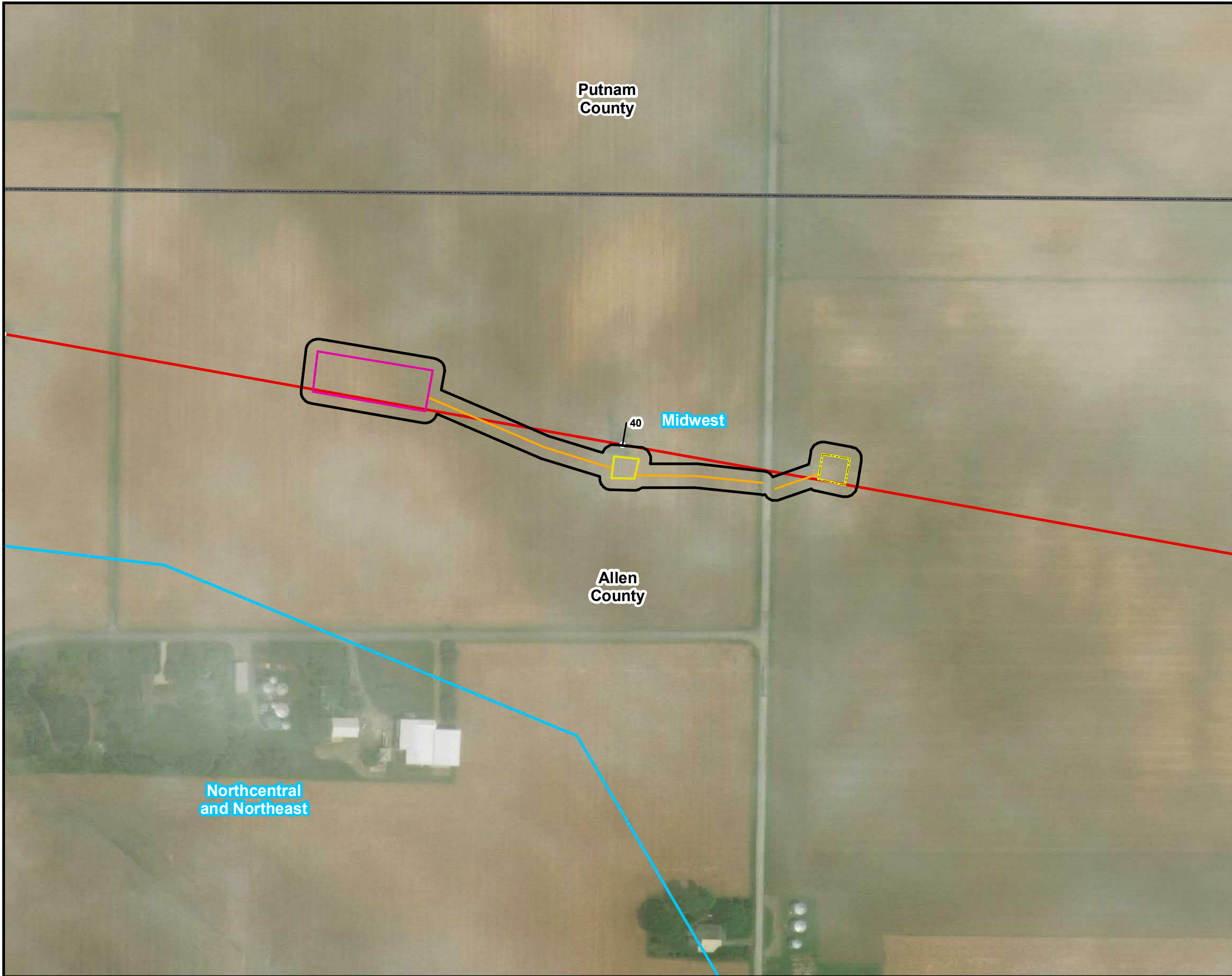
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3F  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

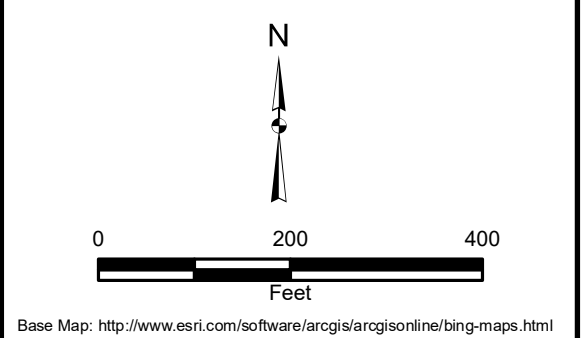
JOB NO. 60601386



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Existing Structure
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access Road



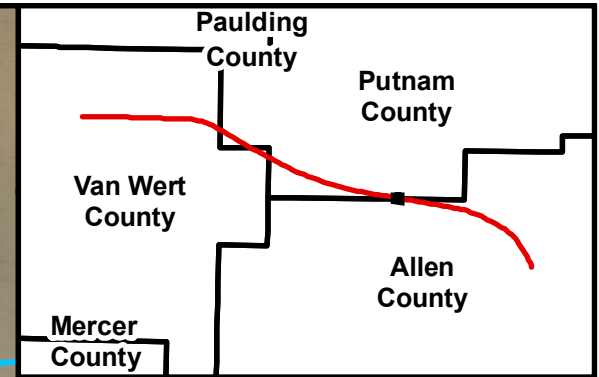
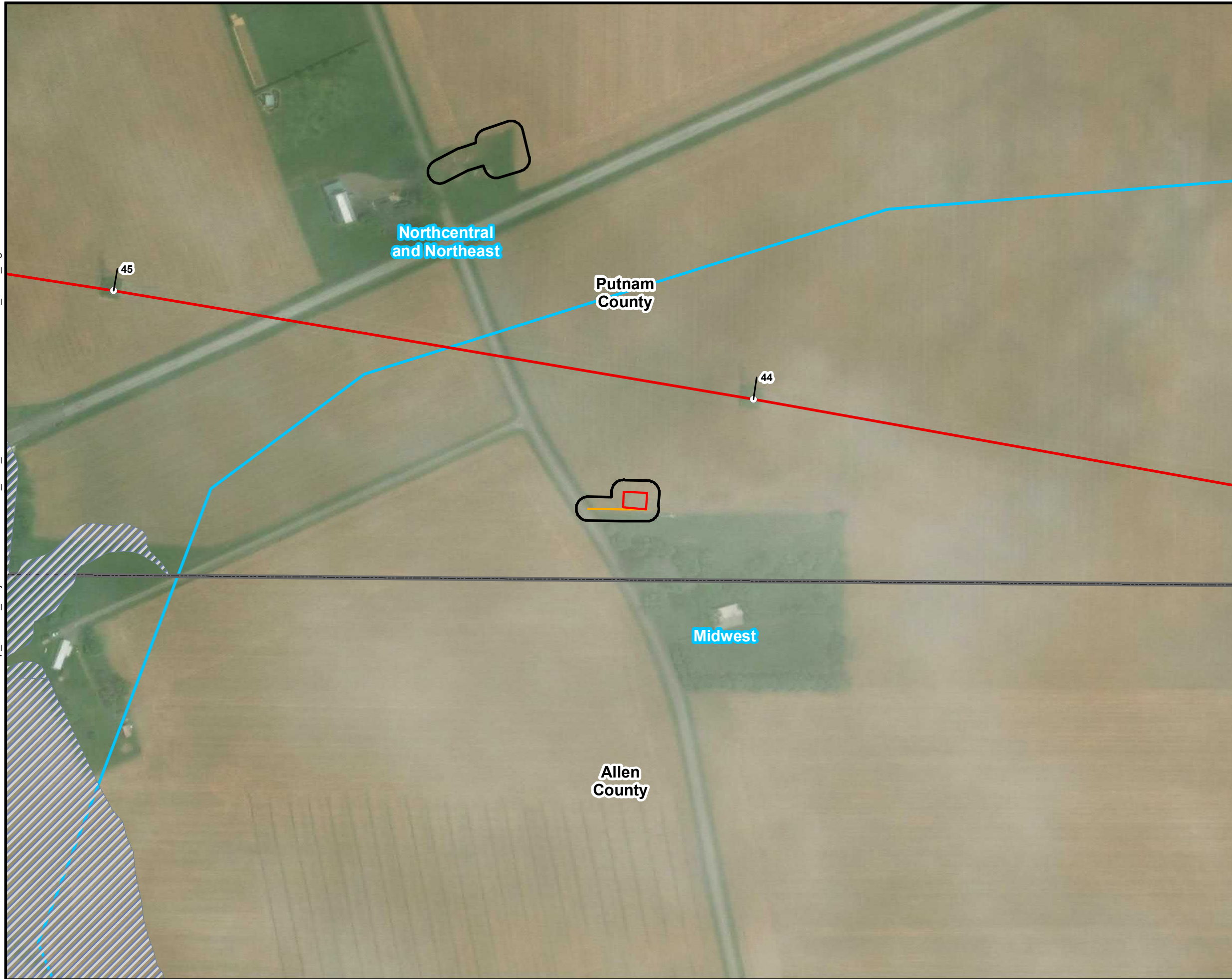
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

**FIGURE 3G**  
**WETLAND DELINEATION**  
**AND STREAM ASSESSMENT MAP**

JOB NO. 60601386 **AECOM**

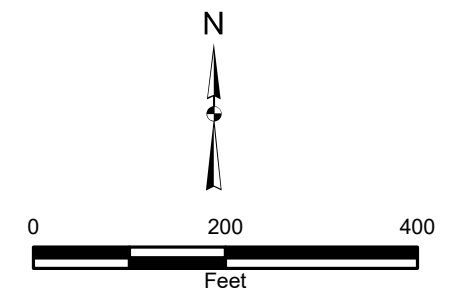


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Existing Structure
- Helipad
- Proposed Access Road
- 100-yr Floodplain

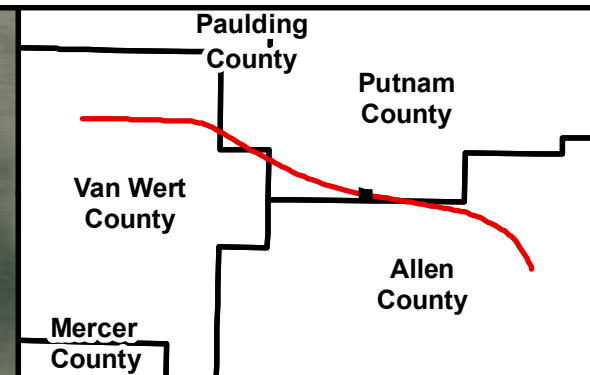
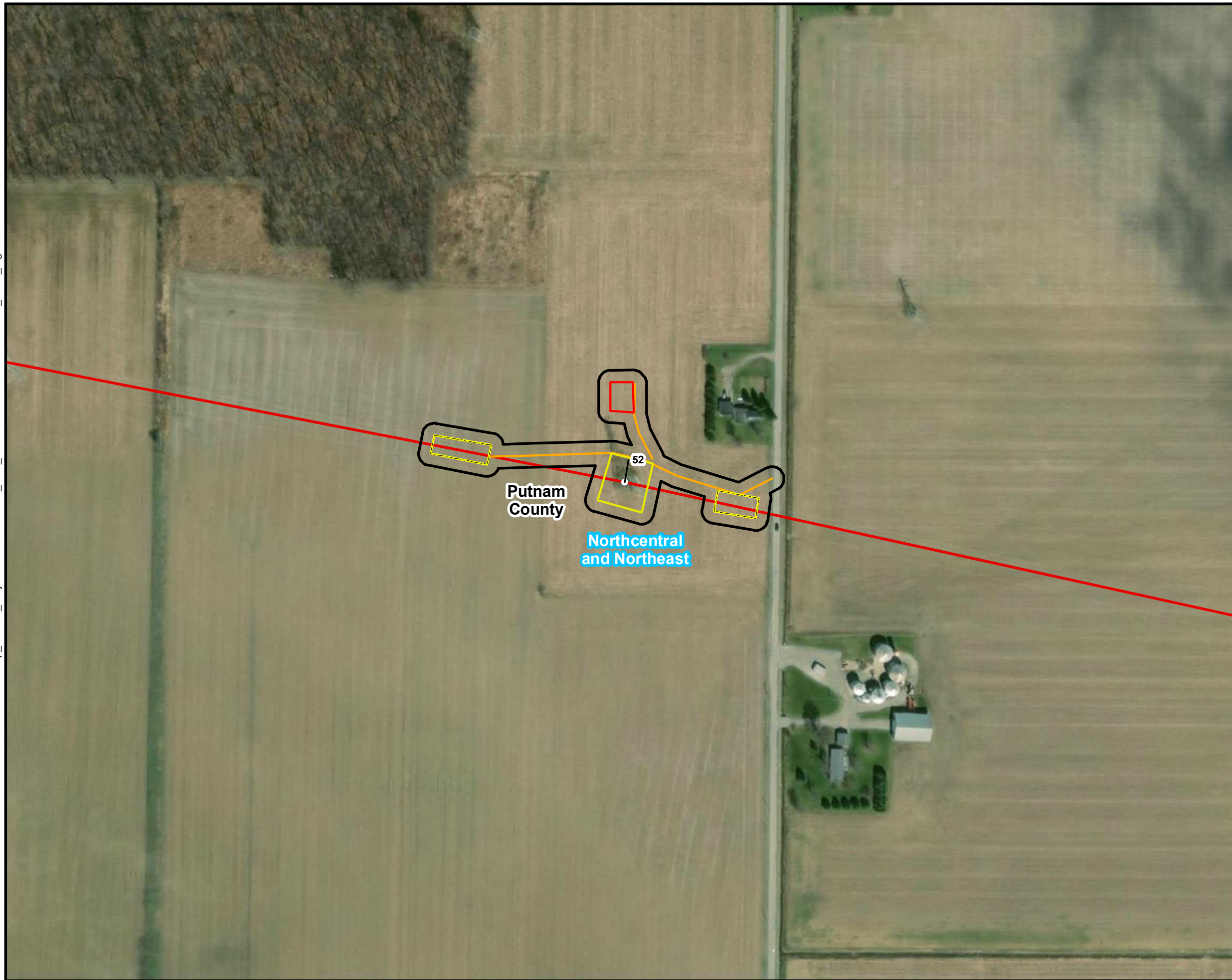


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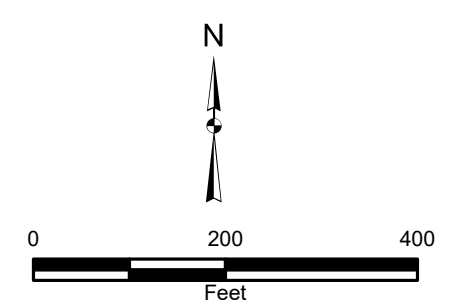
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3H  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Existing Structure
  - Helipad
  - Pull Pad
  - Work Pad
  - Proposed Access Road



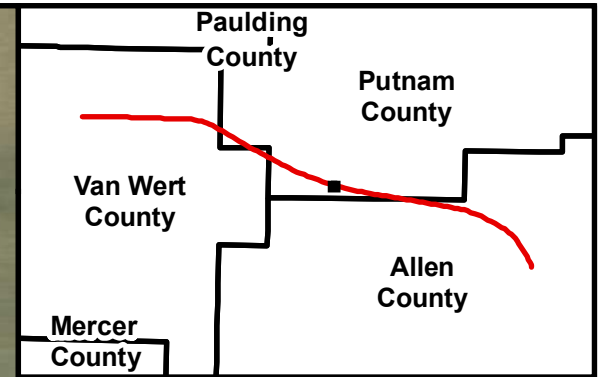
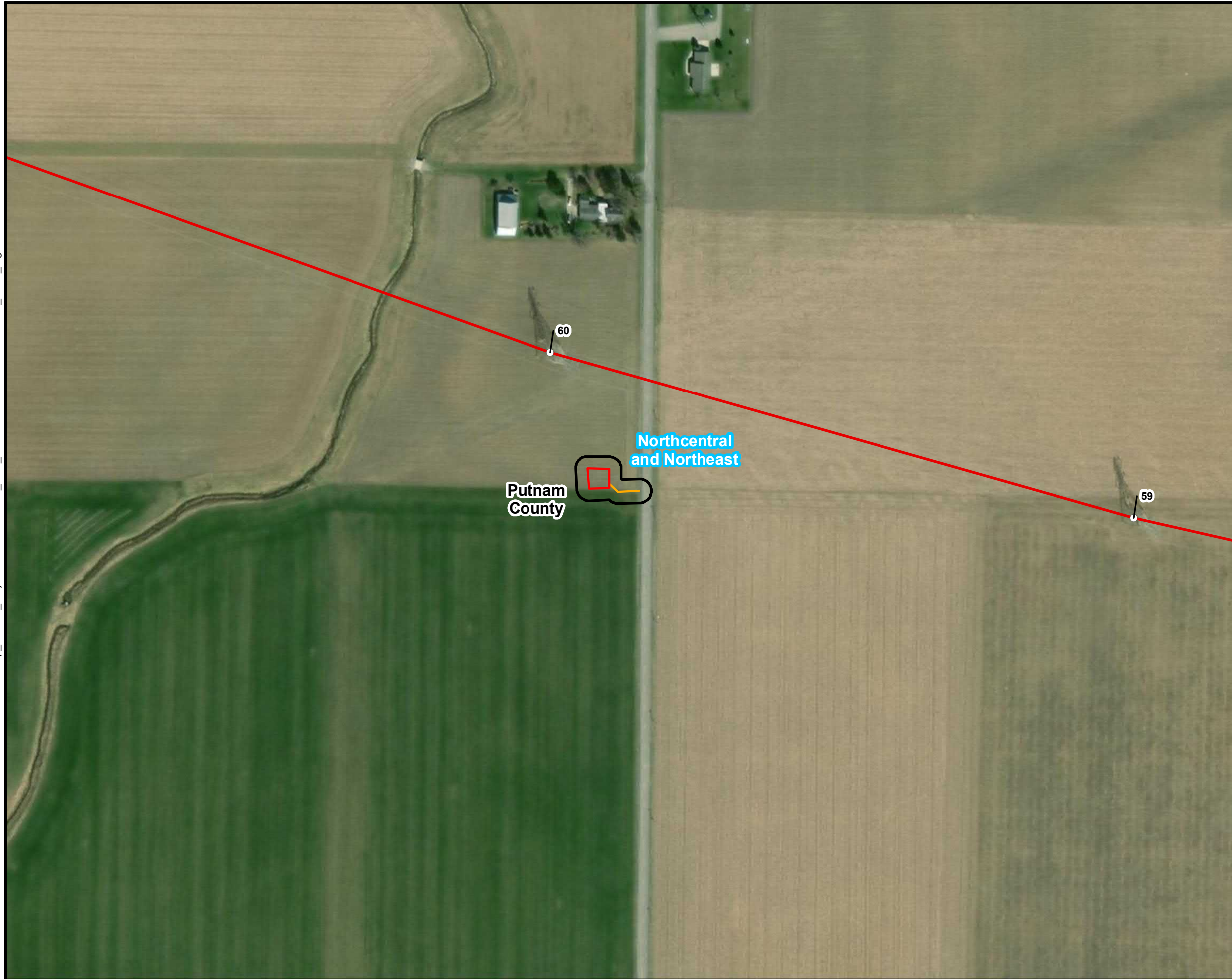
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*








FIGURE 31  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

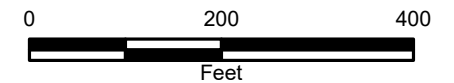


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LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

 *East Lima-Maddox  
345 kV Transmission  
Line Project*

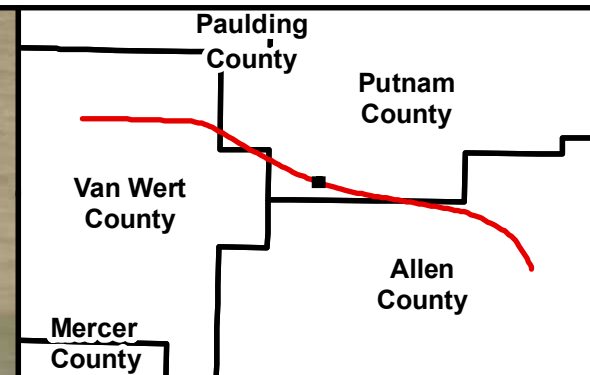
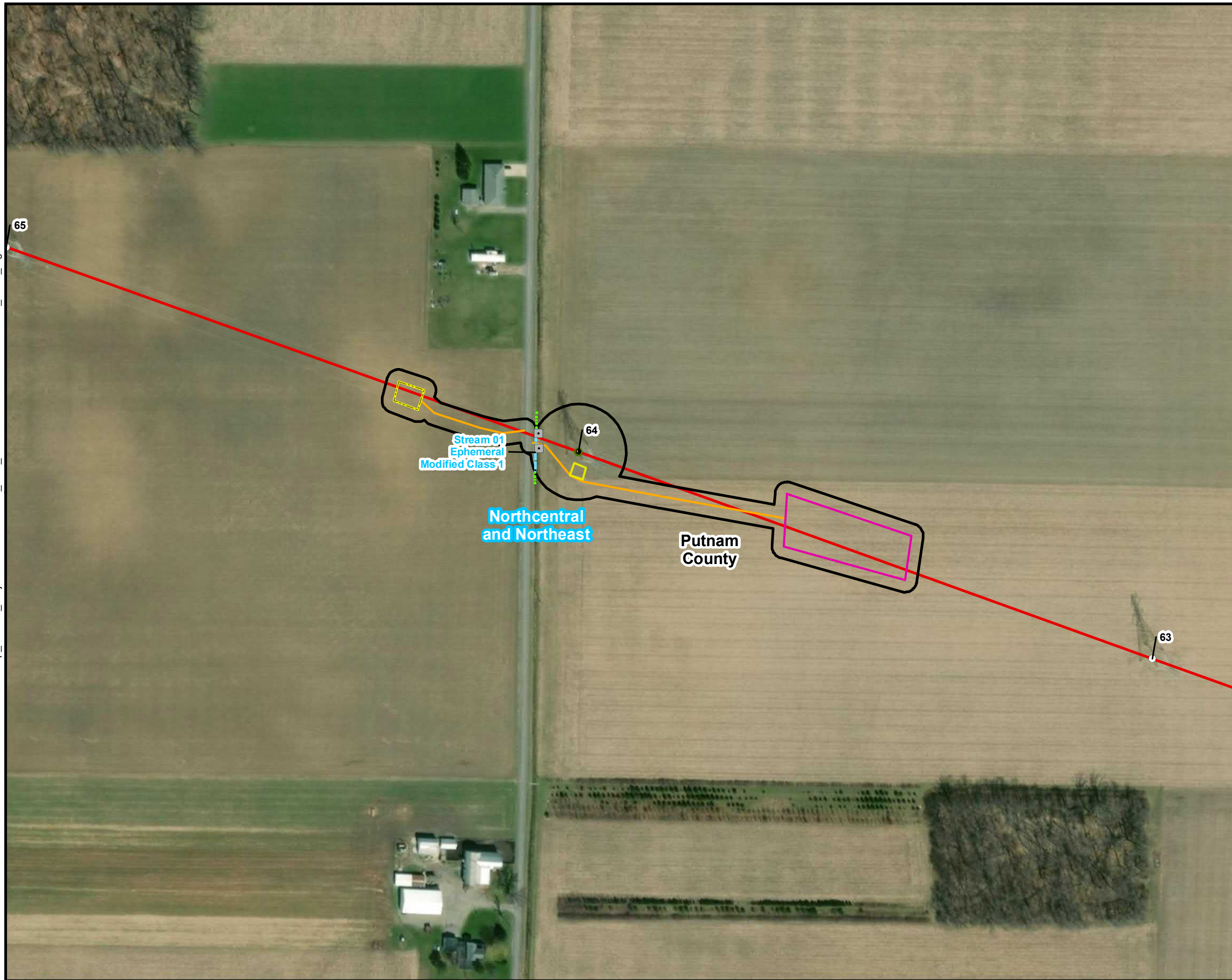
FIGURE 3J  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

JOB NO. 60601386

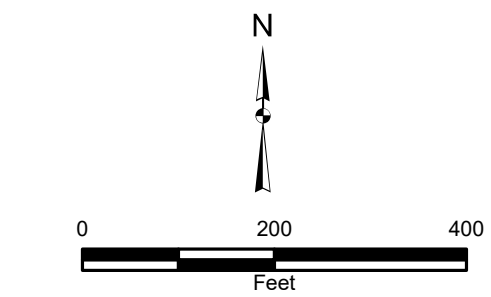




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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Proposed Structure
  - Existing Structure
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access Road
  - Culvert
  - Delineated Ephemeral Stream
  - Approximate Stream Location

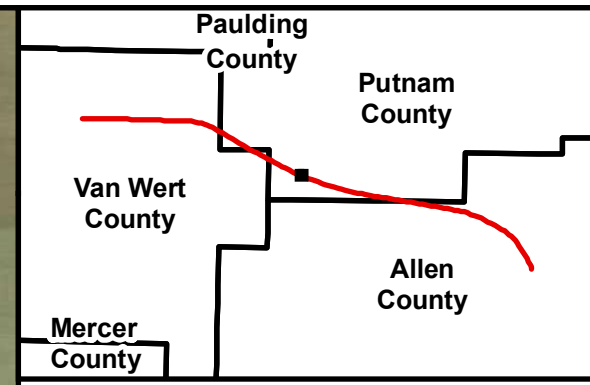
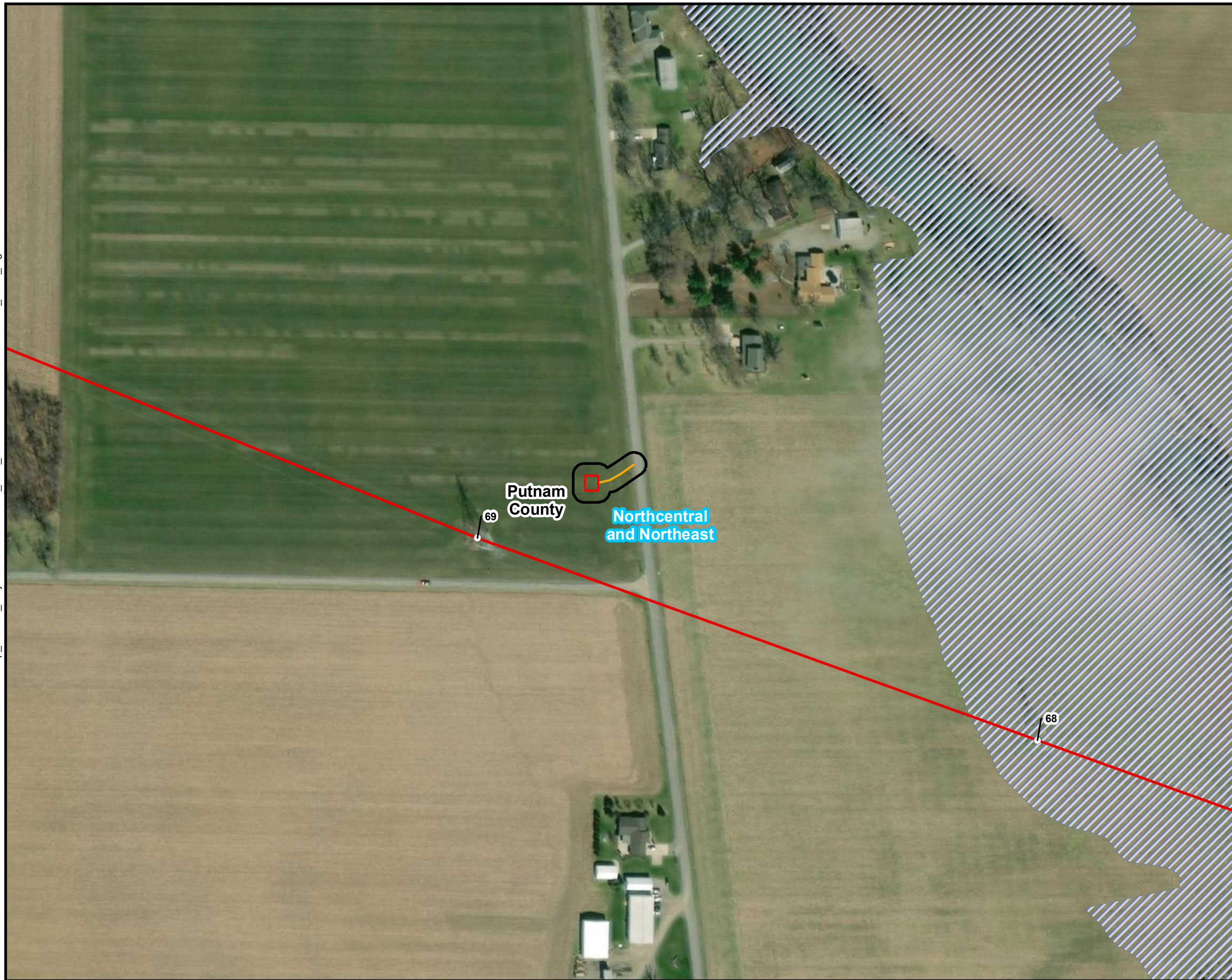


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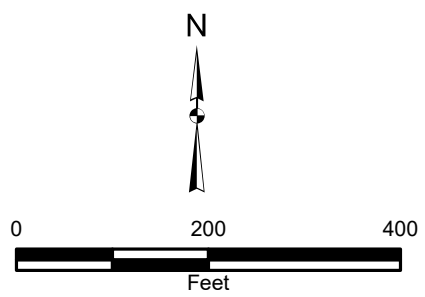
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

**FIGURE 3K  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP**





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Existing Structure
  - Helipad
  - Proposed Access Road
  - 100-yr Floodplain



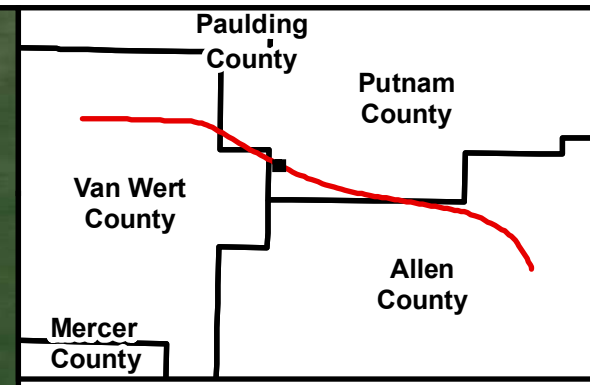
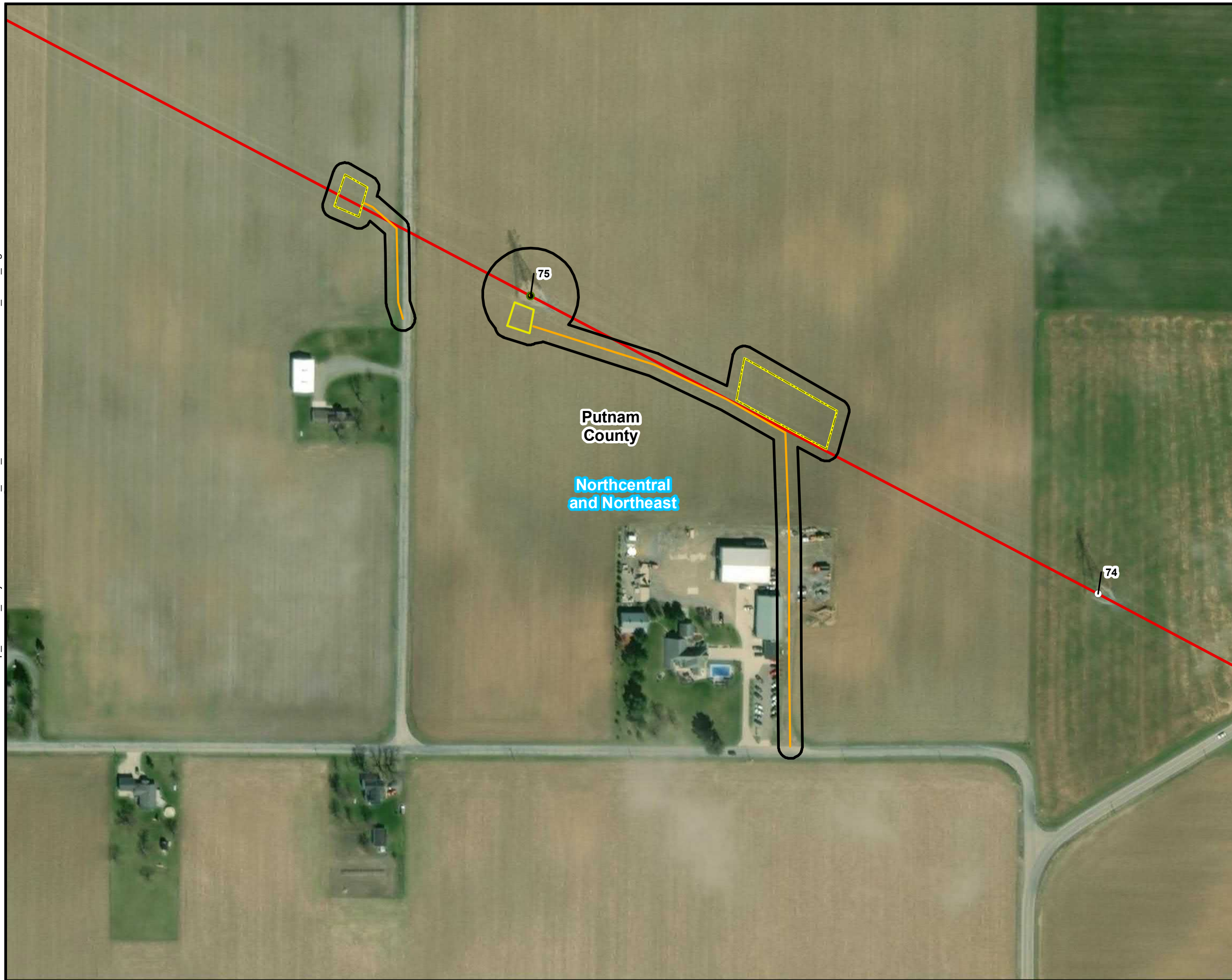
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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

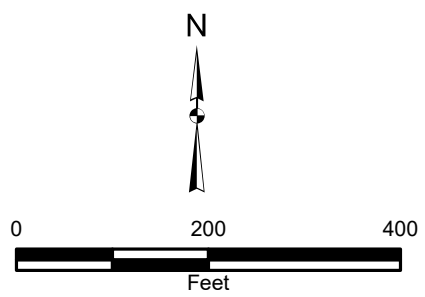
**FIGURE 3L  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP**



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Proposed Structure
  - Existing Structure
  - Pull Pad
  - Work Pad
  - Proposed Access Road

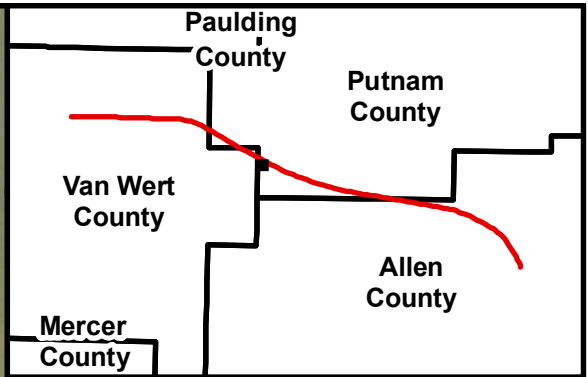
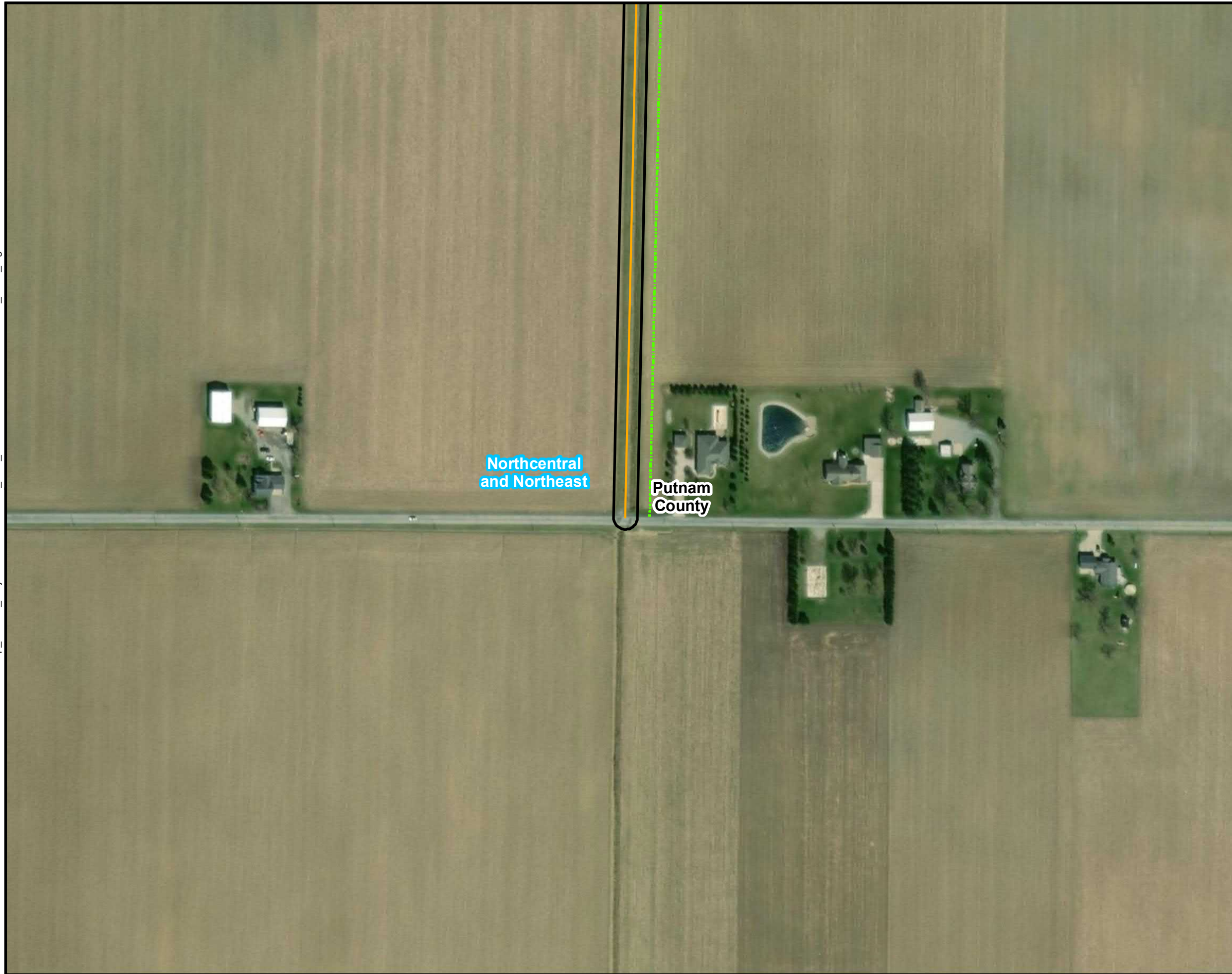


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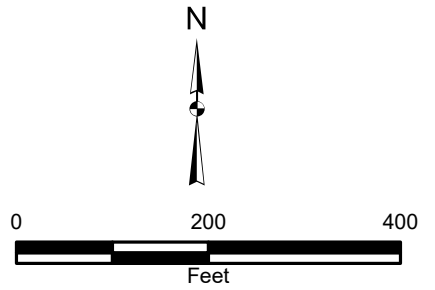
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

FIGURE 3M  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - County
  - USACE Wetland Region
  - Proposed Access Road
  - Approximate Stream Location

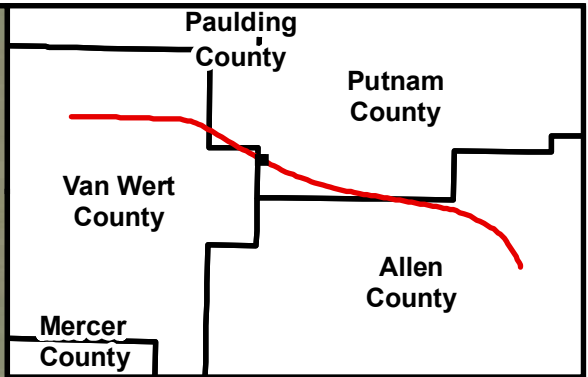
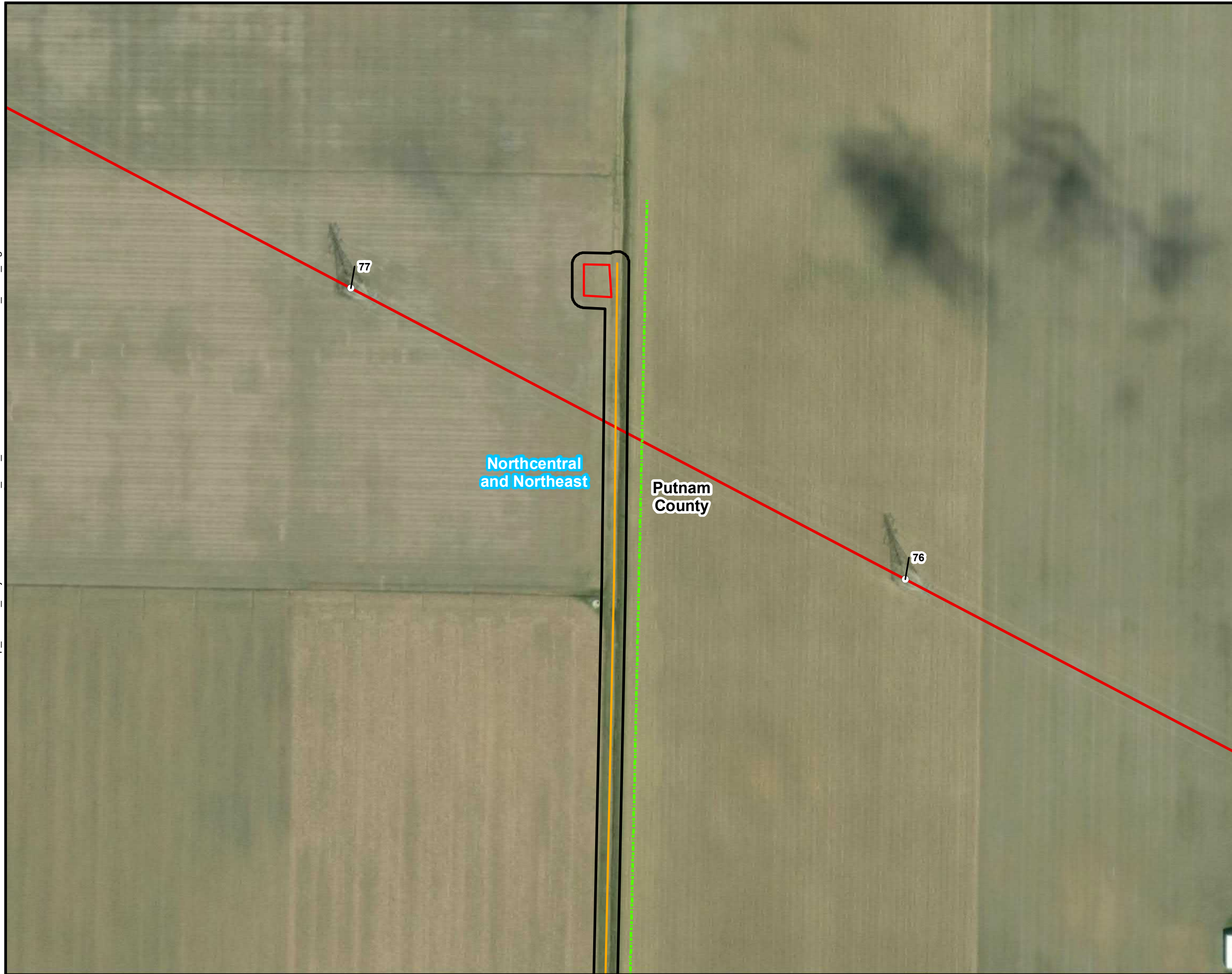


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

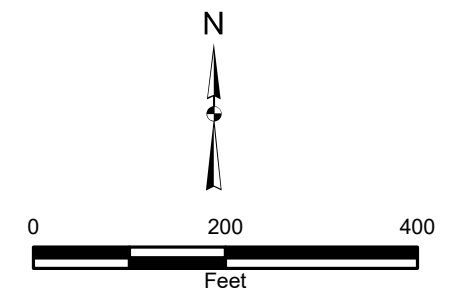
FIGURE 3N  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Existing Structure
- Helipad
- Proposed Access Road
- Approximate Stream Location

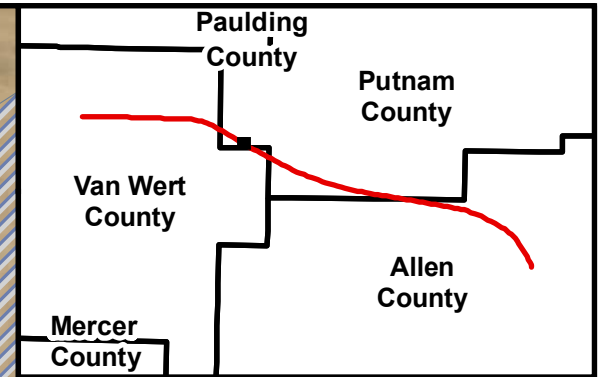
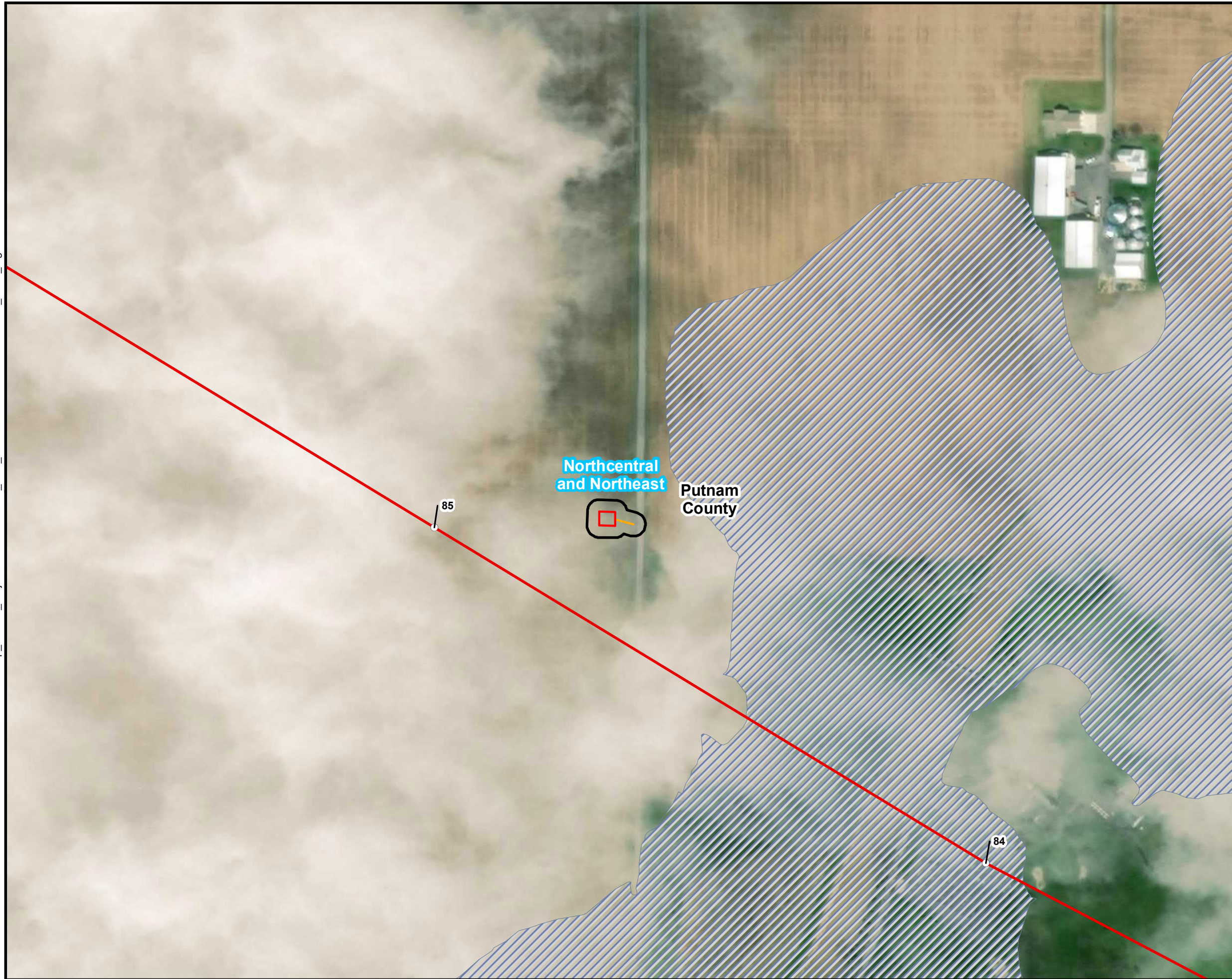


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>









**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

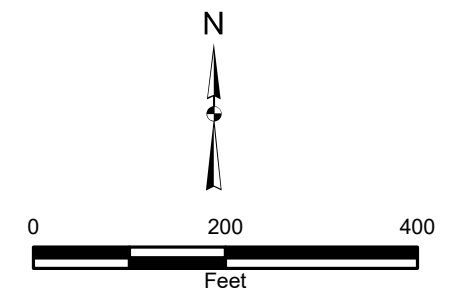
FIGURE 30  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road
-  100-yr Floodplain



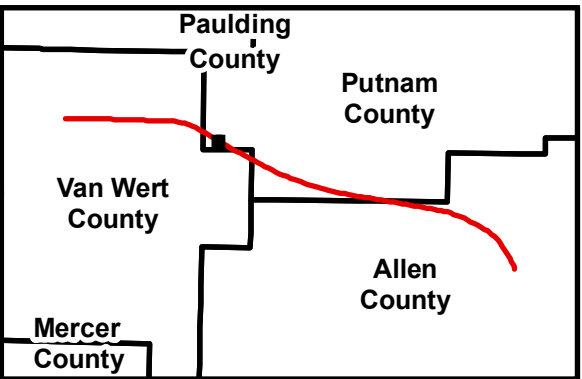
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3P  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

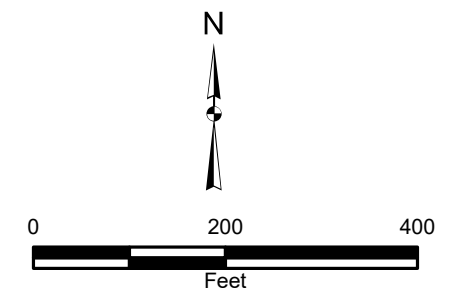


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Proposed Structure
- Existing Structure
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access Road
- Culvert
- Delineated Ephemeral Stream
- Approximate Stream Location



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

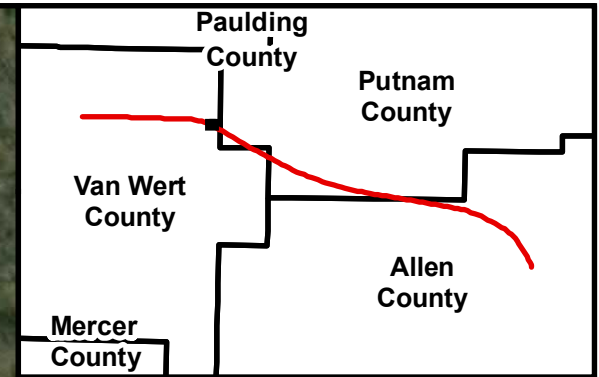
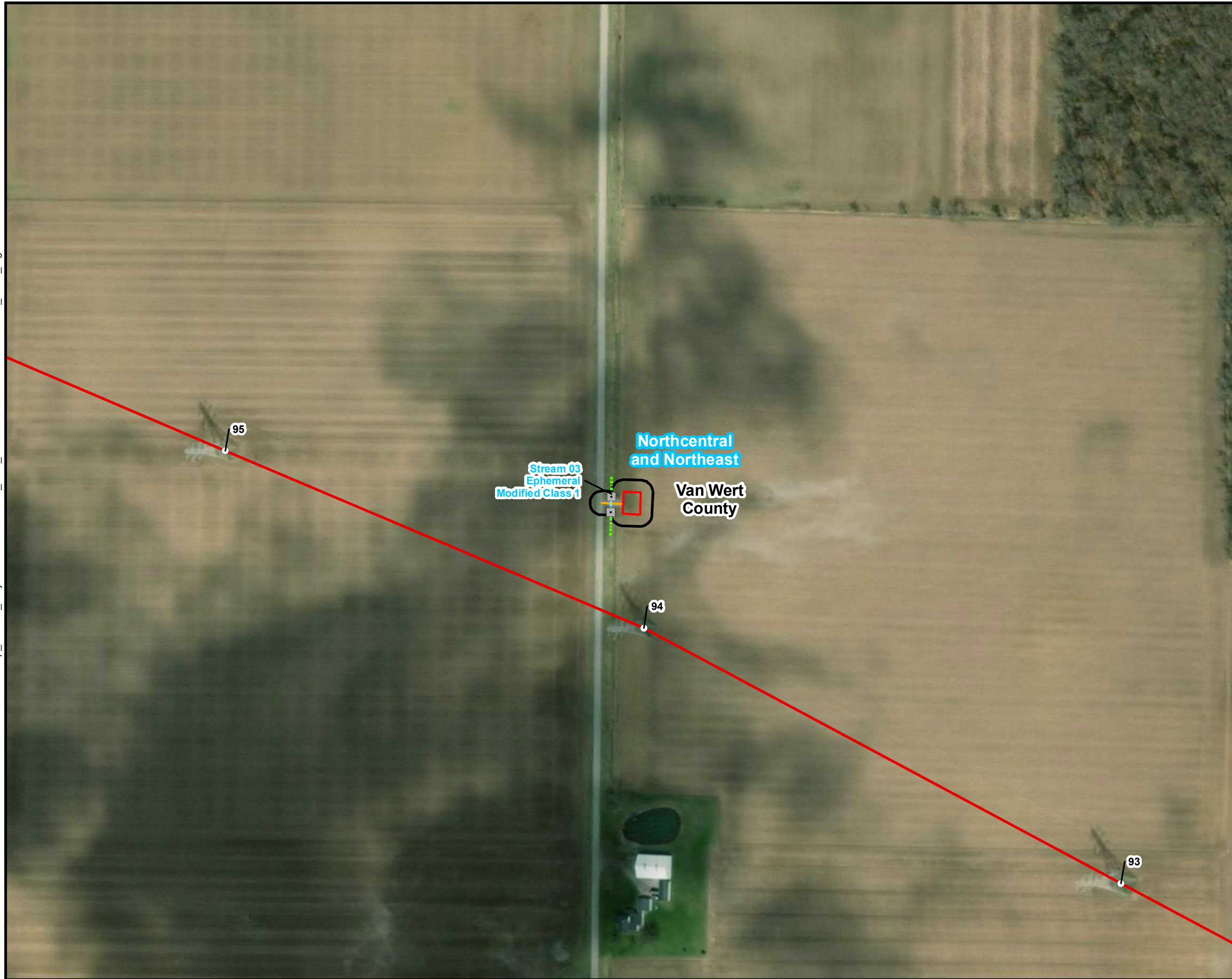
**OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3Q  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

JOB NO. 60601386

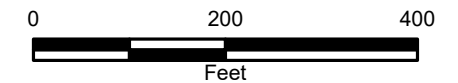
**AECOM**





LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Existing Structure
- Helipad
- Proposed Access Road
- Culvert
- Delineated Ephemeral Stream
- Approximate Stream Location

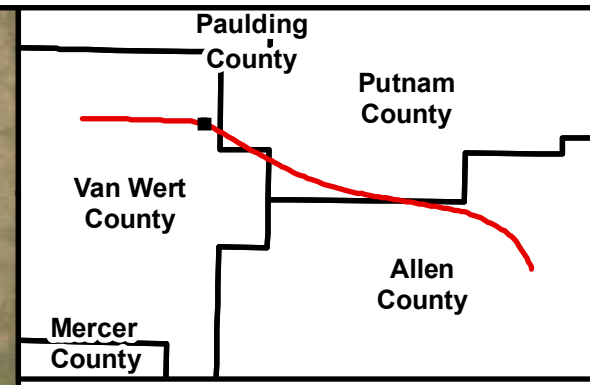
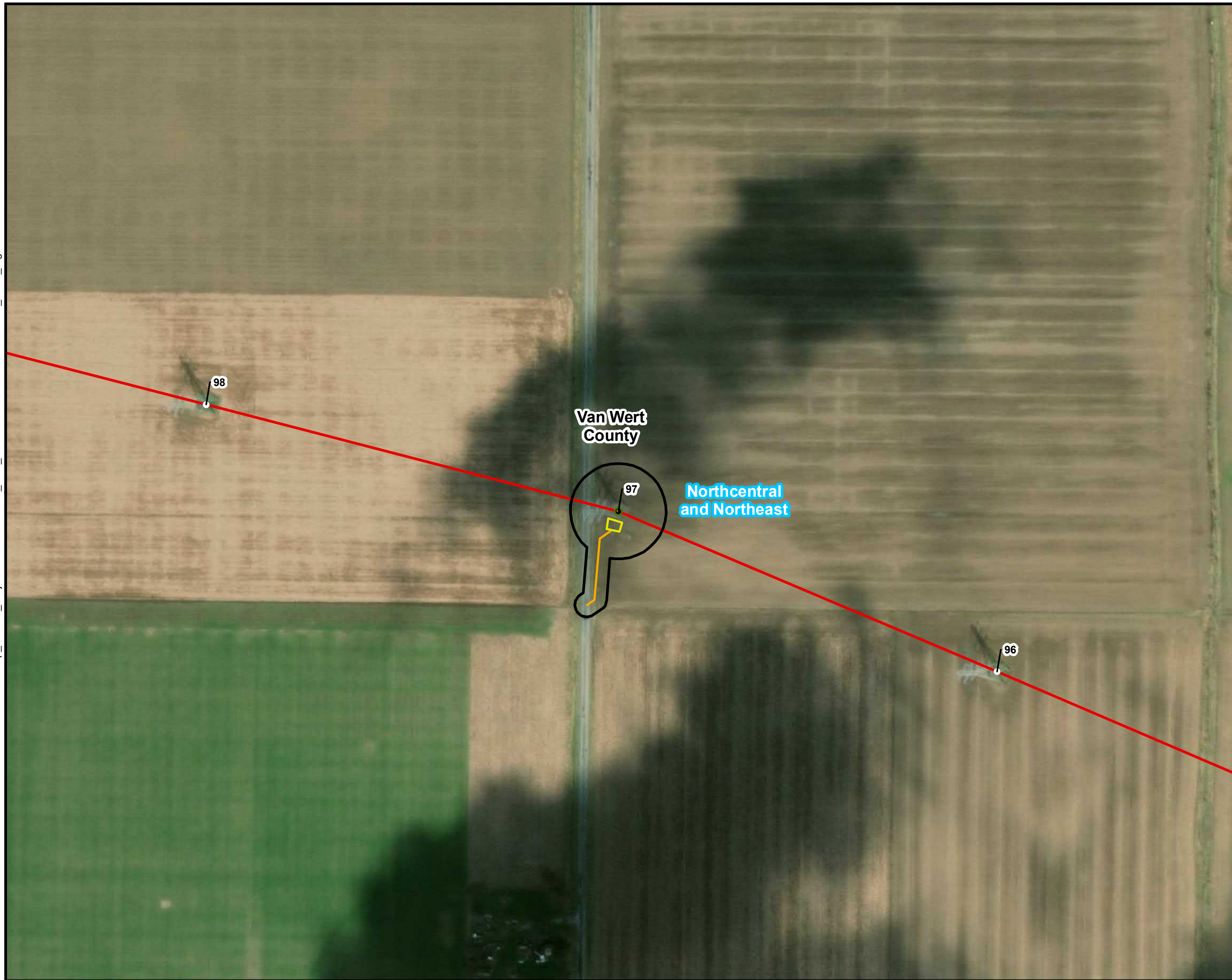


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

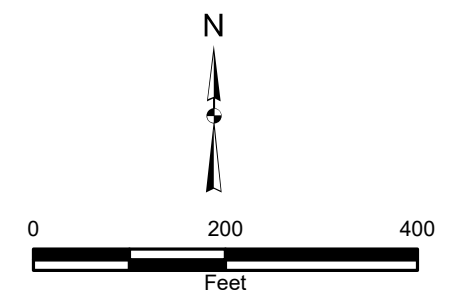
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3R  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Proposed Structure
  - Existing Structure
  - Work Pad
  - Proposed Access Road



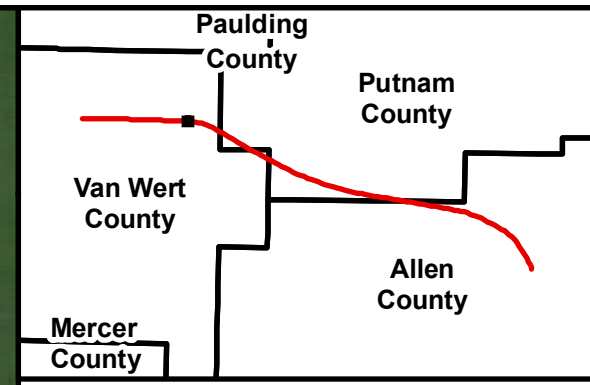
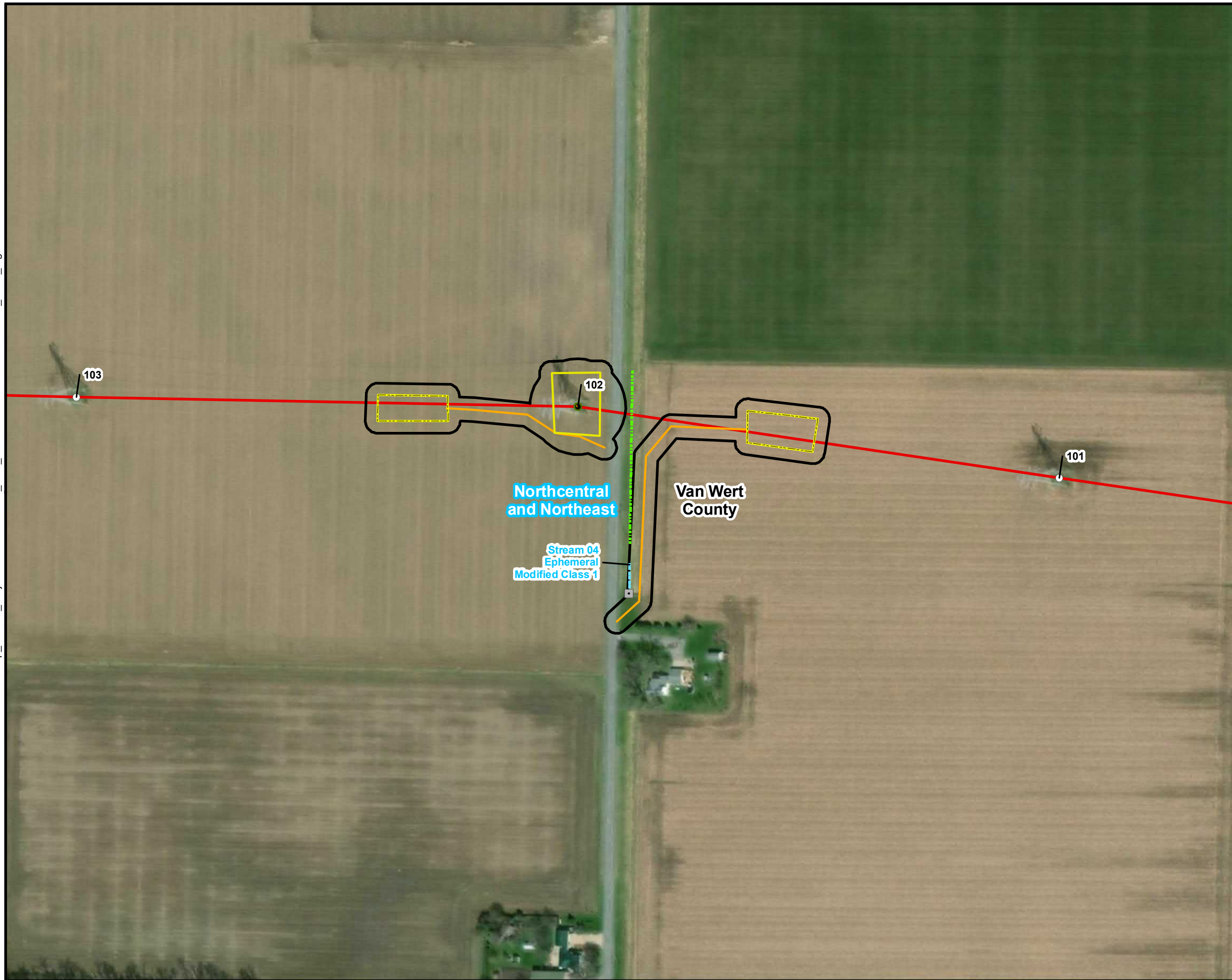
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

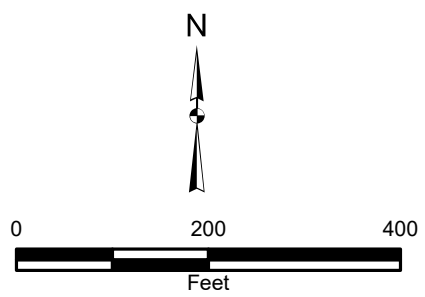
FIGURE 3S  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Proposed Structure
  - Existing Structure
  - Pull Pad
  - Work Pad
  - Proposed Access
  - Culvert
  - Delineated Ephemeral Stream
  - Approximate Stream Location

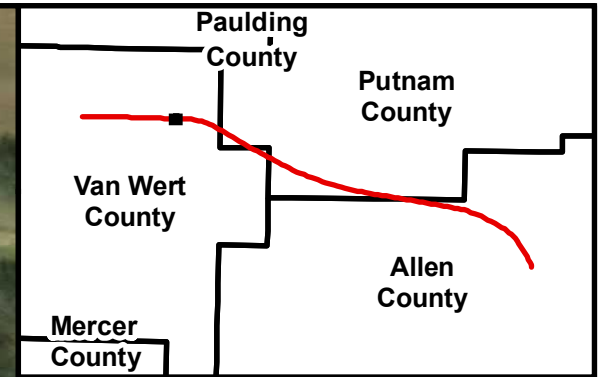
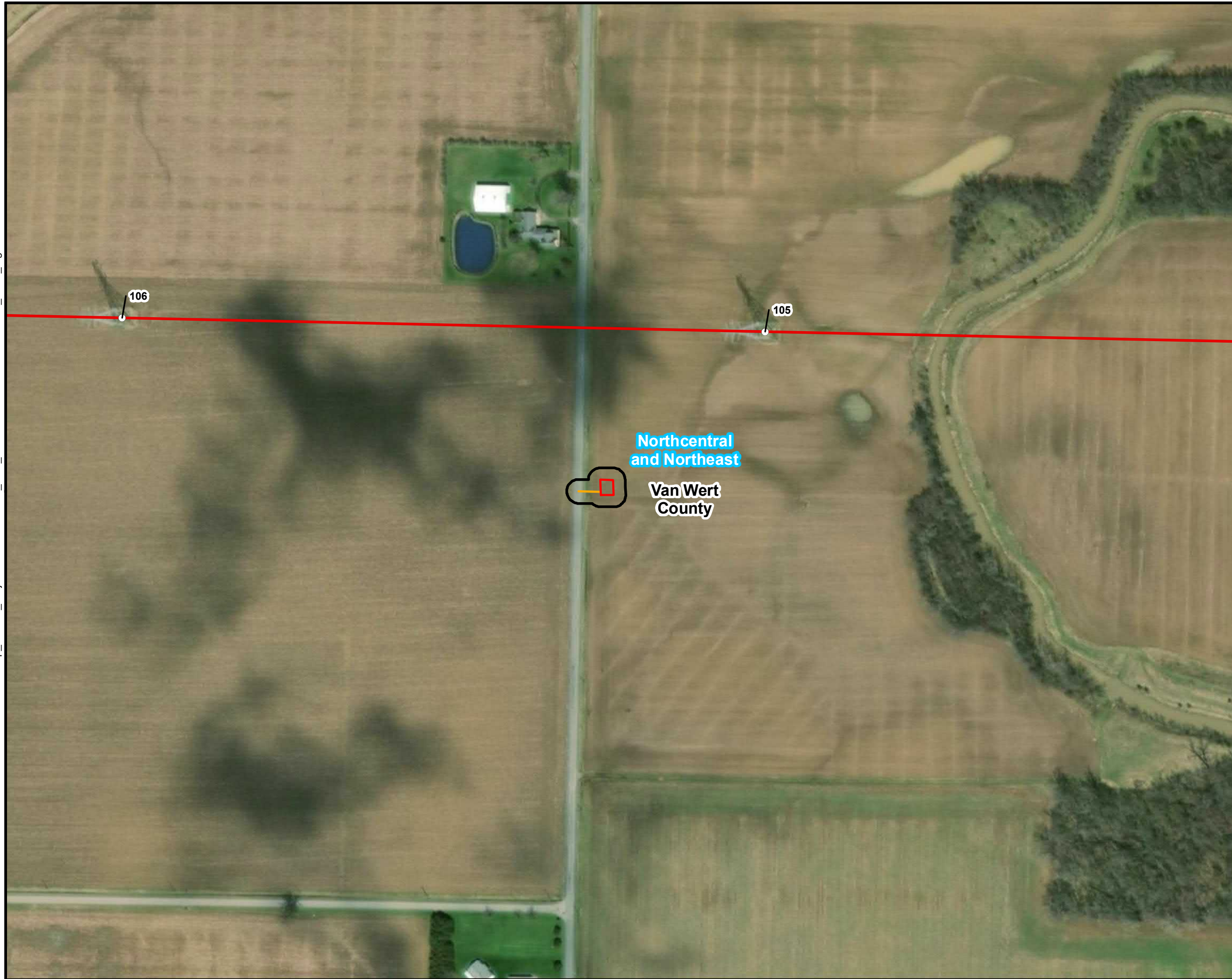


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>








**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

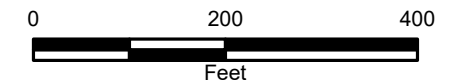
**FIGURE 3T  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP**





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Existing Structure
-  Helipad
-  Proposed Access Road

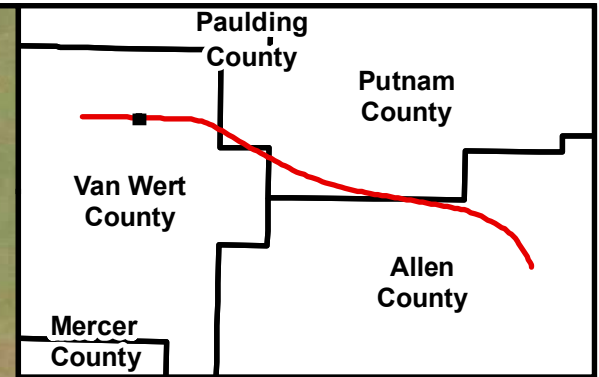
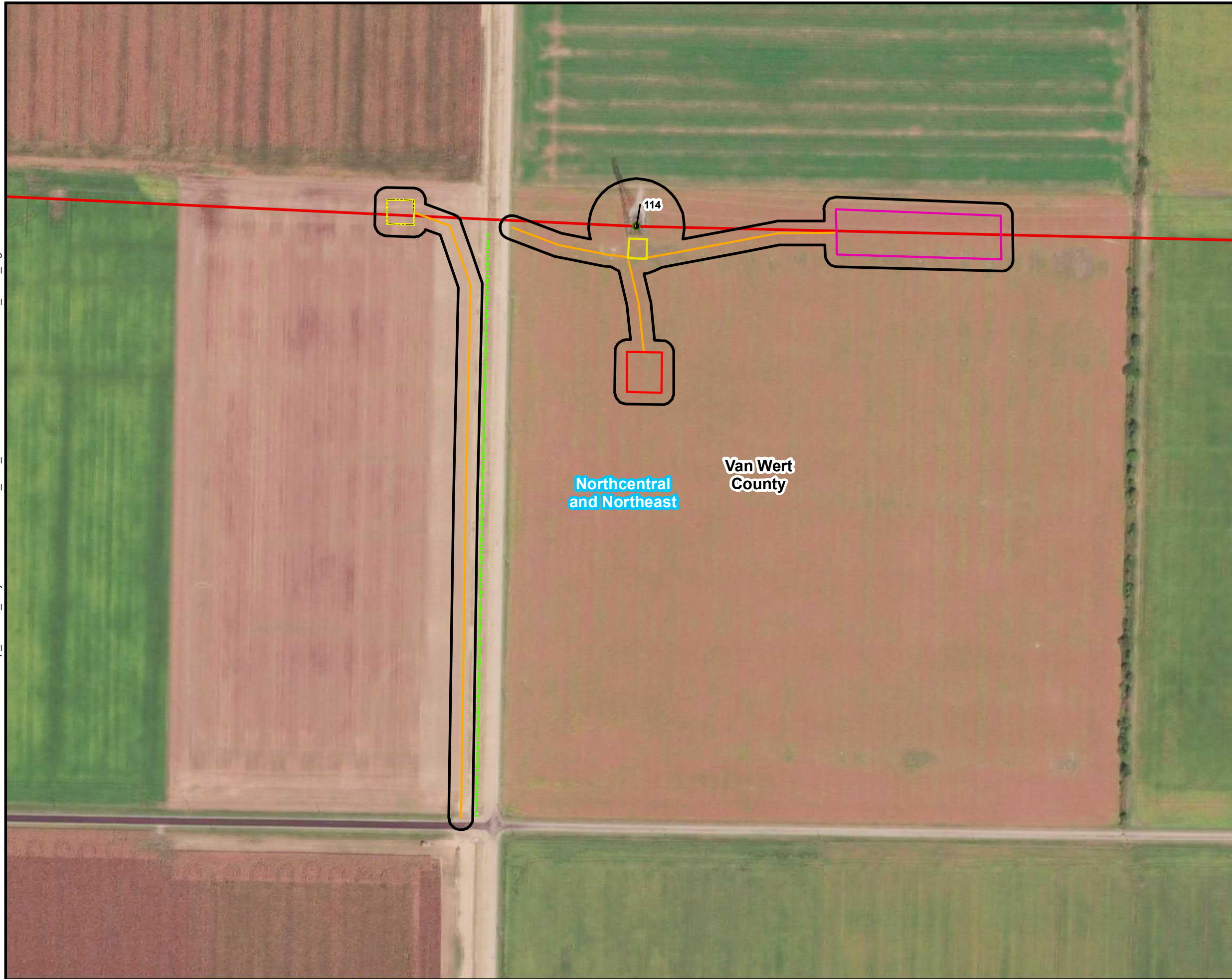


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

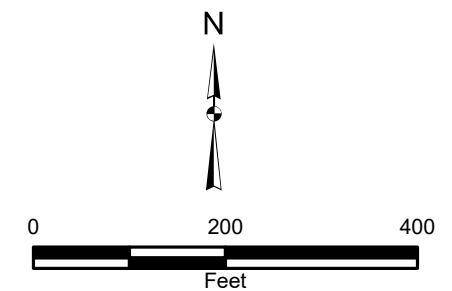
FIGURE 3U  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Proposed Structure
- Existing Structure
- Helipad
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access Road
- Approximate Stream Location



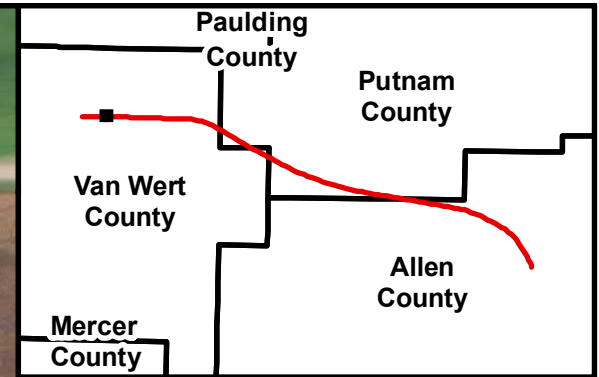
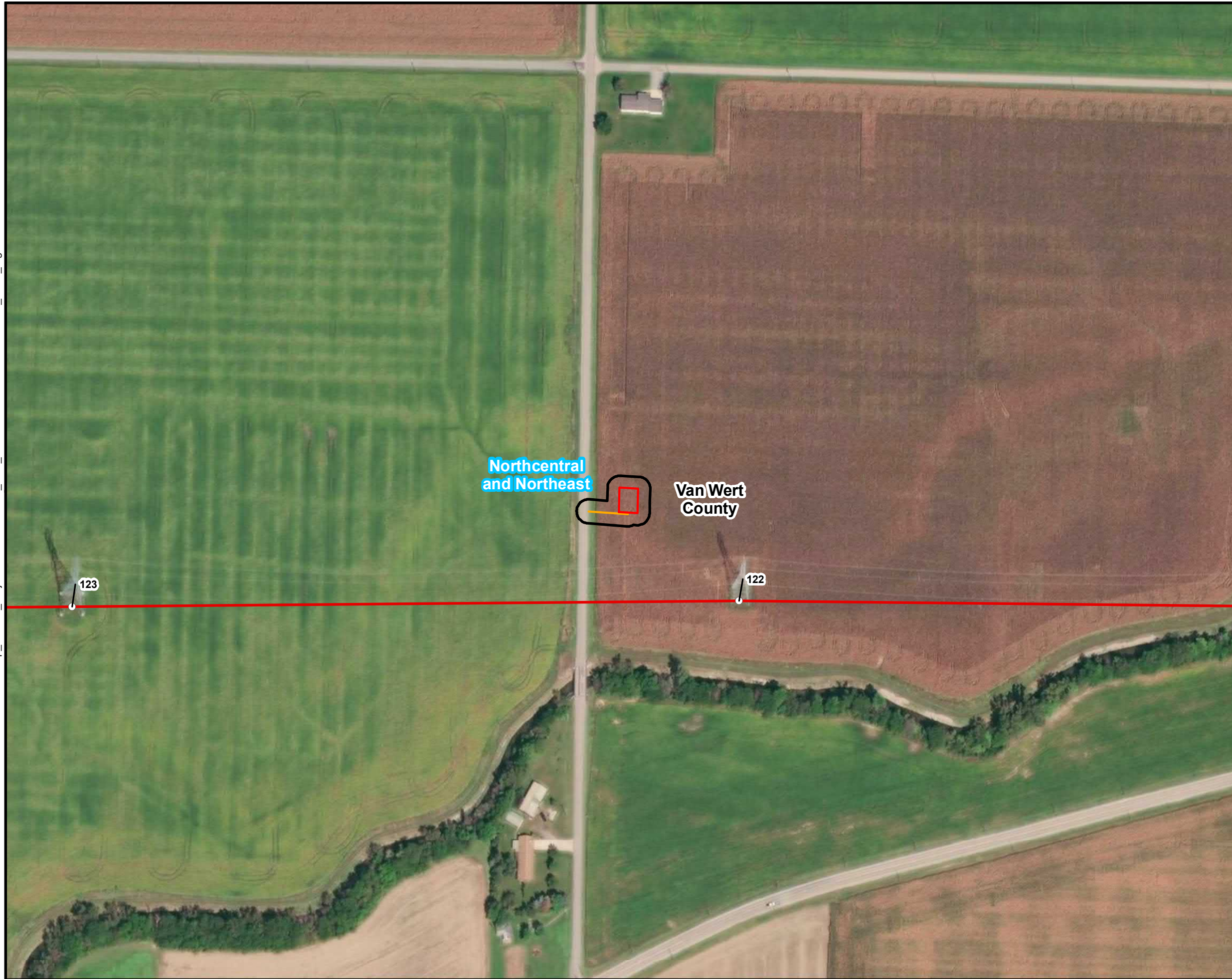
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3V  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP

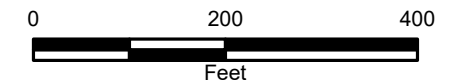


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Existing Structure
- Helipad
- Proposed Access Road



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

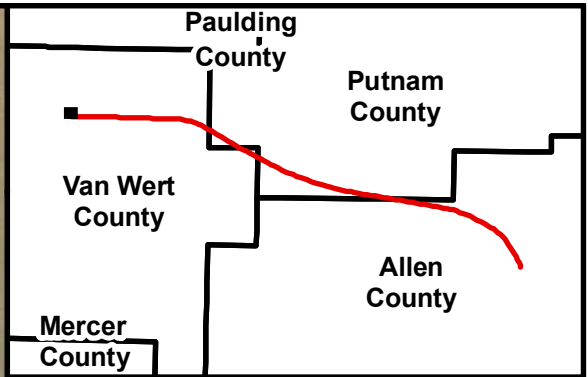
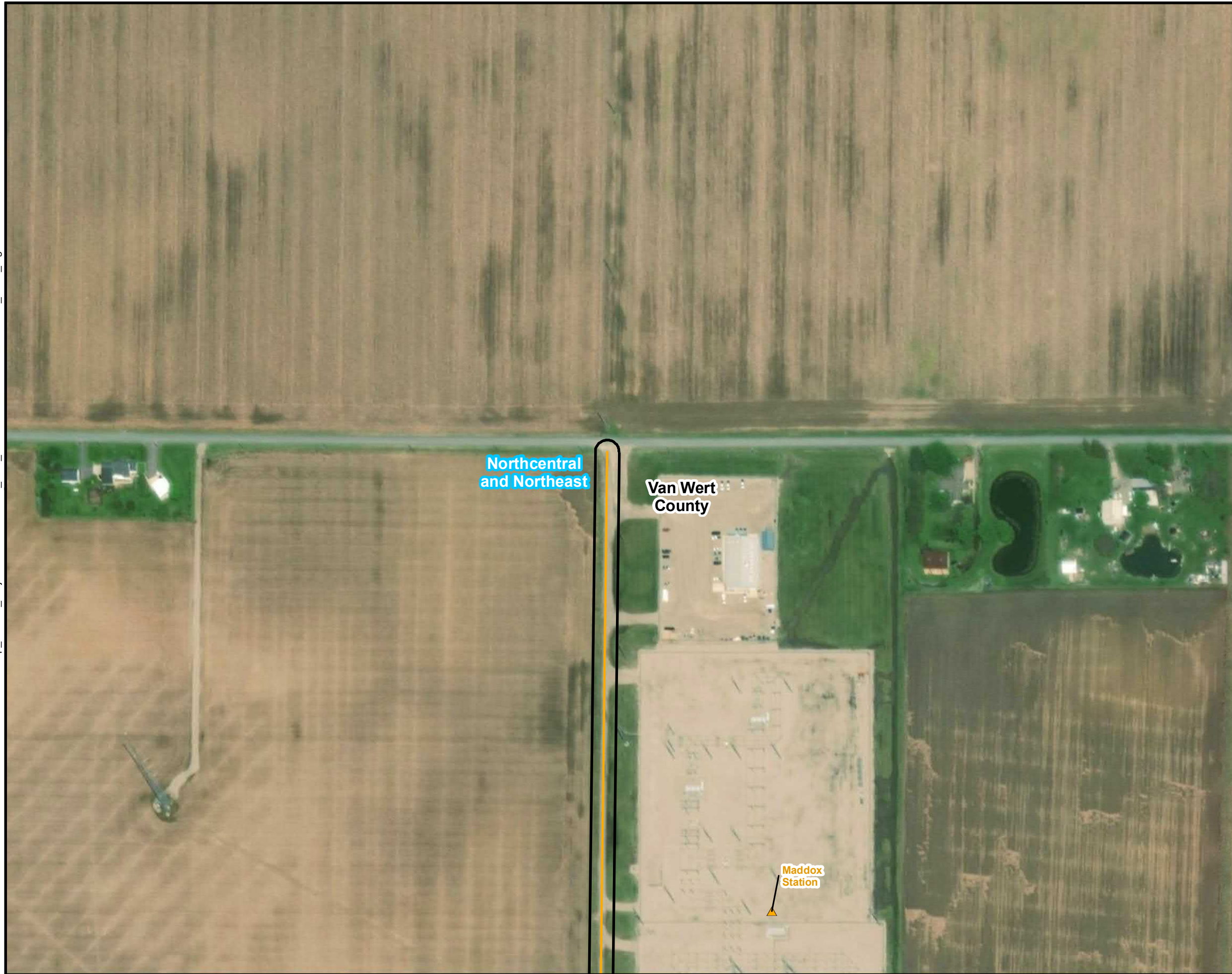
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 3V  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP






JOB NO. 60601386

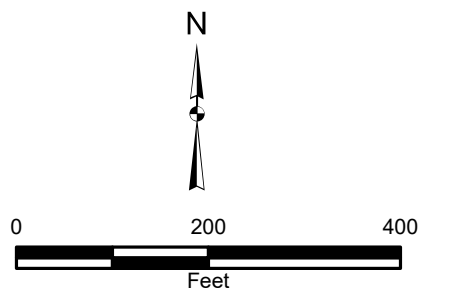






LEGEND:

-  Station
-  Project Survey Corridor
-  County
-  USACE Wetland Region
-  Proposed Access Road

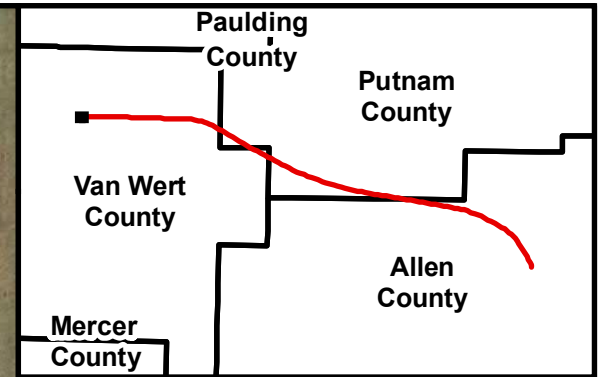
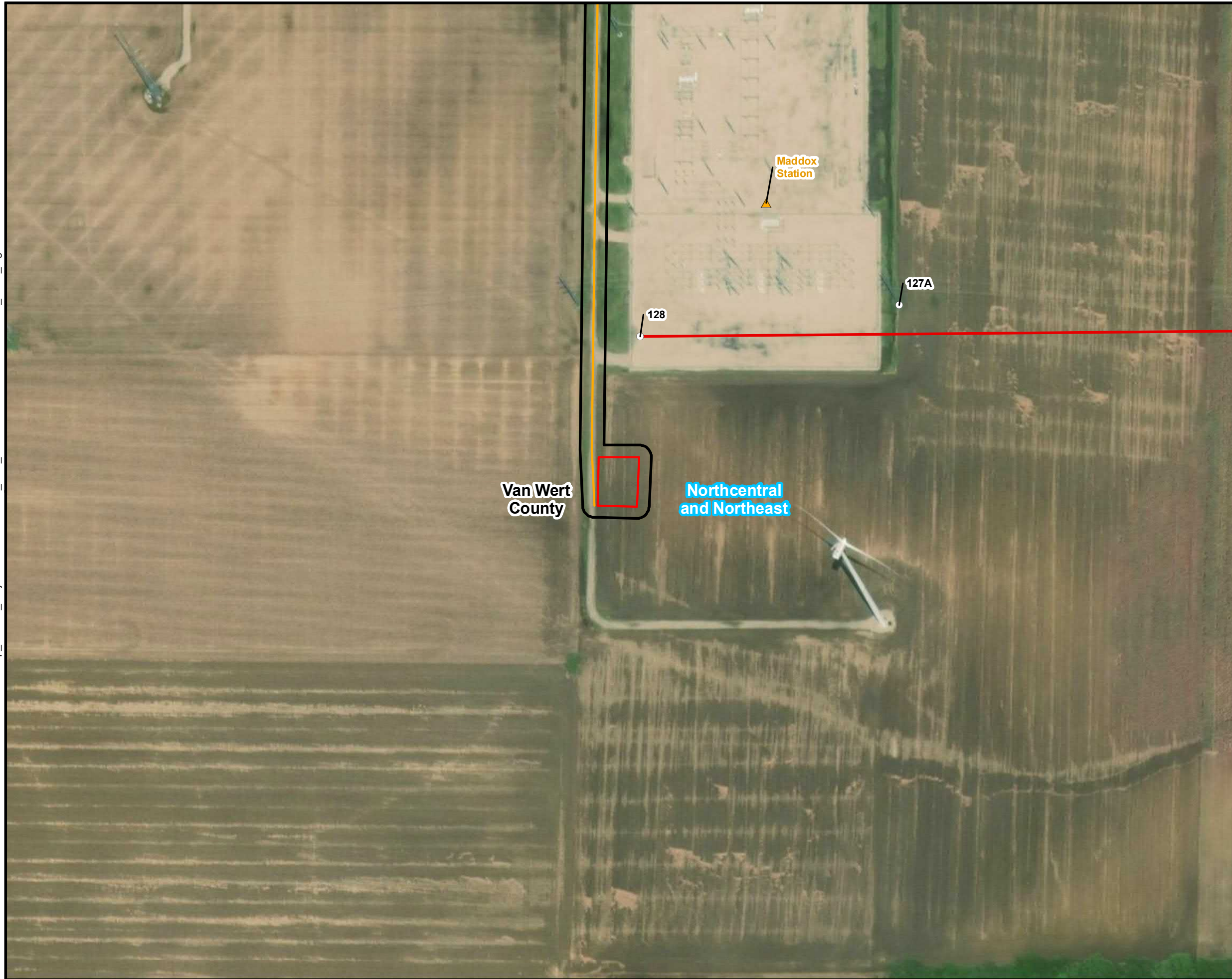


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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

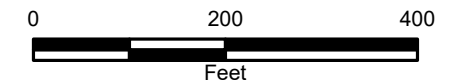
FIGURE 3W  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





LEGEND:

- Station
- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Existing Structure
- Helipad
- Proposed Access Road

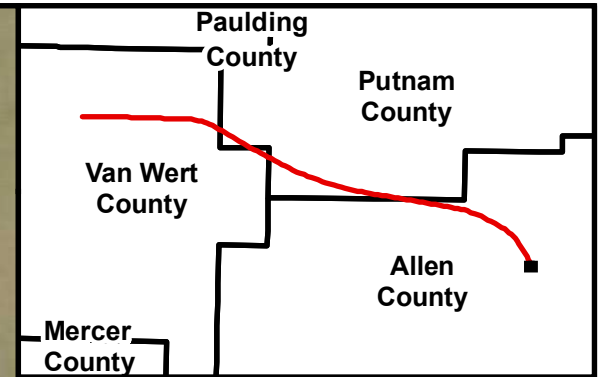
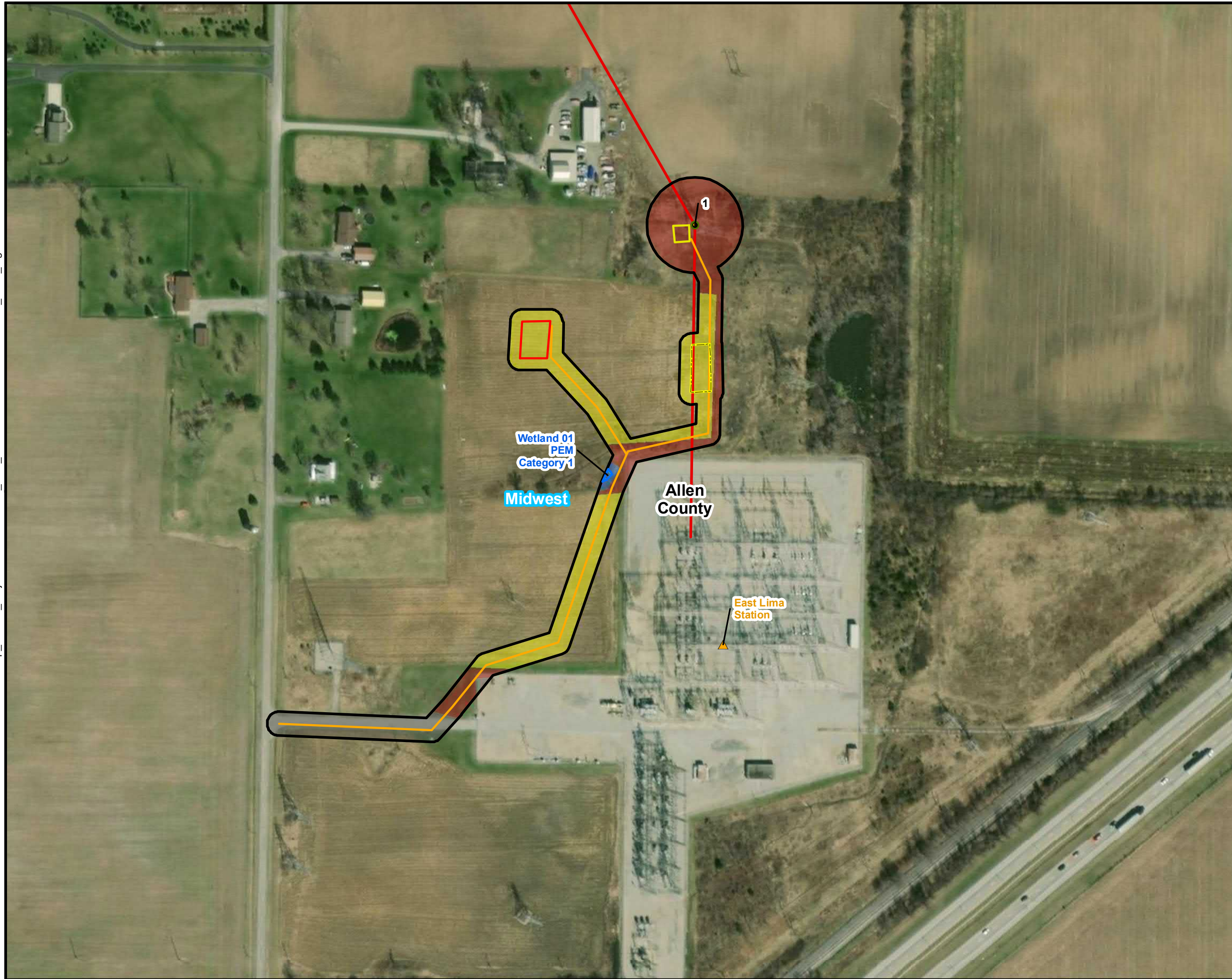


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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

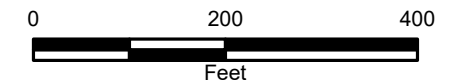
FIGURE 3X  
WETLAND DELINEATION  
AND STREAM ASSESSMENT MAP





LEGEND:

- Station
- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Pull Pad
- Work Pad
- Proposed Access Road
- Proposed Structure
- Existing Structure
- Delineated Wetland
- Agricultural Land
- Old Field
- Stream/Wetland
- Urban

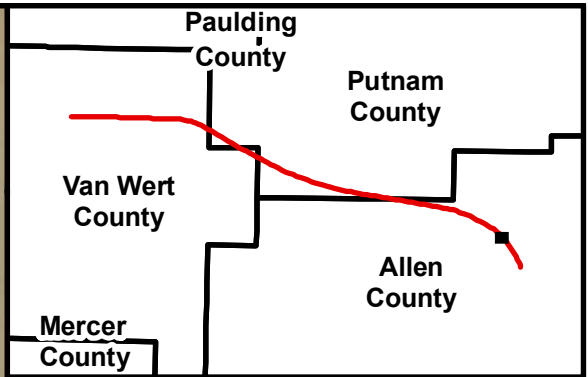
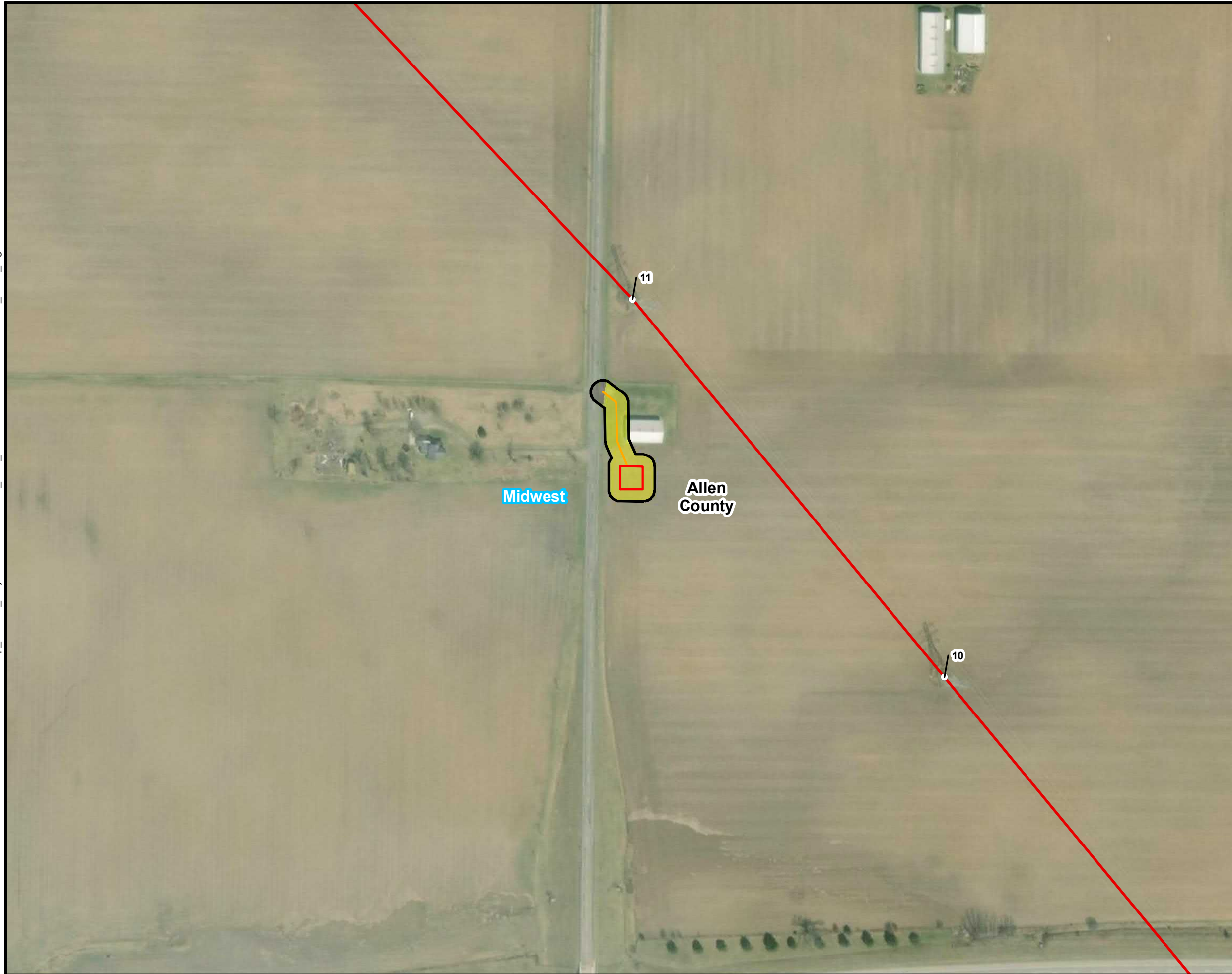


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>










**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

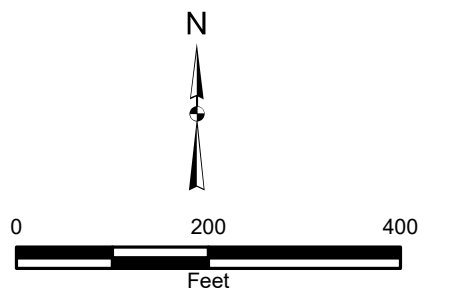
FIGURE 4A  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Helipad
-  Proposed Access Road
-  Existing Structure
-  Agricultural Land
-  Urban



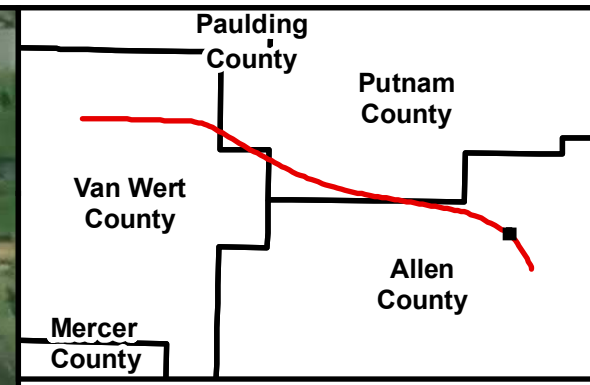
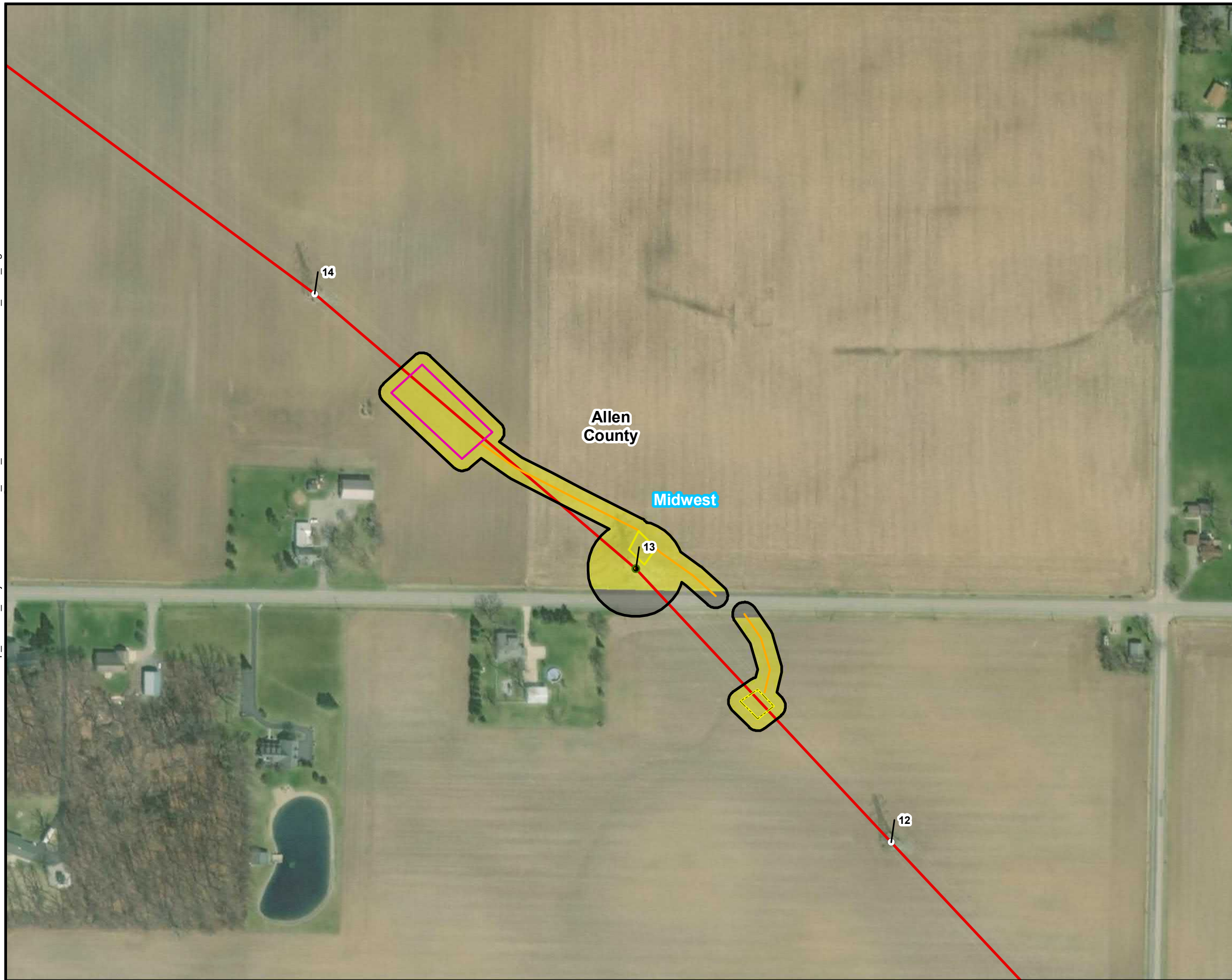
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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

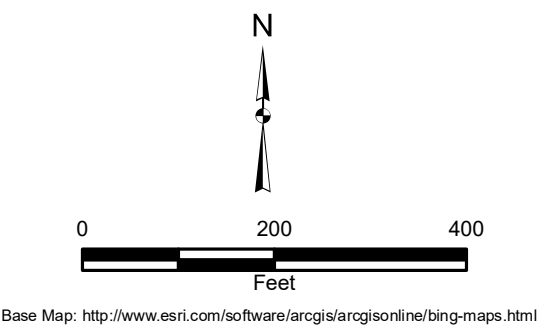
FIGURE 4B  
VEGETATION COMMUNITIES  
ASSESSMENT MAP



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access Road
  - Proposed Structure
  - Existing Structure
  - Agricultural Land
  - Urban

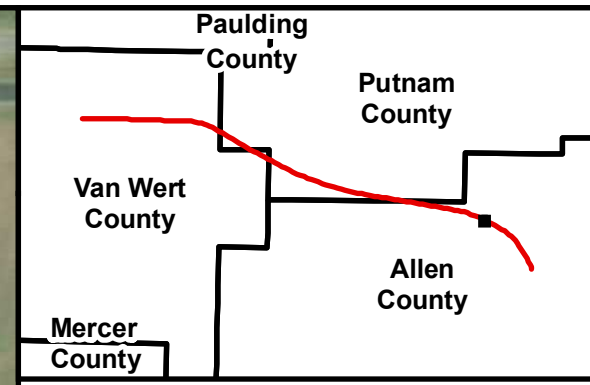
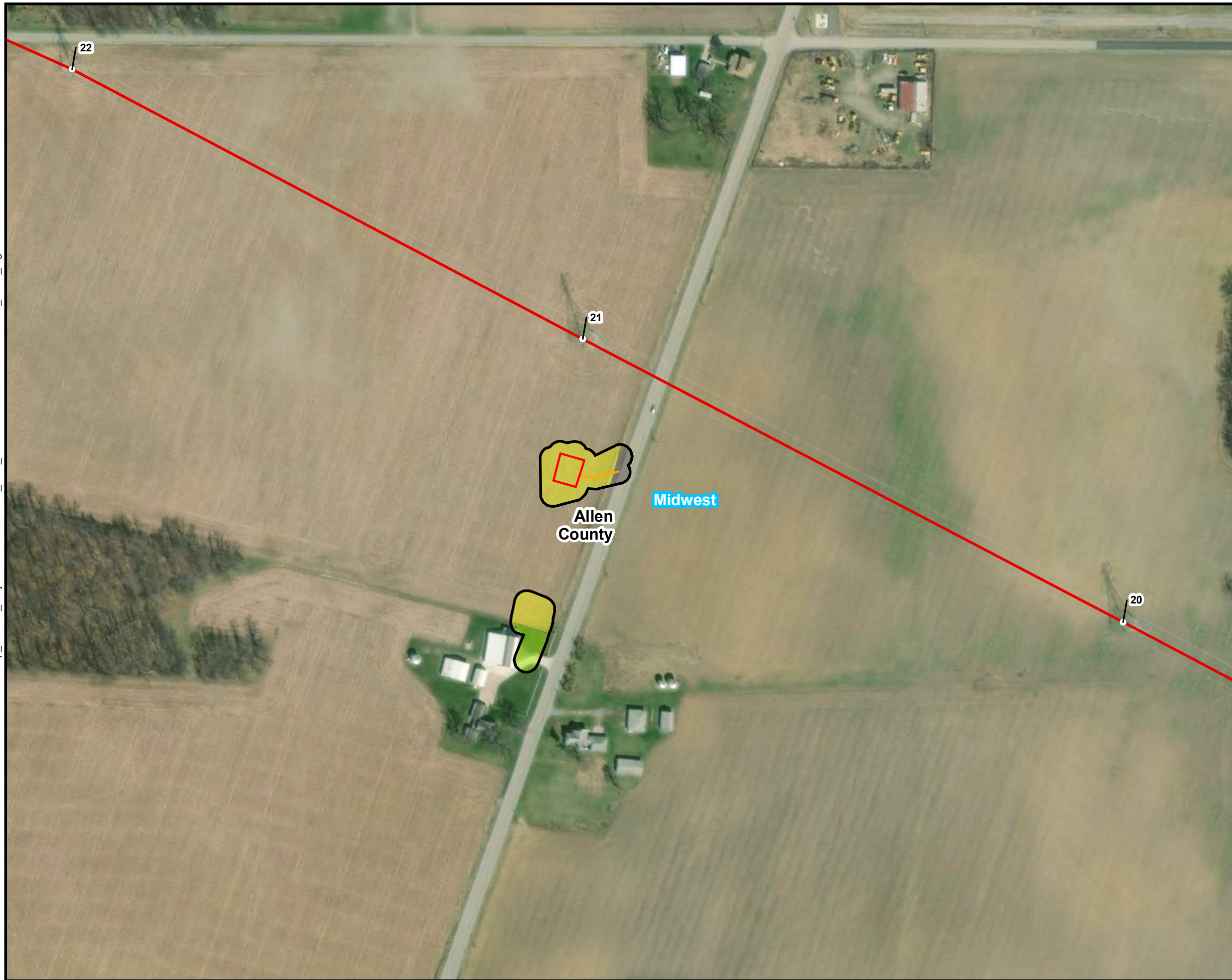


**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

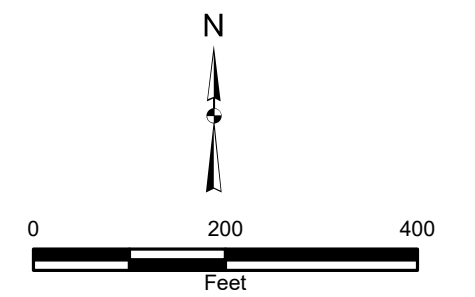
FIGURE 4C  
VEGETATION COMMUNITIES  
ASSESSMENT MAP



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - Agricultural Land
  - Landscaped Area
  - Urban



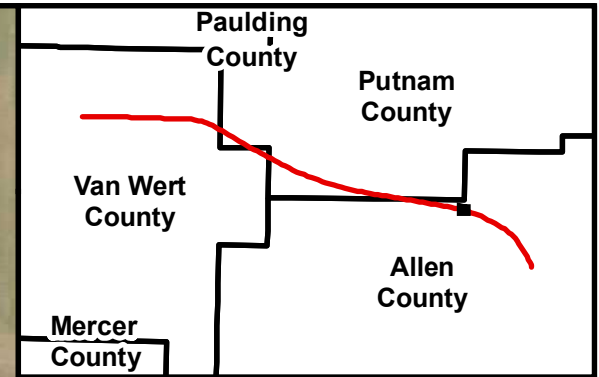
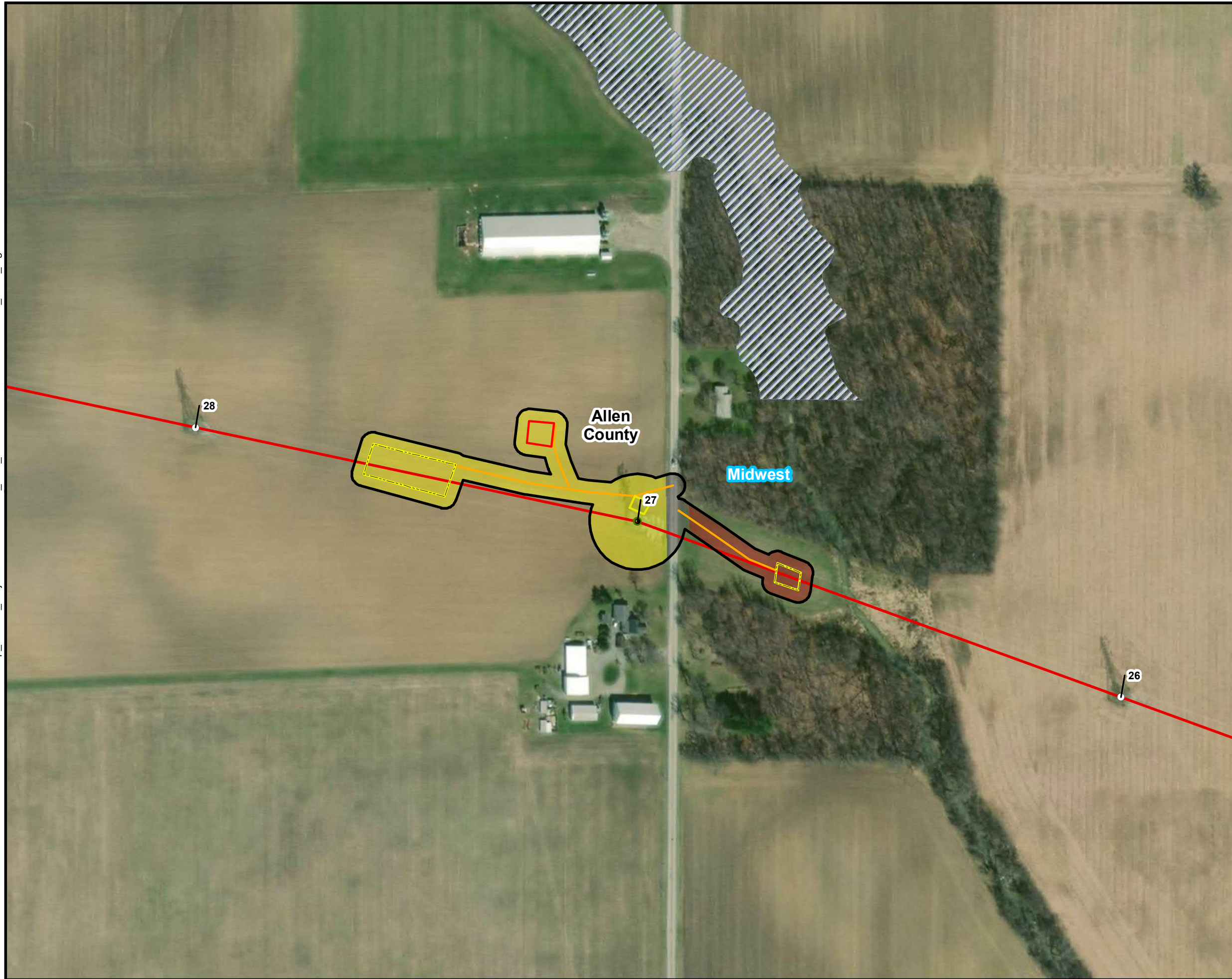
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4D  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

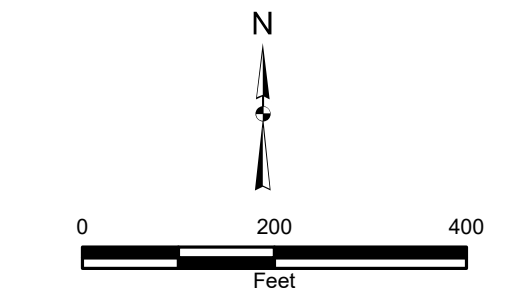


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Pull Pad
- Work Pad
- Proposed Access Road
- Proposed Structure
- Existing Structure
- 100-yr Floodplain
- Agricultural Land
- Old Field
- Urban

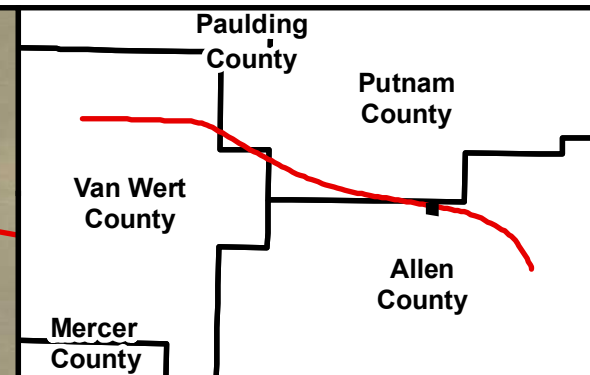
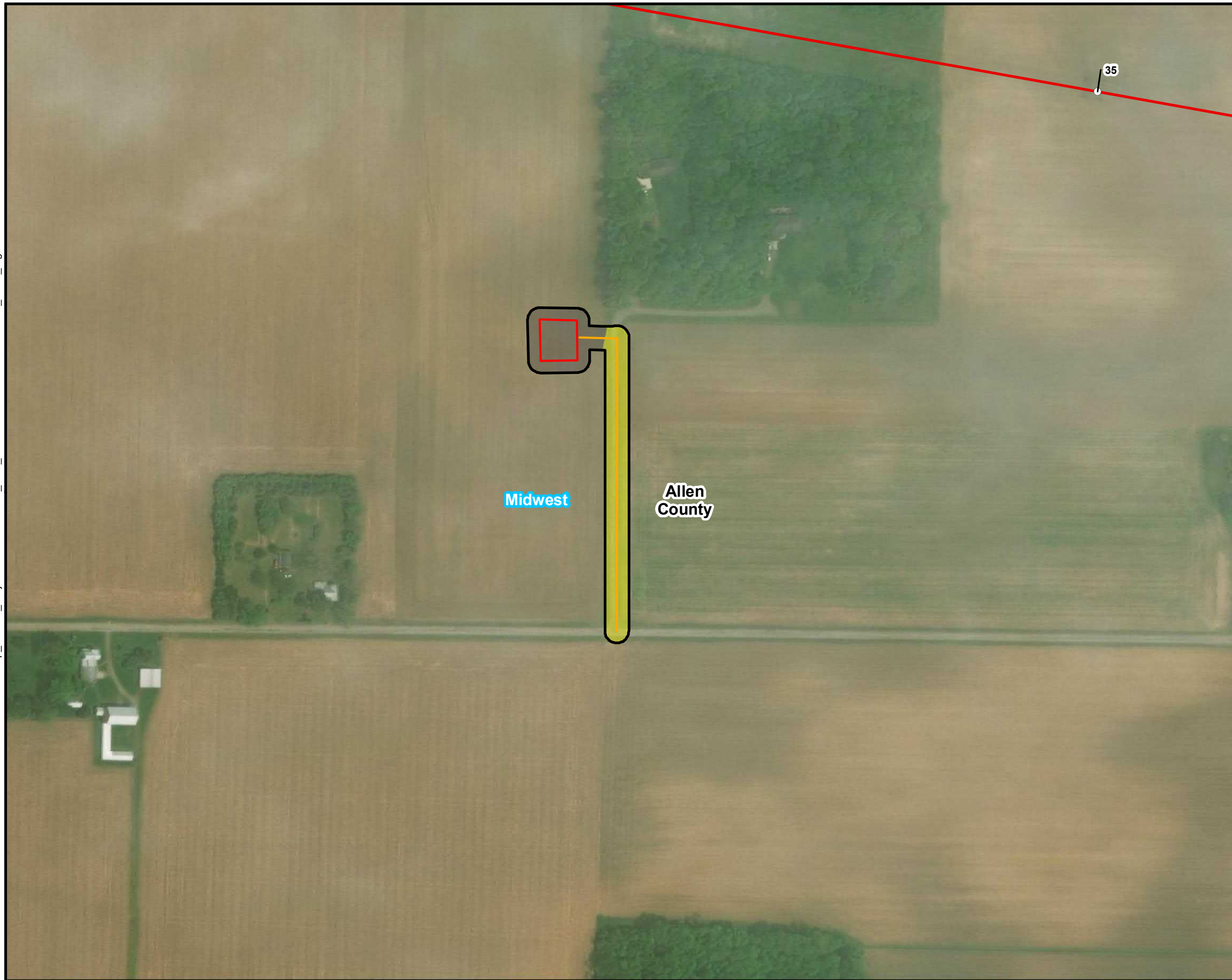


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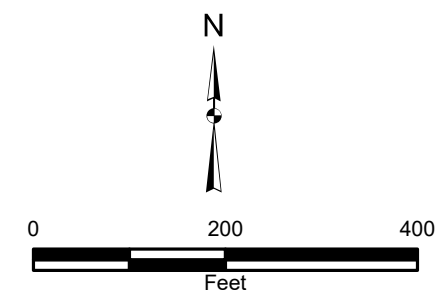
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4E  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - Agricultural Land
  - Urban



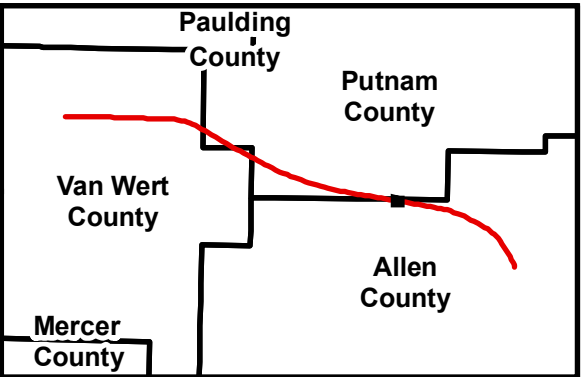
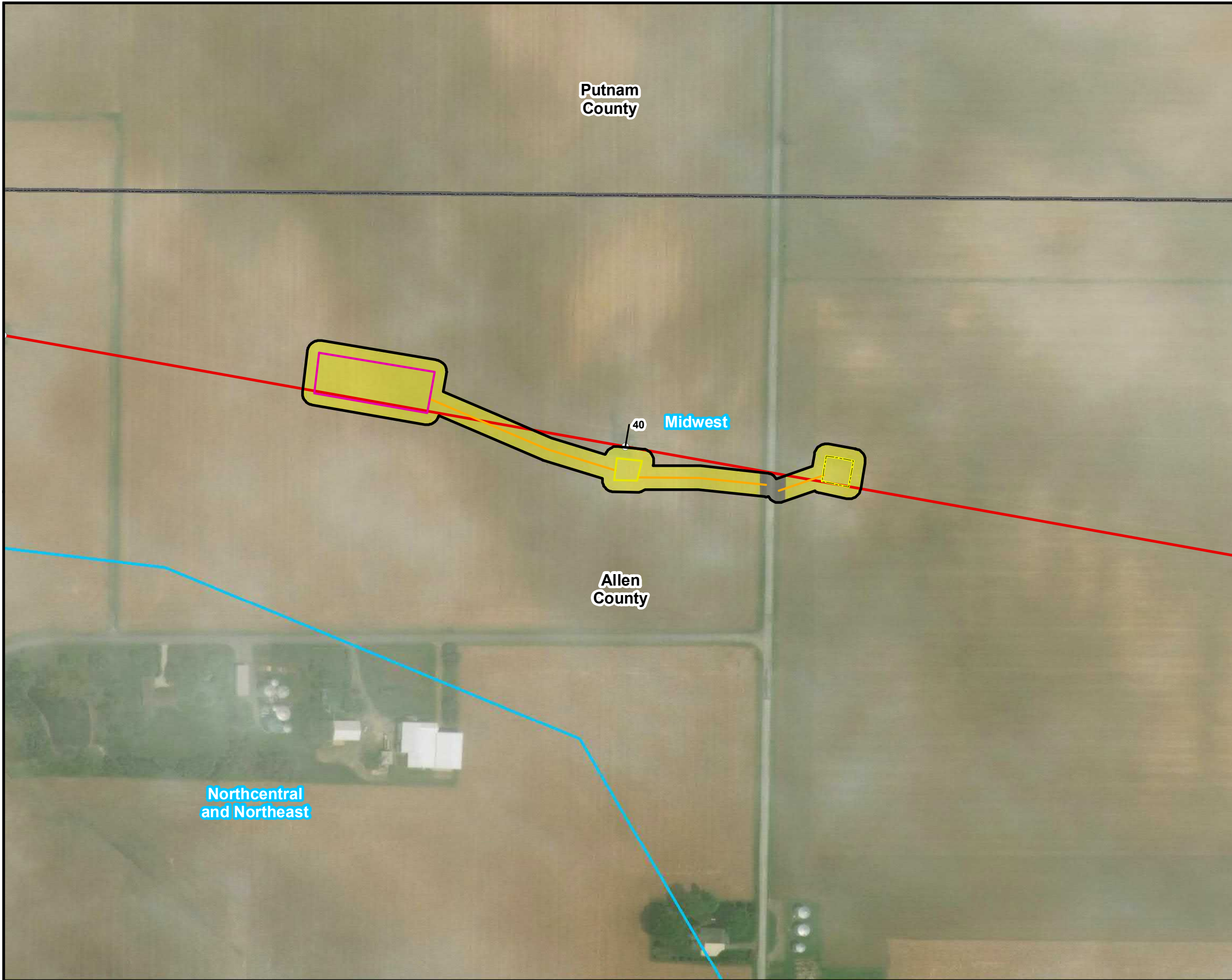
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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

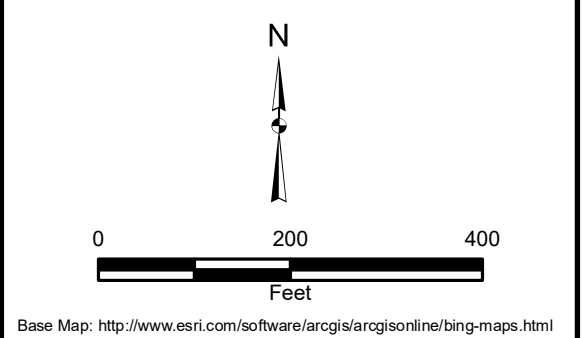
FIGURE 4F  
VEGETATION COMMUNITIES  
ASSESSMENT MAP



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Snub Site
  - Work Pad
  - Proposed Access Road
  - Existing Structure
  - Agricultural Land
  - Urban

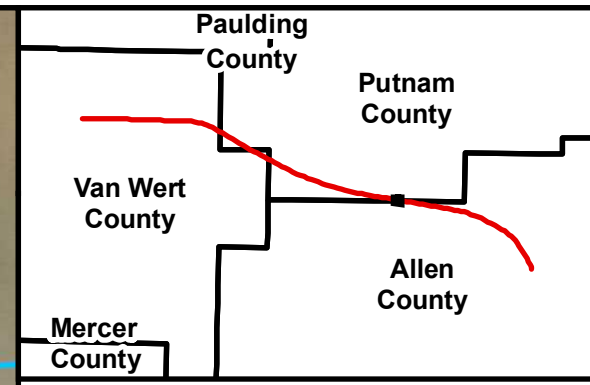
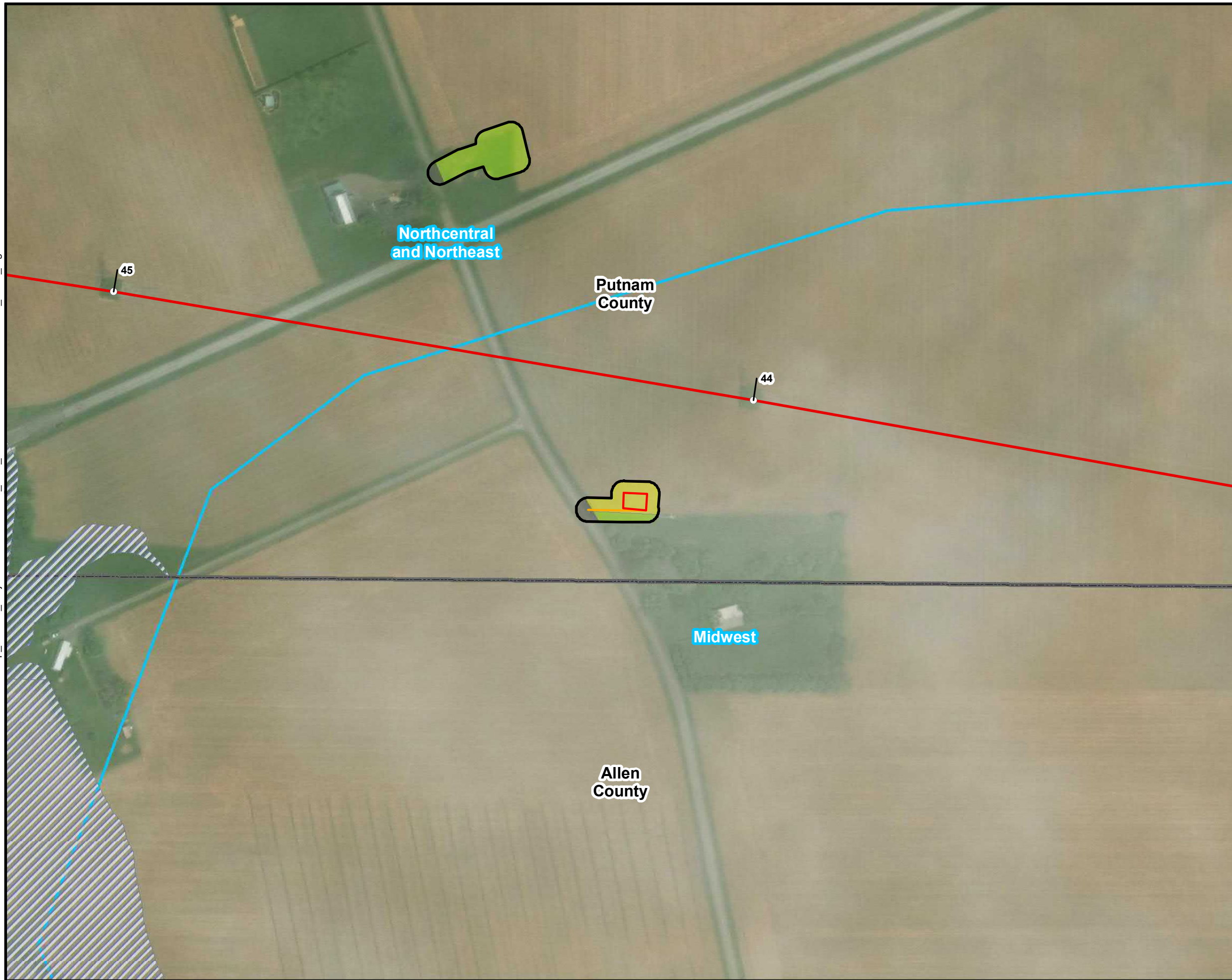


**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

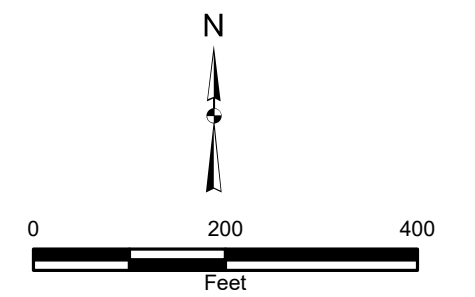
FIGURE 4G  
VEGETATION COMMUNITIES  
ASSESSMENT MAP



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- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - 100-yr Floodplain
  - Agricultural Land
  - Landscaped Area
  - Urban

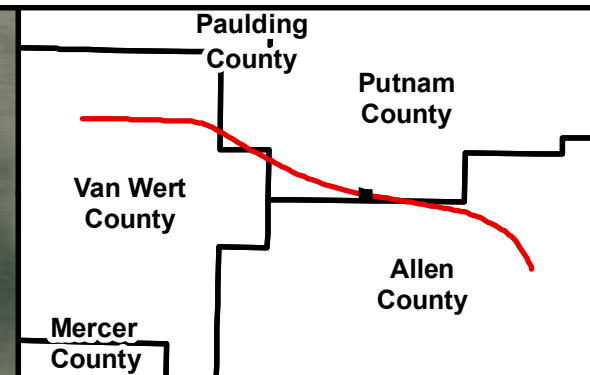
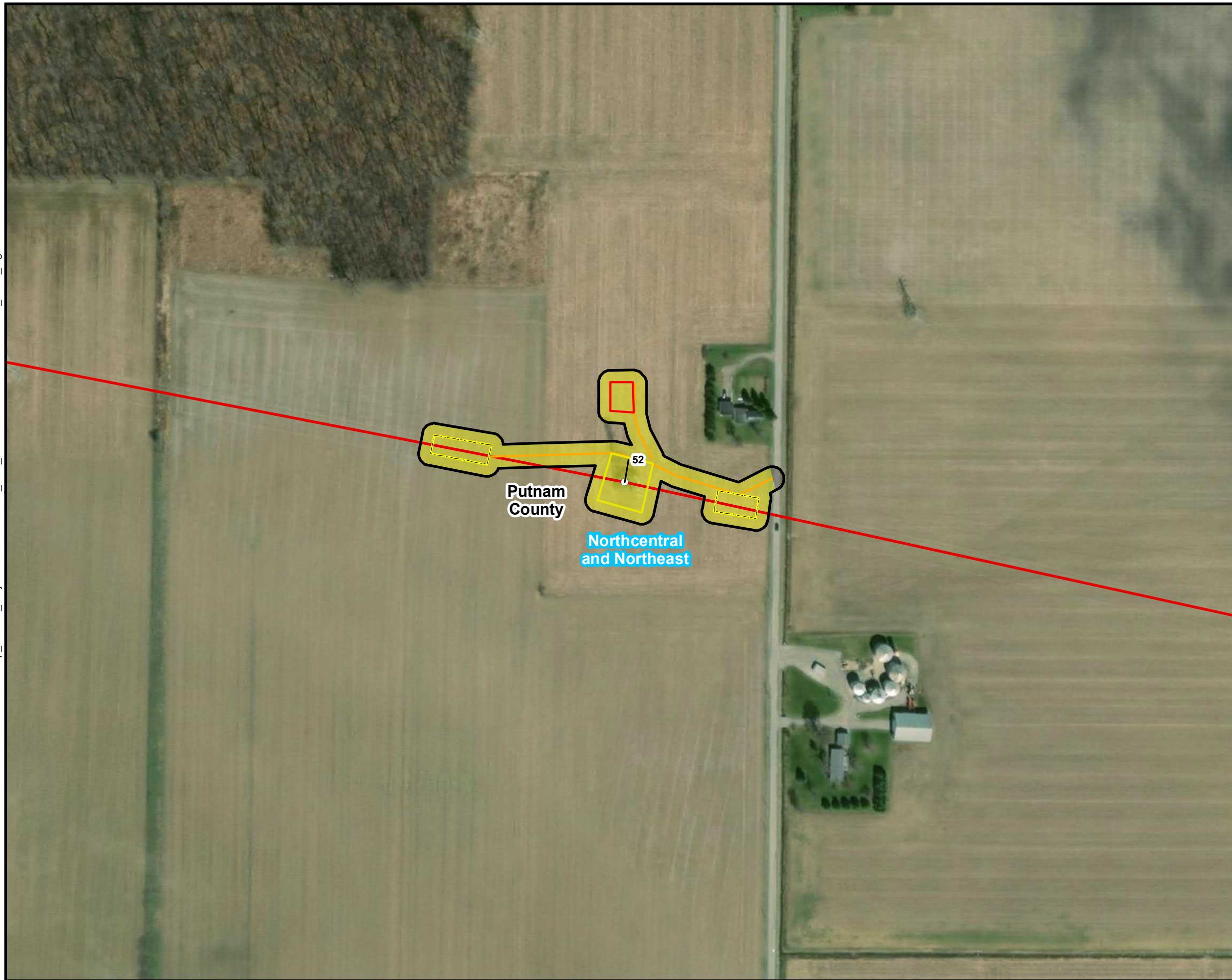


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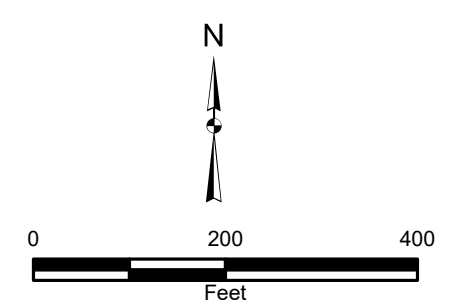
**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4H  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Pull Pad
  - Work Pad
  - Proposed Access Road
  - Existing Structure
  - Agricultural Land
  - Urban

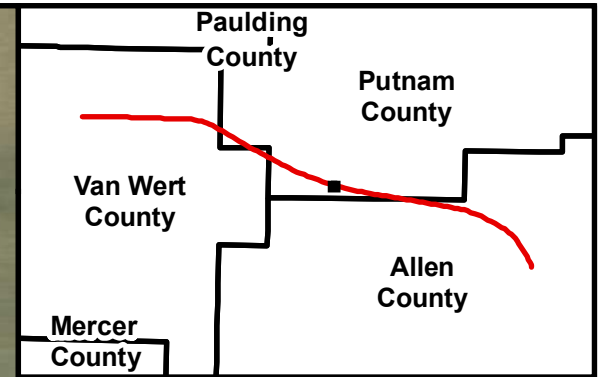
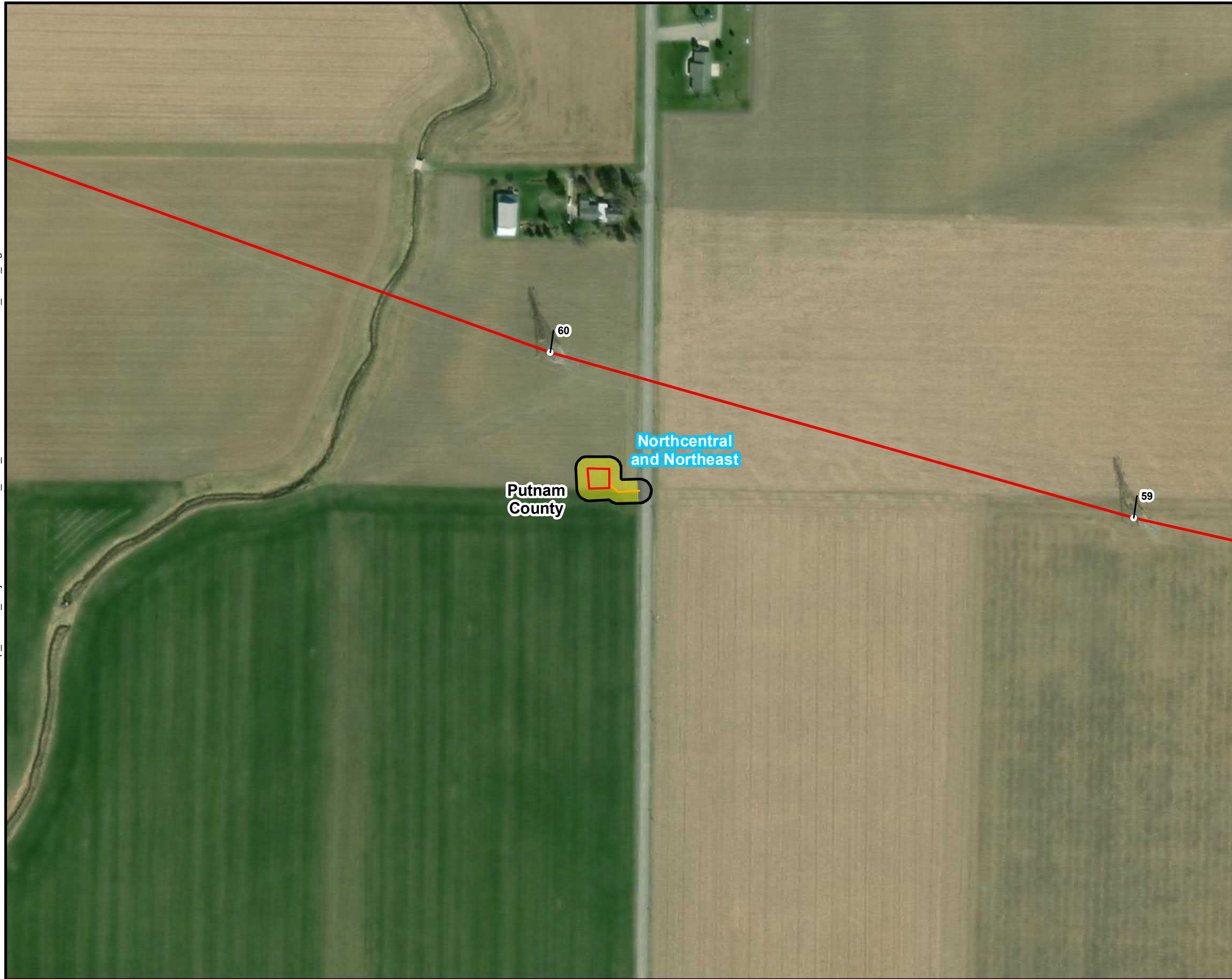


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>










**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

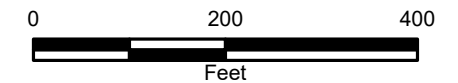
FIGURE 41  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Helipad
-  Proposed Access Road
-  Existing Structure
-  Agricultural Land
-  Urban



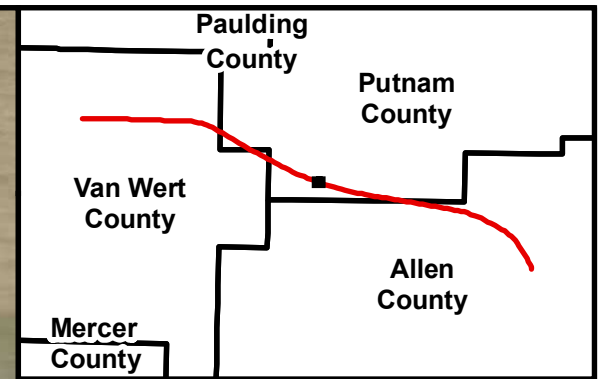
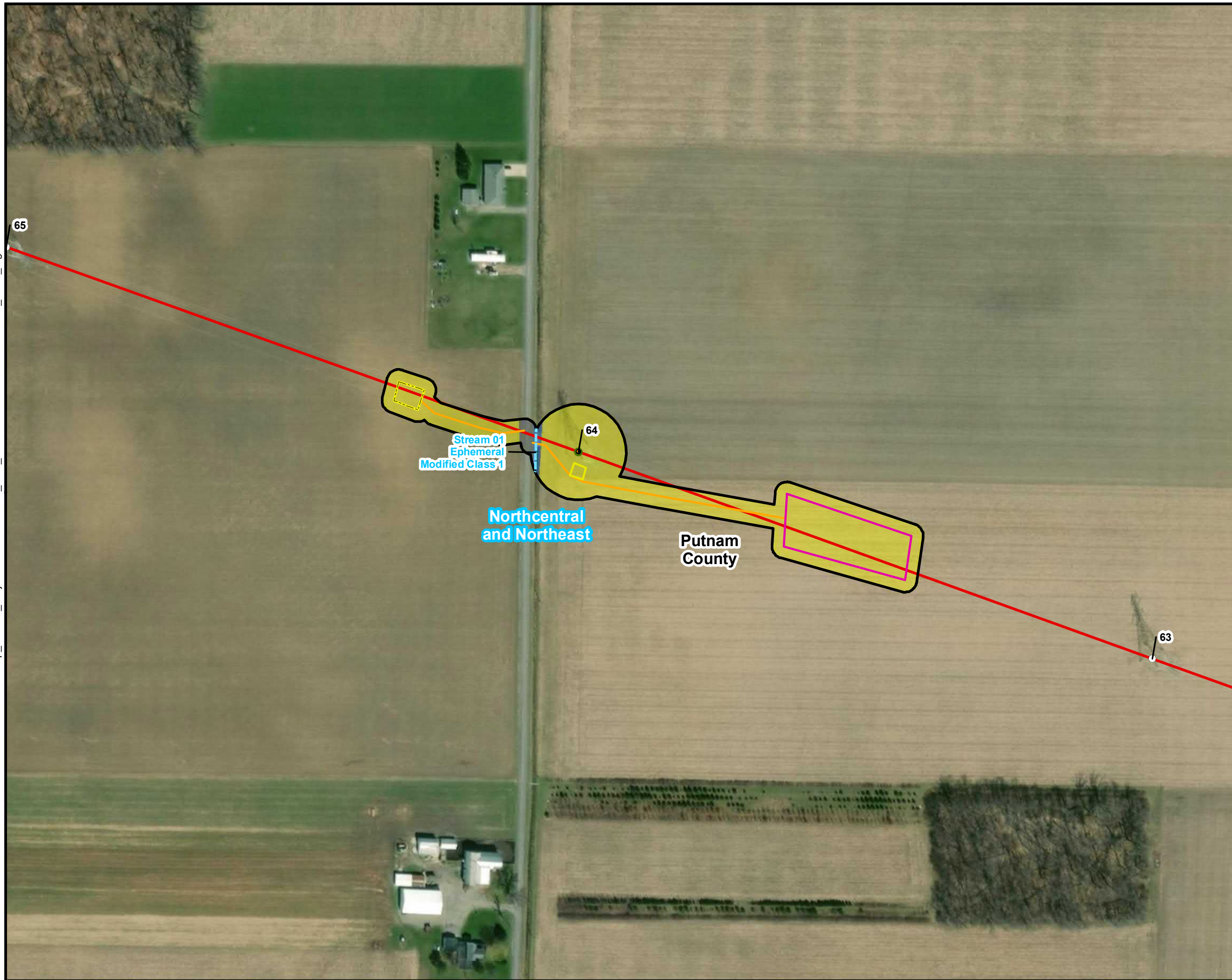
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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4J  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

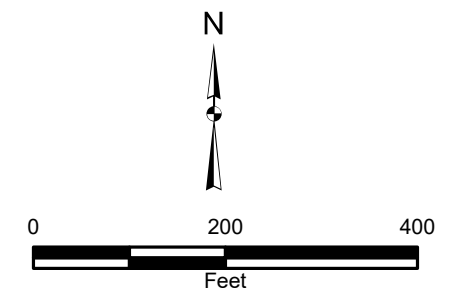


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access
- Proposed Structure
- Existing Structure
- Delineated Ephemeral Stream
- Agricultural Land
- Stream/Wetland
- Urban

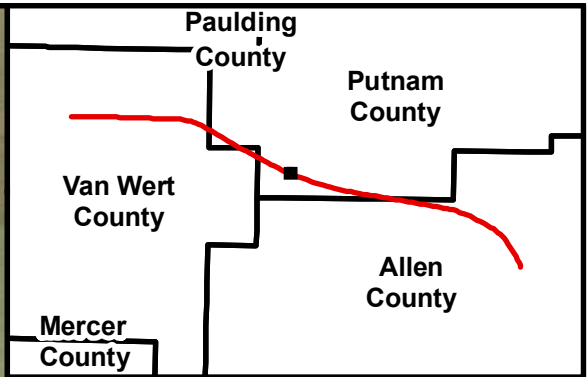
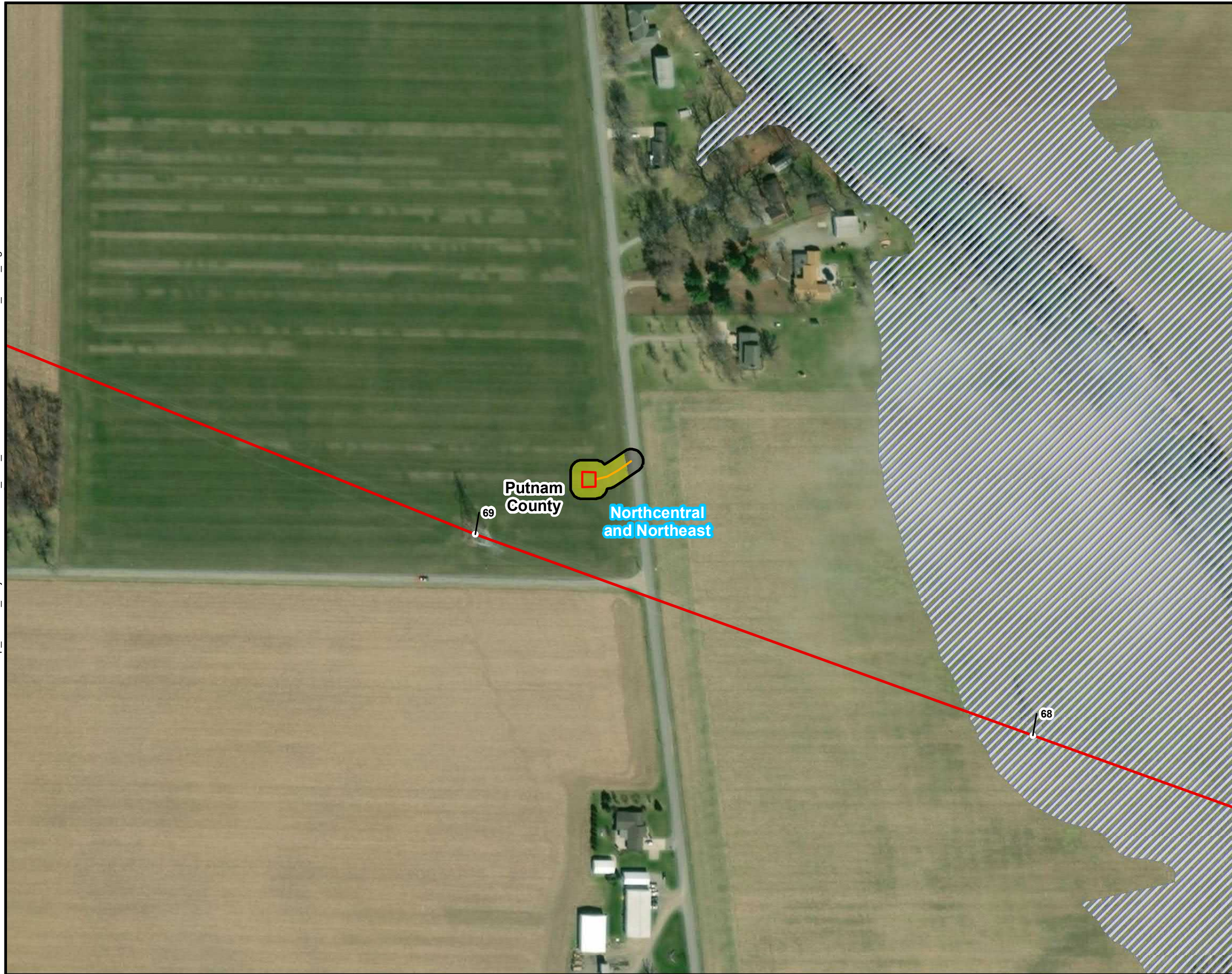


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**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

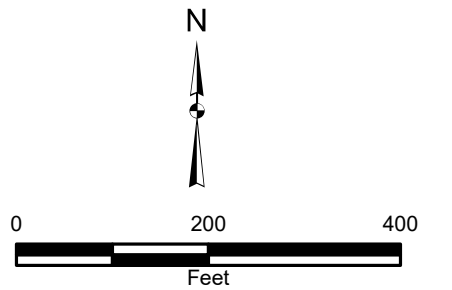
FIGURE 4K  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access Road
- Existing Structure
- 100-yr Floodplain
- Agricultural Land
- Urban



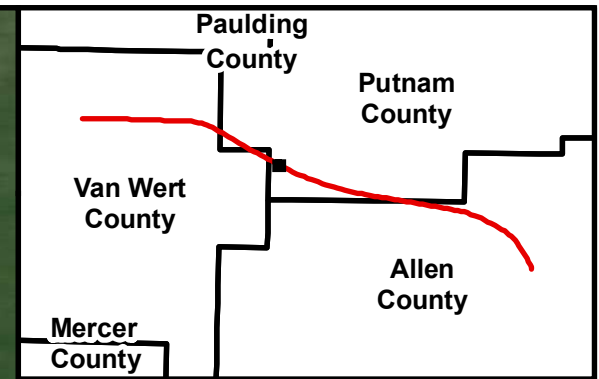
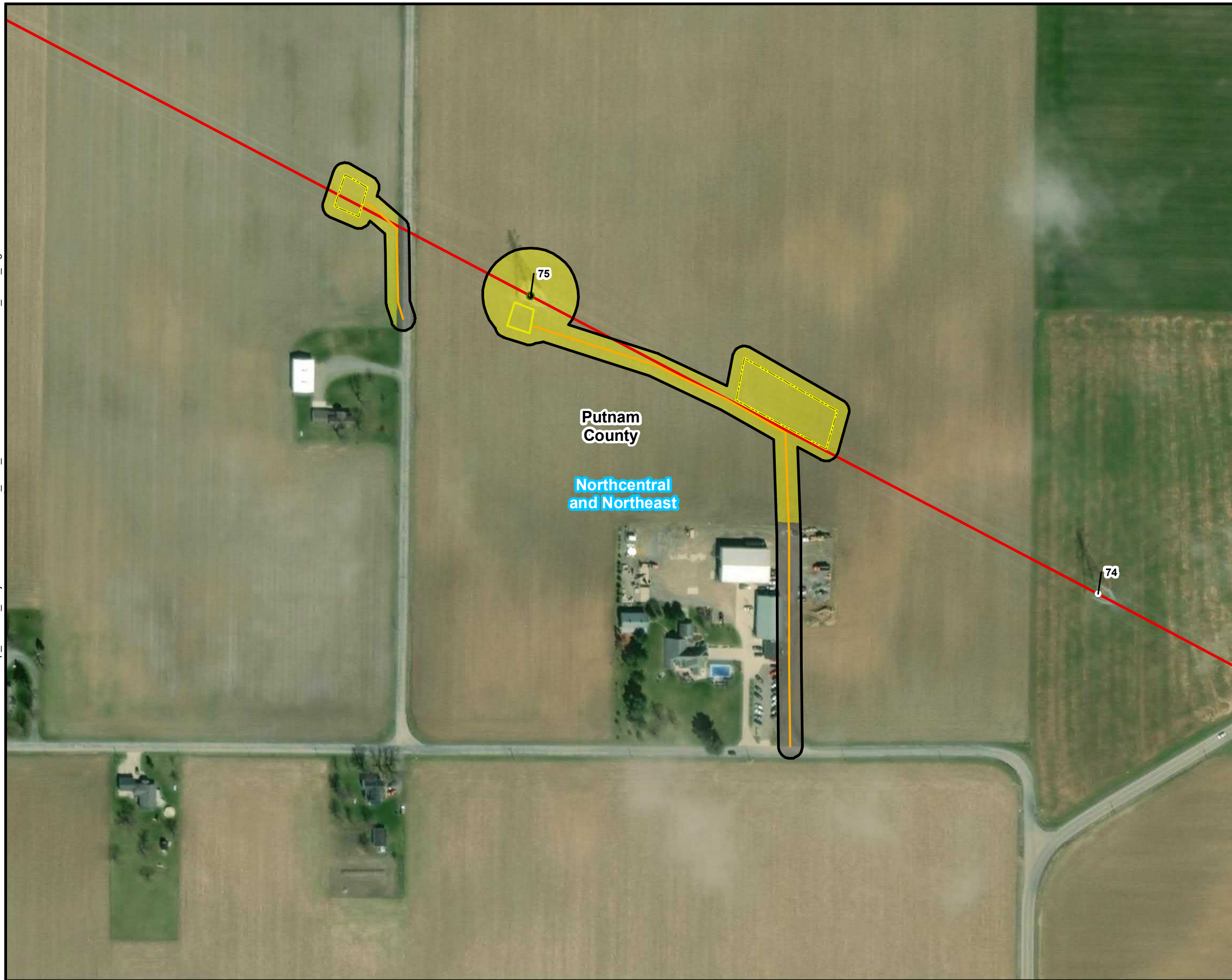
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4L  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

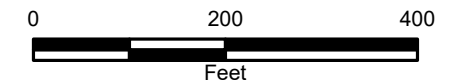


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Pull Pad
- Work Pad
- Proposed Access Road
- Proposed Structure
- Existing Structure
- Agricultural Land
- Urban

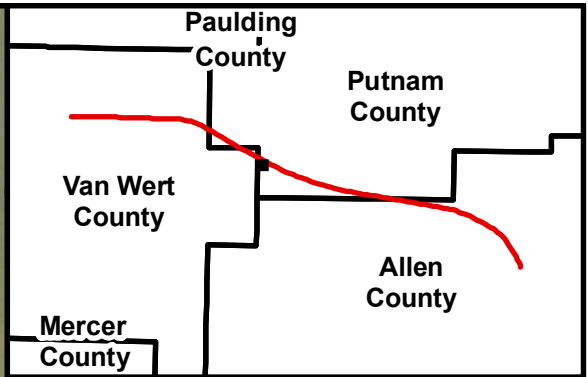
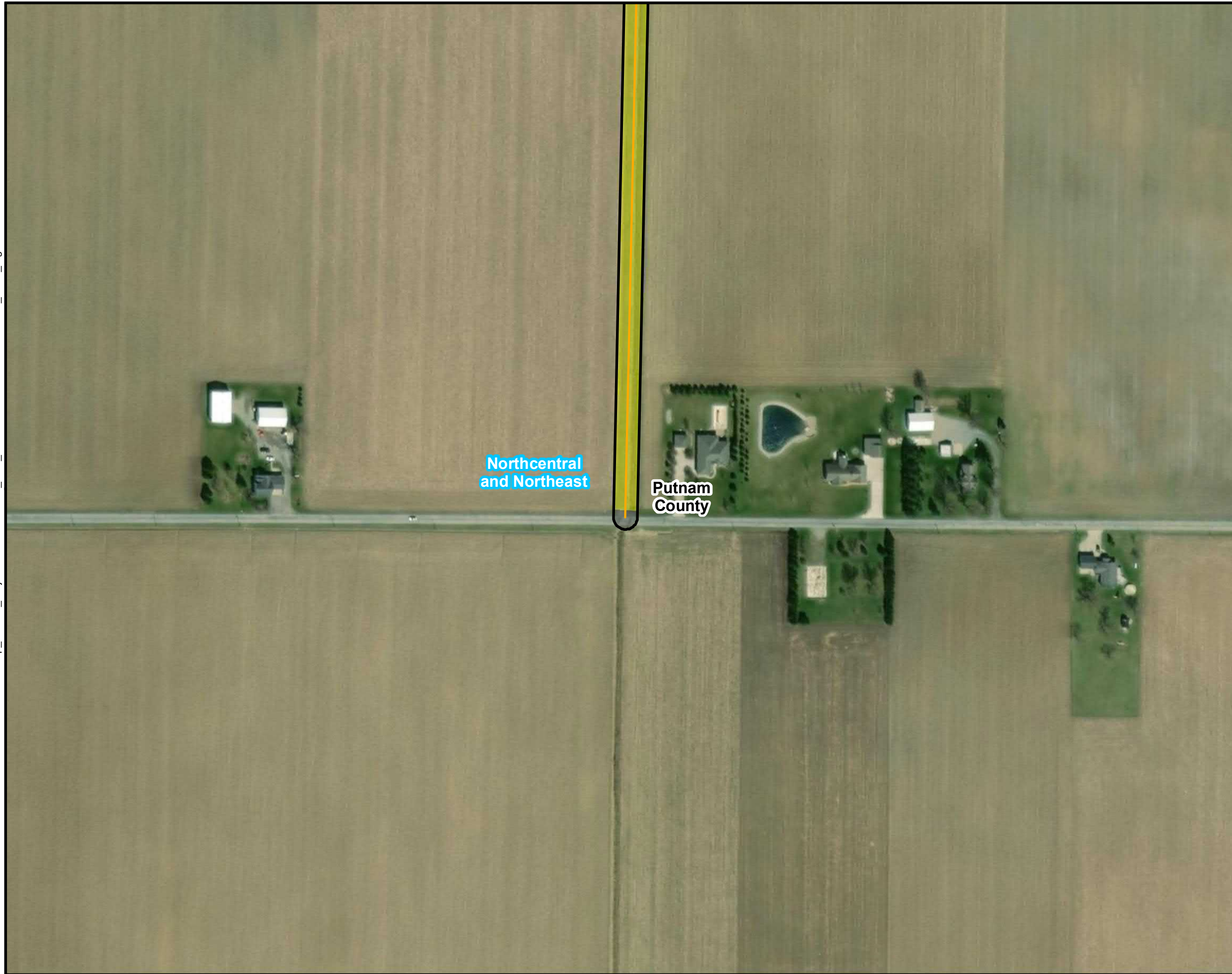


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>







**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

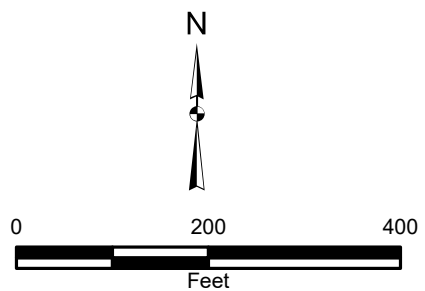
FIGURE 4M  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  County
-  USACE Wetland Region
-  Proposed Access Road
-  Agricultural Land
-  Urban

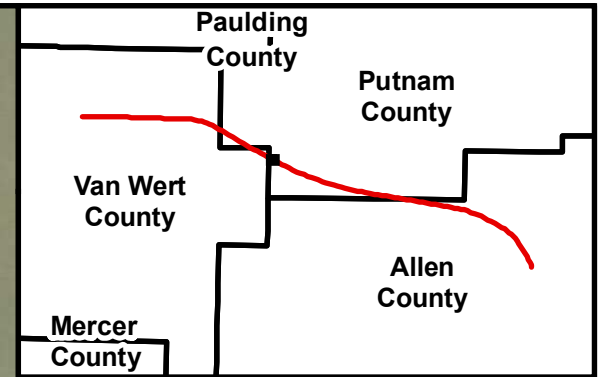


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>









**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

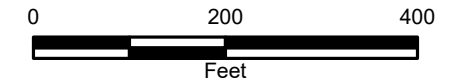
FIGURE 4N  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Helipad
-  Proposed Access Road
-  Existing Structure
-  Agricultural Land

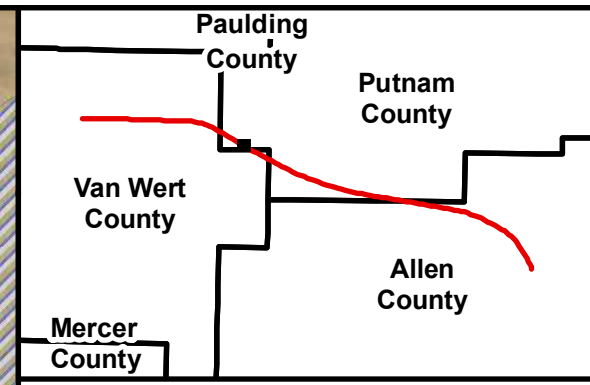
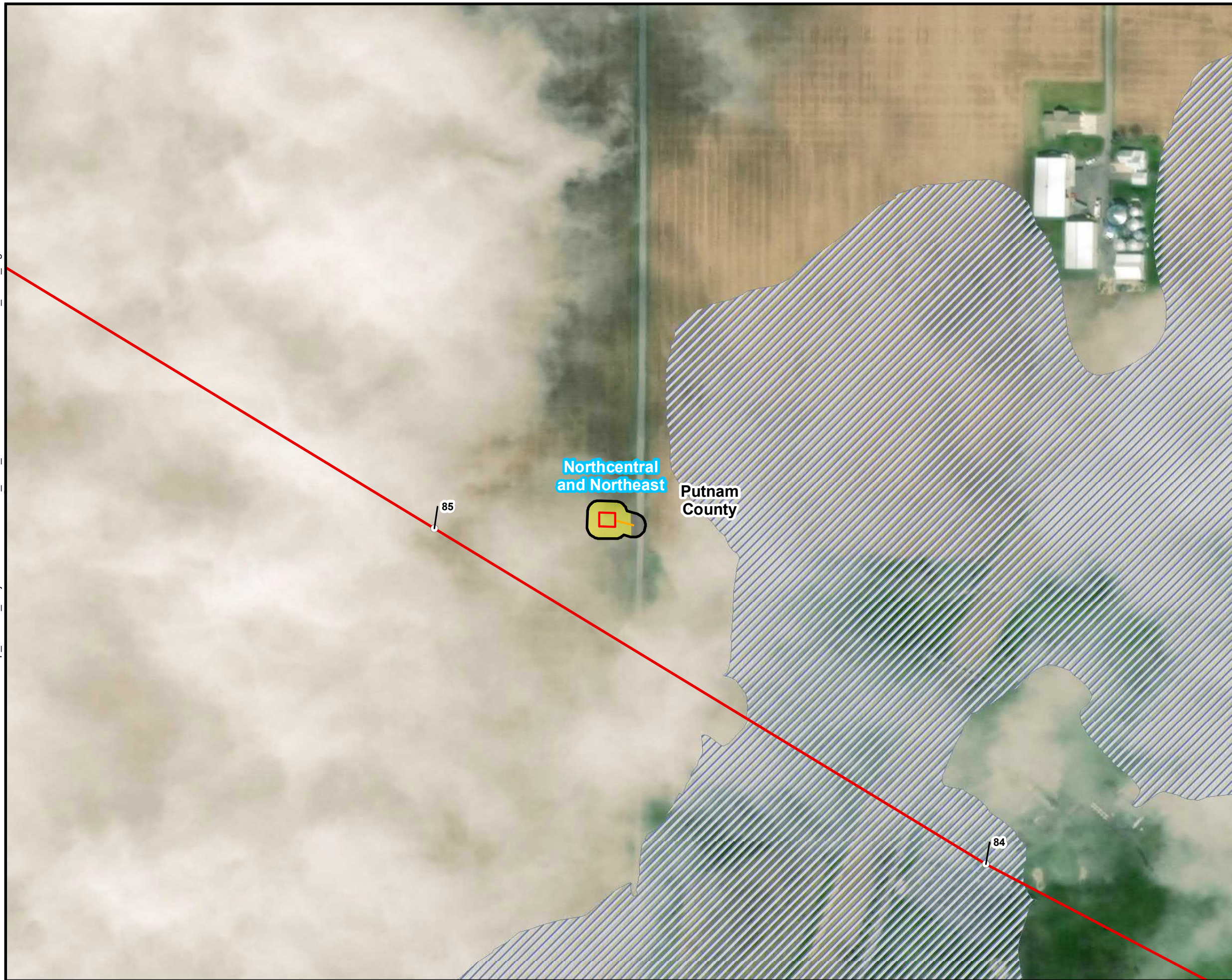


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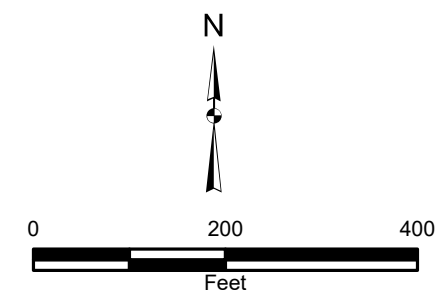
 *East Lima-Maddox  
345 kV Transmission  
Line Project*

FIGURE 40  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access
  - Existing Structure
  - 100-yr Floodplain
  - Agricultural Land
  - Urban



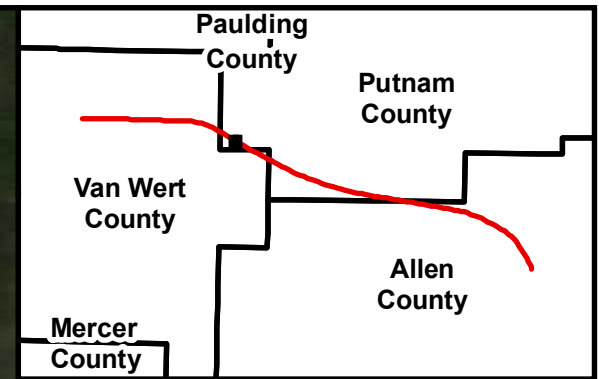
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4P  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

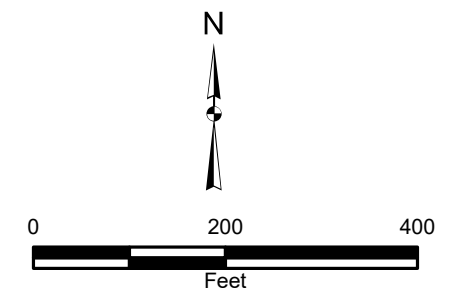


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access Road
- Proposed Structure
- Existing Structure
- Delineated Ephemeral Stream
- Agricultural Land
- Stream/Wetland
- Urban

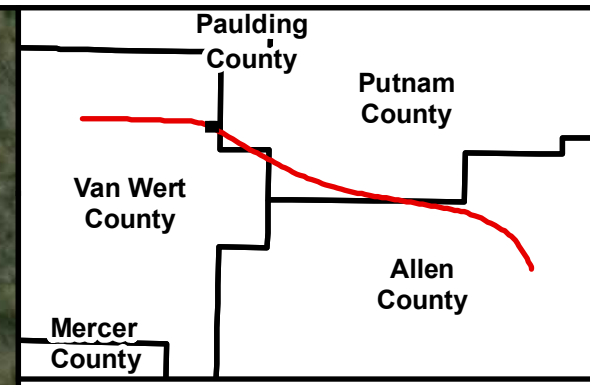
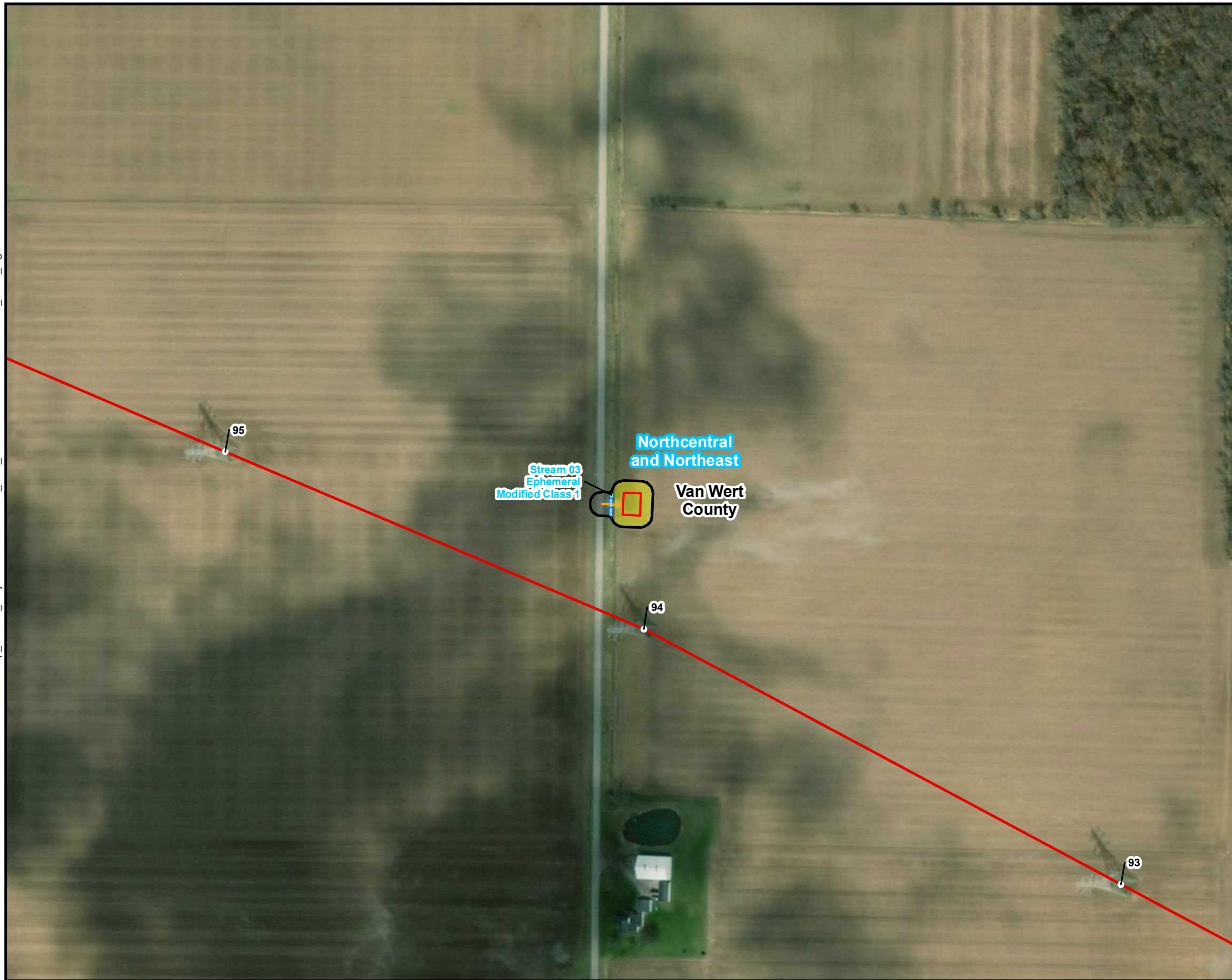


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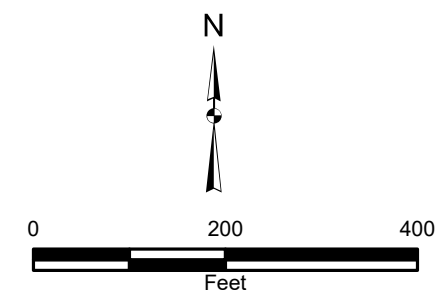
**OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4Q  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Helipad
  - Proposed Access Road
  - Existing Structure
  - Delineated Ephemeral Stream
  - Agricultural Land
  - Stream/Wetland
  - Urban

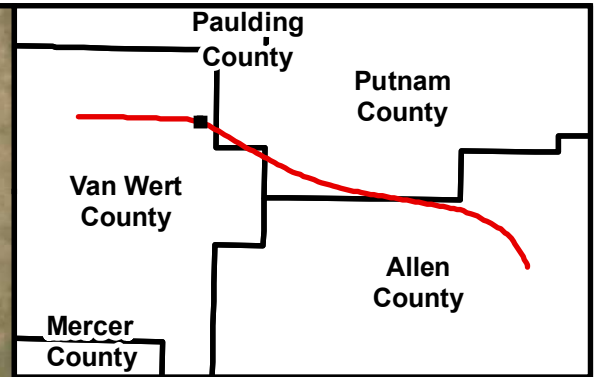
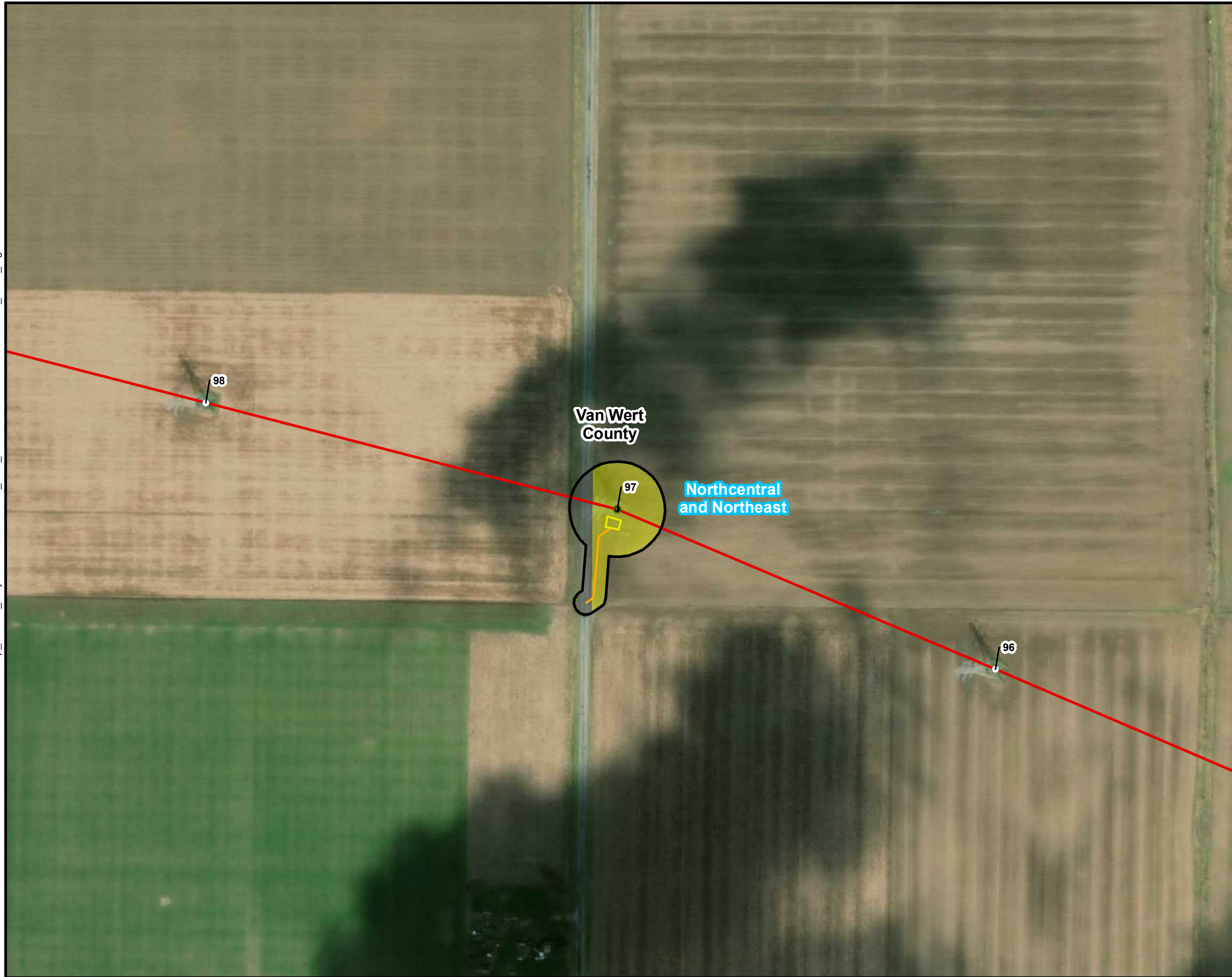


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**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

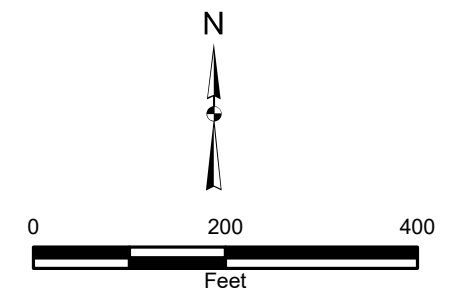
FIGURE 4R  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Work Pad
- Proposed Access Road
- Proposed Structure
- Existing Structure
- Agricultural Land
- Urban

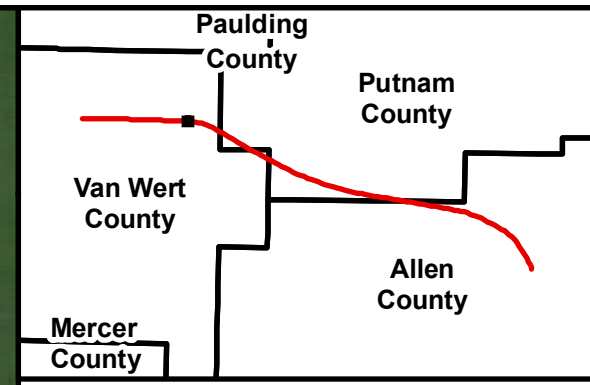
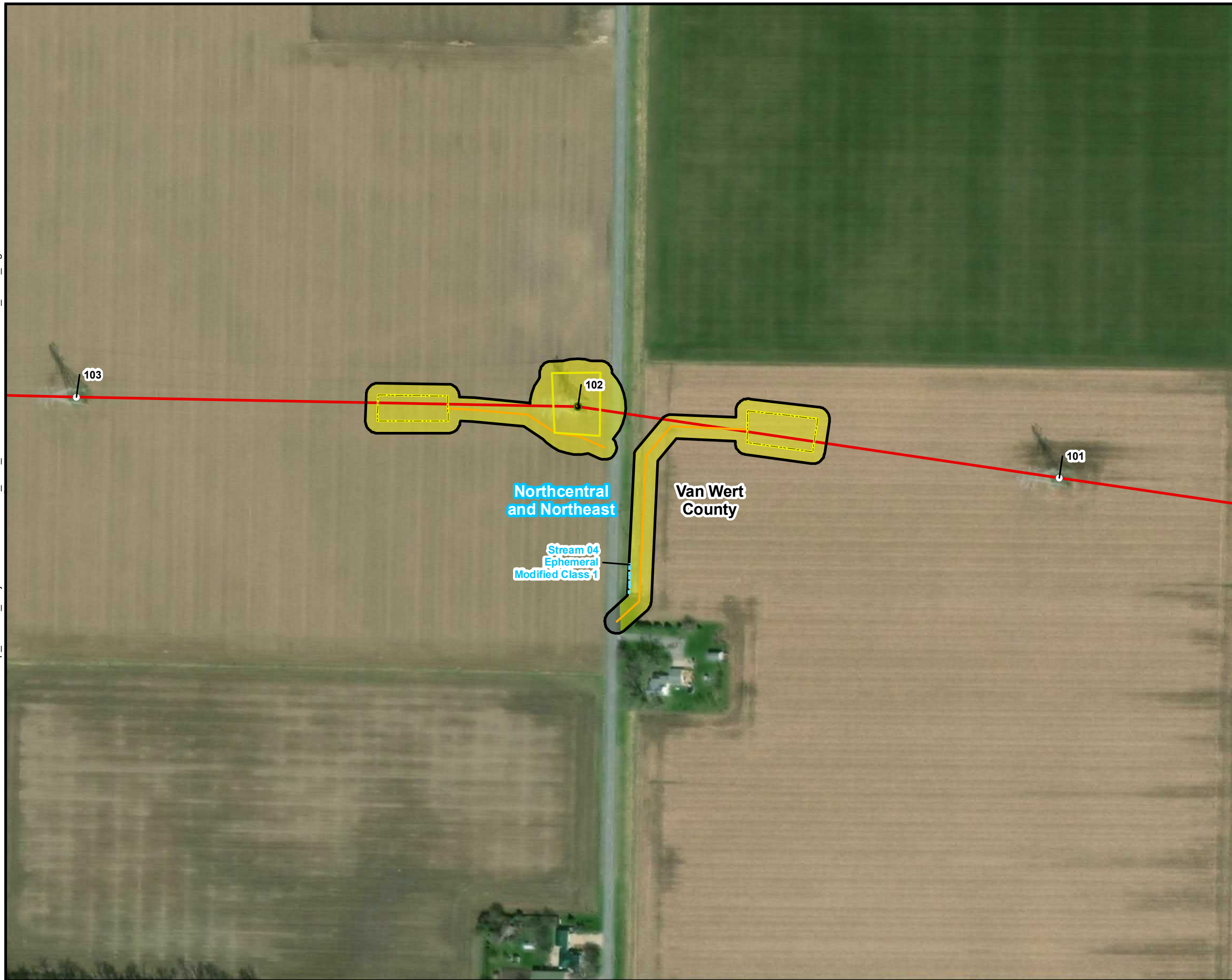


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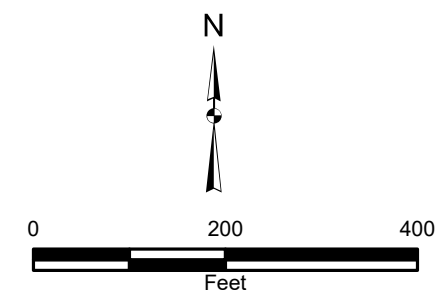
**AEP OHIO TRANSMISSION COMPANY** East Lima-Maddox 345 kV Transmission Line Project

FIGURE 4S  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





- LEGEND:
- Project Survey Corridor
  - East Lima-Maddox 345 kV Transmission Line
  - County
  - USACE Wetland Region
  - Pull Pad
  - Work Pad
  - Proposed Access Road
  - Proposed Structure
  - Existing Structure
  - Delineated Ephemeral Stream
  - Agricultural Land
  - Stream/Wetland
  - Urban

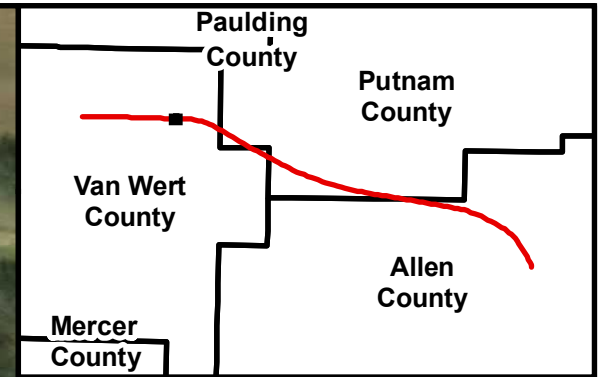
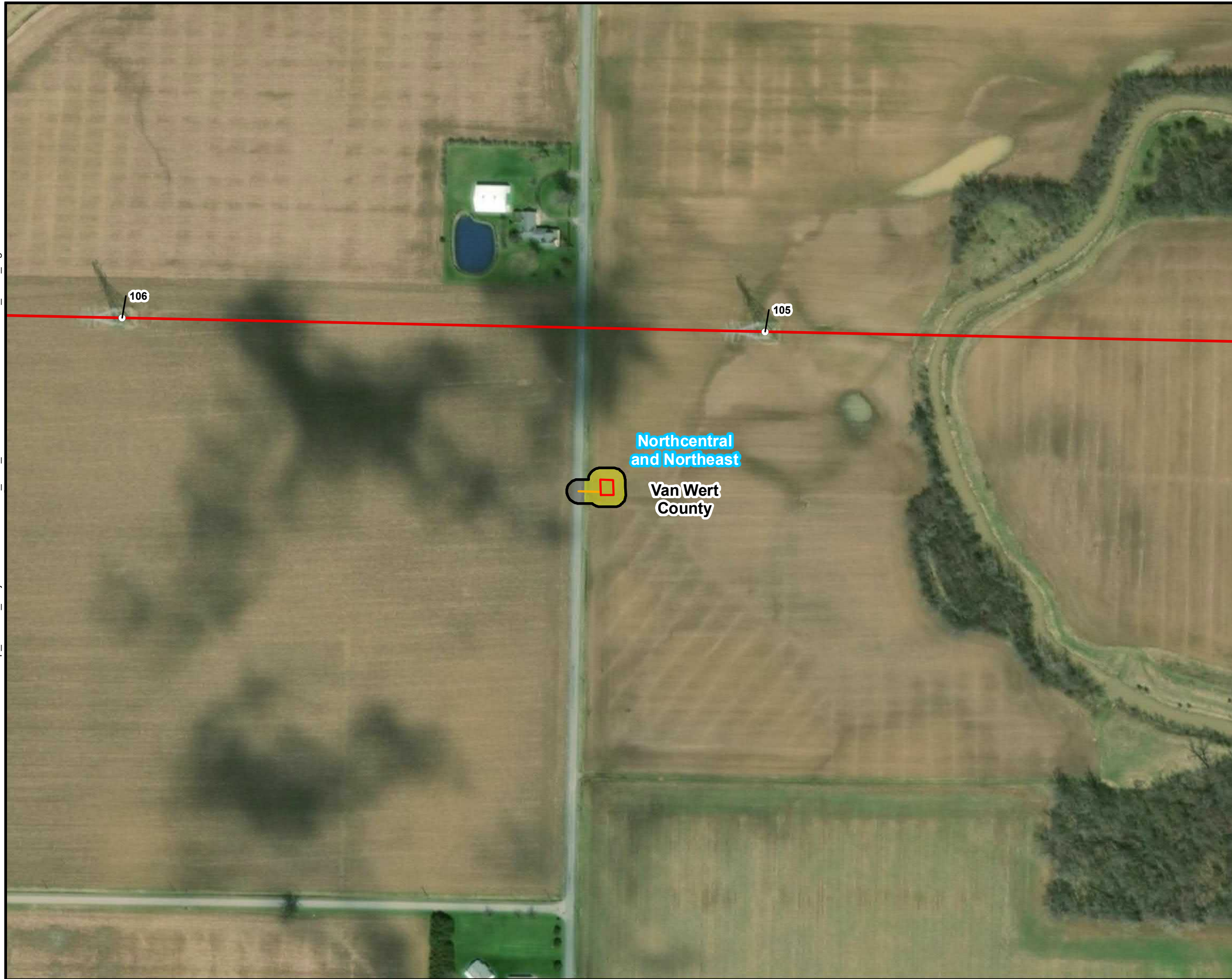


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

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

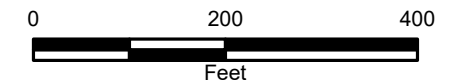
FIGURE 4T  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Helipad
-  Proposed Access Road
-  Existing Structure
-  Agricultural Land
-  Urban



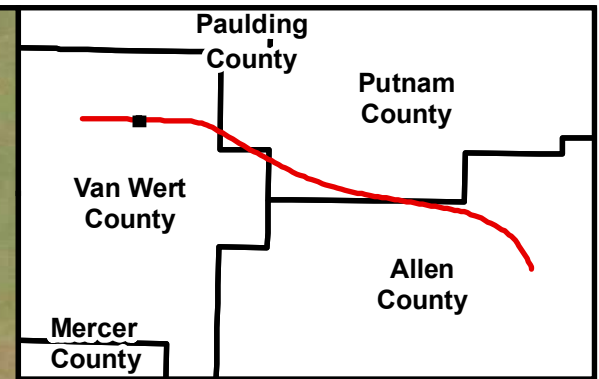
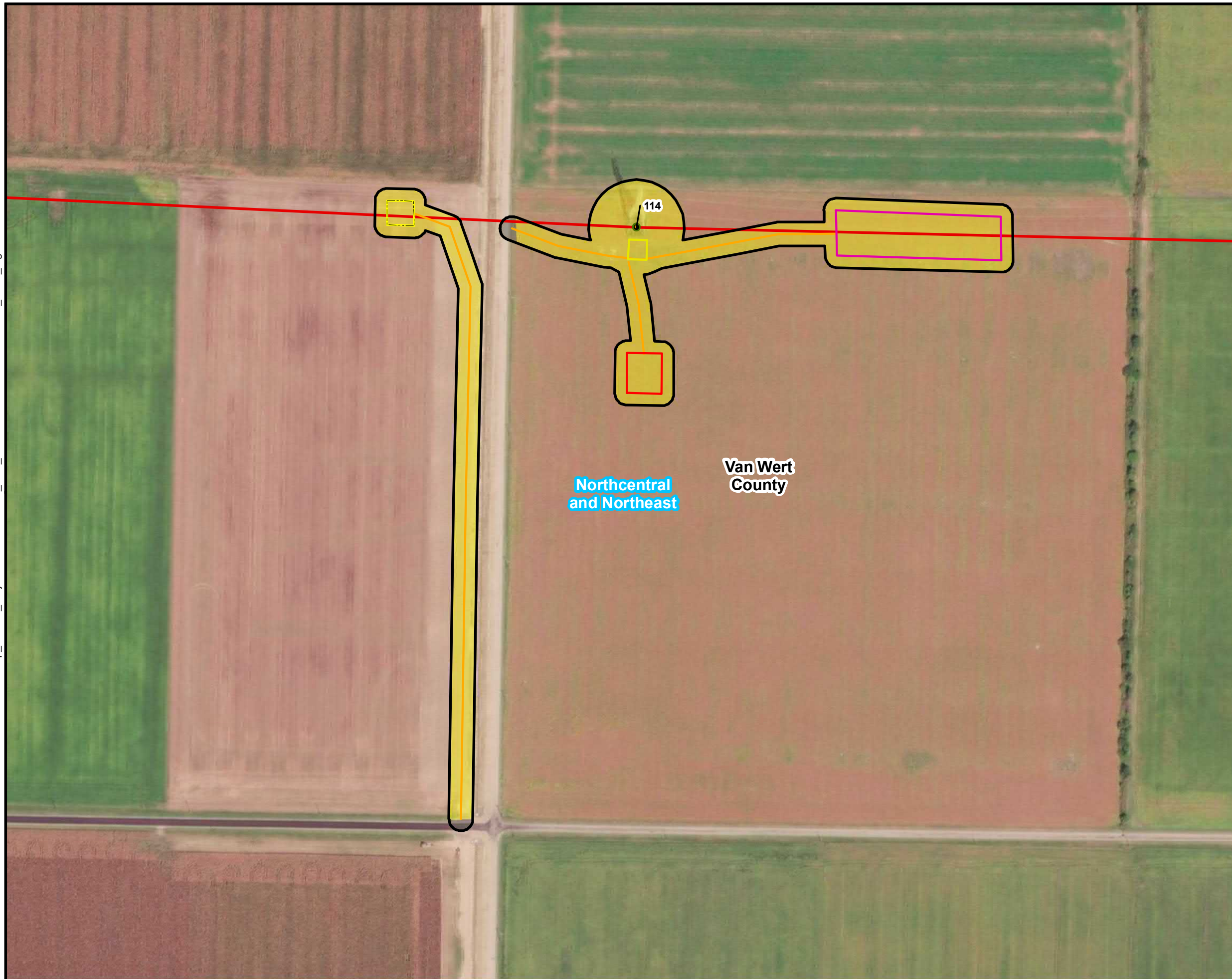
Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4U  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

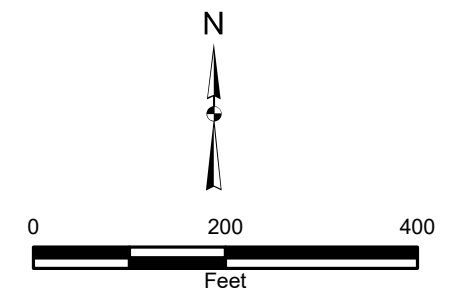


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LEGEND:

- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Pull Pad
- Snub Site
- Work Pad
- Proposed Access
- Proposed Structure
- Existing Structure
- Agricultural Land
- Urban

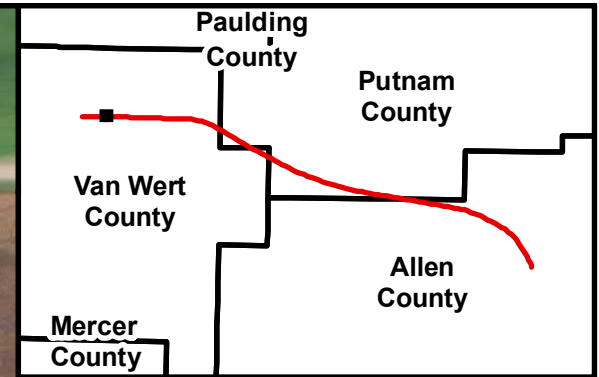
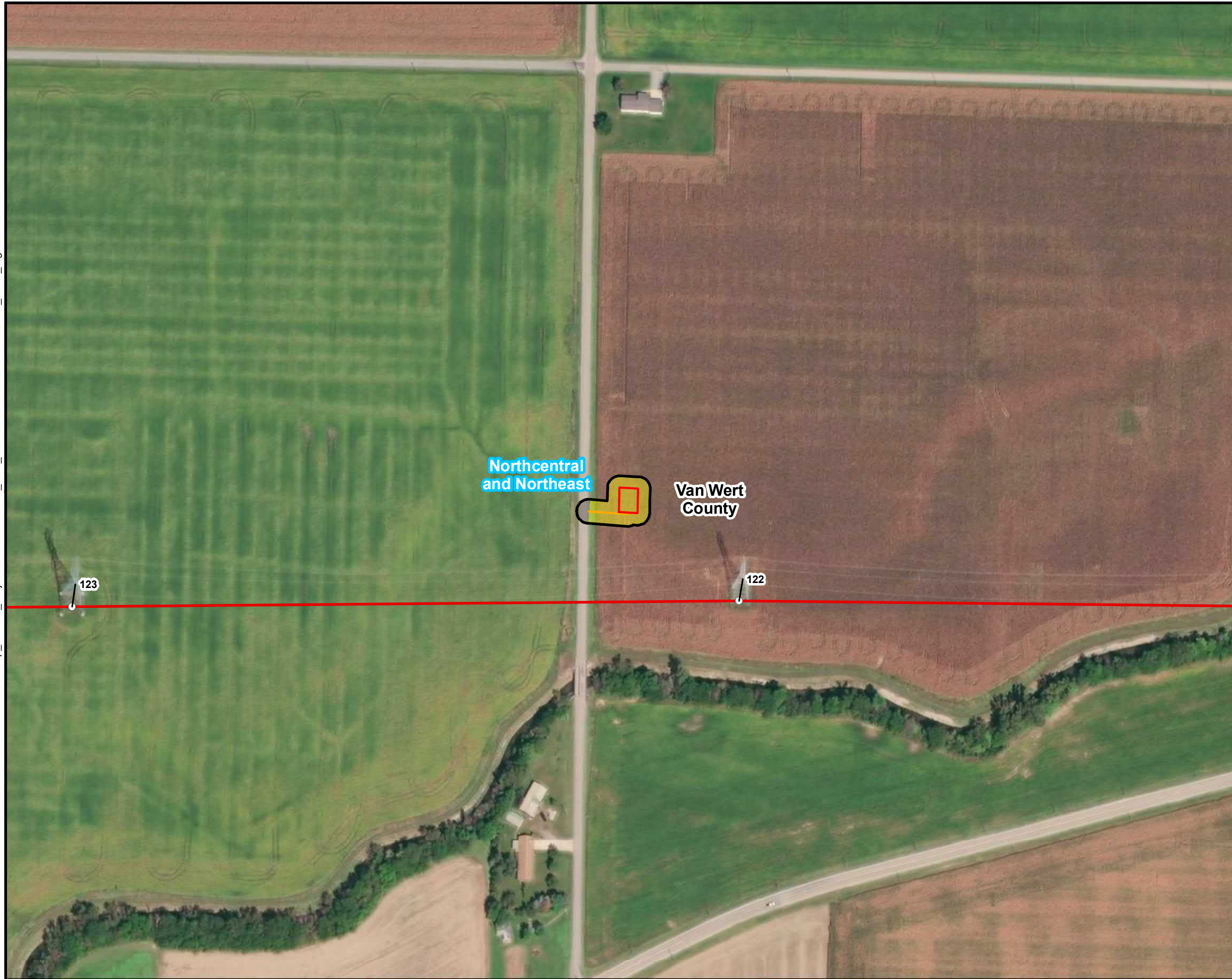


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>










**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

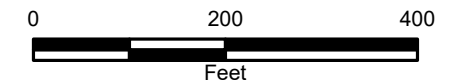
FIGURE 4V  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Project Survey Corridor
-  East Lima-Maddox 345 kV Transmission Line
-  County
-  USACE Wetland Region
-  Helipad
-  Proposed Access Road
-  Existing Structure
-  Agricultural Land
-  Urban

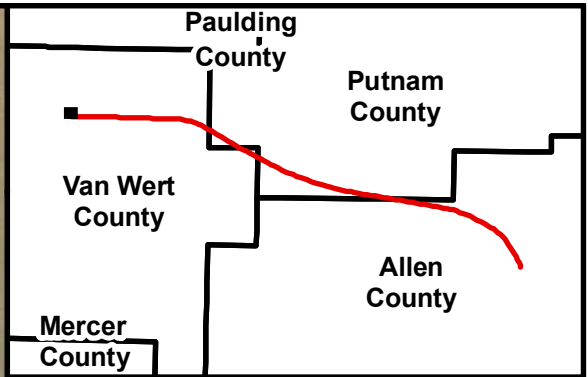
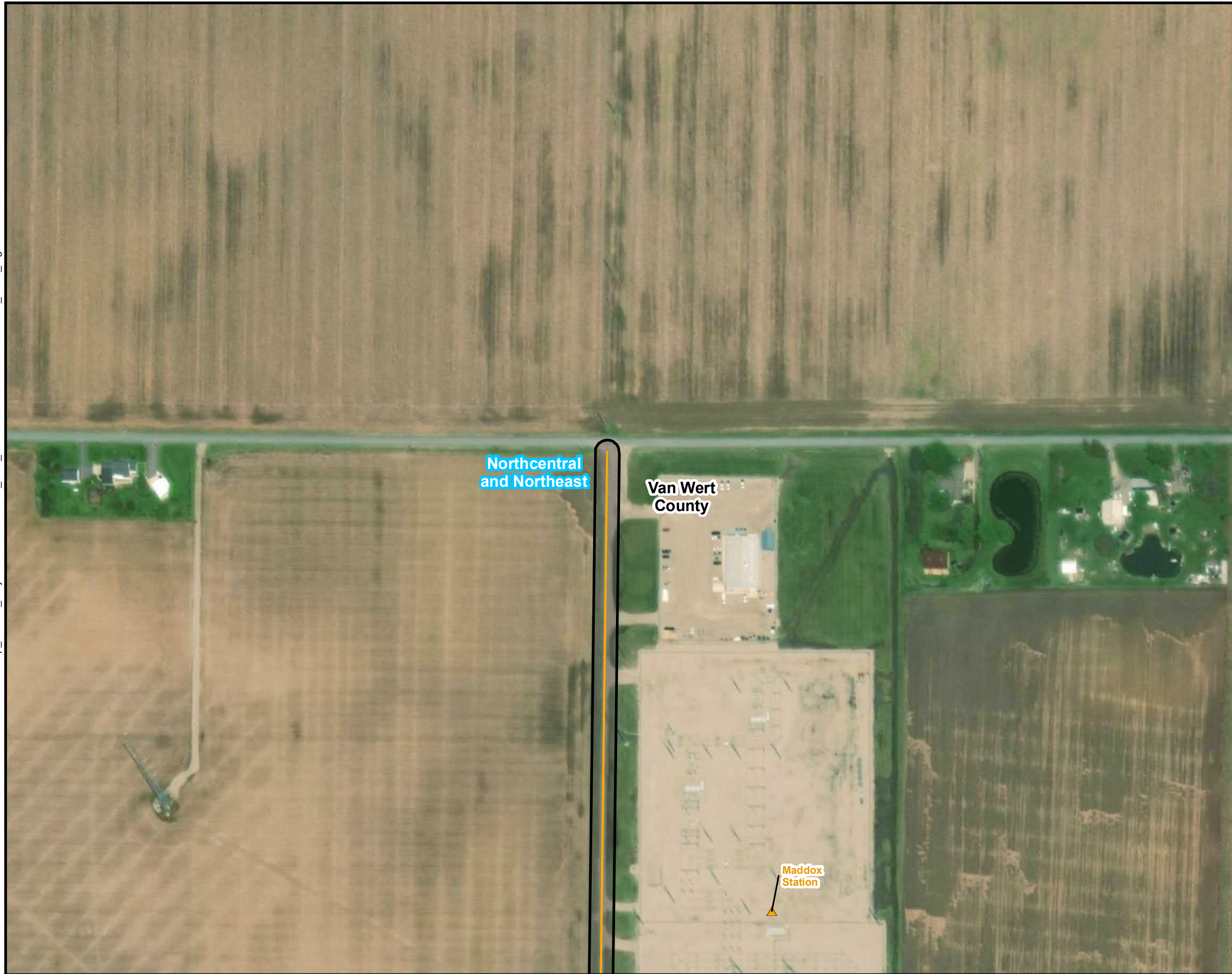


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>







**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

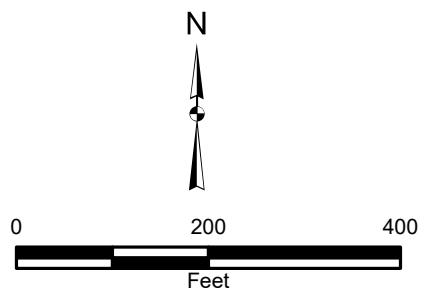
FIGURE 4V  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

-  Station
-  Project Survey Corridor
-  County
-  USACE Wetland Region
-  Proposed Access Road
-  Urban

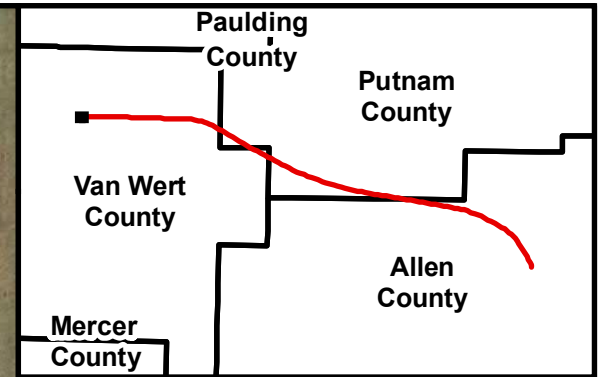


Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

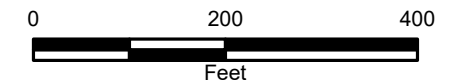
FIGURE 4W  
VEGETATION COMMUNITIES  
ASSESSMENT MAP





LEGEND:

- Station
- Project Survey Corridor
- East Lima-Maddox 345 kV Transmission Line
- County
- USACE Wetland Region
- Helipad
- Proposed Access Road
- Existing Structure
- Agricultural Land
- Urban



Base Map: <http://www.esri.com/software/arcgis/arcgisonline/bing-maps.html>

**AEP OHIO TRANSMISSION COMPANY** *East Lima-Maddox 345 kV Transmission Line Project*

FIGURE 4X  
VEGETATION COMMUNITIES  
ASSESSMENT MAP

**APPENDIX A**

**U.S. ARMY CORPS of ENGINEERS WETLAND AND UPLAND FORMS**



**WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site East Lima to Maddox City/County Allen Sampling Date: 04-Sep-19  
 Applicant/Owner AEP State: OH Sampling Point: **w-aeH-20190904-01**  
 Investigator(s) AEH, SM Section, Township, Range: 11 T 3S R 7E  
 Landform (hillslope, terrace, etc.) Swale Local relief (concave, convex, none) none  
 Slope: 0.0% / 0.0 ° Lat.: 40.803361 Long.: -84.029292 Datum: NAD 83  
 Soil Map Unit Name Glynwood silt loam, end moraine, 2 to 6 percent slopes (Gwe1B1) NWI classification N/A  
 Are climatic/hydrologic conditions on the site typical for this time of ye Yes  No  (If no, explain in Remarks.)  
 Are Vegetation  , Soil  , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation  , Soil  , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>
Remarks:	

**VEGETATION - Use scientific names of plants.**

	Absolute	Species? Rel.Strat	Indicator	
<b>Tree Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%	0	
	0	= Total Cover		
<b>Sapling/Shrub Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
3. _____	0	<input type="checkbox"/> 0.0%		
4. _____	0	<input type="checkbox"/> 0.0%		
5. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		
<b>Herb Stratu</b> (Plot size: _____)				
1. <u>Juncus effusus</u>	25	<input checked="" type="checkbox"/> 23.8%	OBL	
2. <u>Scirpus atrovirens</u>	20	<input checked="" type="checkbox"/> 19.0%	OBL	
3. <u>Carex cristatella</u>	20	<input checked="" type="checkbox"/> 19.0%	FACW	
4. <u>Echinochloa crus-galli</u>	15	<input type="checkbox"/> 14.3%	FACW	
5. <u>Apocynum cannabinum</u>	10	<input type="checkbox"/> 9.5%	FAC	
6. <u>Dipsacus fullonum</u>	10	<input type="checkbox"/> 9.5%	FACU	
7. <u>Solidago canadensis</u>	5	<input type="checkbox"/> 4.8%	FACU	
8. _____	0	<input type="checkbox"/> 0.0%		
9. _____	0	<input type="checkbox"/> 0.0%		
10. _____	0	<input type="checkbox"/> 0.0%		
	105	= Total Cover		
<b>Woody Vine Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%		
2. _____	0	<input type="checkbox"/> 0.0%		
	0	= Total Cover		

**Dominance Test worksheet**

Number of Dominant Species That are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of dominant Species That Are OBL, FACW, or 100.0% (A/B)

---

**Prevalence Index worksheet**

Total % Cover of: Multiply by:

OBL species	<u>45</u>	x 1 =	<u>45</u>
FACW species	<u>35</u>	x 2 =	<u>70</u>
FAC species	<u>10</u>	x 3 =	<u>30</u>
FACU species	<u>15</u>	x 4 =	<u>60</u>
UPL species	<u>0</u>	x 5 =	<u>0</u>
Column Totals:	<u>105</u>	(A)	<u>205</u> (B)

Prevalence Index = B/A = 1.952

---

**Hydrophytic Vegetation Indicators**

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is > 50

3 - Prevalence Index is ≤ 3. <sup>1</sup>

4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation <sup>1</sup> (Explain in Remarks)

<sup>1</sup> Indicators of hydric soil and wetland hydrology must

---

**Hydrophytic Vegetation** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)

<sup>1</sup>Indicator suffix = National status or professional decision assigned because Regional status not defined by

**SOIL**

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks
	Color (moist)	%		Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-18	10YR	5/1	90	10YR	5/6	10	C	M	Silty Clay Loam

<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup> Location: PL=Pore Lining, M

<p><b>Hydric Soil Indicators:</b></p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<p><b>Indicators for Problematic Hydric Soils<sup>3</sup></b></p> <input type="checkbox"/> Coast Prairie Redox (A1) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron Manganese Masses (F1) <input type="checkbox"/> Very Shallow Dark Surface (TF1) <input type="checkbox"/> Other (Explain in Remark)
--	---	--

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be

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

Remarks:

**HYDROLOGY**

<p><b>Wetland Hydrology Indicator</b></p> Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

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

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

Remarks:



**WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site East Lima to Maddox City/County Allen Sampling Date: 04-Sep-19  
 Applicant/Owner AEP State: OH Sampling Point: upl-aeH-20190904-01  
 Investigator(s) AEH, SM Section, Township, Range: 11 T 3S R 7E  
 Landform (hillslope, terrace, etc.) Flat Local relief (concave, convex, none) none  
 Slope: 0.0% / 0.0° Lat.: 40.802056 Long.: -84.029791 Datum: NAD 83  
 Soil Map Unit Name Pewamo silty clay loam, 0 to 1 percent slopes (PmA) NWI classification N/A

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

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

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks:	

**VEGETATION - Use scientific names of plants.**

	Absolut e	Species? Rel.Strat	Indicato r	
<b>Tree Stratu</b> (Plot size: _____ )				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	0	
	0	= Total Cover		
<b>Sapling/Shrub Stratu</b> (Plot size: _____ )				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		
<b>Herb Stratu</b> (Plot size: _____ )				
1. <u>Dipsacus fullonum</u>	65	<input checked="" type="checkbox"/> 56.5%	FACU	
2. <u>Dactylis glomerata</u>	20	<input type="checkbox"/> 17.4%	FACU	
3. <u>Solidago canadensis</u>	15	<input type="checkbox"/> 13.0%	FACU	
4. <u>Daucus carota</u>	10	<input type="checkbox"/> 8.7%	UPL	
5. <u>Carex cristatella</u>	5	<input type="checkbox"/> 4.3%	FACW	
6. _____	0	<input type="checkbox"/> 0.0%	_____	
7. _____	0	<input type="checkbox"/> 0.0%	_____	
8. _____	0	<input type="checkbox"/> 0.0%	_____	
9. _____	0	<input type="checkbox"/> 0.0%	_____	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
	115	= Total Cover		
<b>Woody Vine Stratu</b> (Plot size: _____ )				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		

**Dominance Test workshee**

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of dominant Species That Are OBL, FACW, or 0.0% (A/B)

---

**Prevalence Index workshee**

Total % Cover of:		Multiply by:	
OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>5</u>	x 2 =	<u>10</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>100</u>	x 4 =	<u>400</u>
UPL species	<u>10</u>	x 5 =	<u>50</u>
Column Totals:	<u>115</u>	(A)	<u>460</u> (B)

Prevalence Index = B/A = 4.000

---

**Hydrophytic Vegetation Indicato**

**1 - Rapid Test for Hydrophytic Vegetati**

**2 - Dominance Test is > 50**

**3 - Prevalence Index is ≤3.** <sup>1</sup>

**4 - Morphological Adaptations** <sup>1</sup> (Provide supporting data in Remarks or on a separate

**Problematic Hydrophytic Vegetation** <sup>1</sup> (Expla

<sup>1</sup> Indicators of hydric soil and wetland hydrology must

---

**Hydrophyti  
c  
Vegetation** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by

**SOIL**

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

Depth (inches)	Matrix			Redox Features				Texture	Remarks
	Color (moist)	%		Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-18	10YR	5/1	90	10YR	5/4	10	C	M	Silty Clay Loam

<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.      <sup>2</sup> Location: PL=Pore Lining, M

<p><b>Hydric Soil Indicators:</b></p> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Muck Mineral (S1) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)	<input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input checked="" type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<p><b>Indicators for Problematic Hydric Soils<sup>3</sup></b></p> <input type="checkbox"/> Coast Prairie Redox (A1) <input type="checkbox"/> Dark Surface (S7) <input type="checkbox"/> Iron Manganese Masses (F1) <input type="checkbox"/> Very Shallow Dark Surface (TF1) <input type="checkbox"/> Other (Explain in Remark)
--	---	--

<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be

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

Remarks:

**HYDROLOGY**

<p><b>Wetland Hydrology Indicator</b></p> Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Gauge or Well Data (D9) <input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> FAC-Neutral Test (D5)

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

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

Remarks:



**WETLAND DETERMINATION DATA FORM - Midwest Region**

Project/Site East Lima to Maddox City/County Allen Sampling Date: 04-Sep-19  
 Applicant/Owner AEP State: OH Sampling Point: upl-aeH-20190904-02  
 Investigator(s) AEH, SM Section, Township, Range: 11 T 3S R 7E  
 Landform (hillslope, terrace, etc.) Flat Local relief (concave, convex, none) none  
 Slope: 0.0% / 0.0 ° Lat.: 40.802186 Long.: -84.029657 Datum: NAD 83  
 Soil Map Unit Name Blount silt loam, end moraine, 2 to 4 percent slopes (Ble1B1) NWI classification N/A  
 Are climatic/hydrologic conditions on the site typical for this time of ye Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology  significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology  naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>
Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/>	
Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>	
Remarks:	

**VEGETATION - Use scientific names of plants.**

	Absolute	Dominant Species? Rel. Strat	Indicator	
<b>Tree Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	0	
	0	= Total Cover		
<b>Sapling/Shrub Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
3. _____	0	<input type="checkbox"/> 0.0%	_____	
4. _____	0	<input type="checkbox"/> 0.0%	_____	
5. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		
<b>Herb Stratu</b> (Plot size: _____)				
1. <u>Dipsacus fullonum</u>	25	<input checked="" type="checkbox"/> 23.8%	FACU	
2. <u>Solidago canadensis</u>	20	<input checked="" type="checkbox"/> 19.0%	FACU	
3. <u>Setaria faberi</u>	15	<input checked="" type="checkbox"/> 14.3%	FACU	
4. <u>Echinochloa crus-galli</u>	15	<input checked="" type="checkbox"/> 14.3%	FACW	
5. <u>Dactylis glomerata</u>	10	<input type="checkbox"/> 9.5%	FACU	
6. <u>Apocynum cannabinum</u>	5	<input type="checkbox"/> 4.8%	FAC	
7. <u>Setaria pumila</u>	5	<input type="checkbox"/> 4.8%	FAC	
8. <u>Cycloloma atriplicifolium</u>	5	<input type="checkbox"/> 4.8%	FACU	
9. <u>Melilotus officinale</u>	5	<input type="checkbox"/> 4.8%	FACU	
10. _____	0	<input type="checkbox"/> 0.0%	_____	
	105	= Total Cover		
<b>Woody Vine Stratu</b> (Plot size: _____)				
1. _____	0	<input type="checkbox"/> 0.0%	_____	
2. _____	0	<input type="checkbox"/> 0.0%	_____	
	0	= Total Cover		

<b>Dominance Test worksheet</b>	
Number of Dominant Species That are OBL, FACW, or FAC:	<u>1</u> (A)
Total Number of Dominant Species Across All Strata:	<u>4</u> (B)
Percent of dominant Species That Are OBL, FACW, or	<u>25.0%</u> (A/B)
<b>Prevalence Index worksheet</b>	
Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>15</u>	x 2 = <u>30</u>
FAC species <u>10</u>	x 3 = <u>30</u>
FACU species <u>80</u>	x 4 = <u>320</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>105</u> (A)	<u>380</u> (B)
Prevalence Index = B/A = <u>3.619</u>	
<b>Hydrophytic Vegetation Indicator</b>	
<input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetati	
<input type="checkbox"/> 2 - Dominance Test is > 50	
<input type="checkbox"/> 3 - Prevalence Index is ≤3. <sup>1</sup>	
<input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate	
<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Expla	
<sup>1</sup> Indicators of hydric soil and wetland hydrology must	
<b>Hydrophytic Vegetation</b> Yes <input type="radio"/> No <input checked="" type="radio"/>	

Remarks: (Include photo numbers here or on a separate sheet.)

\*Indicator suffix = National status or professional decision assigned because Regional status not defined by





**APPENDIX B**  
**OEPA WETLAND ORAM FORMS**

# Wetland 01

Site: AEP East lima to maddox | Rater(s): Audrey Hanner and Stacey Mueller | Date: 9/4/2019

Field Id:  
w-aeh-20190904-01

**0** **0**

## Metric 1. Wetland Area (size).

max 6 pts. subtotal

Select one size class and assign score.

- >50 acres (>20.2ha) (6 pts)
- 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- 10 to <25 acres (4 to <10.1ha) (4 pts)
- 3 to <10 acres (1.2 to <4ha) (3 pts)
- 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- <0.1 acres (0.04ha) (0 pts)

acres

**6** **6**

## Metric 2. Upland buffers and surrounding land use.

max 14 pts. subtotal

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- LOW. Old field (>10 years), shrubland, young second growth forest. (5)
- MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

**6.0** **12.0**

## Metric 3. Hydrology.

max 30 pts. subtotal

3a. Sources of Water. Score all that apply.

- High pH groundwater (5)
- Other groundwater (3)
- Precipitation (1)
- Seasonal/Intermittent surface water (3)
- Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select one.

- >0.7 (27.6in) (3)
- 0.4 to 0.7m (15.7 to 27.6in) (2)
- <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- None or none apparent (12)
- Recovered (7)
- Recovering (3)
- Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- 100 year floodplain (1)
- Between stream/lake and other human use (1)
- Part of wetland/upland (e.g. forest), complex (1)
- Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- Semi- to permanently inundated/saturated (4)
- Regularly inundated/saturated (3)
- Seasonally inundated (2)
- Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed

- |  |  |
|--|--|
| <input checked="" type="checkbox"/> ditch            | <input checked="" type="checkbox"/> point source (nonstormwater) |
| <input type="checkbox"/> tile                        | <input checked="" type="checkbox"/> filling/grading              |
| <input type="checkbox"/> dike                        | <input type="checkbox"/> road bed/RR track                       |
| <input type="checkbox"/> weir                        | <input checked="" type="checkbox"/> dredging                     |
| <input checked="" type="checkbox"/> stormwater input | <input type="checkbox"/> Other:                                  |

**5** **17**

## Metric 4. Habitat Alteration and Development.

max 20 pts. subtotal

4a. Substrate disturbance. Score one or double check and average.

- None or none apparent (4)
- Recovered (3)
- Recovering (2)
- Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- Excellent (7)
- Very good (6)
- Good (5)
- Moderately good (4)
- Fair (3)
- Poor to fair (2)
- Poor (1)

4c. Habitat alteration. Score one or double check and average.

- None or none apparent (9)
- Recovered (6)
- Recovering (3)
- Recent or no recovery (1)

Check all disturbances observed

- |   |   |
|---|---|
| <input type="checkbox"/> mowing                       | <input checked="" type="checkbox"/> shrub/sapling removal |
| <input type="checkbox"/> grazing                      | <input type="checkbox"/> herbaceous/aquatic bed removal   |
| <input checked="" type="checkbox"/> clearcutting      | <input checked="" type="checkbox"/> sedimentation         |
| <input checked="" type="checkbox"/> selective cutting | <input type="checkbox"/> dredging                         |
| <input type="checkbox"/> woody debris removal         | <input checked="" type="checkbox"/> farming               |
| <input checked="" type="checkbox"/> toxic pollutants  | <input type="checkbox"/> nutrient enrichment              |

**17**

subtotal this page ORAM v. 5.0 Field Form Quantitative Rating



# Wetland 01

Site: AEP East lima to maddox | Rater(s): Audrey Hanner and Stacey Mueller | Date: 9/4/2019

Field Id:  
w-aeh-20190904-01

subtotal this page

max 10 pts. subtotal

## Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- Bog (10)
- Fen (10)
- Old growth forest (10)
- Mature forested wetland (5)
- Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- Lake Erie coastal/tributary wetland-restricted hydrology (5)
- Lake Plain Sand Prairies (Oak Openings) (10)
- Relict Wet Praires (10)
- Known occurrence state/federal threatened or endangered species (10)
- Significant migratory songbird/water fowl habitat or usage (10)
- Category 1 Wetland. See Question 5 Qualitative Rating (-10)

max 20pts. subtotal

## Metric 6. Plant communities, interspersions, microtopography.

### 6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- Aquatic bed
- Emergent
- Shrub
- Forest
- Mudflats
- Open water
- Other \_\_\_\_\_

### 6b. horizontal (plan view) Interspersions.

Select only one.

- High (5)
- Moderately high(4)
- Moderate (3)
- Moderately low (2)
- Low (1)
- None (0)

### 6c. Coverage of invasive plants. Refer

Table 1 ORAM long form for list. Add or deduct points for coverage

- Extensive >75% cover (-5)
- Moderate 25-75% cover (-3)
- Sparse 5-25% cover (-1)
- Nearly absent <5% cover (0)
- Absent (1)

### 6d. Microtopography.

Score all present using 0 to 3 scale.

- Vegetated hummocks/tussucks
- Coarse woody debris >15cm (6in)
- Standing dead >25cm (10in) dbh
- Amphibian breeding pools

### Vegetation Community Cover Scale

- 0 Absent or comprises <0.1ha (0.2471 acres) contiguous area
- 1 Present and either comprises small part of wetland's 1 vegetation and is of moderate quality, or comprises a significant part but is of low quality
- 2 Present and either comprises significant part of wetland's 2 vegetation and is of moderate quality or comprises a small part and is of high quality
- 3 Present and comprises significant part, or more, of wetland's 3 vegetation and is of high quality

### Narrative Description of Vegetation Quality

Low spp diversity and/or predominance of nonnative or low disturbance tolerant native species

Native spp are dominant component of the vegetation, mod although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp to

A predominance of native species, with nonnative spp high and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

### Mudflat and Open Water Class Quality

- 0 Absent <0.1ha (0.247 acres)
- 1 Low 0.1 to <1ha (0.247 to 2.47 acres)
- 2 Moderate 1 to <4ha (2.47 to 9.88 acres)
- 3 High 4ha (9.88 acres) or more

### Microtopography Cover Scale

- 0 Absent
- 1 Present very small amounts or if more common of marginal quality
- 2 Present in moderate amounts, but not of highest quality or in small amounts of highest quality
- 3 Present in moderate or greater amounts and of highest quality

Category 1

GRAND TOTAL(max 100 pts)

**APPENDIX C**  
**OEPA HHEI STREAM FORMS**





# Primary Headwater Habitat Evaluation Form

**18**

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

SITE NAME/LOCATION **AEP East Lima to Maddox**

**nh-aeh-20190904-01** SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **200** LAT. **40.87605** LONG. **-84.28208** RIVER CODE  RIVER MILE

DATE **09/04/19** SCORER **aeh** COMMENTS **Ephemeral**

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

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

**channelized, culverted**

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<input type="text" value="15%"/>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="85%"/>
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**

TOTAL NUMBER OF SUBSTRATE TYPES: **2**

**HHEI Metric Points**

Substrate Max = 40

**8**

A + B

Pool Depth Max = 30

**5**

Bankfull Width Max=30

**5**

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

COMMENTS  MAXIMUM POOL DEPTH (Inches): **0.50**

**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 (> 9' 7" - 4' 8") [20 pts]	

COMMENTS  AVERAGE BANKFULL WIDTH (Feet): **0.50**

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

COMMENTS

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

<input 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)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

**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:  Quantity:   
 Photograph Information:  **3 photos, upstream, downstream and substrate**  
 Elevated Turbidity? (Y/N):  N Canopy (% open):  **100%**  
 Were samples collected for water chemistry? (Y/N):  N (Note lab sample no. or id. and attach results) Lab Number:   
 Field Measures: Temp (°C)  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:

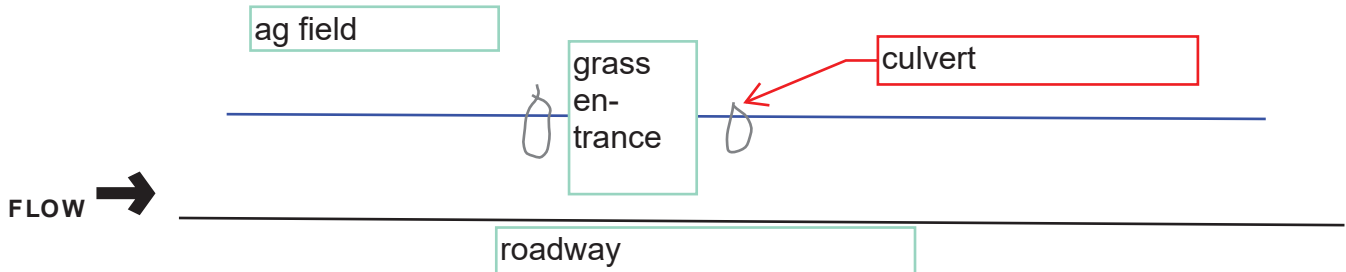
Additional comments/description of pollution impacts:   
**Overall Stability of BOTH Stream Banks (check one):** Stable  Moderately Stable  Unstable

**BIOTIC EVALUATION**

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

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

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







# Primary Headwater Habitat Evaluation Form

**19**

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

SITE NAME/LOCATION **AEP East Lima to Maddox**

**nh-aeh-20190904-02** SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **200** LAT. **40.91048** LONG. **-84.37951** RIVER CODE  RIVER MILE

DATE **09/04/19** SCORER **aeh** COMMENTS **Ephemeral**

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

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

**channelized, culverted**

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	<b>0%</b>	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<b>20%</b>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<b>0%</b>	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<b>70%</b>
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	<b>0%</b>	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<b>0%</b>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<b>0%</b>	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	<b>0%</b>
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<b>0%</b>	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	<b>0%</b>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	<b>0%</b>	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	<b>10%</b>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**

TOTAL NUMBER OF SUBSTRATE TYPES: **3**

**HHEI Metric Points**

Substrate Max = 40

**9**

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

COMMENTS  MAXIMUM POOL DEPTH (Inches): **0.50**

Pool Depth Max = 30

**5**

**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 (> 9' 7" - 4' 8") [20 pts]	

COMMENTS  AVERAGE BANKFULL WIDTH (Feet): **0.50**

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		FLOODPLAIN QUALITY				
L	R	L	R			
<input type="checkbox"/>	<input type="checkbox"/> (Per Bank) Wide >10m	<input type="checkbox"/>	<input type="checkbox"/> (Most Predominant per Bank) Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Urban or Industrial
<input type="checkbox"/>	<input checked="" type="checkbox"/> Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/>	<input checked="" 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 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 checked="" 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)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

**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:  Quantity:   
 Photograph Information:   
 Elevated Turbidity? (Y/N):  N Canopy (% open):   
 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:

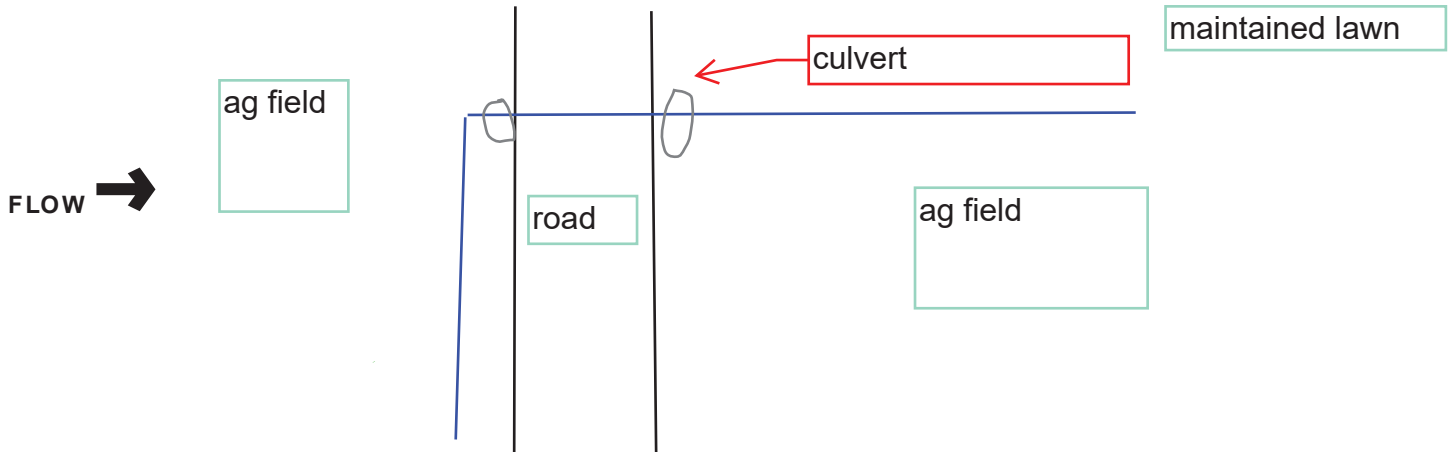
Overall Stability of BOTH Stream Banks (check one): Stable  Moderately Stable  Unstable

**BIOTIC EVALUATION**

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

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

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







Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP East Lima to Maddox**

**nh-aeh-20190904-03** SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **200** LAT. **40.92326** LONG. **-84.08115** RIVER CODE  RIVER MILE

DATE **09/04/19** SCORER **aeh** COMMENTS **Ephemeral**

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

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

**channelized, culverted**

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<input type="text" value="15%"/>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="80%"/>
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="5%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**

TOTAL NUMBER OF SUBSTRATE TYPES: **3**

**HHEI Metric Points**

Substrate Max = 40

**9**

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

COMMENTS  MAXIMUM POOL DEPTH (Inches): **0.50**

Pool Depth Max = 30

**5**

**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 (> 9' 7" - 4' 8") [20 pts]	

COMMENTS  AVERAGE BANKFULL WIDTH (Feet): **1.00**

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		FLOODPLAIN QUALITY			
L	R	L	R		
<input type="checkbox"/>	<input type="checkbox"/> (Per Bank) Wide >10m	<input type="checkbox"/>	<input type="checkbox"/> (Most Predominant per Bank) Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/> Conservation Tillage
<input checked="" type="checkbox"/>	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input checked="" type="checkbox"/>	<input type="checkbox"/> Urban or Industrial
<input type="checkbox"/>	<input checked="" type="checkbox"/> Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/>	<input checked="" 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 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)**

<input type="checkbox"/> WWH Name: <input type="text"/>	Distance from Evaluated Stream <input type="text"/>
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream <input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream <input type="text"/>

**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:  Quantity:   
Photograph Information:   
Elevated Turbidity? (Y/N):  N Canopy (% open):   
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:

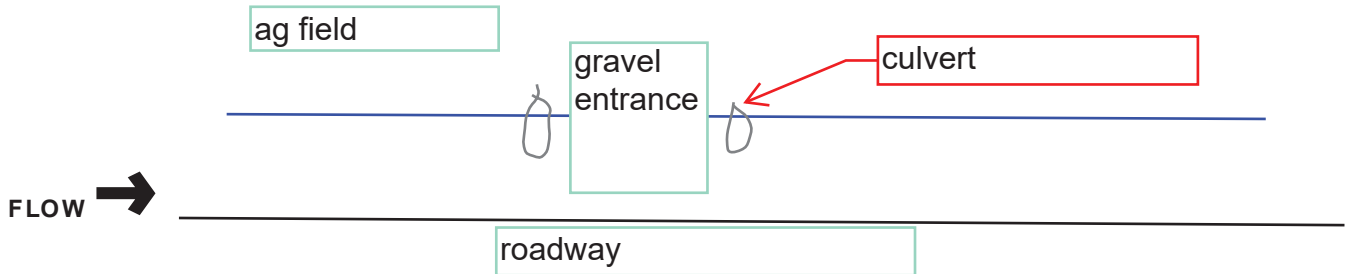
Additional comments/description of pollution impacts:   
**Overall Stability of BOTH Stream Banks (check one):** Stable  Moderately Stable  Unstable

**BIOTIC EVALUATION**

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

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

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







# Primary Headwater Habitat Evaluation Form

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

SITE NAME/LOCATION **AEP East Lima to Maddox**

**nh-aeh-20190904-04** SITE NUMBER  RIVER BASIN  DRAINAGE AREA (mi<sup>2</sup>) **0.01**

LENGTH OF STREAM REACH (ft) **200** LAT. **40.92724** LONG. **-84.43673** RIVER CODE  RIVER MILE

DATE **09/04/19** SCORER **aeh** COMMENTS **Ephemeral**

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

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

**channelized, culverted**

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> <input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> <input type="checkbox"/> SILT [3 pt]	<input type="text" value="25%"/>
<input type="checkbox"/> <input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input checked="" type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="75%"/>
<input type="checkbox"/> <input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> <input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> <input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%** (A)

Substrate Percentage Check **100%** (B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **6**

TOTAL NUMBER OF SUBSTRATE TYPES: **2**

**HHEI Metric Points**

Substrate Max = 40

**8**

A + B

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

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

COMMENTS  MAXIMUM POOL DEPTH (Inches): **0.50**

Pool Depth Max = 30

**5**

**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 (> 9' 7" - 4' 8") [20 pts]	

COMMENTS  AVERAGE BANKFULL WIDTH (Feet): **1.00**

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		FLOODPLAIN QUALITY			
L	R	L	R		
<input type="checkbox"/>	<input type="checkbox"/> (Per Bank) Wide >10m	<input type="checkbox"/>	<input type="checkbox"/> (Most Predominant per Bank) Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/> Conservation Tillage
<input checked="" type="checkbox"/>	<input type="checkbox"/> Moderate 5-10m	<input type="checkbox"/>	<input type="checkbox"/> Immature Forest, Shrub or Old Field	<input checked="" type="checkbox"/>	<input type="checkbox"/> Urban or Industrial
<input type="checkbox"/>	<input checked="" type="checkbox"/> Narrow <5m	<input type="checkbox"/>	<input type="checkbox"/> Residential, Park, New Field	<input type="checkbox"/>	<input checked="" 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 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)**

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

**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:  Quantity:   
Photograph Information:   
Elevated Turbidity? (Y/N):  N Canopy (% open):   
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:

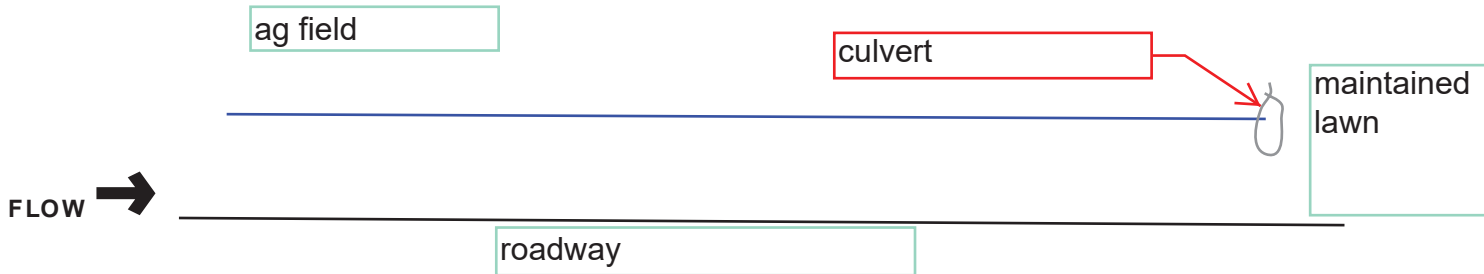
Additional comments/description of pollution impacts:   
**Overall Stability of BOTH Stream Banks (check one):** Stable  Moderately Stable  Unstable

**BIOTIC EVALUATION**

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

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

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





**APPENDIX D**

**DELINEATED FEATURES PHOTOGRAPHS**

**D1 – DELINEATED WETLANDS**



<b>Client Name:</b> AEP Ohio Transco	<b>Site Location:</b> East Lima-Maddox 345kV Re-Conductoring Project	<b>Project No.:</b> 60601386
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<b>Date:</b> September 04, 2019		
<b>Description:</b> Wetland 01 PEM wetland Category 1		
		

**D2 – DELINEATED STREAMS**



<b>Client Name:</b> AEP	<b>Site Location:</b> East Lima-Maddox 345kV Re-Conductoring Project	<b>Project No.:</b> 60601386
----------------------------	---	---------------------------------

<b>Date:</b> September 4, 2019
<b>Description:</b> Stream 01 Ephemeral Modified Class 1



Facing Upstream






Facing Downstream



Substrate



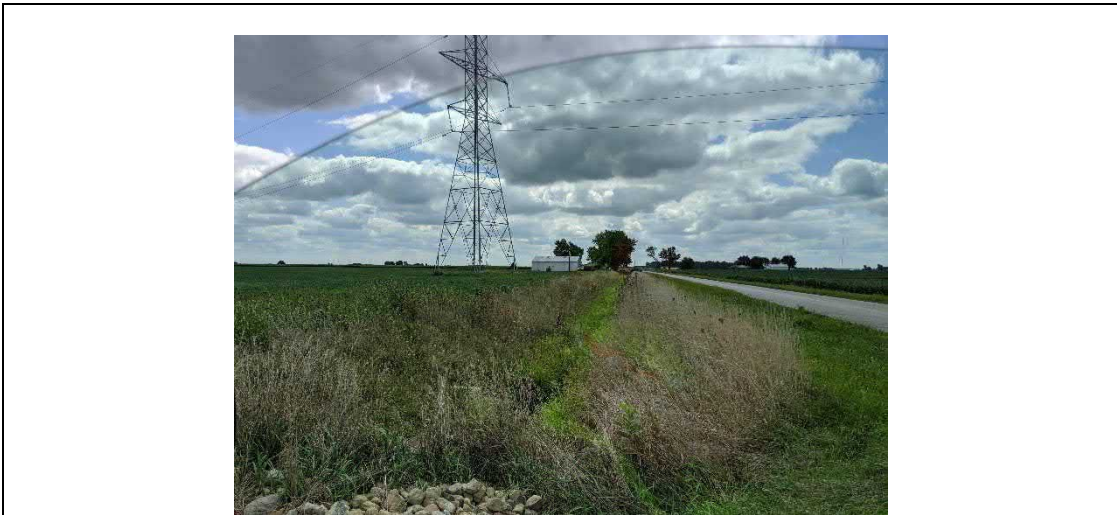
<b>Client Name:</b> AEP	<b>Site Location:</b> East Lima-Maddox 345kV Re-Conductoring Project	<b>Project No.:</b> 60601386
----------------------------	---	---------------------------------

<b>Date:</b> September 4, 2019	 <p>Facing Upstream</p>  <p>Facing Downstream</p>  <p>Substrate</p>
<b>Description:</b> Stream 02 Ephemeral Modified Class 1	



<b>Client Name:</b> AEP	<b>Site Location:</b> East Lima-Maddox 345kV Re-Conductoring Project	<b>Project No.:</b> 60601386
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<b>Date:</b> September 4, 2019
<b>Description:</b> Stream 03 Ephemeral Modified Class 1



Facing Upstream



Facing Downstream



Substrate

<b>Client Name:</b> AEP	<b>Site Location:</b> East Lima-Maddox 345kV Re-Conductoring Project	<b>Project No.:</b> 60601386
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<b>Date:</b> September 4, 2019
<b>Description:</b> Stream 04 Ephemeral Modified Class 1



Facing Upstream



Facing Downstream



Substrate



**APPENDIX E**

**CORRESPONDENCE LETTERS FROM USFWS AND ODNR**



# Ohio Department of Natural Resources

MIKE DEWINE, GOVERNOR

MARY MERTZ, DIRECTOR

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

April 19, 2019

Charlotte Stallone  
AECOM  
525 Vine Street, Suite 1800  
Cincinnati, Ohio 45202

**Re:** 19-251; East Lima-Maddox 345 kV Re-conductoring Project

**Project:** The proposed project involves the re-conductoring approximately 30 miles of 345 kV line between East Lima Station in Allen County to Maddox Station in Van Wert County.

**Location:** The proposed project is located in Allen, Putnam and Van Wert Counties, Ohio.

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

**Natural Heritage Database:** The Natural Heritage Database has the following records at or within a one-mile radius of the project area:

Purple wartyback (*Cyclonaias tuberculata*), SC  
Wavy-rayed lampmussel (*Lampsilis fasciola*), SC  
Creek heelsplitter (*Lasmigona compressa*), SC  
Clubshell (*Pleurobema clava*), E, FE  
Purple lilliput (*Toxolasma lividus*), E, FSC  
Deertoe (*Truncilla truncata*), SC  
Greater redhorse (*Moxostoma valenciennesi*), T, FSC  
Bald eagle (*Haliaeetus leucocephalus*), FSC

The review was performed on the project area you specified in your request as well as an additional one-mile radius. Records searched date from 1980. This information is provided to inform you of features present within your project area and vicinity.

Please note that Ohio has not been completely surveyed and we rely on receiving information from many sources. Therefore, a lack of records for any particular area is not a statement that



rare species or unique features are absent from that area. Although all types of plant communities have been surveyed, we only maintain records on the highest quality areas.

Statuses are defined as: E = state endangered; T = state threatened; P = state potentially threatened; SC = state species of concern; SI = state special interest; A = species recently added to state inventory, status not yet determined; X = presumed extirpated in Ohio; FE = federal endangered, FT = federal threatened, FSC = federal species of concern, FC = federal candidate species.

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

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

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

The project is within the range of the northern riffleshell (*Epioblasma torulosa rangiana*), a state endangered and federally endangered mussel, the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, the white catspaw (*Epioblasma obliquata perobliqua*), a state endangered and federally endangered mussel, the wartyback (*Quadrula nodulata*), a state endangered mussel, the purple lilliput (*Toxolasma lividus*), a state endangered mussel, the rabbitsfoot (*Quadrula cylindrica cylindrica*), a state endangered mussel, and the pondhorn (*Unio tetralasmus*), a state threatened mussel. This project must not have an impact on freshwater native mussels at the project site. This applies to both listed and non-listed species. Per the Ohio Mussel Survey Protocol (2018), all Group 2, 3, and 4 streams (Appendix A) require a mussel survey. Per the Ohio Mussel Survey Protocol, Group 1 streams (Appendix A) and unlisted streams with a watershed of 10 square miles or larger above the point of impact should be assessed using the Reconnaissance Survey for Unionid Mussels (Appendix B) to determine if mussels are present. Mussel surveys may be recommended for these streams as well. This is further explained within the Ohio Mussel Survey Protocol. Therefore, if in-water work is planned in any stream that meets any of the above criteria, the DOW recommends the applicant provide information to indicate no mussel impacts will occur. If this is not possible, the DOW recommends a professional malacologist conduct a mussel survey in the project area. If mussels that cannot be avoided are found in the project area, as a last resort, the DOW recommends a

professional malacologist collect and relocate the mussels to suitable and similar habitat upstream of the project site. Mussel surveys and any subsequent mussel relocation should be done in accordance with the Ohio Mussel Survey Protocol. The Ohio Mussel Survey Protocol (2018) can be found at:

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

The project is within the range of the pugnose minnow (*Opsopoeodus emiliae*), a state endangered fish, and the greater redhorse (*Moxostoma valenciennesi*), a state threatened fish. The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact these or other aquatic species.

The project is within the range of the upland sandpiper (*Bartramia longicauda*), a state endangered bird. Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (CRP). If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of April 15 to July 31. If this type of habitat will not be impacted, this project is not likely to impact this species.

The project is within the range of the northern harrier (*Circus cyaneus*), a state endangered bird. This is a common migrant and winter species. Nesters are much rarer, although they occasionally breed in large marshes and grasslands. Harriers often nest in loose colonies. The female builds a nest out of sticks on the ground, often on top of a mound. Harriers hunt over grasslands. If this type of habitat will be impacted, construction should be avoided in this habitat during the species' nesting period of May 15 to August 1. If this habitat will not be impacted, this project is not likely to impact this species.

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

**Water Resources:** The Division of Water Resources has the following comment.

The local floodplain administrator should be contacted concerning the possible need for any floodplain permits or approvals for this project. Your local floodplain administrator contact information can be found at the website below.

[http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List\\_8\\_16.pdf](http://water.ohiodnr.gov/portals/soilwater/pdf/floodplain/Floodplain%20Manager%20Community%20Contact%20List_8_16.pdf)

ODNR appreciates the opportunity to provide these comments. Please contact Sarah Tebbe, Environmental Specialist, at (614) 265-6397 or [Sarah.Tebbe@dnr.state.oh.us](mailto:Sarah.Tebbe@dnr.state.oh.us) if you have questions about these comments or need additional information.

John Kessler  
Environmental Services Administrator



From: susan\_zimmermann@fws.gov on behalf of Ohio, FW3 <ohio@fws.gov>  
Sent: Monday, March 18, 2019 1:01 PM  
To: Stallone, Charlotte  
Cc: nathan.reardon@dnr.state.oh.us; kate.parsons@dnr.state.oh.us  
Subject: East Lima - Maddox 345 kV Re-conductoring & Structure Replacement



UNITED STATES DEPARTMENT OF THE INTERIOR  
U.S. Fish and Wildlife Service  
Ecological Services Office  
4625 Morse Road, Suite 104  
Columbus, Ohio 43230  
(614) 416-8993 / Fax (614) 416-8994



TAILS# 03E15000-2019-TA-0907

Dear Ms. Stallone,

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 U.S. Fish and Wildlife Service (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.

**FEDERALLY LISTED SPECIES COMMENTS:** All projects in the State of Ohio lie within the range of the federally endangered **Indiana bat** (*Myotis sodalis*) and the federally threatened **northern long-eared bat** (*Myotis septentrionalis*). In Ohio, presence of the Indiana bat and northern long-eared bat is assumed wherever suitable habitat occurs unless a presence/absence survey has been performed to document absence. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags  $\geq 3$  inches diameter at breast height (dbh) that have any exfoliating bark, cracks, crevices, hollows and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. In the winter, Indiana bats and northern long-eared bats hibernate in caves and abandoned mines.

Should the proposed site contain trees  $\geq 3$  inches dbh, we recommend that trees be saved wherever possible. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and trees  $\geq 3$  inches dbh cannot be avoided, we recommend that removal of any trees  $\geq 3$  inches dbh only occur between October 1 and March 31. Seasonal clearing is being recommended to avoid adverse effects to Indiana bats and northern long-eared

bats. While incidental take of northern long-eared bats from most tree clearing is exempted by a 4(d) rule (see <http://www.fws.gov/midwest/endangered/mammals/nleb/index.html>), incidental take of Indiana bats is still prohibited without a project-specific exemption. Thus, seasonal clearing is recommended where Indiana bats are assumed present.

If implementation of this seasonal tree cutting recommendation is not possible, summer surveys may be conducted to document the presence or probable absence of Indiana bats within the project area during the summer. If a summer survey documents probable absence of Indiana bats, the 4(d) rule for the northern long-eared bat could be applied. Surveys must be conducted by an approved surveyor and be designed and conducted in coordination with the Endangered Species Coordinator for this office. Surveyors must have a valid federal permit. Please note that in Ohio summer mist net surveys may only be conducted between June 1 and August 15.

If there is a federal nexus for the project (e.g., federal funding provided, federal permits required to construct), no tree clearing should occur on any portion of the project area 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 and northern long-eared 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 ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at [john.kessler@dnr.state.oh.us](mailto:john.kessler@dnr.state.oh.us).

If you have questions, or if we can be of further assistance in this matter, please contact our office at (614) 416-8993 or [ohio@fws.gov](mailto:ohio@fws.gov).

Sincerely,



Patrice Ashfield

Ohio Field Office Supervisor

cc: Nathan Reardon, ODNR-DOW  
Kate Parsons, ODNR-DOW