

LETTER OF NOTIFICATION FOR THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT (BROOKSIDE-SAWMILL)



An **AEP** Company

BOUNDLESS ENERGY™

PUCO Case No. 19-1974-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.

November 5, 2019

Letter of Notification

AEP Ohio Transmission Company, Inc. Bethel-Sawmill 138 kV Transmission Line Rebuild Project- Phase 1

4906-6-05

AEP Ohio Transmission Company, Inc. ("AEP Ohio Transco" or the "Company") 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.

The Company proposes the Bethel-Sawmill 138 kilovolt ("kV") Transmission Line Project (Brookside-Sawmill) ("Project"), located in Washington Township and the City of Dublin, Franklin County, Ohio. The Company proposes to rebuild and upgrade approximately 2.6 miles of 138 kV transmission line between the existing Sawmill Station and the existing Brookside Station.

The Project consists of rebuilding the 138 kV transmission line within existing right-of-way ("ROW"), which is owned by Ohio Power Company. Figures 1 and 2A-2D in Appendix A shows the location of the Project in relation to the surrounding vicinity.

The Project meets the requirements for a Letter of Notification ("LON") because it is within the types of projects defined by item 2(b) 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:

(b) More than two miles.

The Project has been assigned PUCO Case No. 19-1974-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.

The Project (b3109) is necessary to address a baseline planning criteria violation. The Project need and solution were submitted to the PJM Subregional RTEP Committee during a November 2018 and February

2019 meeting. The planning criteria violations identified include thermal overloads on the line of up to 127% on the Brookside-Sawmill 138kV circuit and up to 102% on the Bethel-Brookside 138kV circuit. These violations were initially driven by a load ramp schedule provided by a new customer that greatly increased area load. Upon further investigation into possible solutions, it was found that existing encroachments of AEP's ROW reduced clearances on the subject line such that the circuits involved needed to be derated. Derating the circuits increased the thermal overloads. In addition to the discovered encroachments, the line, which was constructed in 1956-57, was found to have 35 open conditions. Rebuilding this existing line will eliminate the stated thermal overloads. The existing circuits involved in the project were referenced in the Company's 2019 Long Term Forecast Table FE-T9 pages 22 & 26 of 102 (see Appendix B).

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.

Figure 1 shows the location of the Project in relation to existing transmission facilities on a United States Geological Survey 1:24,000 topographic quadrangle. Figure 2 identifies the Project components on a 2017 aerial photograph.

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.

Refer to Section 3.3 in Appendix C, the Rebuild Siting Study, for information on alternatives considered for the Project.

Based on desktop and field examinations, the Company concluded that construction of the Project on the existing alignment was the best and most reasonable route. The Project route is short, efficient, and direct and uses existing ROW to minimize viewshed impacts. The Project also provides for distribution underbuild onto the new transmission structures, which creates a cleaner, more simplified ROW where all of the utilities would be located on one set of poles rather than parallel alignments. Currently, in areas where there is existing distribution, the distribution facilities are located on separate poles that parallel the transmission line. As such, abandoning the existing ROW for a new greenfield route is neither practical nor necessary in this instance.

Further, the Company confirmed that extended outages could be obtained in order to rebuild the existing line within the existing ROW. Additionally, the design provides for proper clearances within the existing ROW and existing ROW easements permit rebuilding and upgrading the existing line. Ecological and cultural surveys were conducted within the existing easement, and it was determined that no cultural or ecological features would be permanently impacted by the Project.

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.

The Company informs affected property owners and tenants about its projects through several different mediums. Within seven days of filing this LON, the Company 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, the Company will mail a letter, via first class mail, to affected landowners, tenants, contiguous owners, and any other landowner the Company 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). The Company also plans to host an informational open house following the LON filing. The Company will have subject matter experts available at the informational meeting to discuss the project details, the right-of-way acquisition process, tree clearing and what to expect during construction. The Company 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 the Project. Lastly, the Company 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 the first quarter of 2020, and the anticipated in-service date will be approximately May 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.

Figure 1 provides a topographic map of existing and proposed facilities at 1:24,000, and Figure 2 provides an aerial photograph showing roads and highways, clearly marked with project components.

To visit the Project from Columbus, Ohio, take I-70W/I-71S to OH-315N. Continue on OH-315N for approximately 9 miles to the Bethel Road exit. Turn left onto Bethel Road and continue for 1.4 miles. Turn right onto Godown Road and continue for 0.6 mile, then make a left onto West Case Road for 1.9 miles. Next, turn left onto Sawmill Road and travel 0.4 miles. The Bethel Road Station will be located on the right at approximately 4900 Sawmill Road, Columbus, Ohio 43235 (40.068536, -83.093100).

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 will be constructed within existing ROW. Provided in Appendix D is a table of property parcel numbers with an indication as to whether the easement/option necessary to construct and operate the facility has been obtained.

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 transmission line construction will include the following:

Voltage: 138kV
Conductors: 1590 kcmil 54/19 ACSR
Static Wire: 7#8 Alumoweld
Insulators: Polymer
ROW Width: 50 Feet, 1 span requiring 60 feet
Structure Types: Five (5) single circuit, steel monopole deadend
Two (2) double circuit, steel monopole
Four (4) double circuit, two pole steel deadend
Thirty-six (36) single circuit, steel monopole

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

Bethel - Sawmill 138 kV EMF Levels**				
Condition	Sawmill – Brookside / Linworth to Bethel 138 kV Load (A)	Ground Clearance (feet)	Electric Field (kV/m)*	Magnetic Field (mG)*
(1) Normal Max. Loading[^]	525 / 19	47	0.62/ 1.00 /0.62	17.06/19.77/14.42
(2) Emergency Line Loading^{^^}	936 / 148	46	0.63/1.04/0.63	34.26/40.29/29.89
(3) Winter Conductor Rating^{^^^}	2607 / 1247	47	0.62/ 1.00 /0.62	114.15/136.76/106.97

*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 25 feet (left) and 25 feet (right) of centerline, respectively.

**EMF results calculated using EPRI's EMF Workstation 2015 software

[^]Peak line flow expected with all system facilities in service

^{^^}Maximum flow during a critical system contingency

^{^^^}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.

Transmission line rebuild work associated with the Project will occur within Ohio Power Company's existing ROW.

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 \$10,900,000 (Class 4 estimate).

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 is located within Washington township and the City of Dublin, Franklin County, Ohio. Field observations indicate the Project area is primarily comprised of maintained residential lawns, commercial land, and paved surfaces. The southern portion of the Project area is predominately commercial development and intersected by Interstate 270, and the northern portion of the Project area is a mix of residential, commercial, institutional, and recreational land use. Two institutional facilities were identified within the Project area. Dublin Scioto High School is located north of Hard Road, and Grace Point Sanctuary, a place of worship, is located north of Summit View Road. In addition to the institutional facilities, one recreational area was identified within the Project area. Emerald Fields Park is located along the existing transmission centerline, between Wyandotte Woods Boulevard and Summit View Road. Limited areas of old field, woodlots, and palustrine emergent wetlands were identified within the Project area. The Project will require 3.9 acres of tree clearing. This acreage includes a small portion of tree clearing required outside of existing ROW near the Brookside Station, which is due to temporary construction necessary for 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 Project is not located within any registered agricultural district, based on coordination with the Franklin County Auditor's Office on October 29, 2019. Based on field survey observations, there is no agricultural land in the Project area (see Figure 2, Appendix A).

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 resource survey and report were conducted by the Company's consultant for the Project in July 2018. Correspondence from the State Historic Preservation Office ("SHPO") was received in August 2018, see Appendix E. The SHPO stated that the Project will have no adverse affect on historic properties and that no further archaeological work is necessary.

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.

Best management practices (BMPs) will be implemented and maintained to minimize erosion and control sediment to protect surface water quality during storm events. A project-specific Storm Water Pollution Prevention Plan (SWPPP) will be prepared and a Notice of Intent (NOI) will be filed with the Ohio Environmental Protection Agency (OEPA) for authorization of construction storm water discharges under General Permit OHC000005.

One palustrine emergent wetland, one perennial stream, and one intermittent stream are located in the Project Area (see the Ecological Resources Inventory Report included as Appendix F). Project construction activities are not expected to result in the discharge of fill material in the wetland or streams and appears these features can be easily avoided by access roads associated with the Project. Therefore, the Project is not expected to require a Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers or a Section 401 Water Quality Certification from the OEPA.

The Project crosses one small area of Federal Emergency Management Agency ("FEMA") 100-year floodplain. This 100-year floodplain area is located north of Bright Road, as shown on Figure 2 in Appendix F. Project construction activities are not expected to result in the placement of temporary or permanent fill material within this floodplain. Therefore, no floodplain permitting is required for the Project. The City of Dublin has local construction stormwater permits that will be acquired prior to initiation of construction activities in that area. There are no other known local, state or federal permitting requirements that must be met prior to commencement of the 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 Ecological Services Field Office list of federally endangered, threatened, and candidate species in Ohio by County (available at <https://www.fws.gov/midwest/ohio/EndangeredSpecies/pdf/SpeciesListByCountyApril2018.pdf>) was reviewed to determine the threatened and endangered species currently known to occur, or that potentially occur, in Franklin County. This USFWS publication listed the following threatened and endangered species and federal species of concern as occurring in Franklin County: Indiana bat (*Myotis sodalis*; federally endangered), northern long-eared bat (*Myotis septentrionalis*; federally threatened), running buffalo clover (*Trifolium stoloniferum*; federally endangered), Scioto madtom (*Noturus trautmani*; federally endangered), clubshell (*Pleurobema clava*; federally endangered), northern riffleshell (*Epioblasma torulosa rangiana*; federally endangered), rabbitsfoot (*Quadrula cylindrica clindrica*; federally threatened), rayed bean (*Villosa fabalis*; federally endangered), snuffbox (*Epioblasma triquetra*; federally

endangered), and bald eagle (*Haliaeetus leucocephalus*; federal species of concern). No potential winter hibernacula for the Indiana bat or northern long-eared bat were observed during threatened and endangered species habitat assessment field surveys completed within the Project Area. However, as shown on Figure 3 in Appendix F, limited areas of forested habitat (early successional deciduous forest, early successional riparian forest, and mixed early successional/second growth deciduous forest) that may contain potentially suitable roost trees for the Indiana bat and/or northern long-eared bat are present within the Project Area. If tree clearing is necessary in these areas, AEP intends to clear trees between October 1 and March 31. Therefore, no impacts to the Indiana bat or northern long-eared bat are anticipated due to construction activities associated with the Project. Other than potentially suitable foraging and roosting habitat for the Indiana bat and northern long-eared bat, no potentially suitable habitat for other federally listed species or federal species of concern was observed within the Project Area.

As part of the ecological study completed for the Project, a coordination letter was submitted to the USFWS Ohio Ecological Services Field Office seeking technical assistance on the Project for potential impacts to threatened or endangered species. The July 31, 2018 response letter from the USFWS (see Appendix F) indicated that due to the Project type, size, and location, they do not anticipate adverse effects to federally endangered, threatened, proposed, or candidate species.

Several state-listed threatened species, endangered species, and species of concern are listed by the Ohio Department of Natural Resources (<http://wildlife.ohiodnr.gov/portals/wildlife/pdfs/species%20and%20habitats/state-listed%20species/franklin.pdf>) as occurring, or potentially occurring in Franklin County. These state-listed species are addressed in detail in Appendix F. No Project-related impacts to any state-listed threatened or endangered species are anticipated.

Coordination letters were submitted via email to the Ohio Department of Natural Resources (“ODNR”) Division of Wildlife (“DOW”) Ohio Natural Heritage Program (“ONHP”) and the ODNR - Office of Real Estate in July 2018, seeking an environmental review of the proposed Project for potential impacts on state-listed and federally-listed threatened or endangered species. Correspondence from ODNR’s DOW/ONHP and the ODNR – Office of Real Estate was received on September 25, 2018 (see Appendix F).

According to the ODNR – Division of Wildlife, the Project is within the range of the Indiana bat. If suitable Indiana bat habitat occurs within the Project area and trees must be cut, the ODNR recommends cutting between October 1 and March 31. If cutting must occur during summer months, the ODNR recommends a mist net survey be conducted between June 1 and August 15 prior to any cutting. As stated, no winter hibernacula were observed within the Project Area, but potentially suitable foraging habitat and areas of forested habitat that may contain potential roost trees for the Indiana bat and/or northern long-eared bat was observed in the Project Area. AEP will avoid summer roosting and foraging habitat to the extent possible and will determine if any summer tree clearing is necessary and proceed accordingly. It is anticipated that any necessary tree clearing required in these areas will take place between October 1 and March 31.

The ODNR – Division of Wildlife indicated that the Project is within the range of several state-listed threatened and endangered species of mussels and fish. However, the ODNR stated that due to the location and that there is no in-water work proposed in perennial streams, this Project is not likely to impact these species or other aquatic species.

The ODNR – Division of Wildlife indicated that the Project is within the range of the state-listed endangered upland sandpiper (*Bartramia longicauda*). They stated that if suitable nesting habitat (large areas of hayfields, grasslands, and pastures) for this species is present within the Project Area and will be impacted, construction activities should be avoided in this habitat during the species' nesting period (April 15 to July 31). No suitable nesting habitat for the upland sandpiper is present within the Project Area. Therefore, this Project is not likely to impact this species.

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.

The ODNR – Division of Wildlife response indicated that there are no areas of ecological concern reported as occurring at or within one mile of the Project Area. The City of Dublin's Indian Run Falls Park is located within one mile of the Project Area, but it is not located within the Project Area and will not be affected by construction activities associated with the Project. Correspondence received from the USFWS indicated that there are no federal wilderness areas, wildlife refuges, or designated critical habitat in the Project vicinity (see Appendix F).

FEMA Flood Insurance Rate Maps were consulted to identify any floodplains/flood hazard areas that have been mapped in the Project Area (specifically, map numbers 39049C0039K; 39049C0038K; 39049C0151K). Based on these maps, The Project crosses one small area of FEMA 100-year floodplain. This 100-year floodplain area is located along Stream 2 north of Bright Road, as shown on Figure 2 in Appendix F. Project construction activities are not expected to result in the placement of temporary or permanent fill material within this floodplain.

Wetland and stream delineation field surveys were completed within the Project area by the Company's consultant in July and October of 2018. The results of the wetland and stream delineations are presented in Appendix F. One palustrine emergent wetland, one perennial stream, and one intermittent stream are located in the Project Area (see Figure 2 in Appendix F). The proposed transmission line rebuild construction activities are not expected to impact the wetland or streams.

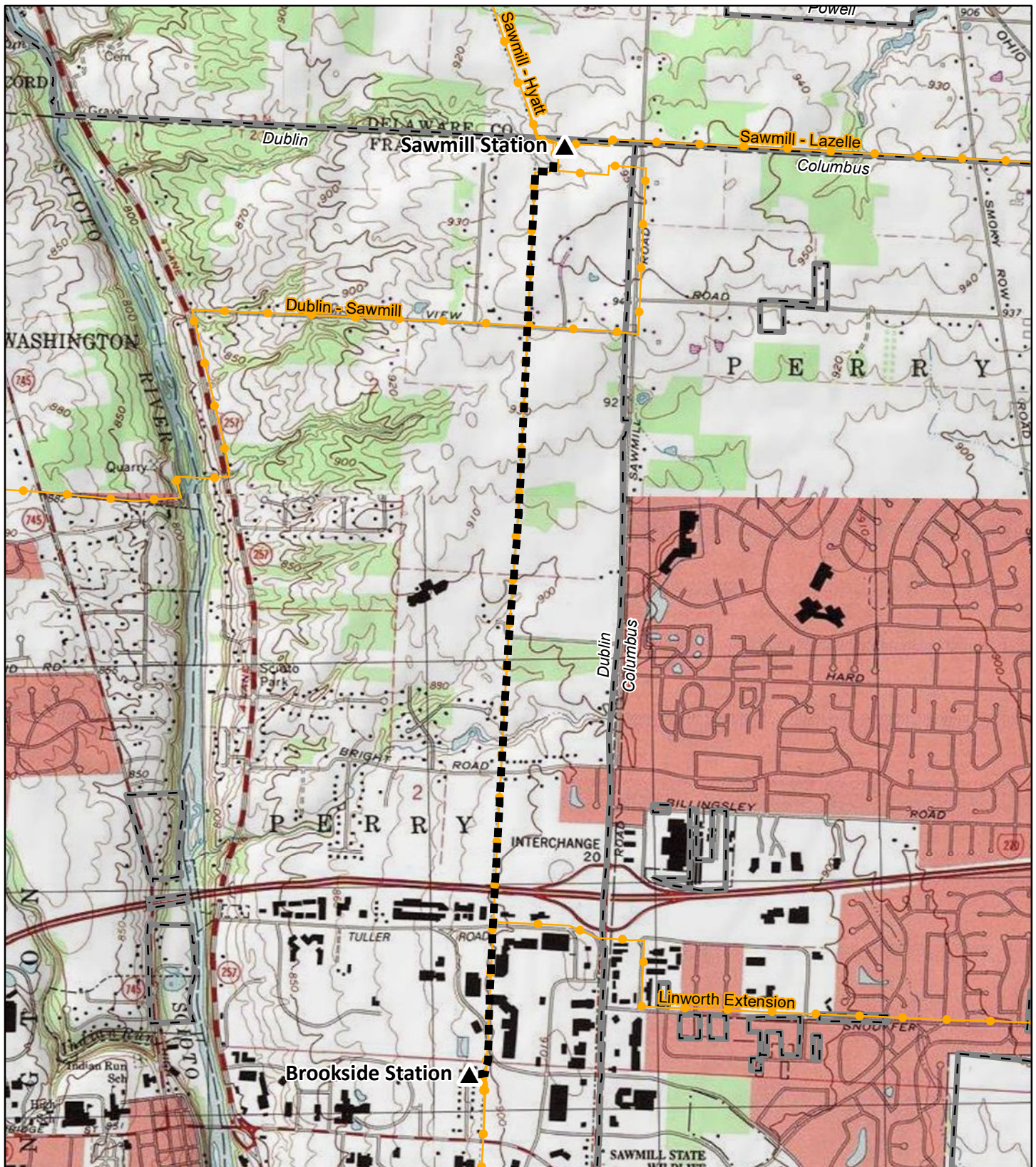
B(10)(g) Unusual Conditions

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

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

**LETTER OF NOTIFICATION FOR THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT
(BROOKSIDE-SAWMILL)**

Appendix A Project Maps and Figures



LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- Preferred Route

Data Sources: AEP, USGS

Coordinate System
and Datum
NAD 83 State Plane
Ohio North



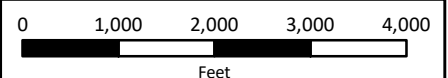
October 28, 2019

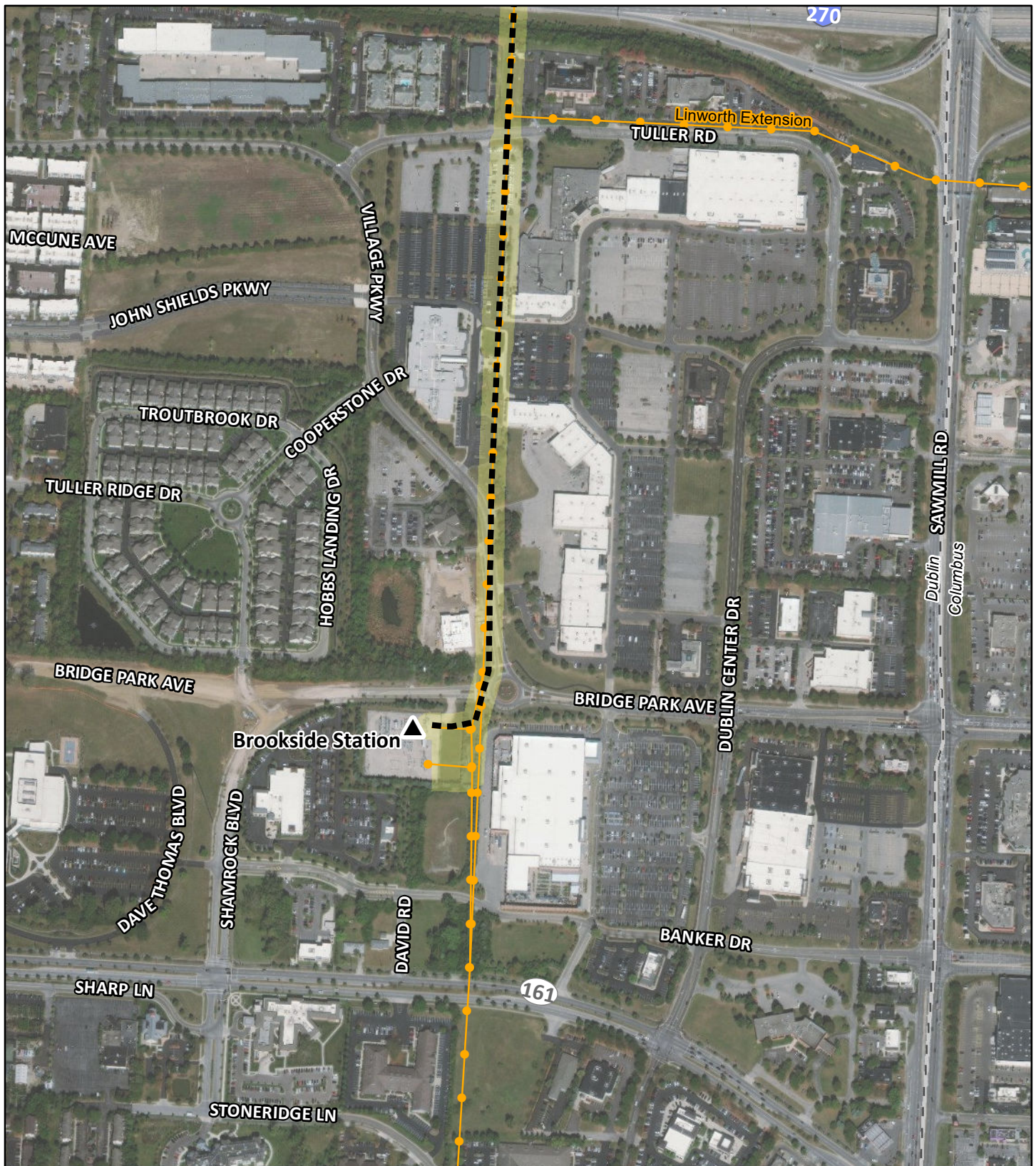


**FIGURE 1
TOPOGRAPHIC OVERVIEW**



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project
(Brookside - Sawmill)





LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- - Preferred Route
- ▭ Municipal Boundary
- Project Area

Data Sources or Notes
ArcMap Basemap,
World Imagery, 2017

Coordinate System
and Datum
NAD 83 State Plane
Ohio North

October 28, 2019

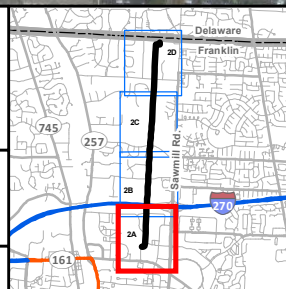
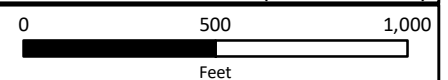
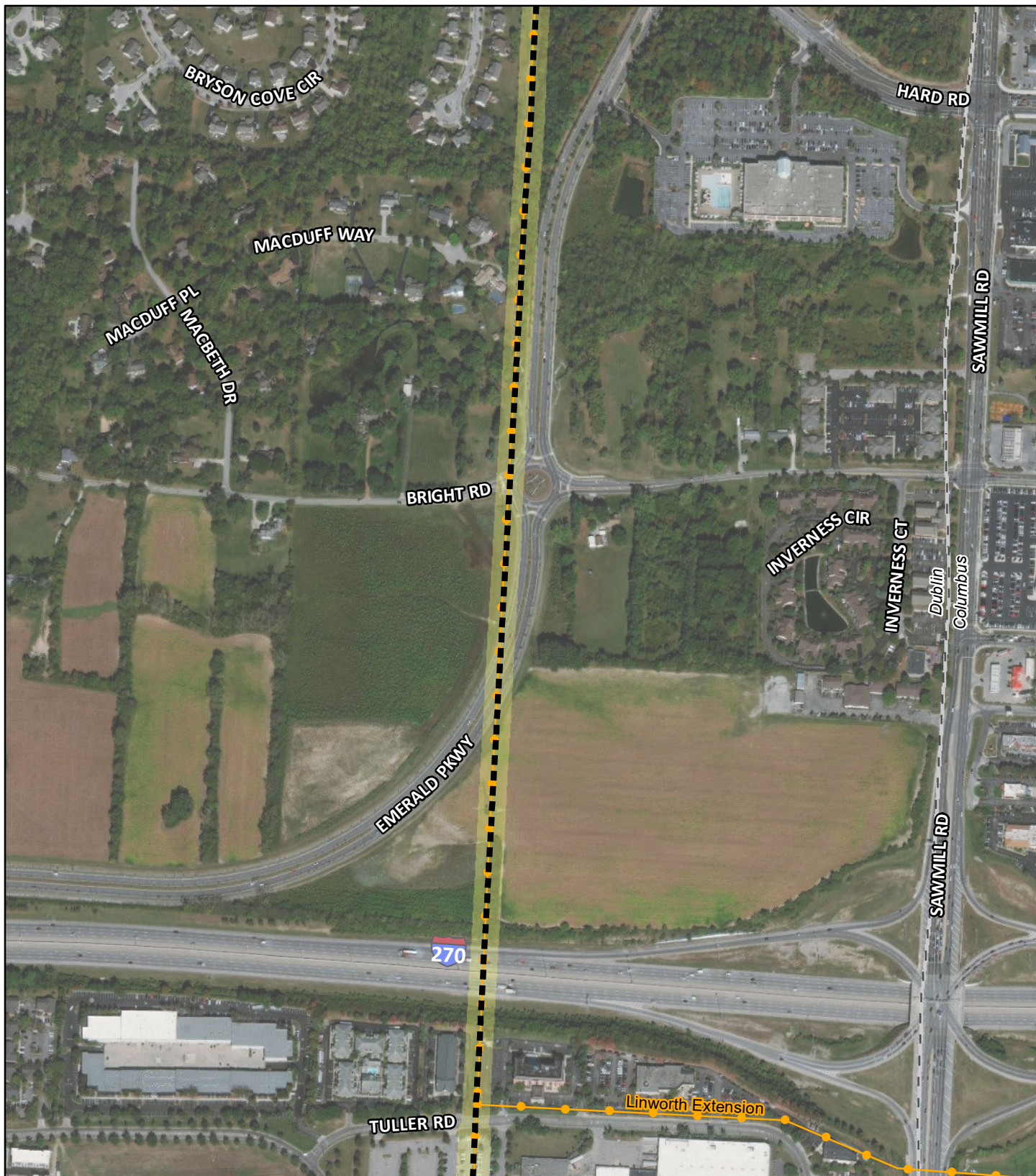


Figure 2A
AERIAL MAP



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project
(Brookside - Sawmill)





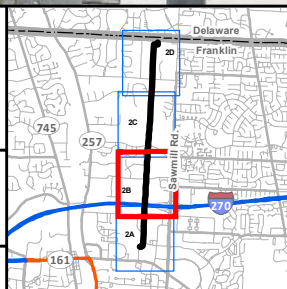
LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- Preferred Route
- Municipal Boundary
- Project Area

Data Sources or Notes
ArcMap Basemap,
World Imagery, 2017

Coordinate System
and Datum
NAD 83 State Plane
Ohio North

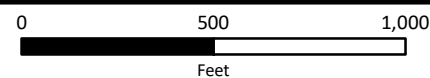
October 28, 2019



**Figure 2B
AERIAL MAP**



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project
(Brookside - Sawmill)





LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- Preferred Route
- Municipal Boundary
- Project Area

Data Sources or Notes
ArcMap Basemap,
World Imagery, 2017

Coordinate System
and Datum
NAD 83 State Plane
Ohio North

October 28, 2019

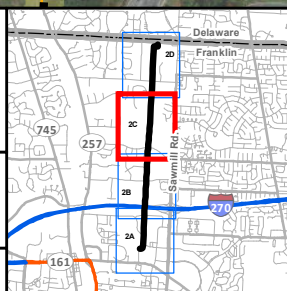
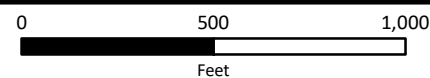
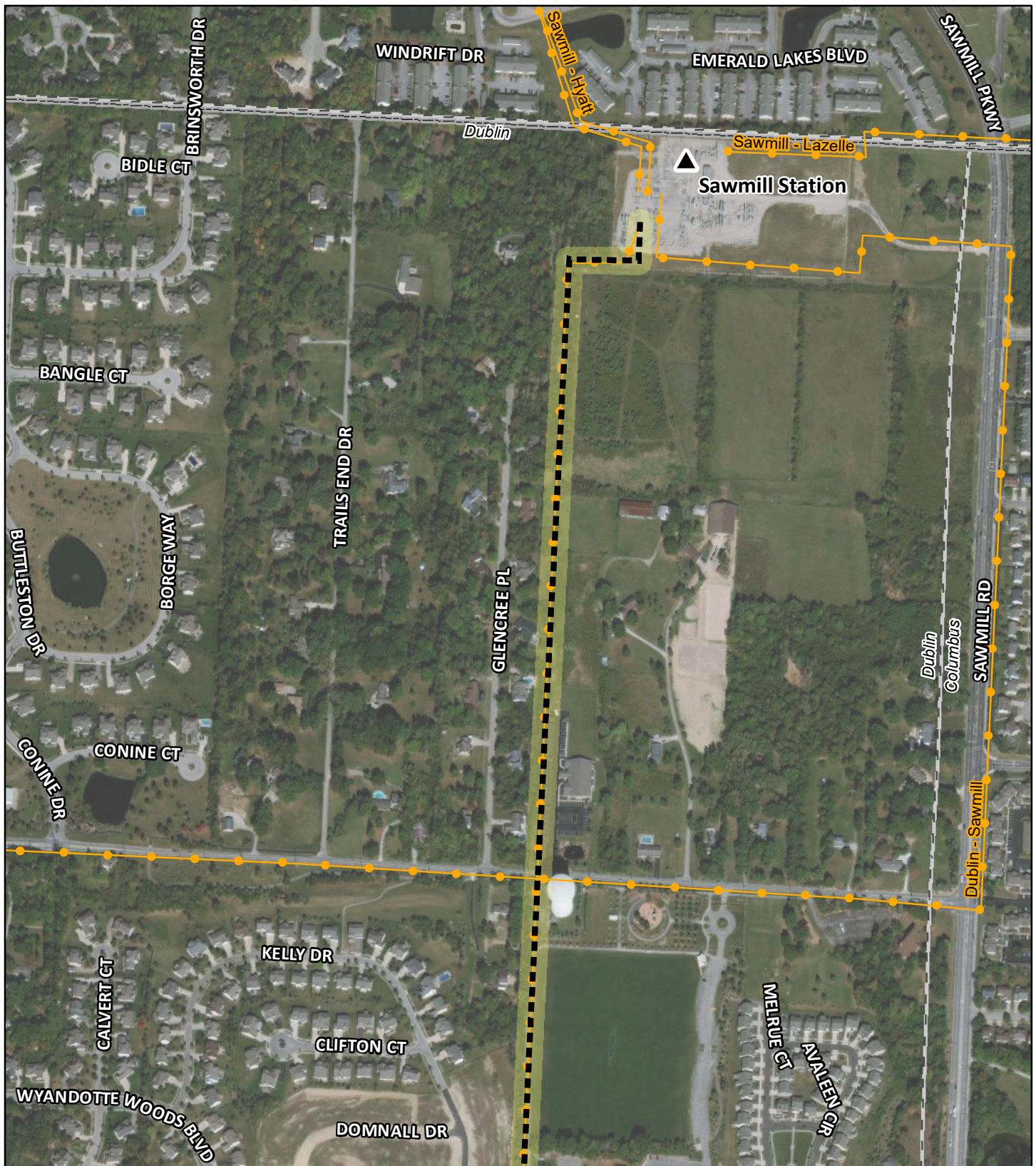


Figure 2C
AERIAL MAP



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project
(Brookside - Sawmill)





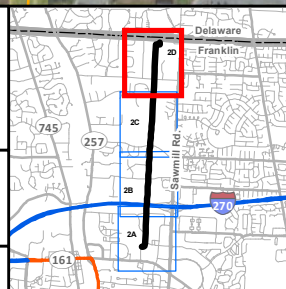
LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- - Preferred Route
- ▭ Municipal Boundary
- Project Area

Data Sources or Notes
ArcMap Basemap,
World Imagery, 2017

Coordinate System
and Datum
NAD 83 State Plane
Ohio North

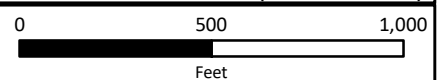
October 28, 2019



**Figure 2D
AERIAL MAP**



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project
(Brookside - Sawmill)



Appendix B PJM Submittal and 2019 Long Term Forecast Report



AEP Transmission Zone: Baseline Dublin, Ohio

Basecase Analysis and N-1-1 Violation

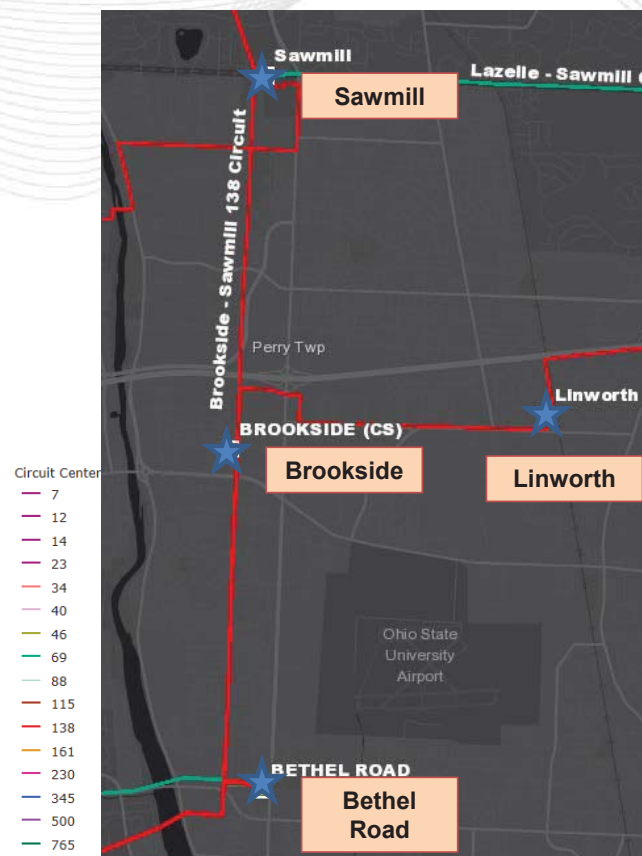
Problem Statement:

The Bethel – Brookside - Sawmill 138 kV line was derated due to the results of a sag study performed on the line, which identified existing encroachments on the line that resulted in the derate. (Summer Normal/Emergency ratings from 216/216 MVA to 151/151MVA)

The Bethel – Brookside line section is overload about 102% for the loss of the 345kV tower lines between Robert and Hayden. It is also shown overloaded in N-1-1 test.

The Brookside – Sawmill line section is overloaded up to 128% for multiple N-1 contingencies and N-1-1 pairs.

AEP has received requests for increased demand in the Dublin area. Newly connected customer loads are scheduled to ramp up, significantly contributing to area thermal concerns.





AEP Transmission Zone: Baseline Dublin, Ohio

Proposed Solution:

- Rebuild 5.2 mile Bethel-Sawmill 138kV line. 1590 ACSR 54/19 Falcon conductor is recommended pending engineering verification. Include new ADSS.
- Upgrade risers and relaying at Brookside, Bethel, Sawmill, and Linworth stations.
- Mitigate any ROW encroachments found as needed.
- Upgrade Brookside 1,200A line switches to 3,000A ratings.
- Upgrade risers at Bethel station. **(b3109)**

Alternatives:

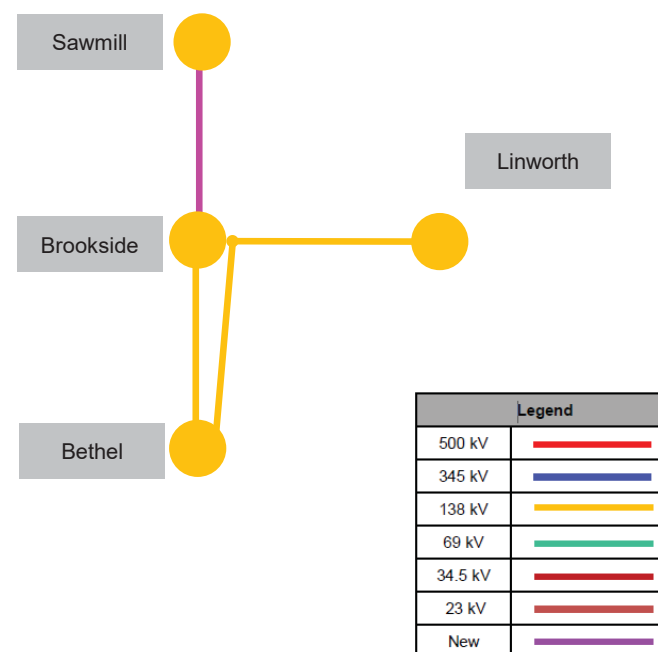
- Various alternatives were investigated but there are no viable alternatives to upgrading this line rating via rebuild.

Total Estimated Transmission Cost: \$34.54M

Required IS Date: 6/1/2019

Projected IS Date: 6/1/2020

Project Status: Engineering



PUCO FORM FE-T9
AEP OHIO TRANSMISSION COMPANY
SPECIFICATIONS OF PLANNED TRANSMISSION LINES

1.	LINE NAME AND NUMBER:	Bethel - Linworth 138kV (PJM number pending)
2.	POINTS OF ORIGIN AND TERMINATION	Bethel, Linworth; INTERMEDIATE STATION - N/A
3.	RIGHTS-OF-WAY: LENGTH / WIDTH / CIRCUITS	2.6 miles / 100 ft / 2 circuit (of construction)
4.	VOLTAGE: DESIGN / OPERATE	138kV / 138kV
5.	APPLICATION FOR CERTIFICATE:	Certificate 2019-2020
6.	CONSTRUCTION:	2019-2021
7.	CAPITAL INVESTMENT:	\$9M
8.	PLANNED SUBSTATION:	NAME - N/A; TRANSMISSION VOLTAGE - N/A; ACREAGE - N/A; LOCATION - N/A
9.	SUPPORTING STRUCTURES:	Steel
10.	PARTICIPATION WITH OTHER UTILITIES	N/A
11.	PURPOSE OF THE PLANNED TRANSMISSION LINE	Mitigate anticipated thermal violations due to increase customer load.
12.	CONSEQUENCES OF LINE CONSTRUCTION DEFERMENT OR TERMINATION	Thermal violations would arise and go unmitigated.
13.	MISCELLANEOUS:	N/A

PUCO FORM FE-T9
AEP OHIO TRANSMISSION COMPANY
SPECIFICATIONS OF PLANNED TRANSMISSION LINES

1.	LINE NAME AND NUMBER:	Brookside - Sawmill 138kV (PJM number pending)
2.	POINTS OF ORIGIN AND TERMINATION	Brookside, Sawmill; INTERMEDIATE STATION - N/A
3.	RIGHTS-OF-WAY: LENGTH / WIDTH / CIRCUITS	2.6 miles / 100 ft / 2 circuit, mostly 1 circuit
4.	VOLTAGE: DESIGN / OPERATE	138kV / 138kV
5.	APPLICATION FOR CERTIFICATE:	LON or Certificate 2019-2020
6.	CONSTRUCTION:	2019-2021
7.	CAPITAL INVESTMENT:	\$9M
8.	PLANNED SUBSTATION:	NAME - N/A; TRANSMISSION VOLTAGE - N/A; ACREAGE - N/A; LOCATION - N/A
9.	SUPPORTING STRUCTURES:	Steel
10.	PARTICIPATION WITH OTHER UTILITIES	N/A
11.	PURPOSE OF THE PLANNED TRANSMISSION LINE	Mitigate anticipated thermal violations due to increase customer load.
12.	CONSEQUENCES OF LINE CONSTRUCTION DEFERMENT OR TERMINATION	Thermal violations would arise and go unmitigated.
13.	MISCELLANEOUS:	N/A

**LETTER OF NOTIFICATION FOR THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT
(BROOKSIDE-SAWMILL)**

Appendix C Rebuild Siting Study

Rebuild Siting Study

Bethel-Sawmill 138 kV Rebuild Project Case No. 19-1974-EL-BLN

Prepared by:



Submitted to:

Ohio Power Siting Board

November 2019

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Attachment A. Maps

- Map 1. Study Area
- Map 2. Natural Resource Constraints
- Map 3. Land Use Constraints
- Map 4. Proposed Route

Key Terminology

Alternative Routes	Assemblage of Study Segments that form routes for analysis and comparison
Conceptual Routes	Initial routes for the project that adhere to a series of general siting and technical guidelines
Constraints	Specific areas that should be avoided to the extent reasonably practical during the route development and site selection process
Distribution Line	An electric line that delivers power from a substation to households and businesses
Diversion	A minor adjustment to the existing route where no other alternative is considered
Focus Area	Areas along the existing route where rebuilding may not be feasible due to the presence of constraints.
Opportunity Feature	Areas where the transmission line may have less disruption to area land uses and the natural and cultural environment
Project Endpoint	The project starting and ending point(s), which may include substations, switch stations, tap points, or other locations defined by the Company's planners and engineers
Proposed Route	The alignment on which the applicant/Siting Team proposes to construct a transmission line. The Proposed Route (1) reasonably minimizes adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a timely, safe and reliable manner.
Segment Endpoint	The intersection of two or more Study Segments
Siting Team	A multidisciplinary team of experts in transmission line routing, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management
Study Segments	Study Segments are partial alignments that when combined form a complete route
Substation	an enclosed assemblage of equipment, e.g., switches, circuit breakers, buses, and transformers, through which electric energy is passed for the purpose of switching or modifying its characteristics

Switching Station	A particular type of substation without transformers and operating only at a single voltage level
Tap Point	The location where power is tapped from an existing transmission line to source a substation or customer
Transmission Line	An electric line that moves bulk electric power from a generating plant to a substation or between substations

ACRONYMS

AEP	American Electric Power
EHV	Extra-high voltage
EPA	U.S. Environmental Protection Agency
ESRI	Environmental Systems Research Institute
DBH	Diameter at breast height
GIS	Geographic information system
GPS	Global positioning system
kV	Kilovolt
LiDAR	Light Detection and Ranging
msl	Mean sea level
MRLC	Multi-resolution land characteristics
NAIP	National Agricultural Imagery Project
NERC	North American Electric Reliability Corporation
NCED	National Conservation Easement Database
NGOs	Non-government agencies
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service of the U.S. Department of Agriculture
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
ROW	Right-of-way
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic Database
T&E	Threatened and endangered (species)
UNT	Unnamed tributary
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service

USFWS
USGS

U.S. Fish and Wildlife Service
U.S. Geological Survey

1.0 PROJECT OVERVIEW

1.1 Project Description

AEP Ohio Transco is proposing to rebuild approximately 5.2 miles of its Bethel-Sawmill 138 kilovolt (kV) transmission line (hereafter the “Project”). The existing transmission line is located in the cities of Dublin and Columbus, in Franklin County, Ohio.

The existing line is over 60 years old and North American Electric Reliability Corporation (“NERC”) criteria violations have been identified on it. The NERC planning criteria violations identified include thermal overloads on the existing line. These violations were initially driven by a load ramp schedule provided by a new customer that greatly increased area load. Upon further investigation into possible solutions, it was found that existing encroachments of AEP’s ROW reduced clearances on the subject line such that the circuits involved needed to be derated. Derating the circuits increased the thermal overloads. Rebuilding the existing line with a larger conductor will address the identified violations and improve the ratings and capacity of the line.

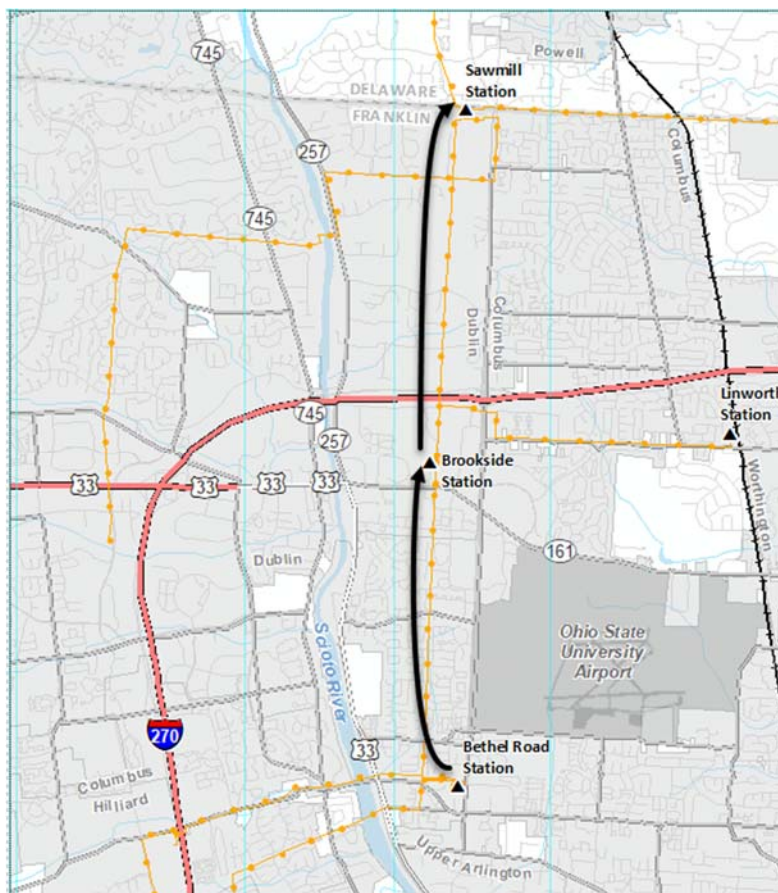


Figure 1. Project Location Map

1.2 Project Characteristics

Project Endpoints and Improvement Description

The Project begins at the Bethel Station in Columbus, Ohio and traverses due north to the Sawmill Station in Dublin, Ohio. The existing right-of-way (ROW) is currently 50 feet wide and the Project will remain within the existing 50 foot wide ROW. The existing structures are double-circuit steel lattice towers approximately 100 feet tall. Two different structure types will be used for the line. From the Bethel Road Station to the existing Linworth Extension, the proposed structures are double-circuit steel monopoles approximately 85 feet tall. From the Linworth Extension to Sawmill Station, the proposed structures will be single-circuit steel monopoles, approximately 85 feet tall. Other structure types may be used, as necessary and for unique design situations. The proposed rebuild will require approximately three times the number of structures compared to the existing transmission line to meet current design standards.

Figure 2A and 2B Typical Existing Structures



2A



2B

Figure 2C and 2D Typical Proposed Structures



2C



2D

Construction and Maintenance Considerations

The proposed Project requires surveying, access road construction, ROW clearing, foundation installation, structure assembly and erection, conductor and shield wire installation, and restoration upon completion. Construction activities will be conducted in accordance with any and all local, state, and/or federal permits that are necessary for the project.

1.3 Project Timeline and Overview of Regulatory Approvals

The Siting Team reviewed the existing transmission line and its right of way as well as high level alternatives to the Project from July through October of 2018. AEP Ohio Transco selected a Preferred Route (Proposed Rebuild) and prepared a letter of notification to the Ohio Power Siting Board (OPSB) in November of 2019. Pending approval from the OPSB, construction is expected to begin in the first quarter of 2020 to meet a May 2021 in-service date.

1.4 Goal of the Rebuild Siting Study

The Rebuild Siting Study is intended to review the existing line and associated right of way, , consider the need and feasibility of alternative alignments, and facilitate the identification of a Proposed alignment for the Project. The route identified should be the route that (1) reasonably minimizes any new adverse impacts on area land uses and the natural and cultural environment; (2) minimizes special design requirements and unreasonable costs; and (3) can be constructed and operated in a timely, safe and reliable manner.

2.0 ROUTE AND SITE DEVELOPMENT PROCESS

2.1 Route Development Process Summary/Methodology

The route development process is inherently iterative with frequent modifications made throughout the study as a result of the identification of new constraints, input from agencies, landowners, and other stakeholders, periodic re-assessment of routes with respect to the siting criteria, and adjustments to the overall route.

The Rebuild Siting Study was conducted in the following general steps.

1. Defined the Project Study Area.
2. Collected readily available environmental, land use, and engineering data within the Study Area.
3. Completed a desktop review of the existing line and right of way as well as nearby constraints and opportunities.
4. Conducted Siting Team meetings and field inspections of the Study Area and existing transmission line.
5. Considered alternatives to the rebuild in the existing right-of-way.
6. Analyzed and assessed the Proposed Rebuild.
7. Initiated public outreach process and review of the Project with stakeholders.
8. Finalized the Proposed Rebuild.

2.2 Siting Team Members

A multi-disciplinary Siting Team performed the siting study. Team members were selected to bring wide experience to the siting study to achieve a thorough review of all aspects of developing the route. Members of the Siting Team have experience in transmission line siting, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management.

2.3 Data Collection

The following sources of information were used to develop data for the Siting Study. A detailed table of data sources is provided in **Attachment A**.

2.3.1 Geographic Information System (GIS) Data Collection

Aerial photography is an important tool for route selection. The primary sources of aerial imagery used in the route identification, analysis, and selection effort for the Project include:

- Google
- National Agricultural Imagery Program, 2017
- Ohio Statewide Imagery Program, 2013

Updated information, such as the location of new residences and other constraints, was annotated to the photography by either paper maps (at the public meetings) and transferred into the GIS, or digitized directly into the GIS as identified during field inspections.

The study made extensive use of information in existing GIS data sets, obtained from many sources, including federal, state, and local governments. Much of this information was obtained through official agency GIS data access websites, some was provided directly by government agencies, and the Siting Team created some by digitizing information from paper-based maps, aerial photo interpretation, and field inspections.

GIS data sources vary with respect to their accuracy and precision. For this reason, GIS-based calculations and maps presented throughout this study should be considered reasonable approximations of the resource or geographic feature they represent and not absolute measures or counts. The data and calculations presented in this study allow for relative comparisons among project alternatives, with the assumption that any inherent errors or inaccuracies would be generally equal across all alternatives. Field reconnaissance is conducted to verify certain features (e.g., locations of residential, commercial and industrial buildings). **Attachment D**

2.3.2 Field Reconnaissance

Siting Team members conducted numerous field inspections throughout the Study Area and along the Proposed Rebuild. The team members examined the Proposed Rebuild by automobile from public roads and other points of public access and correlated observed features to information shown on aerial photography, USGS 7.5 minute topographic maps, road maps, and the range of GIS sources compiled.

2.3.3 Federal, State and Local Government Coordination

The Siting Team obtained information from or contacted various federal, state, and local agencies and/or officials to inform them of the Project and request data for the route planning process. The agencies contacted are listed below. Copies of agency correspondence are included as **Attachment E**.

Federal Agencies

- United States Fish and Wildlife Service (USFWS)

State Agencies

- Ohio Department of Natural Resources (ODNR)
- Ohio History Connection (OHC)

Local Agencies and/or Officials

The Siting Team coordinated with local government agencies/officials to aid the route development process. These entities included:

- City of Columbus, Department of Public Utilities

2.3.4 Other Stakeholders

The Siting Team also coordinated with Ohio State University Airport (Don Scott Field) to discuss any future development and discuss the proposed Project.

2.3.5 Public Outreach Summary

AEP Ohio Transco has contacted all affected property owners in connection with obtaining permission to survey their property. Additionally, affected property owners will be invited to an informational open house, where AEP representatives will be available to answer questions regarding the Project, existing and proposed structures will be displayed, and construction sequencing details will be available.

3.0 PROPOSED REBUILD DEVELOPMENT

3.1 Study Area Description

The Study Area is that territory in which line route options can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize new environmental impacts and Project costs. The Study Area was intended to encompass all reasonable alignments between these connection points. Given these considerations, the Siting Team identified a Study Area for the Project, which is defined as roughly a half-mile buffer around the existing centerline and encompasses approximately 3,500 acres (5.5 square miles) in the cities of Dublin and Columbus, Franklin County, Ohio (see **Appendix A, Map 1**). The existing Bethel Road Station is the southern terminus of the Project and the existing Sawmill Station is the northern terminus of the Project.

The Project Study Area is generally bounded by Sawmill Station to the north, Sawmill Road and heavy commercial development to the east, the Ohio State University Airport to the southeast, Bethel Station to the south, and the Scioto River to the west. The Study Area is dominated by residential and commercial development throughout with some recreational trails, parks, and schools. The southern portion of the study area is dominated by dense residential development, the central portion of the study area is predominately commercial development intersected by Interstate 270 (I-270), and the northern portion of the study area is comprised of a mix of residential, commercial, institutional, and recreation land use (**Appendix A, Map 1**).

3.2 Opportunities and Constraints

The Siting Team identified and mapped siting constraints and opportunities along the existing route and within the Study Area.

Constraints are specific areas that should be avoided to the extent practical during the route development and selection process when considering new alignments. Constraints in and around the Study Area include the Dublin High Street Historic District adjacent to the western-central portion of the Study Area; the Ohio State University Airport located a half mile east of the Bethel Road Station; and numerous commercial developments in the cities of Dublin and Columbus. The most recent of the commercial developments is the Bridge Street District in the western-central portion of the Study Area. Finally, the I-270/Sawmill Road interchange is located in the eastern-central portion of the Study Area and was reviewed as an engineering and constructability concern.

Existing linear features are generally considered "opportunities" to parallel or use for routing transmission lines. The existing Bethel-Sawmill 138 kV Transmission Line is identified as the primary opportunity feature for the Project. Using the existing right of way of the line proposed for reconstruction is the preferred approach to avoid or minimize the potential for introducing new impacts to area land use. This approach is also a preference for many federal, state, and

local officials, and is commonly preferred by the general public. Two other linear features, Sawmill Road and Riverside Drive (US Route 33) that flank the eastern and western side of the Study Area, were also identified as potential opportunity features and considered in this analysis.

3.3 Alternatives Considered but Eliminated

Alternatives to the existing rebuild were considered along the other existing linear features within the Study Area, such as Sawmill Road and Riverside Drive. These potential options were ultimately eliminated from further review due to constructability concerns, the likelihood of new impacts to dense development, traffic control and congestion issues, conflicts with existing underground utilities, the potential to introduce new visual and environmental impacts to a previously unaffected area, and potential conflicts with the Ohio State University Airport.

Overhead alignment options along Sawmill Road would involve numerous potential conflicts with the Ohio State University Airport; traffic management, existing commercial development, and associated signage; and the existing underground electric and gas infrastructure. The latter restricted suitable pole placement opportunities on either side of the congested commercial thoroughfare. Similar challenges were noted along Riverside Drive where any alignment options would also likely add new visual impacts for several miles along the Scioto River, near the Dublin High Street Historic District, and adjacent to the dense suburban/urban developments along the east side of the river.

Underground construction options were considered relative to using the existing ROW due to the highly congested nature of the project area as well as the height restrictions surrounding the Ohio State University Airport. Ultimately, the project team found many challenges that would limit the potential for underground solutions, create significant construction challenges, and/or increase the already high cost of underground construction when compared to reusing the existing ROW. It should be noted that any underground alternative would involve added costs associated with reconfiguring three substations to account for connections with an underground transmission line.

The team found that any underground line alternatives along Sawmill Road would have significant conflicts associated with the existing underground utilities within and crossing Sawmill Road. Most notably, the team found that the presence and location of existing underground utilities for water, sewer, gas, and electric lines and their associated offset requirements would prevent suitable alignments along and within the road in many places. In addition, 110 different locations were identified where existing underground utility crossings would likely involve costly directional bores to avoid disturbing existing facilities and their associated services. Additional construction challenges were also noted with the lengthy directional bore required for passing under the I-270/Sawmill interchange. Finally, an underground alternative would likely have

significant traffic control impacts both during construction and for maintenance and emergency restoration along the Sawmill commercial thoroughfare.

An underground option within the existing ROW was also eliminated from further consideration due to the suitability of the existing ROW for an above ground option and the existing underground utilities within the ROW easement. The presence of a large diameter sewer main within the existing ROW provided insufficient space for an underground alternative along the existing ROW.

Finally, several different structure design alternatives were considered for rebuilding within the existing right of way to address various height, structure count, and right of way restrictions along the existing ROW. These design considerations included varying structure types and span lengths. However, all of these alternatives were eliminated from further consideration because they either exceeded the height restrictions at the Ohio State University Airport, did not account for the need for distribution, or would require additional ROW in this highly congested area (likely requiring the removal of homes).

3.4 Proposed Rebuild

The Siting Team reviewed the Proposed Rebuild based on the opportunities and constraints within the Study Area. The primary routing criteria was to maximize the use of the existing transmission line ROW and rebuild back on centerline. The Proposed Rebuild is 5.2 miles long and exclusively uses the existing transmission line ROW.

The Siting Team assessed the suitability of using the existing Bethel-Sawmill 138 kV ROW and rebuilding the existing line, by completing the following activities:

- AEP Ohio Transco planners determined that an extended outage to rebuild the existing line within the existing ROW is feasible.
- AEP Ohio Transco engineers flew LiDAR (aerial topographic survey), conducted preliminary engineering design, and determined a design that maintains proper clearances within the existing ROW.
- AEP Ohio Transco ROW agents reviewed the existing ROW easements (initially obtained in the 1940's and 1950's) and determined that they permit rebuilding and upgrading the existing line.
- AEP Ohio Transco ROW agents conducted field reconnaissance of the existing ROW. Although there are encroachments, no residences are located within the ROW and the ROW is generally in good condition. Additionally, the entire Siting Team (engineering, siting, and environmental staff) also conducted numerous field reviews of the existing line and ROW to ensure the rebuild was practical and minimized impacts.

- AEP Ohio Transco retained consultants to evaluate the environmental and cultural impacts of the Project and coordinate with appropriate agencies. The Siting Team concluded that using the existing ROW minimizes impacts to land use, cultural, and the natural environment.

Siting Team verified that abandoning the existing ROW for a new greenfield route is neither practical nor necessary. Using the existing ROW minimizes new visual impacts in the area, as there is an existing transmission line and visual impact along the existing ROW. Utilizing existing ROW limits the additional impacts and cost of construction when compared with a new greenfield route through this highly developed area and the existing easements allow for reconstruction of the existing facilities. The following Section 4.0 describes the assessment of the existing ROW.

4.0 ASSESSMENT OF THE PROPOSED REBUILD

The Proposed Rebuild was reviewed in detail using a combination of information collected in the field, GIS data sources, and the collective knowledge and experience of the Siting Team.

The entirety of the Proposed Rebuild is located within the existing 50 foot wide ROW. The total length of the Proposed Rebuild is 5.2 miles

4.1 Natural Resources

Natural resource impacts include potential impacts to vegetation and habitat, surface waters, threatened and endangered species, and conservation and recreation lands. Potential impacts discussed in this section are based on publically available maps and data, field delineated data, as well as consultation with federal and state agencies. Natural Resource constraints along the Proposed Rebuild are shown in **Appendix A, Map 2**.

Field delineation of the existing ROW was conducted in July and October 2018. One palustrine emergent wetland, two perennial streams, and one intermittent stream are located within the existing ROW. The proposed transmission line rebuild construction activities are not expected to permanently impact the delineated wetland or streams.

The Project will require approximately 7 acres of additional tree clearing within the ROW. However, whether this Project is rebuilt or not, vegetation within the existing ROW will need to be cleared and removed per existing rights, as the existing vegetation does not currently meet AEP Forestry standards.

One small area of FEMA 100-year floodplain is located along a stream within the existing ROW, north of Bright Road, however, construction activities are not expected to result in the placement of temporary or permanent fill within this floodplain.

4.2 Land Use

Land use impacts include direct and indirect impacts to residential, commercial and industrial development, institutional uses (e.g., schools, places of worship, cemeteries, and hospitals), cultural resources, and land use. Construction of a new transmission line can result in changes in land use and aesthetic impacts to residents, commuters and travelers, employees, and recreational users. The different land use within the Study Area are shown in **Appendix A, Map 3 and Figures 3A through 3D** below, show images of the existing transmission line.

Although there are existing steel lattice towers within the current 50 foot ROW (see **Figure 3A-3D** below), there will be some additional visual impacts associated with the Project. As mentioned above, approximately 7 acres of tree clearing will be required, and although the structure heights will be decreasing by approximately 15 feet, the Proposed Rebuild will require approximately three times the number of structures to accommodate the narrow ROW and heavier conductor. However, the Proposed Rebuild structure monopoles will have smaller footprints than the existing lattice towers and are typically preferred by the landowners over lattice towers. Furthermore, the Company plans to consolidate distribution and transmission lines onto the new monopoles in areas where there is existing distribution, located on separate poles (see **Figures 3A and 3D**). The Proposed Rebuild would plan for distribution underbuild onto the new transmission structures, which would create a cleaner, more streamlined ROW where all of the utilities would be located on one set of poles rather than parallel alignments. Finally, no residences are located within the ROW and the Project is not expected to require acquiring any residences. However, depending on final design, some outbuildings (sheds) may need to be relocated.



3A



3B



3C



3D

Figures 3A through 3D. Pictures from existing Bethel-Sawmill 138 kV Transmission Line

4.3 Constructability

This section discusses the feasibility of a proposed transmission line, as it relates to engineering and construction concerns. Constructability evaluates the use of existing transmission corridors, engineering challenges, and accessibility issues of a Proposed Route. Major factors that affect constructability include, but are not limited to, topography, condensed or constrained ROWs, large angles, proximity to major highways, access, safety and cost.

Utilizing the existing ROW for the Project minimizes route length and ROW acquisition, as the existing line is a direct route between the Bethel Road and Sawmill stations. In addition, utilizing existing ROW is consistent with public preference and general siting guidelines. Furthermore, AEP Ohio Transco transmission planning determined that an outage on the existing line could be taken to allow the Proposed Rebuild to be rebuilt on the existing centerline.

Underground utilities were identified within the existing ROW, however, transmission line engineering reviewed the data during the conceptual design phase and determined that rebuilding along existing centerline is feasible and that the existing underground utilities can be avoided or mitigated.

Access along the Proposed Rebuild is a noted challenge. In heavily residential areas with numerous fenced in yards, access may be difficult without moving, removing, and/or rebuilding existing fence lines, sheds, and other outbuildings. However, the Project crosses 21 roads which should allow for alternate access in some locations to avoid damages during construction. The Project also requires crossing over I-270. Coordination with ODOT will be required prior to construction.

The Project will require crossing two existing transmission lines. The first crossing occurs near the Bethel Road Station, where the existing Bethel-Hilliard 69 kV line currently runs under the existing centerline. The second crossing occurs along Summit View Road, where the existing centerline runs over the Dublin-Sawmill 138 kV transmission line. A large water tower owned by the City of Columbus is also located in the vicinity. During preliminary engineering, it was determined that rebuilding on existing centerline was feasible in both locations, but may require different conductor configuration to cross over the Dublin-Sawmill 138 kV transmission line.

The Ohio State University Airport is located approximately 1,800 feet east of the existing centerline. The Siting Team determined that structure heights need to remain the same height to meet FAA regulations. Any alternatives identified closer to the airport (as described above) may require non-standard design or be unfeasible. The final design will be submitted and reviewed by the FAA as required.

5.0 RESULTS AND CONCLUSION

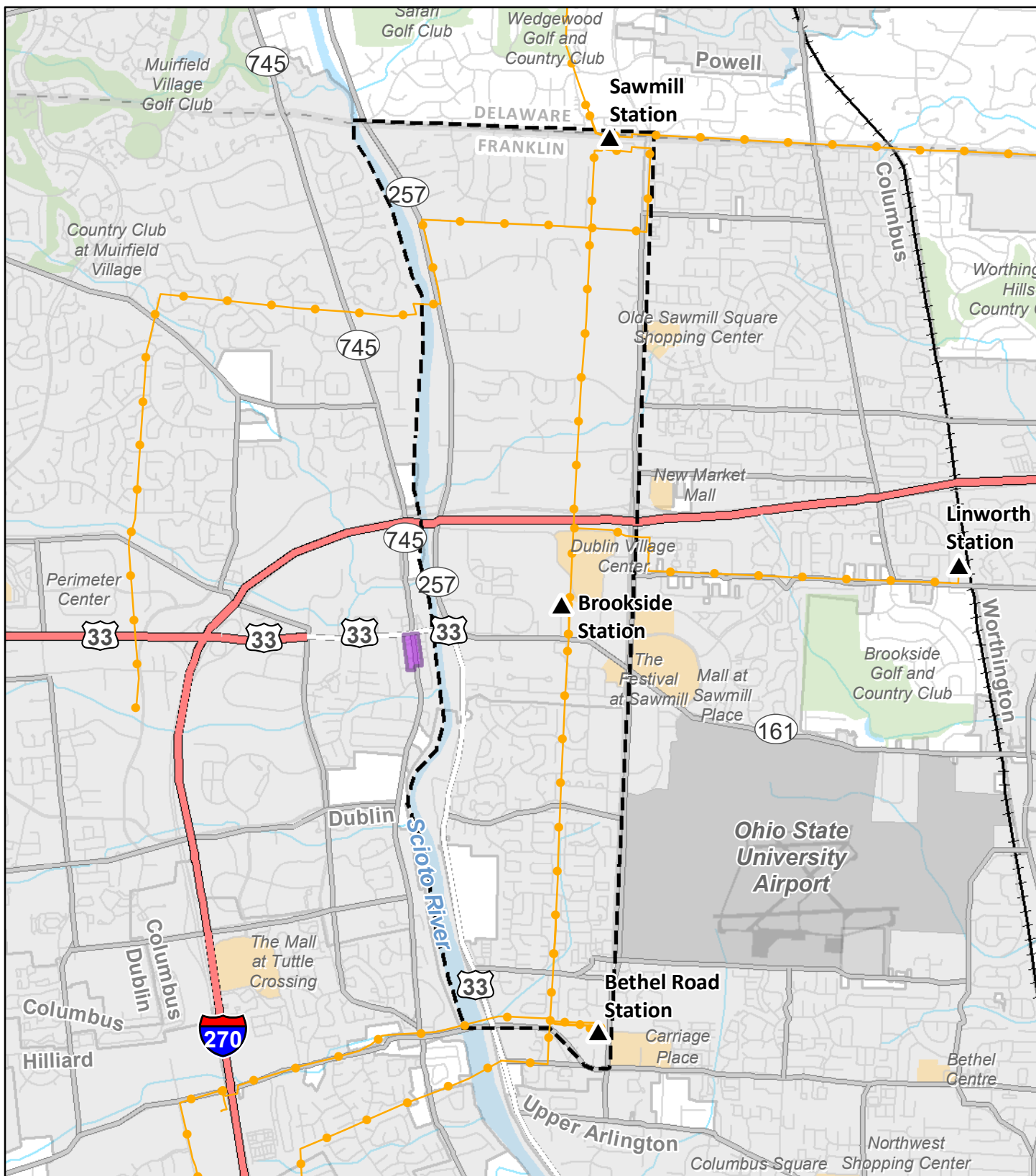
In assessing the suitability of using the existing Bethel-Sawmill 138kV ROW, the following activities were concluded:

- Based on desktop and field examinations, the Siting Team concluded that construction of the Proposed Rebuild on the existing alignment is reasonable and the best route. The existing route is short, efficient and direct.
- The Siting Team reviewed the existing ROW easements and determined that the easements permit rebuilding and upgrading the line. Easements will be supplemented to include additional language to prohibit structures, however, the easements widths will remain at 50 feet.
- Based on field investigations, one wetland and three streams were identified within the existing ROW, none of these features will be permanently impacted by the Project. Using the existing centerline, as compared to a new greenfield route, will minimize environmental, visual, cultural, and landuse impacts.
- Company engineers determined a design during preliminary engineering that maintains the proper clearances to continue using the 50 foot ROW. In addition, the design allows for a more streamlined ROW, where distribution can be underbuilt on the Proposed Rebuild and eliminates parallel alignments within the ROW.

Conclusion

Overall, based on a qualitative and quantitative review of information obtained from GIS data, existing easements, field reconnaissance, agency consultation and public outreach as well as engineering and financial estimates for the Project, the Siting Team recommends rebuilding on the existing centerline with short span construction (**Appendix A, Map 4**). Abandoning the existing ROW for a new greenfield route was determined neither practical nor necessary given the impacts described in this document when compared to the suitability of the existing ROW under the proposed design. Collectively, the Siting Team believes that the Proposed Rebuild on the existing centerline is reasonable, the best route, and consistent with public preferences and general siting guidelines for paralleling or utilizing existing ROW for new or rebuild transmission facilities.

Attachment A: Maps



LEGEND:

- ▲ Existing Station
- Existing Transmission Line
- Dublin High Street Historic District
- Study Area

Data Sources or Notes

Coordinate System
and Datum
NAD 83 State Plane
Ohio North



October 31, 2019



MAP 1 PROJECT STUDY AREA

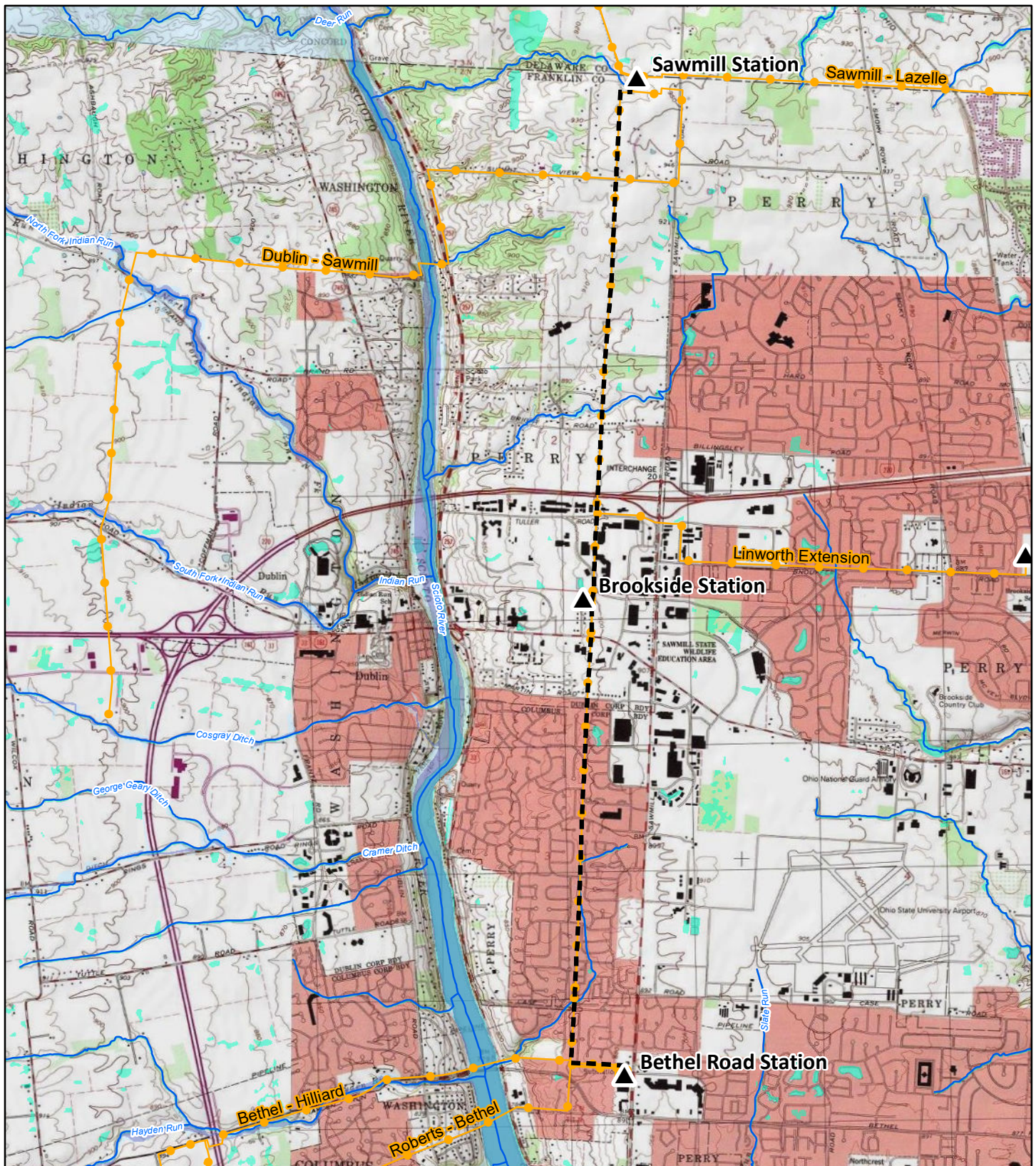


Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project

BOUNDLESS ENERGY™

0 0.25 0.5 0.75 1

Miles



LEGEND:

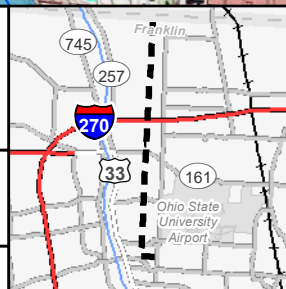
- ▲ Existing Station
- Proposed Rebuild
- Existing Transmission Line
- Stream (NHD)
- 100 Year Floodplain
- Floodway
- Wetland (NWI)

Data Sources or Notes

Coordinate System
and Datum
NAD 83 State Plane
Ohio North



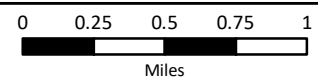
October 28, 2019

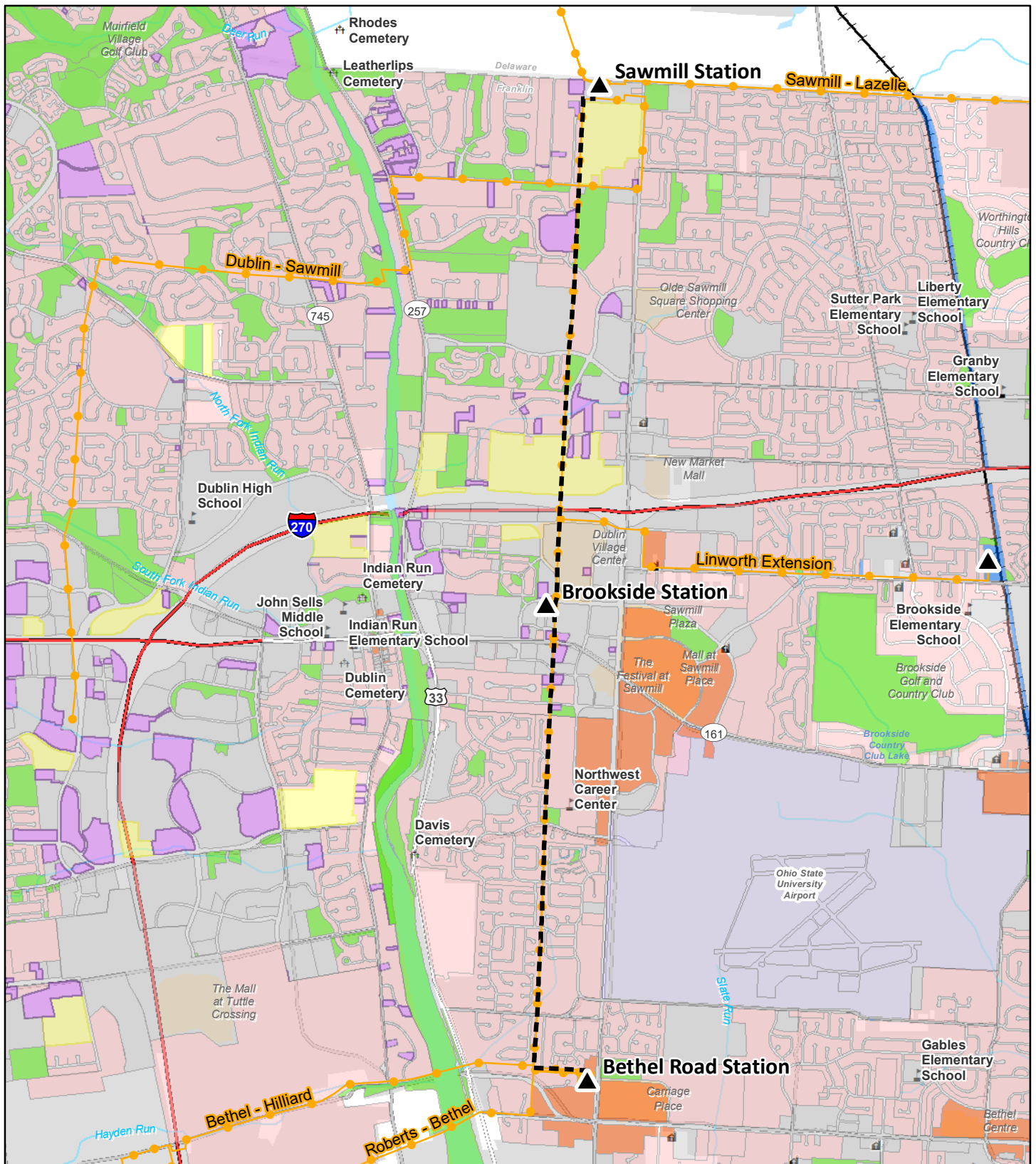


MAP 2 NATURAL RESOURCES



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project





LEGEND:

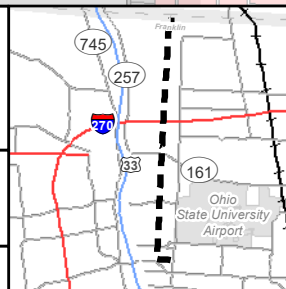
- ▲ Existing Station
- Proposed Rebuild
- Existing Transmission Line
- Land Use**
- Agriculture
- Commercial/Industrial/Ins...
- Mixed Use
- Other
- Parks/Open Space
- Residential
- ⛪ Church
- 🎓 School
- 🏥 Hospital
- ⛦ Cemetery
- ⚡ Limited Access
- ⚡ Highway
- ⚡ Major Road

Data Sources or Notes

Coordinate System
and Datum
NAD 83 State Plane
Ohio North



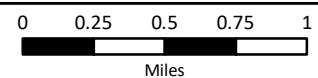
October 31, 2019



MAP 3 LAND USE



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project





LEGEND:

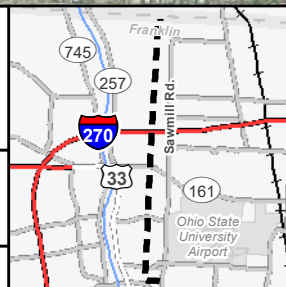
- ▲ Existing Station
- - - Proposed Rebuild
- Existing Transmission Line
- Municipal Boundary

Data Sources or Notes
ArcMap Basemap,
World Imagery, 2017

Coordinate System
and Datum
NAD 83 State Plane
Ohio North



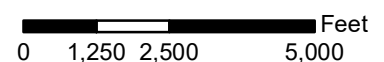
October 28, 2019



**Map 4
AERIAL MAP**



Bethel-Sawmill 138 kV
Transmission Line
Rebuild Project



LETTER OF NOTIFICATION FOR THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT
(BROOKSIDE-SAWMILL)

Appendix D Property Parcel Number Table

Property Parcel Number	Easement Agreement/ Option Obtained* (Yes/No)
273-009084	Yes
273-009094	Yes
273-008284	Yes
273-008286	Yes
273-008313	Yes
273-010949	Yes
273-010950	Yes
273-010951	Yes
273-010952	Yes
273-009511	Yes
273-008390	Yes
273-008393	Yes
273-009750	Yes
273-008759	Yes
273-008764	Yes
273-012156	Yes
273-008668	Yes
273-012518	Yes
273-008843	Yes
273-008845	Yes
273-008847	Yes
273-008849	Yes
273-008851	Yes
273-008855	Yes
273-008993	Yes
273-009035	Yes
273-009077	Yes
273-009118	Yes
273-009119	Yes
273-009153	Yes
273-008315	Yes
273-008316	Yes
273-009152	Yes
273-008841	Yes
273-008853	Yes
273-008413	Yes
273-010948	Yes
273-010953	Yes
273-010954	Yes

*The Company may supplement its existing rights under all blanket and defined easements identified above

Property Parcel Number	Easement Agreement/ Option Obtained* (Yes/No)
273-008880	Yes
273-008881	Yes
273-012521	Yes
273-012737	Yes
273-010955	Yes
273-011017	Yes
273-008610	Yes
273-012353	Yes
273-012151	Yes
273-008380	Yes
273-011301	Yes
273-009125	Yes
273-012517	Yes
273-008882	Yes
273-009140	Yes
273-012875	Yes
273-012874	Yes
273-012873	Yes
273-008810	Yes
273-011289	Yes
273-012519	Yes
273-012872	Yes
273-012884	Yes
273-012883	Yes
273-012882	Yes
273-012881	Yes
273-012880	Yes
273-012879	Yes
273-012878	Yes
273-012877	Yes
273-012876	Yes
273-008679	Yes
273-012589	Yes
273-008637	Yes
273-009054	Yes
273-009045	Yes

*The Company may supplement its existing rights under all blanket and defined easements identified above

LETTER OF NOTIFICATION FOR THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT
(BROOKSIDE-SAWMILL)

Appendix E SHPO Correspondence



In reply, refer to
2018-FRA-42673

August 30, 2018

Mr. Ryan J. Weller
Weller & Associates, Inc.
1395 West Fifth Avenue
Columbus, Ohio 43212

RE: Bethel-Sawmill 138kV Rebuild Project, Perry Township, Franklin County, Ohio

Dear Mr. Weller:

This letter is in response to the correspondence received on July 31, 2018 regarding the proposed Bethel-Sawmill 138kV Rebuild Project, Perry Township, Franklin County, Ohio. We appreciate the opportunity to comment on this project. The comments of the Ohio State Historic Preservation Office (SHPO) are made pursuant to Section 149.53 of the Ohio Revised Code and the Ohio Power Siting Board rules for siting this project (OAC 4906-4). The comments of the Ohio SHPO are also submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. 306108 [36 CFR 800]).

The following comments pertain to the *Phase I Archaeological Investigations for the 8.9 km (5.5 mi) Bethel-Sawmill 138kv Rebuild Project in Perry Township, Franklin County, Ohio* by Weller & Associates, Inc. (2018).

A literature review, visual inspection, surface collection, shovel probe, and shovel test unit excavation was completed as part of the investigations. Six (6) previously identified archaeological sites are located within the project area. Ohio Archaeological Inventory (OAI) site #33FR0483 (including portions of OAI#33FR0484 and 33FR0485) was recommended for Phase II investigation in 1999, which was completed in 2000. The site was found not eligible for listing in the National Register of Historic Places (NRHP). OAI#33FR1442, 33FR1445, and 33FR1478 were also identified in 1999 and recommended not eligible for listing in the NRHP. One (1) new archaeological site was identified during the survey. OAI#33FR3111 is prehistoric lithic scatter consisting of two (2) secondary thinning flakes of Delaware chert. The site was recommended not eligible for listing in the NRHP. Our office agrees with your determination and no further archaeological work is necessary.

The following comments pertain to the *History/Architecture Investigations for the 8.9 km (5.5 mi) Bethel-Sawmill 138kv Rebuild Project in Perry Township, Franklin County, Ohio* by Weller & Associates, Inc. (2018).

The history/architecture field survey included a systematic approach to identifying all properties fifty years of age or older that may have a potential view of the project. Two previously recorded Ohio Historic Inventory (OHI) properties were identified within the area of potential effects (FRA0163102 and FRA0163302). Additionally, sixty-six individual resources fifty years of age or older were identified during field investigations.

It is Weller's recommendation that the identified properties are not eligible for inclusion in the National Register of Historic Places due to a lack of associative significance, a loss of integrity, or a lack of character defining features. Our office agrees with Weller's recommendations regarding eligibility.

RPR Serial No: 1075019-1075020

Mr. Ryan J. Weller
Page 2
August 30, 2018

The results of the architectural investigation identified no historic properties located within the APE that exhibit potential significance for inclusion in the National Register of Historic Places. Therefore, we agree that the project as proposed will have no effect on historic properties.

Based on the information provided, we agree the project will not affect historic properties. No further coordination with this office is necessary, unless the project changes or unless new or additional historic properties are discovered during implementation of this project. In such a situation, this office should be contacted.

If you have any questions, please contact me at (614) 298-2022, or by e-mail at khorrocks@ohiohistory.org, or Joy Williams at jwilliams@ohiohistory.org. Thank you for your cooperation.

Sincerely,



Krista Horrocks, Project Reviews Manager
Resource Protection and Review

cc: Ron Howard, AEP (rmhoward@aep.com)

RPR Serial No: 1075019-1075020

OHIO HISTORY CONNECTION

800 E. 17th Ave., Columbus, OH 43211-2474 • 614.297.2300 • ohiohistory.org

Appendix F Ecological Resources Inventory Report

**Bethel-Sawmill 138 kV
Transmission Line Rebuild Project,
Franklin County, Ohio**

**Ecological Resources Inventory
Report**



Prepared for:

AEP Ohio Transmission Company, Inc.
700 Morrison Road
Gahanna, OH 43230

Prepared by:

Stantec Consulting Services Inc.
11687 Lebanon Road
Cincinnati, OH 45241

October 16, 2018

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

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**ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO**

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ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Introduction
October 16, 2018

1.0 Introduction

AEP Ohio Transmission Company, Inc. (AEP) is proposing to rebuild approximately 5.5 miles of the existing Bethel-Sawmill 138 kV transmission line in Franklin County, Ohio (the Project) to increase service reliability to its customers. The Project will include replacing the existing structures on the Bethel-Sawmill 138 kV transmission line within the existing AEP right-of-way (ROW) (Figure 1, Appendix A). Stantec Consulting Services, Inc. (Stantec) performed surveys for wetlands, waterbodies, and potential threatened, endangered, and rare species habitat on July 11 and 12, 2018. A subsequent survey was conducted on October 12, 2018 at the Bethel Station (substation) property. The approximate locations of features located up to 50 feet outside of the survey corridors were also recorded during the field surveys, where landowner access was permitted. However, no data forms were collected on features that did not extend into the survey corridors. These features are shown on the Figure 2 maps in Appendix A as “approximate” wetlands, waterways (streams), open waters, and upland drainage features.

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Methods
October 16, 2018

2.0 Methods

2.1 WETLAND DELINEATION

Prior to completing the field surveys, a desktop review of the Project area was conducted using U.S. Geological Survey (USGS) topographic mapping, National Wetlands Inventory (NWI) maps, U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey data, and aerial imagery mapping. Stantec completed a wetland delineation study in accordance with the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest* (Version 2.0) (USACE 2010). Wetland categories were classified using the Ohio Rapid Assessment Method (ORAM) for Wetlands Version 5.0 (Mack 2001).

2.2 STREAM DELINEATION

Streams that demonstrated a continuously defined channel (bed and bank), ordinary high water mark (OHWM), and the disturbance of terrestrial vegetation were delineated within the Project area, per the protocols outlined in the USACE's *Guidance on Ordinary High Water Mark Identification* (Regulatory Guidance Letter, No. 05-05) (USACE 2005). Delineated streams were classified as ephemeral, intermittent, or perennial per definitions in the Federal Register/Vol. 67, No. 10 (USACE 2002). Functional assessment of streams within the Project area was based on completion of the Ohio Environmental Protection Agency's (OEPA) Headwater Habitat Evaluation Index (HHEI; OEPA 2012) and/or Qualitative Habitat Evaluation Index (QHEI; OEPA 2006) data forms. The centerline of each waterway (stream) was identified and surveyed using a handheld sub-meter accuracy GPS unit and mapped with geographic information system (GIS) software. Additionally, the locations of ponds/open water features and upland drainage features (which lacked a continuously defined bed and bank/OHWM) identified within the Project area were also recorded with a sub-meter accuracy GPS unit during the field surveys.

2.3 RARE SPECIES

Prior to conducting the field surveys, Stantec contacted the Ohio Department of Natural Resources (ODNR) and the U.S. Fish and Wildlife Service (USFWS) for information regarding rare, threatened, or endangered species and their habitats of concern within the vicinity of the Project area (Appendix B – Agency Correspondence). To assess potential impacts to rare, threatened, or endangered species, Stantec scientists conducted a pedestrian reconnaissance of the proposed Project area, collected information on existing habitats within the Project area, and assessed the potential for these habitats to be used by these species.

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

3.0 Results

3.1 TERRESTRIAL HABITAT

Stantec completed field surveys within the Project area on July 11 and 12, 2018, for wetlands, waterbodies, and threatened and endangered species or their habitats. A subsequent survey was conducted on October 12, 2018 at the Bethel Station property. Figure 2 (Appendix A) shows the wetlands and waterbodies identified by Stantec within the Project area, as well as the locations of upland drainage features identified within the Project area. Figure 3 (Appendix A) shows the habitats, land cover types, and locations of any identified rare, threatened or endangered species habitat observed within the Project area during the rare, threatened, and endangered species habitat assessment surveys. Representative photographs of the wetlands, streams, upland drainage features, and other habitats identified within the Project area are included in Appendix C of this report (photo locations are shown on Figures 2 and 3, Appendix A). Completed wetland determination, ORAM, HHEI, and QHEI data forms are included in Appendix D.

Table 1. Vegetation Communities and Land Cover Found within the Bethel-Sawmill 138 kV Transmission Line Rebuild Project Area, Franklin County, Ohio

Vegetation Communities and Land Cover Types within the Project Area	Degree of Human-Related Ecological Disturbance	Unique, Rare, or High Quality?	Approximate Acreage Within Project Area
Agricultural Field	Extreme Disturbance/Ruderal Community (dominated by planted non-native row crop species, opportunistic invaders, and/or native highly tolerant taxa). Dominant species included corn (<i>Zea mays</i>), soybean (<i>Glycine max</i>), foxtail (<i>Setaria</i> spp.), Johnsongrass (<i>Sorghastrum halapense</i>), and pigweed (<i>Amaranthus</i> spp.).	No	0.73
New Field	Extreme Disturbance/Ruderal Community (dominated by planted non-native and native herbaceous species, opportunistic invaders and/or native highly tolerant taxa). Dominant species included Amur honeysuckle (<i>Lonicera maackii</i>), tall fescue (<i>Schedonorus arundinaceus</i>), Kentucky bluegrass (<i>Poa pratensis</i>), and switchgrass (<i>Panicum virgatum</i>).	No	1.80

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

Vegetation Communities and Land Cover Types within the Project Area	Degree of Human-Related Ecological Disturbance	Unique, Rare, or High Quality?	Approximate Acreage Within Project Area
Old Field	Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders and/or native highly tolerant taxa). Dominant species included Canada goldenrod (<i>Solidago altissima</i>), Allegheny blackberry (<i>Rubus allegheniensis</i>), multiflora rose (<i>Rosa multiflora</i>), switchgrass, Amur honeysuckle, flat-top goldentop (<i>Euthamia graminifolia</i>), white ash (<i>Fraxinus americana</i>), timothy (<i>Phleum pratense</i>), black walnut (<i>Juglans nigra</i>), asters (<i>Symphyotrichum</i> spp.) tall fescue, and broomsedge bluestem (<i>Andropogon virginicus</i>).	No	1.79
Maintained Lawn	Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders, planted non-native species, and/or native highly tolerant taxa). Dominant species included Kentucky bluegrass, Amur honeysuckle, Johnsongrass, tall fescue, Fuller's teasel (<i>Dipsacus fullonum</i>), garlic mustard (<i>Allaria petiolata</i>), white clover (<i>Trifolium repens</i>), and common dandelion (<i>Taraxicum officinale</i>).	No	2.34
Residential Lawn	Extreme Disturbance/Ruderal Community (dominated by opportunistic invaders, planted non-native species, and/or native highly tolerant taxa). Dominant species included tall fescue, Kentucky bluegrass, Amur honeysuckle, Johnsongrass, black walnut, Fuller's teasel, white clover, and common dandelion.	No	15.94
Paved Surface	Extreme Disturbance/existing gravel or paved road. No plant species observed in these areas.	No	1.86
Early Successional Deciduous Forest	Moderate Disturbance/Natural Community (dominated by native woody and herbaceous species and/or opportunistic invaders). Dominant species included boxelder (<i>Acer negundo</i>), Amur honeysuckle, poison ivy (<i>Toxicodendron radicans</i>), tall fescue, Canada goldenrod, Allegheny	No	4.23

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

Vegetation Communities and Land Cover Types within the Project Area	Degree of Human-Related Ecological Disturbance	Unique, Rare, or High Quality?	Approximate Acreage Within Project Area
	blackberry, garlic mustard, multiflora rose, privet (<i>Ligustrum</i> spp.), and field bindweed (<i>Convolvulus arvensis</i>).		
Mixed Early Successional/ Second Growth Deciduous Forest	Moderate Disturbance/Natural Community (dominated by native woody and herbaceous species and/or opportunistic invaders). Dominant species included privet, white ash (<i>Fraxinus americana</i>), Amur honeysuckle, late flowering thoroughwort (<i>Eupatorium serotinum</i>), Allegheny blackberry, black snakeroot (<i>Sanicula canadensis</i>), eastern redbud (<i>Cercis canadensis</i>), garlic mustard, Japanese honeysuckle (<i>Lonicera japonica</i>), common blue violet (<i>Viola sororia</i>), multiflora rose, eastern white pine (<i>Pinus strobus</i>), common hackberry (<i>Celtis occidentalis</i>), and American elm (<i>Ulmus americana</i>).	No	0.54
Industrial Land	Extreme Disturbance/Ruderal Community (graveled areas free of vegetation or dominated by opportunistic invaders, planted non-native species, and/or native highly tolerant taxa). Dominant species included tall fescue, Canada goldenrod, multiflora rose, red clover (<i>Trifolium pratense</i>), Fuller's teasel, yellow sweetclover (<i>Melilotus officinalis</i>), and crown vetch (<i>Securigera varia</i>).	No	3.08
Commercial Land	Extreme Disturbance/Ruderal Community (graveled areas free of vegetation or dominated by opportunistic invaders, planted native trees, planted non-native species, and/or native highly tolerant taxa). Dominant species included tall fescue, Kentucky bluegrass, common dandelion, red maple (<i>Acer rubrum</i>), silver maple (<i>Acer saccharinum</i>), white clover, and black walnut.	No	3.06
Prairie (Planted)	Low Disturbance/Natural Community (dominated by native grasses and forbs). Dominant species included big bluestem (<i>Andropogon gerardii</i>),	No	0.03

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

Vegetation Communities and Land Cover Types within the Project Area	Degree of Human-Related Ecological Disturbance	Unique, Rare, or High Quality?	Approximate Acreage Within Project Area
	rattlesnake master (<i>Eryngium yuccifolium</i>), Canada thistle (<i>Cirsium arvense</i>), black-eyed Susan (<i>Rudbeckia hirta</i>), compass plant (<i>Silphium laciniatum</i>), wild bergamot (<i>Monarda fistulosa</i>), common yarrow (<i>Achillea millefolium</i>), foxglove beardtongue (<i>Penstemon digitalis</i>), fox sedge (<i>Carex vulpinoidea</i>), Ohio spiderwort (<i>Tradescantia ohiensis</i>), white vervain (<i>Verbena urticifolia</i>), switchgrass, bluejoint grass (<i>Calamagrostis canadensis</i>), and Canada goldenrod.		
Early Successional Riparian Forest	Moderate Disturbance/Natural Community (dominated by native woody species, native herbaceous species, and/or opportunistic invaders). Dominant species included privet, American sycamore (<i>Platanus occidentalis</i>), eastern redbud, great blue lobelia (<i>Lobelia siphilitica</i>), Virginia creeper (<i>Parthenocissus quinquefolia</i>), wingstem (<i>Verbesina alternifolia</i>), common plantain (<i>Plantago major</i>), green ash (<i>Fraxinus pennsylvanica</i>), Amur honeysuckle, white heath aster (<i>Symphyotrichum ericoides</i>), American elm, American pokeweed (<i>Phytolacca americana</i>), and sandbar willow (<i>Salix interior</i>).	No	0.20
Palustrine Emergent Wetland	Moderate Disturbance/Natural Community (Dominated by native herbaceous species and/or opportunistic invaders). Dominant species included rice cutgrass (<i>Leersia oryzoides</i>), dark green bulrush (<i>Scirpus atrovirens</i>), common rush (<i>Juncus effusus</i>), common boneset (<i>Eupatorium perfoliatum</i>), narrowleaf cattail (<i>Typha angustifolia</i>), giant goldenrod (<i>Solidago gigantea</i>), fox sedge (<i>Carex vulpinoidea</i>), harvestlice (<i>Agrimonia parviflora</i>), and fowl mannagrass (<i>Glyceria striata</i>).	No	0.08
TOTAL			35.59

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

3.2 WETLANDS

Stantec completed field surveys within the Project area on July 11 and 12, 2018, for wetlands. A subsequent survey was conducted on October 12, 2018 at the Bethel Station property. Figure 2 (Appendix A) shows the wetland identified by Stantec within the Project area. Representative photographs of the wetland identified within the Project area are included in Appendix C of this report (photo locations are shown on Figure 2, Appendix A). Completed wetland determination and ORAM data forms are included in Appendix D. Information regarding the Cowardin classification and ORAM category of the wetland identified within the Project area are provided in Table 2.

Table 2. Summary of Wetland Resources Found within the Bethel-Sawmill 138 kV Transmission Line Rebuild Project Area, Franklin County, Ohio

Wetland Name	Photo Location ¹	Isolated?	Wetland Classification ²	ORAM Score ⁴	ORAM Category ⁴	Delineated Area (acres) within Project Area
Wetland 1	3	Yes	PEM	24	1	0.08
TOTAL						0.08
¹ Figure 2 and Appendix C – Representative Photographs						
² Wetland classification is based on Cowardin et al. (1979).						
³ PEM = Palustrine Emergent Wetland						
⁴ ORAM Score and Category are based on the Ohio Rapid Assessment Method for Wetlands v. 5.0 (Mack 2001).						

3.3 WATERBODIES

Stantec completed field surveys within the Project area on July 11 and 12, 2018, for waterbodies. A subsequent survey was conducted on October 12, 2018 at the Bethel Station property. Figure 2 (Appendix A) shows the waterbodies (streams and open water features) identified by Stantec within the Project area, as well as the locations of upland drainage features identified within the Project area. Three streams were identified within the Project area, as well as several upland drainage features and existing stormwater detention basins. Representative photographs of the streams, upland drainage features, and existing stormwater detention basin identified within the Project area are included in Appendix C of this report (photo locations are shown on Figure 2, Appendix A). Completed HHEI and QHEI data forms for streams identified in the Project area are included in Appendix D. Information regarding the streams identified within the Project area is provided in Table 3.

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

Results

October 16, 2018

**Table 3. Summary of Stream Resources Found within the Bethel-Sawmill 138 kV Transmission Line
Rebuild Project Area, Franklin County, Ohio**

Stream Name	Photo Location ¹	Receiving Waters	Stream Flow Regime ²	Stream Evaluation Method	Stream Evaluation Score	Approximate OHWM Width (feet) ³	Delineated Length (feet) within Project Area
Stream 1	1	Scioto River	Perennial	HHEI	70	8.0	66
Stream 2	2	Scioto River	Perennial	QHEI	49	7.0	53
Stream 3	5	Scioto River	Intermittent	HHEI	40	2.5	59
TOTAL							154
¹ Figure 2 and Appendix C – Representative Photographs							
² Stream classification is based on Federal Register/Vol. 67, No. 10 (USACE 2002)							
³ OHWM = Ordinary High Water Mark							

Results
October 16, 2018

3.4 RARE, THREATENED, OR ENDANGERED SPECIES HABITAT

Table 4. Summary of Potential Ohio State-Listed Species within the Bethel-Sawmill 138 kV Transmission Line Rebuild Project Area, Franklin County, Ohio

Common Name	Scientific Name	State Listing ¹	Known to Occur Within Franklin County? ²	Known Within One Mile of Project Area? ³	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	ODNR Comments/Recommendations
Amphibians								
Eastern Hellbender	<i>Cryptobranchus alleganiensis alleganiensis</i>	E	Yes	No	Found mostly in unglaciated (south and east) Ohio, hellbenders prefer large, swift flowing streams where they hide during the day under large rocks (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Midland Mud Salamander	<i>Pseudotriton montanus diastictus</i>	T	Yes	No	Muddy springs, slow floodplain streams, and swamps along slow streams; backwater ponds and marshes created by beaver activity (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Insects								
Regal Fritillary	<i>Speyeria idalia</i>	E	Yes	No	Occurs in tall grass prairie remnants (Lotts and Naberhaus 2016). This species prefers open grassland, savannah, and old field habitats; all with varying degrees of hydrology. Heavily treed areas are not utilized due to the impediment of movement and migration (NatureServe 2018).	Yes	Some potentially suitable habitat is present within the Project area (old field habitat). Impacts are possible though not likely due to the overall rarity of this species.	No comments received.
Plants								
Spreading Rock Cress	<i>Arabis patens</i>	E	Yes	Yes	This species occurs on shaded, calcareous cliffs, bluffs, and talus slopes (ODNR 1984).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Arbor Vitae	<i>Thuja occidentalis</i>	PT	Yes	Yes	This species is found in open to semi-open habitats on calcareous substrates; cliffs, limestone ledges, uplands, and fens (ODNR 1998).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Birds								
Upland Sandpiper	<i>Bartramia longicauda</i>	E	No	No	Nesting upland sandpipers utilize dry grasslands including native grasslands, seeded grasslands, grazed and ungrazed pasture, hayfields, and grasslands established through the Conservation Reserve Program (ODNR 2018b). Large areas of grassland/lightly-moderately grazed pasture habitats (≥ ≈ 20 acres) are required to be suitable as upland sandpiper nesting habitat (McCormac and Kennedy 2004; NatureServe 2018; USFWS 2001).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	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 type of habitat will not be impacted, this Project is not likely to impact this species.
Fish								
Spotted Darter	<i>Etheostoma maculatum</i>	E	Yes	No	This species is found in medium-sized rivers and streams. They are typically found in areas of swift current at the top or bottom end of a riffle where there are many very large boulders or flab slabs or rock. They spend most of their time hiding under the upstream edge of these large rocks with their heads sticking out watching for food (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.

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Common Name	Scientific Name	State Listing ¹	Known to Occur Within Franklin County? ²	Known Within One Mile of Project Area? ³	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	ODNR Comments/Recommendations
Shortnose Gar	<i>Lepisosteus platostomus</i>	E	Yes	No	This species is found in large rivers and associated overflow ponds and backwaters (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Popeye Shiner	<i>Notropis ariommus</i>	E	Yes	No	This fish is found in extremely clear waters in moderate sized streams. These streams usually have slow to moderate flow and many long slow pools (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Scioto Madtom	<i>Noturus trautmani</i>	E	Yes	No	This species prefers the tail end of riffles over sand and gravel substrates (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	E	No	No	Adult northern brook lampreys are found in clear brooks with fast flowing water and either sand or gravel bottoms. Juveniles or ammocoetes are found in slow moving water buried in soft substrate of medium to large streams. Water sources must be free flowing (free of dams for both life phases (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Tippecanoe Darter	<i>Etheostoma tippecanoe</i>	T	Yes	No	These species prefers medium to large streams in the Ohio River drainage system and are found in riffles of moderate current with substrate of gravel or cobble sized rocks (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Tonguetied Minnow	<i>Exoglossum laurae</i>	T	Yes	No	Habitat includes rocky pools and runs of cool to warm water. They prefer clear creeks and small to medium sized rivers of moderate gradient with unsilted bottoms of gravel, cobble,	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous

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Common Name	Scientific Name	State Listing ¹	Known to Occur Within Franklin County? ²	Known Within One Mile of Project Area? ³	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	ODNR Comments/Recommendations
					and/or boulder. Spawning occurs in gravel nests in slow to moderate current (NatureServe 2018).			aquatic species and their habitat. If no in-water work is proposed, this project is not likely to impact this species or other aquatic species.
Paddlefish	<i>Polyodon spathula</i>	T	Yes	No	This species is found in the Ohio River and its larger tributaries, preferring sluggish pools and backwater areas (ODNR 2018b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	The ODNR 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, this project is not likely to impact this species or other aquatic species.
Mussels								
Fanshell	<i>Cyprogenia stegaria</i>	E	Yes	No	The species occurs in medium to large streams and rivers with moderate to strong current in coarse sand and gravel and depths ranging from shallow to deep (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Butterfly	<i>Ellipsaria lineolata</i>	E	Yes	No	This mussel prefers stable substrate containing rock, gravel, and sand in swift currents of large rivers (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Elephant-ear	<i>Elliptio crassidens crassidens</i>	E	Yes	No	This species is an inhabitant of channels in large creeks to rivers with moderate to swift currents, primarily on sand and limestone or rock substrates (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Purple Cat's Paw	<i>Epioblasma obliquata obliquata</i>	E	Yes	No	This mussel can be found in medium to large rivers with moderate gradient and riffles. Substrates can be sand to gravel (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Northern Riffleshell	<i>Epioblasma torulosa rangiana</i>	E	Yes	No	Habitat includes riffles and firmly packed substrates of fine to coarse gravel. This mussel needs highly oxygenated water (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Snuffbox	<i>Epioblasma triquetra</i>	E	Yes	No	Occurs in medium-sized streams to large rivers, generally on mud, rocky, gravel, or sand substrates in flowing water. This species is often deeply buried in substrate and overlooked by collectors (NatureServe 2018). It is found in a wide range of particle sized substrates. However, swift shallow riffles with sand and gravel are where it is typically found (Parmalee and Bogan 1998; Watters et al. 2009).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.

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Common Name	Scientific Name	State Listing ¹	Known to Occur Within Franklin County? ²	Known Within One Mile of Project Area? ³	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	ODNR Comments/Recommendations
Ebonyshell	<i>Fusconaia ebena</i>	E	Yes	No	Inhabits large rivers and prefers swift water and stable sand or gravel shoals. Coarse sand and gravel substrate provides the most suitable habitat. It can occur at depths of 10-15 feet with current associated (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Long-solid	<i>Fusconaia maculata maculata</i>	E	Yes	No	This mussel is found in the gravel substrates of shoals and riffles of large rivers, as well as impounded areas (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Pocketbook	<i>Lampsilis ovata</i>	E	Yes	No	Very generalized in habitat preference, adapting well to both impoundment situations as well as free-flowing, shallow rivers. Usually found in moderate to strong current, it can survive in standing water. The most suitable substrate consists of a mixture of gravel and coarse sand mixed with some silt or mud (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Washboard	<i>Megaloniaias nervosa</i>	E	Yes	No	This species is typically a large river species, living in the main channel and in some of the overbank areas of reservoirs, but in some instances, it may also become established in medium-sized and even small rivers. It is found in areas with a slow current with muddy to coarse gravel substrates (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Clubshell	<i>Pleurobema clava</i>	E	Yes	No	The clubshell is found in small to medium rivers, but occasionally is also found in large rivers, especially those having large shoal areas. It is generally found in clean, coarse sand and gravel in runs, often just downstream of a riffle and cannot tolerate mud or slackwater conditions (USFWS 1994). Badra and Goforth (2001) found the clubshell in gravel/sand substrates, in runs having laminar flow (0.06-0.25 m/sec) within small to medium sized streams (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Ohio Pigtoe	<i>Pleurobema cordatum</i>	E	Yes	No	This species prefers strong currents of large rivers with substrates of sand and gravel, though is somewhat tolerant of lentic systems (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	E	Yes	No	The typical habitat for this species is small to medium rivers with moderate to swift currents. In smaller streams it inhabits bars or gravel and cobble close to the fast current. In medium to large rivers it occurs in sand and gravel shoals (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Wartyback	<i>Quadrula nodulata</i>	E	Yes	No	This species occurs in medium to large rivers at depths of up to 15-18 feet on a sand and mud substrates (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	No comments received.
Rayed Bean	<i>Villosa fabalis</i>	E	Yes	No	Habitat includes gravel or sandy substrate, especially in areas of thick roots of aquatic plants, increase substrate	No	No suitable habitat is present within the Project area.	Due to the location, and that there is no in-water work

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					stability (NatureServe 2018; Parmalee and Bogan 1998). Rayed bean can be associated with shoal or riffle areas, and in shallow, wave-washed areas of glacial lakes. It is generally found in smaller, headwater creeks, but sometimes in larger rivers and open-water bodies. It can occur in shallow riffles or in lakes with water depths up to four feet. It has been found in riffles, generally in vegetation, and deeply buried in sand and gravel bound together by roots (Parmalee and Bogan 1998).		Therefore, no impacts are anticipated.	proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Black Sandshell	<i>Ligumia recta</i>	T	Yes	No	Typically found in medium-sized to large rivers in locations with strong current and substrates of coarse sand and gravel with cobble in water depths from several inches to six feet or more (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Threehorn Wartyback	<i>Obliquaria reflexa</i>	T	Yes	No	This species is typical of large rivers where there is moderately strong current and a stable substrate composed of gravel, sand, and mud (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Fawnsfoot	<i>Truncilla donaciformis</i>	T	Yes	No	This species occurs in both large and medium-sized rivers at depths varying from less than three feet up to 15 to 18 feet in big rivers. Substrates of either sand or mud is suitable and although it is typically found in moderate current, it can adapt to a lake or embayment environment lacking current (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Pondhorn	<i>Unio merus tetralasmus</i>	T	Yes	No	This species typically inhabits the quiet or slow-moving, shallow waters of sloughs, borrow pits, ponds, ditches, and meandering streams. It is tolerant of poor water conditions and can be found well buried in substrates of fine silt and/or mud. It has been known to survive for extended periods of time when a pond or slough has temporarily dried up by burying itself deep into the substrate (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.
Mammals								
Indiana Bat	<i>Myotis sodalis</i>	E	Yes	No	The Indiana bat is likely distributed over the entire state of Ohio, though not uniformly. This species generally forages in openings and edge habitats within upland and floodplain forest, but they also forage over old fields and pastures (Brack et al. 2010). Natural roost structures include trees (live or dead) with exfoliating bark, and exposure to solar radiation. Other important factors for roost trees include relative location to other trees, a permanent water source and foraging areas; Dead trees are preferred as maternity roosts; however, live trees are often used as secondary roosts depending on microclimate conditions (USFWS 2007a; USFWS 2018b). Roosts have also occasionally been found to consist of cracks and hollows in trees, utility poles, buildings, and bat boxes. Primarily use caves for hibernacula,	Yes	No potential hibernacula were observed. However, potentially suitable roost trees and summer foraging habitat were observed within the Project area. AEP anticipates that any necessary tree clearing will take place during winter months. Therefore, no impacts to this species are anticipated. If any summer tree clearing is determined to be necessary, AEP will proceed in	If suitable habitat occurs within the Project area, the ODNR recommends trees be conserved. If suitable habitat occurs within the Project area and trees must be cut, the ODNR recommends cutting occur between October 1 and March 31. If no tree removal is proposed, this Project is not likely to impact this species.

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Common Name	Scientific Name	State Listing ¹	Known to Occur Within Franklin County? ²	Known Within One Mile of Project Area? ³	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	ODNR Comments/Recommendations
					although are also known to hibernate in abandoned underground mines (Brack et al. 2010).		accordance with agency requirements.	
¹ E=Endangered; T=Threatened ² According to Ohio Department of Natural Resources, State Listed Wildlife Species by County (ODNR 2018a). ³ According to Ohio Natural Heritage Program (Appendix B).								

Table 5. Summary of Potential Federally-Listed Species within the Bethel-Sawmill 138 kV Transmission Line Rebuild Project Area, Franklin County, Ohio

Common Name	Scientific Name	Federal Listing ¹	Known to Occur in Franklin County? ²	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	USFWS Comments/Recommendations
Mammals							
Indiana Bat	<i>Myotis sodalis</i>	E	Yes	The Indiana bat is likely distributed over the entire state of Ohio, though not uniformly. This species generally forages in openings and edge habitats within upland and floodplain forest, but they also forage over old fields and pastures (Brack et al. 2010). Natural roost structures include trees (live or dead) with exfoliating bark, and exposure to solar radiation. Other important factors for roost trees include relative location to other trees, a permanent water source and foraging areas; Dead trees are preferred as maternity roosts; however, live trees are often used as secondary roosts depending on microclimate conditions (USFWS 2007a; USFWS 2018b). Roosts have also occasionally been found to consist of cracks and hollows in trees, utility poles, buildings, and bat boxes. Primarily use caves for hibernacula, although are also known to hibernate in abandoned underground mines (Brack et al. 2010).	Yes	No potential hibernacula were observed. However, potentially suitable roost trees and summer foraging habitat were observed within the Project area. AEP anticipates that any necessary tree clearing will take place during winter months. Therefore, no impacts to this species are anticipated. If any summer tree clearing is determined to be necessary, AEP will proceed in accordance with agency requirements.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.

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Common Name	Scientific Name	Federal Listing ¹	Known to Occur in Franklin County? ²	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	USFWS Comments/ Recommendations
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	T	Yes	The northern long-eared bat is found throughout Ohio. This species generally forages in forested habitat and openings in forested habitat and utilizes cracks, cavities, and loose bark within live and dead trees, as well as buildings as roosting habitat (Brack et al. 2010; USFWS 2016). The species utilizes caves and abandoned mines as winter hibernacula. Various sized caves are used providing they have a constant temperature, high humidity, and little to no air current (Brack et al. 2010).	Yes	No potential hibernacula were observed. However, potentially suitable roost trees and summer foraging habitat were observed within the Project area. AEP anticipates that any necessary tree clearing will take place during winter months. Therefore, no impacts to this species are anticipated. If any summer tree clearing is determined to be necessary, AEP will proceed in accordance with agency requirements.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Fish							
Scioto Madtom	<i>Noturus trautmani</i>	E	Yes	Prefers tail end of riffles over sand and gravel substrate (ODNR 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Mussels							
Clubshell	<i>Pleurobema clava</i>	E	Yes	The clubshell is found in small to medium rivers, but occasionally found in large rivers, especially those having large shoal areas. It is generally found in clean, coarse sand and gravel in runs, often just downstream of a riffle and cannot tolerate mud or slackwater conditions (USFWS 1994). (Badra and Goforth 2001) found the clubshell in gravel/sand substrate, runs having laminar flow (0.06-0.25 m/sec) within small to medium sized streams (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.

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Common Name	Scientific Name	Federal Listing ¹	Known to Occur in Franklin County? ²	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	USFWS Comments/ Recommendations
Northern Riffleshell	<i>Epioblasma torulosa rangiana</i>	E	Yes	Habitat includes riffles and firmly packed substrates of fine to coarse gravel. This mussel needs highly oxygenated water (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Rabbitsfoot	<i>Quadrula cylindrica cylindrica</i>	T	Yes	The typical habitat for this species is small to medium rivers with moderate to swift currents, and in smaller streams it inhabits bars or gravel and cobble close to the fast current. Found in medium to large rivers in sand and gravel shoals (NatureServe 2018).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Rayed Bean	<i>Villosa fabalis</i>	E	Yes	Habitat includes gravel or sandy substrate, especially in areas of thick roots of aquatic plants, increase substrate stability (NatureServe 2018; Parmalee and Bogan 1998). Rayed bean can be associated with shoal or riffle areas, and in shallow, wave-washed areas of glacial lakes. It is generally found in smaller, headwater creeks, but sometimes in larger rivers and open-water bodies. It can occur in shallow riffles or in lakes with water depths up to four feet. It has been found in riffles, generally in vegetation, and deeply buried in sand and gravel bound together by roots (Parmalee and Bogan 1998).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Snuffbox	<i>Epioblasma triquetra</i>	E	Yes	Occurs in medium-sized streams to large rivers, generally on mud, rocky, gravel, or sand substrates in flowing water. This species is often deeply buried in substrate and overlooked by collectors (NatureServe 2018). It is found in a wide range of particle sized substrates. However, swift shallow riffles with sand and gravel are where it is typically found (Parmalee and Bogan 1998; Watters et al. 2009).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
Plants							

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Common Name	Scientific Name	Federal Listing ¹	Known to Occur in Franklin County? ²	Habitat Preference	Habitat Observed in Project Area?	Impact Assessment	USFWS Comments/ Recommendations
Running Buffalo Clover	<i>Trifolium stoloniferum</i>	E	Yes	Running buffalo clover habitat most commonly consists of mesic woodland in partial to filtered sunlight, where there is a pattern of moderate periodic disturbance for a prolonged period, such as mowing, trampling, or grazing. It has also been found in a variety of disturbed woodland habitats, floodplains, streambanks, grazed woodlots, cemeteries, lawns, old logging roads, and jeep trails (USFWS 2007b).	No	No suitable habitat is present within the Project area. Therefore, no impacts are anticipated.	Due to the project type, size, and location, no adverse impacts to this species or any other federally listed species are anticipated.
<div>¹E=Endangered; T=Threatened</div> <div>²According to USFWS (2018a).</div>							

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4.0 Conclusions and Recommendations

Stantec conducted a wetland and waterbodies delineation and a preliminary habitat assessment for threatened and endangered species within the Project area on July 11 and 12, 2018. A subsequent survey was conducted on October 12, 2018 at the Bethel Station property. During the field surveys, one wetland and three streams were identified within the Project area. No USGS-named streams were identified within the Project area. The information provided by Stantec regarding wetland and stream boundaries is based on an analysis of the wetland and upland conditions present within the Project area at the time of the field work. The delineations were performed by experienced and qualified professionals using regulatory agency-accepted practices and sound professional judgment.

A technical assistance/environmental review request letter was sent to ODNR Office of Real Estate. The response received from the ODNR Office of Real Estate (Appendix B) notes that the Project area is within the range of the state listed endangered Indiana bat, purple cat's paw, clubshell, northern riffleshell, rayed bean, rabbitsfoot, snuffbox, long solid, Ohio pigtoe, pocketbook, washboard, elephant-ear, black sandshell, Scioto madtom, popeye shiner, northern brook lamprey, spotted darter, shortnose gar, and upland sandpiper. The response also notes that the Project area is within the range of the state listed threatened threehorn wartyback, pondhorn, fawnsfoot, tonguetied minnow, paddlefish, and Tippecanoe darter. Due to factors such as lack of habitat, project location, and since no in-water work is proposed in a perennial stream, the response concludes that the Project will not likely impact these species.

If suitable Indiana bat roost habitat occurs within the Project area, the ODNR recommends trees be conserved. If suitable habitat occurs in the Project area and trees must be cut, the ODNR recommends cutting occur between October 1 and March 31. If suitable trees must be cut during summer months, the ODNR recommends a mist net survey be conducted between June 1 and August 15, prior to any cutting. If no tree removal is proposed, the ODNR stated that this Project is not likely to impact this species. No suitable winter hibernacula or summer roost trees were observed in the Project area. However, potentially suitable Indiana bat roost trees and potentially suitable summer foraging habitat was observed within the Project area. AEP will determine if any summer tree clearing is necessary in areas containing suitable foraging habitat and will proceed accordingly.

The ODNR Office of Real Estate also notes that Indian Run Falls Park (owned by the City of Dublin) is located within a one-mile radius of the Project area. However, the Project area does not occur within the noted park. According to the ODNR, there are also records of the state listed endangered spreading rock cress (*Arabis patens*) and the state listed potentially threatened arbor vitae (*Thuja occidentalis*) within a one-mile radius of the Project area. No potentially suitable habitats for these species was observed within the Project area. Therefore, no impacts are anticipated. According to the ODNR, records of a cave or cavern, a natural bridge or arch, and

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a waterfall have also been listed within a one-mile radius of the Project area. None of these resources were observed within the Project area.

A technical assistance request letter was also submitted to the USFWS. The USFWS response letter, sent July 21, 2018, states that there are no federal wilderness areas, wildlife refuges, or designated critical habitat within the vicinity of the Project area (Appendix B). The USFWS recommends that impacts to wetlands and other water resources be avoided or minimized to the fullest extent possible, and that best management practices be utilized to minimize erosion and sedimentation.

The Project area includes potentially suitable roost trees and foraging habitat for the Indiana bat and northern long-eared bat. However, no suitable winter hibernacula for these species were observed in the Project area. It is anticipated that AEP will conduct tree clearing activities for the Project between October 1 and March 31. Therefore, no adverse effects to the Indiana bat or northern long-eared bat are anticipated. If this seasonal tree clearing is not possible, AEP will proceed in accordance with agency requirements.

The USFWS does not anticipate adverse effects to federally endangered, threatened, proposed or candidate species due to the project type, size, and location (Appendix B).

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References

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5.0 References

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Appendix A **Figures**

A.1 FIGURE 1 – PROJECT LOCATION MAP

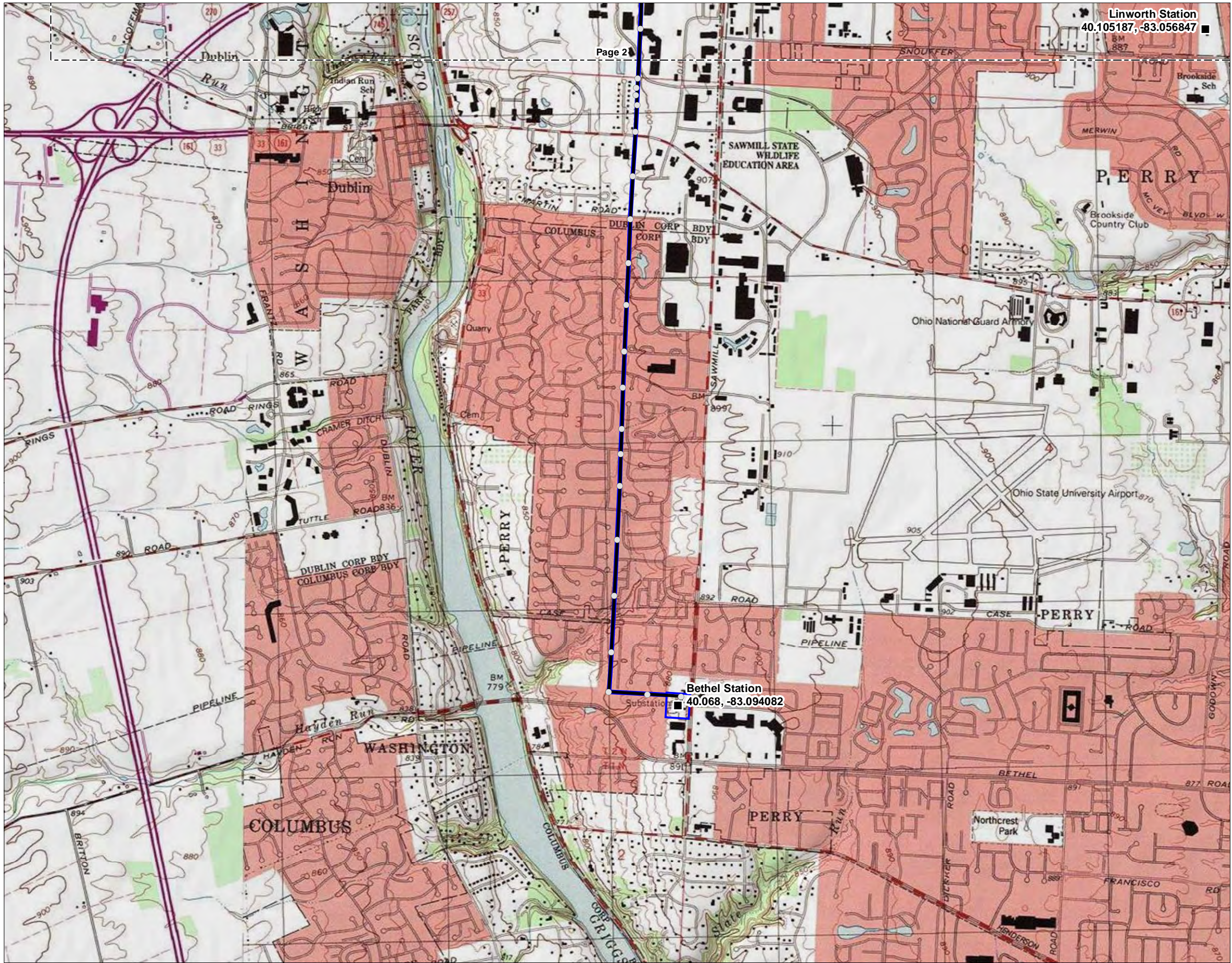
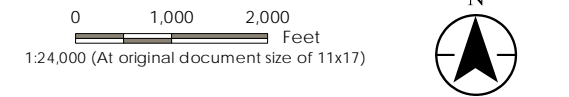


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Project Location Map

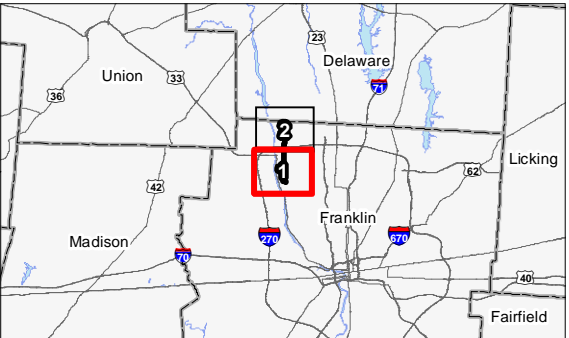
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AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by JH on 2018-06-21
Technical Review by NN on 2018-07-17
Independent Review by DJG on 2018-10-16



- Legend
- AEP Substation
 - Existing Structure to be Replaced
 - Existing 138 kV Transmission Line
 - Project Area



Notes

1. Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet
2. Data Sources Include: Stantec, AEP, USGS, NADS
3. Background: USGS 7.5 Topographic Quadrangles: Northwest Columbus, OH (1984), Powell, OH (1980)



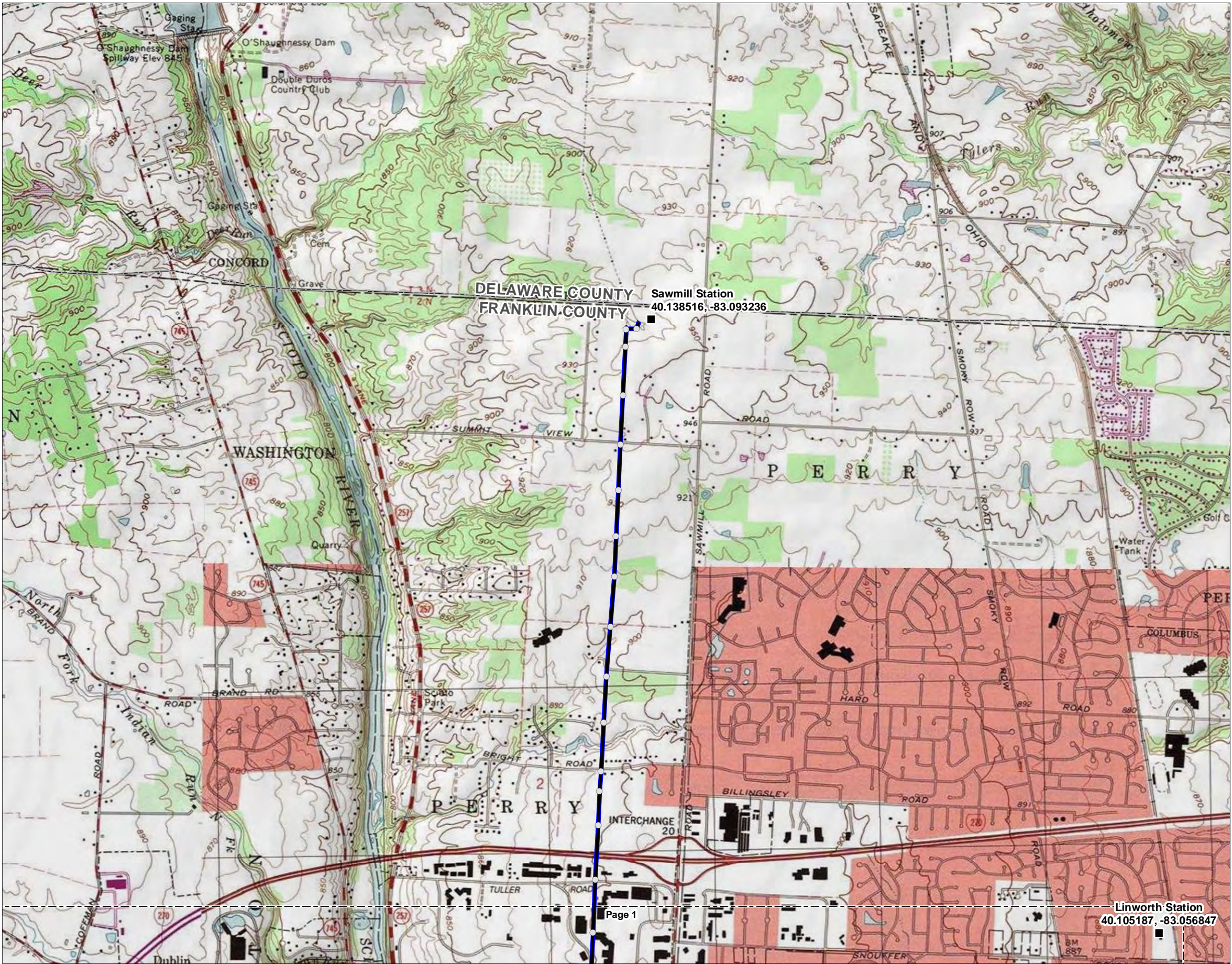
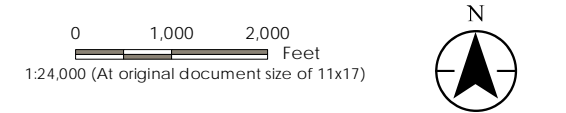


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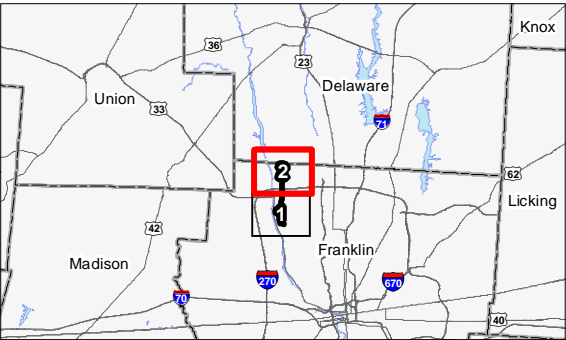
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ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

A.2 FIGURE 2 – WETLAND AND WATERBODY DELINEATION MAP



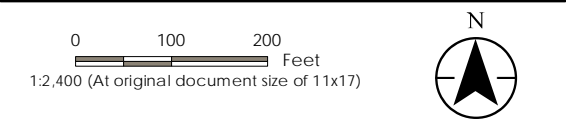
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Wetland and Waterbody
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Client/Project
AEP Ohio Transmission Company, Inc.
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Rebuild Project

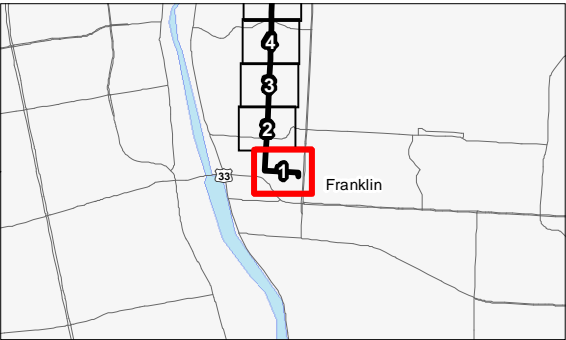
Project Location
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193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
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Legend

- AEP Substation
- Existing Structure to be Replaced
- Existing 138 kV Transmission Line
- Project Area
- Existing Culvert
- Existing Manhole
- Wetland Determination Sample Point
- Photo Location
- Upland Drainage Feature
- Approximate Upland Drainage Feature
- Field Delineated Waterway
- Approximate Waterway
- Field Delineated Emergent Wetland
- Approximate Wetland
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- 100-year Flood Zone
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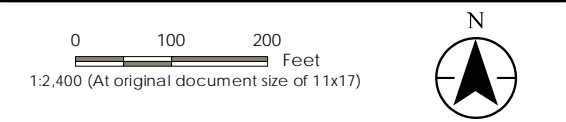
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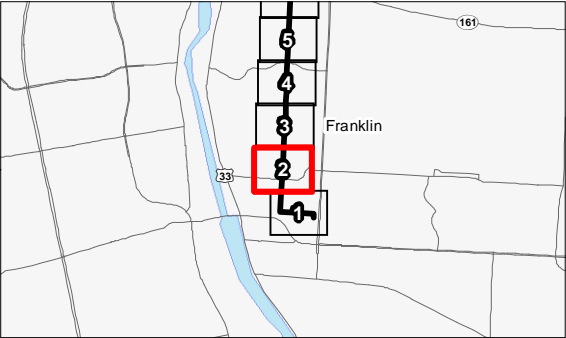
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- Legend
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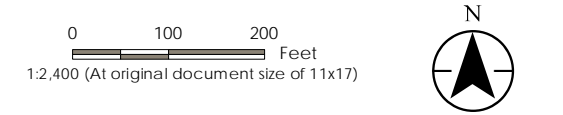
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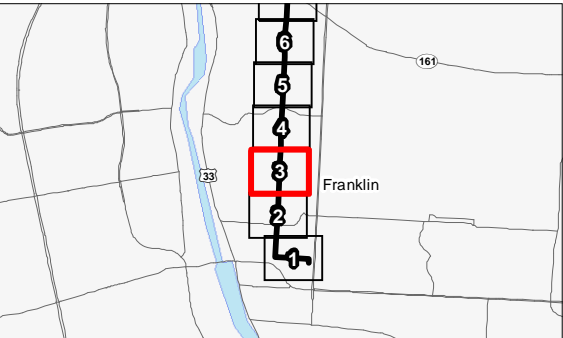
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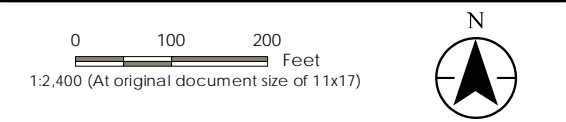
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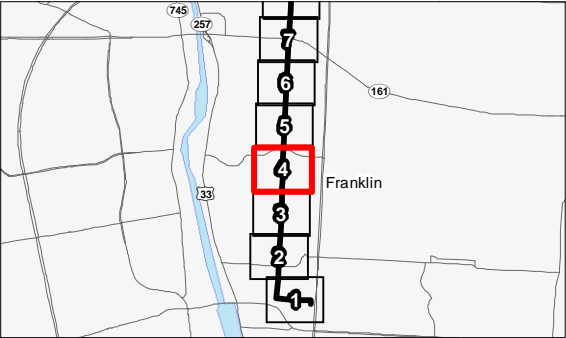
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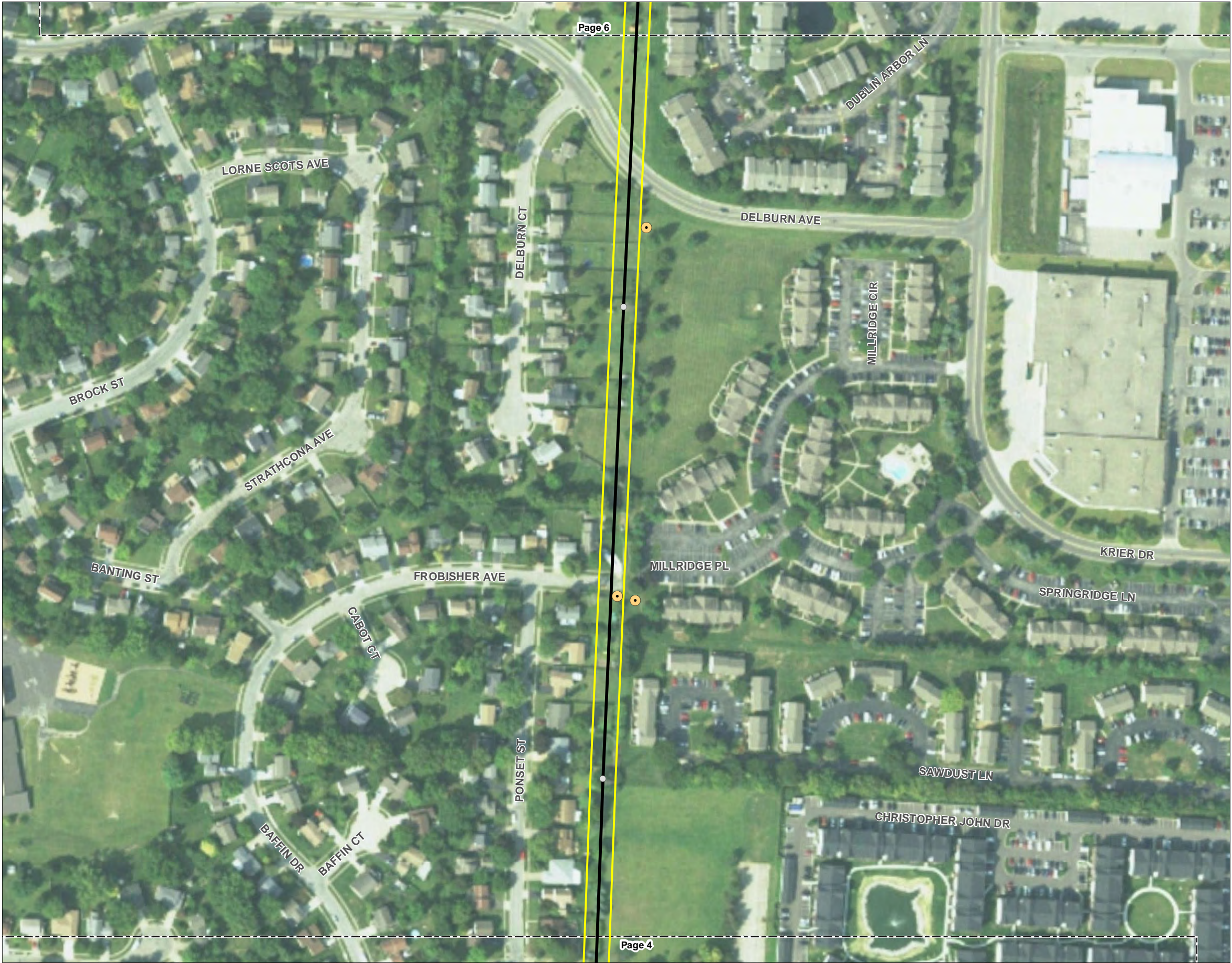


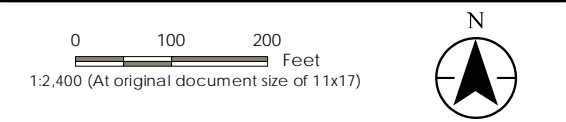
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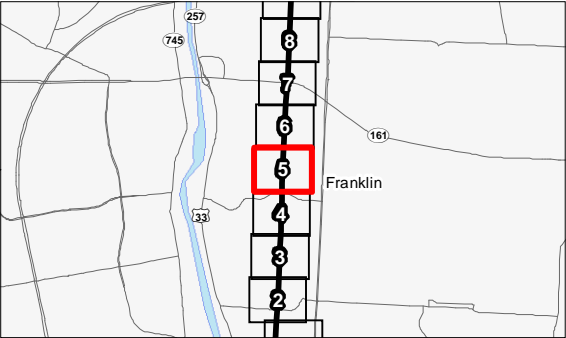
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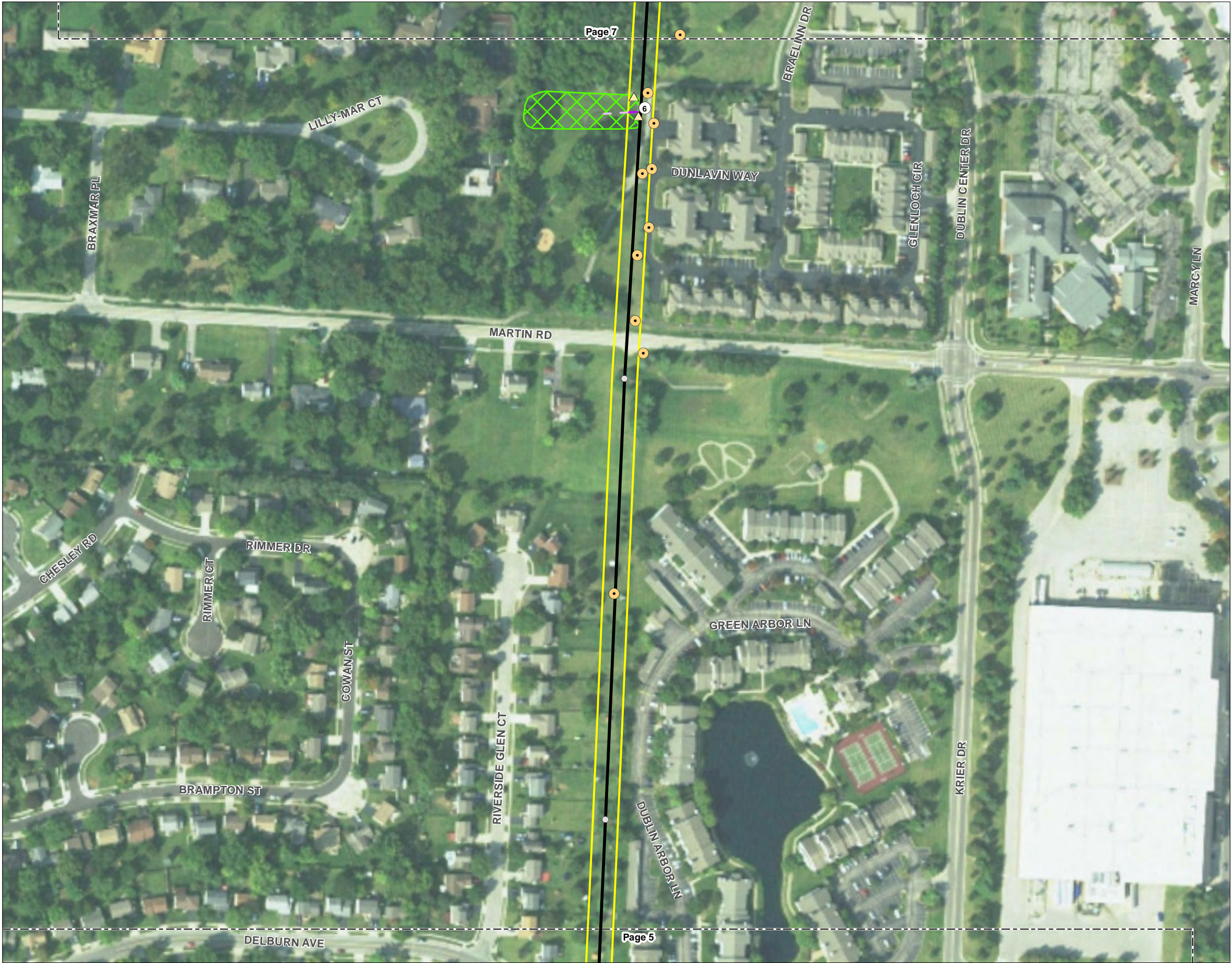
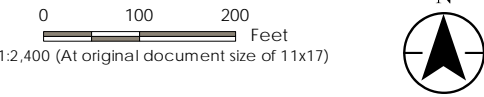


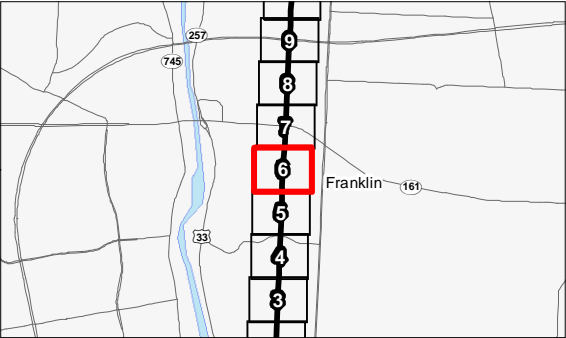
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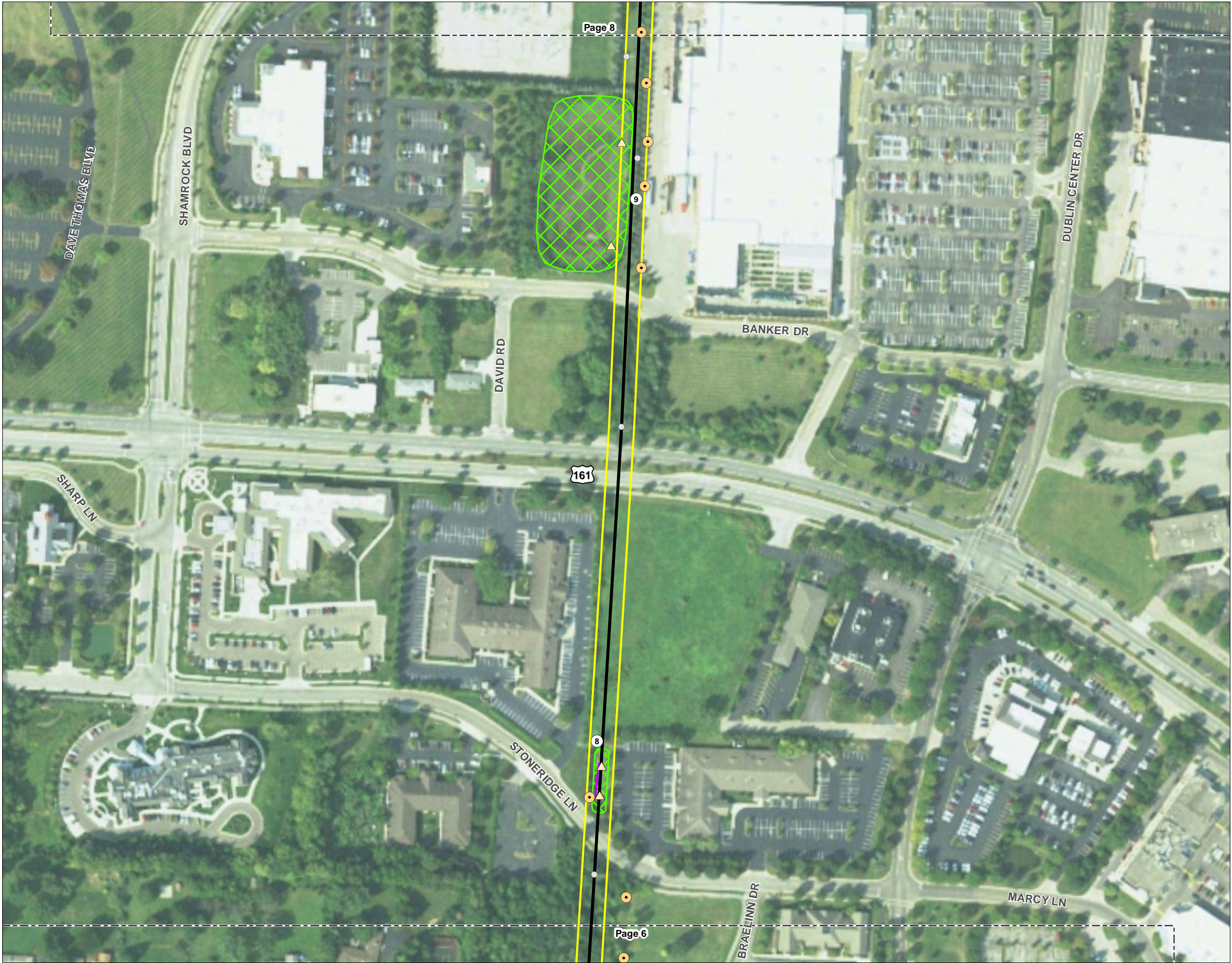


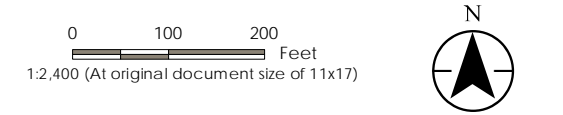
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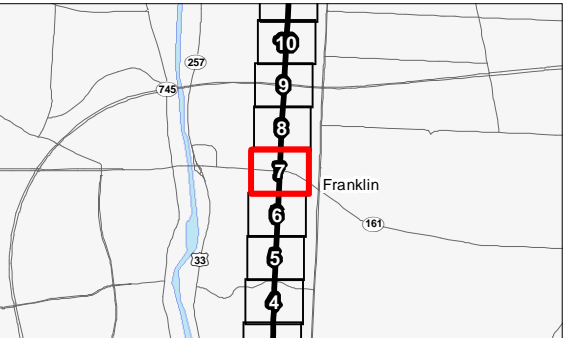
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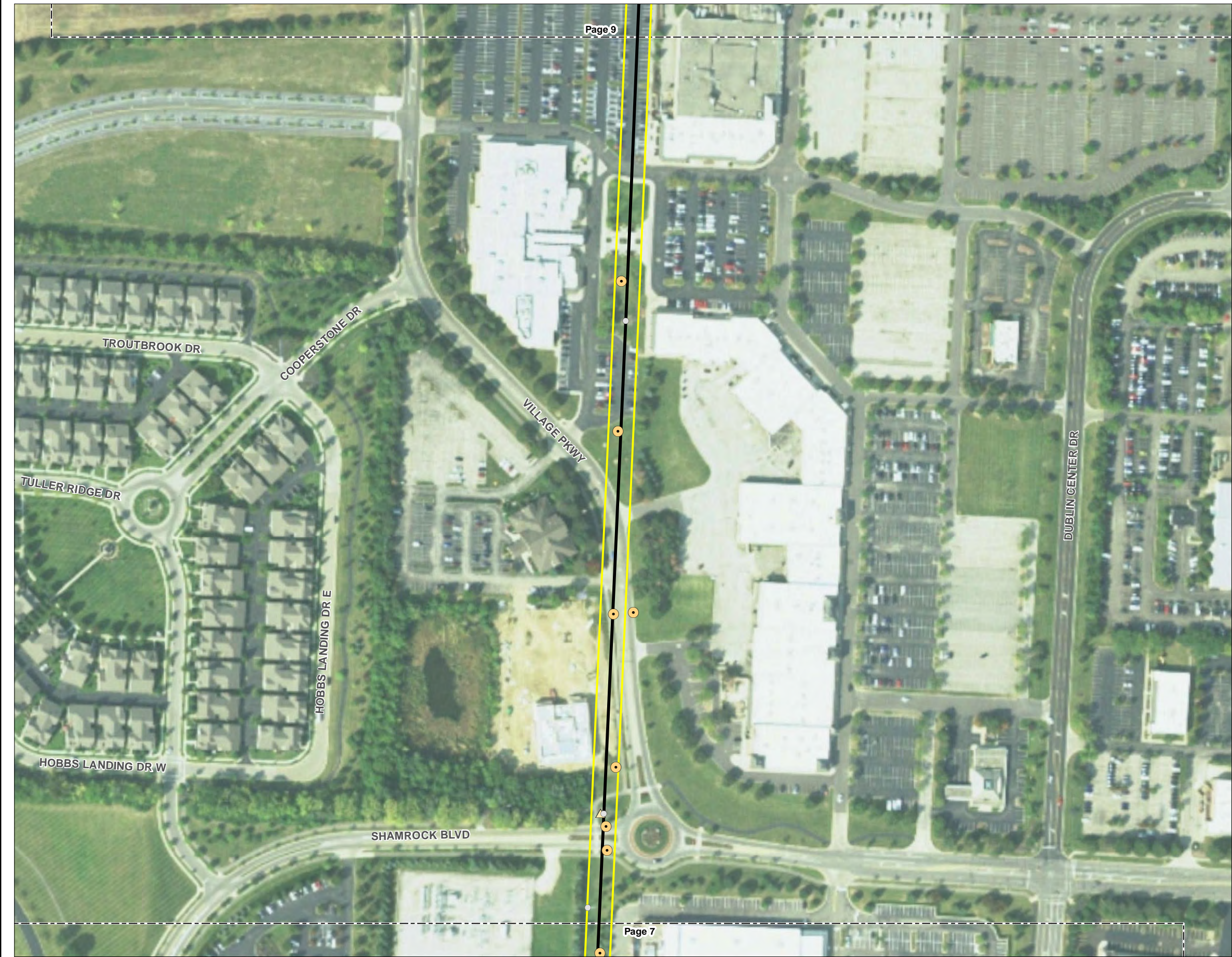


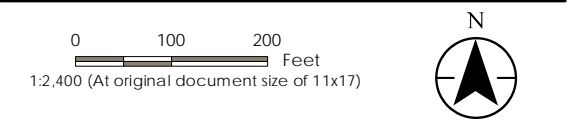
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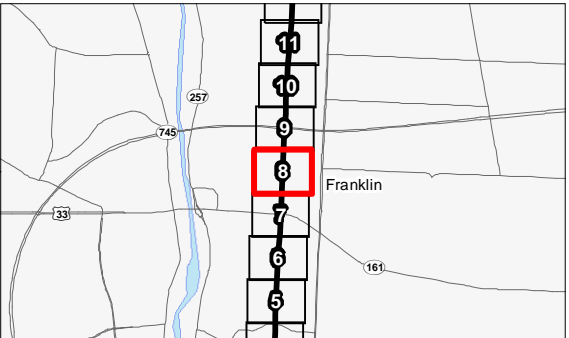
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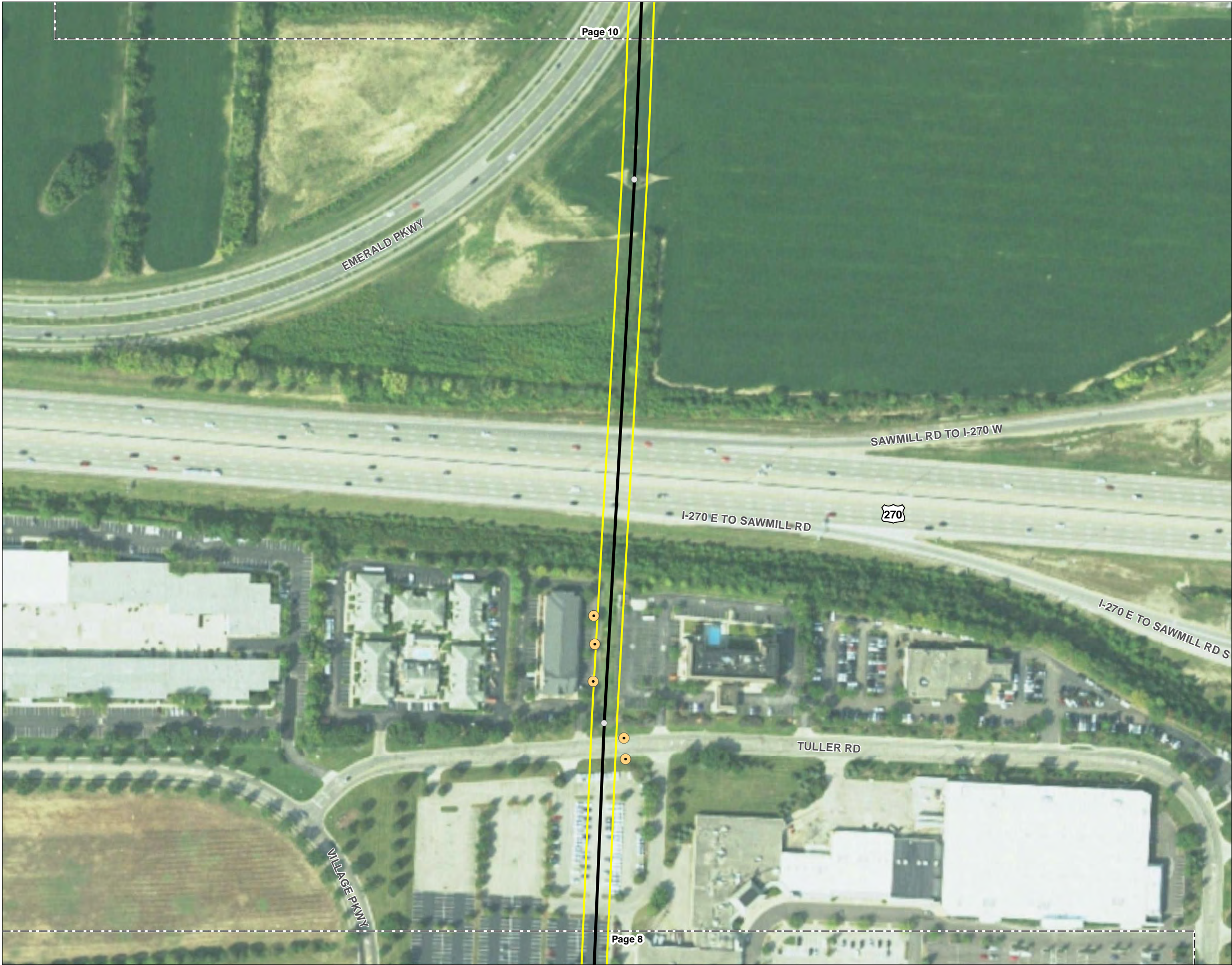


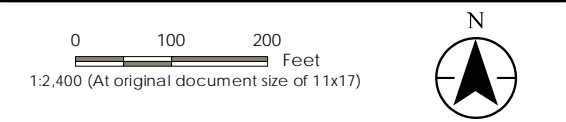
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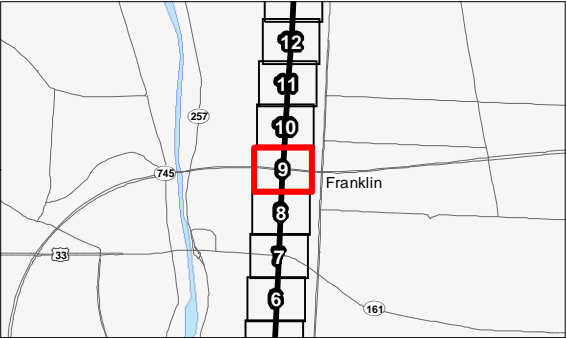
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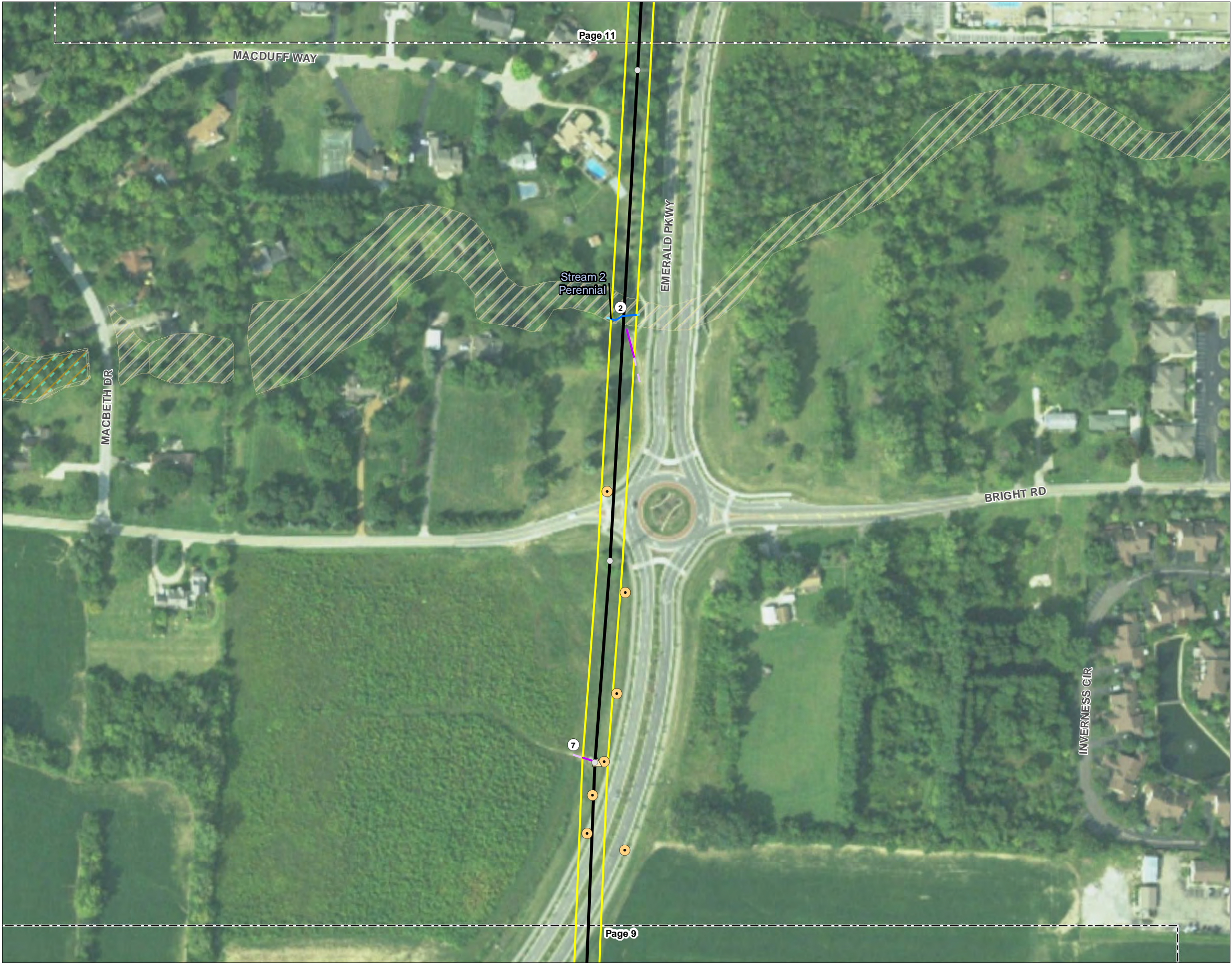


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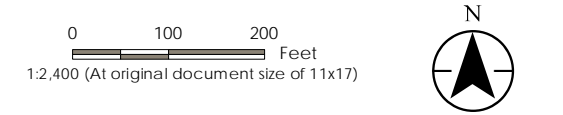
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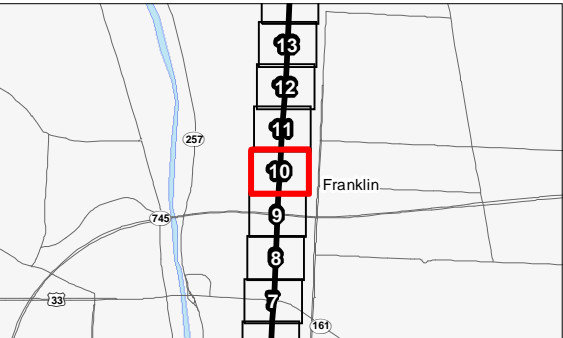
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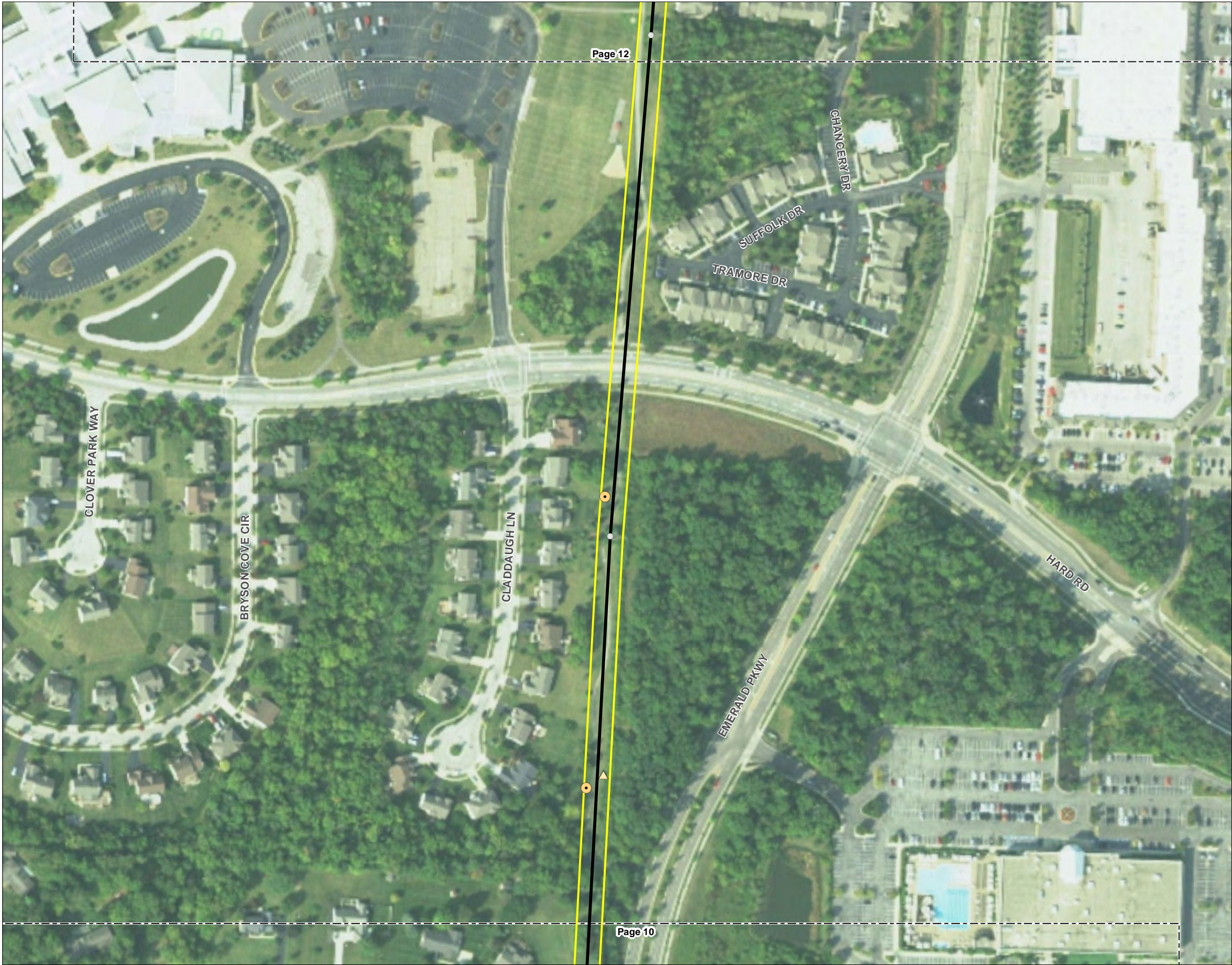
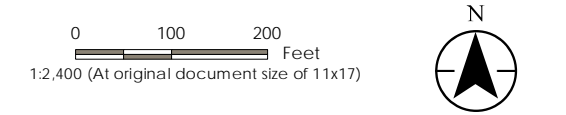


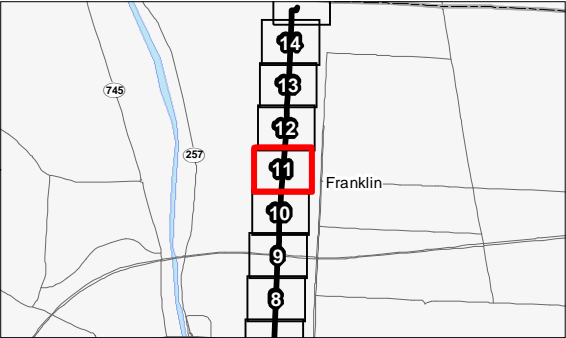
Figure No.
2
Title
Wetland and Waterbody
Delineation Map

Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio
193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
Independent Review by DJG on 2018-10-16



- Legend
- AEP Substation
 - Existing Structure to be Replaced
 - Existing 138 kV Transmission Line
 - Project Area
 - ▲ Existing Culvert
 - Existing Manhole
 - Wetland Determination Sample Point
 - Photo Location
 - ~ Upland Drainage Feature
 - - - Approximate Upland Drainage Feature
 - ~ Field Delineated Waterway
 - - - Approximate Waterway
 - Field Delineated Emergent Wetland
 - Approximate Wetland
 - Existing Stormwater Detention Basin
 - FEMA Flood Hazard Area
 - 100-year Flood Zone
 - 100-year Floodway



Notes

1. Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet
2. Data Sources Include: Stantec, AEP, USGS, FEMA, OGRIP, NADS
3. Orthophotography: 2017 NAIP



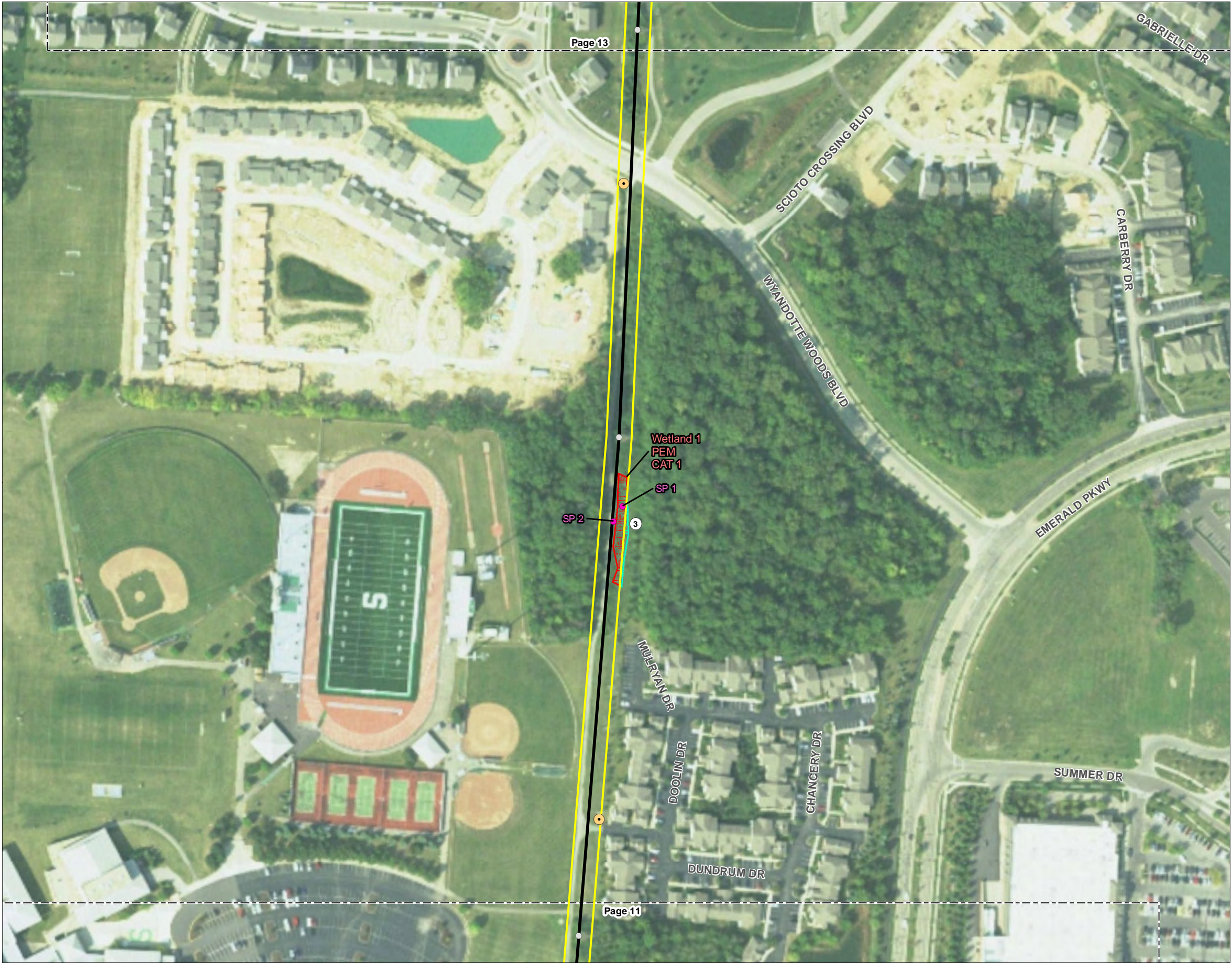
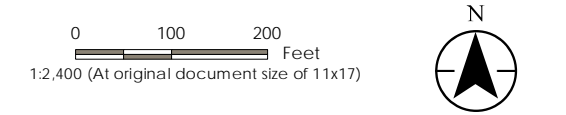


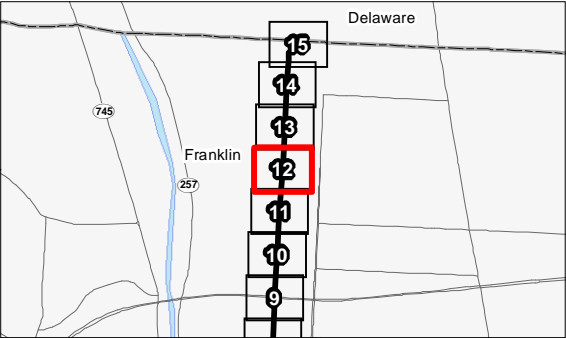
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Rebuild Project

Project Location
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193706228
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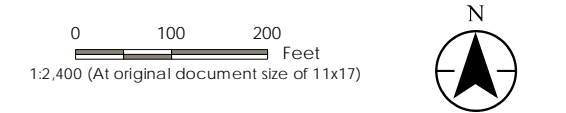




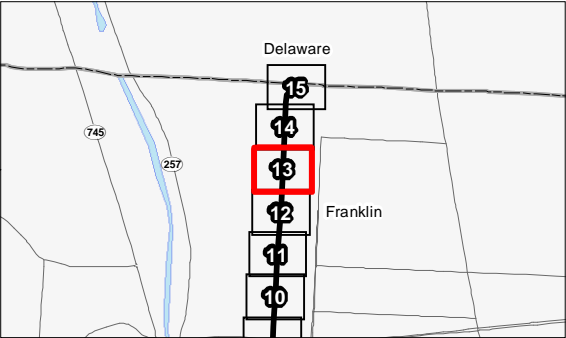
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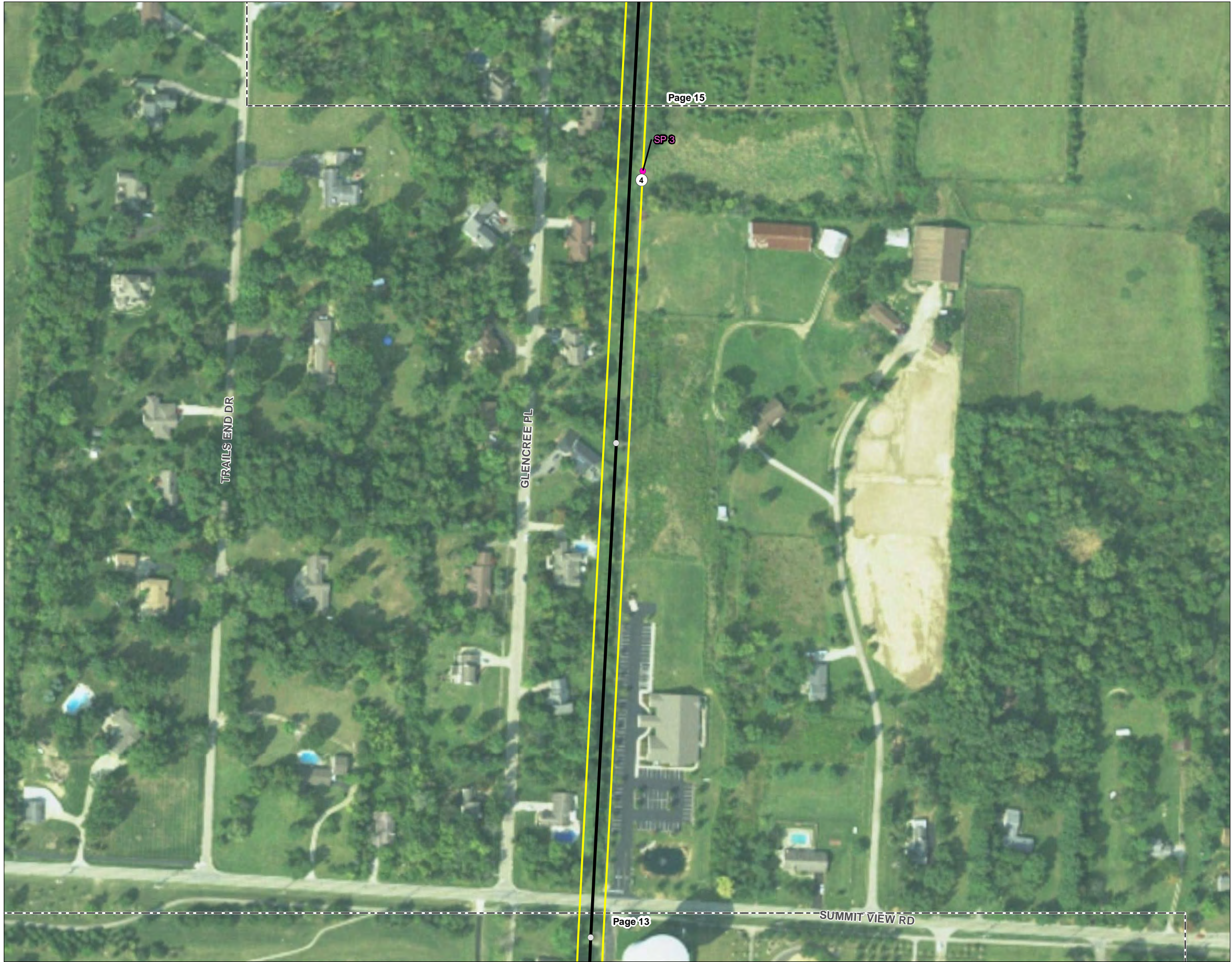


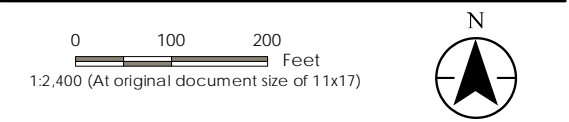
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Title
Wetland and Waterbody
Delineation Map

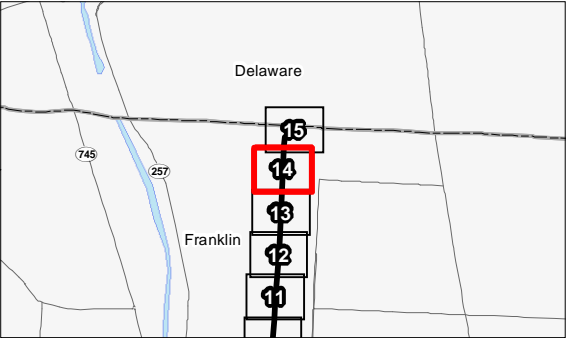
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Rebuild Project

Project Location
Franklin County, Ohio

193706228
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Independent Review by D.J.G. on 2018-10-16



- Legend
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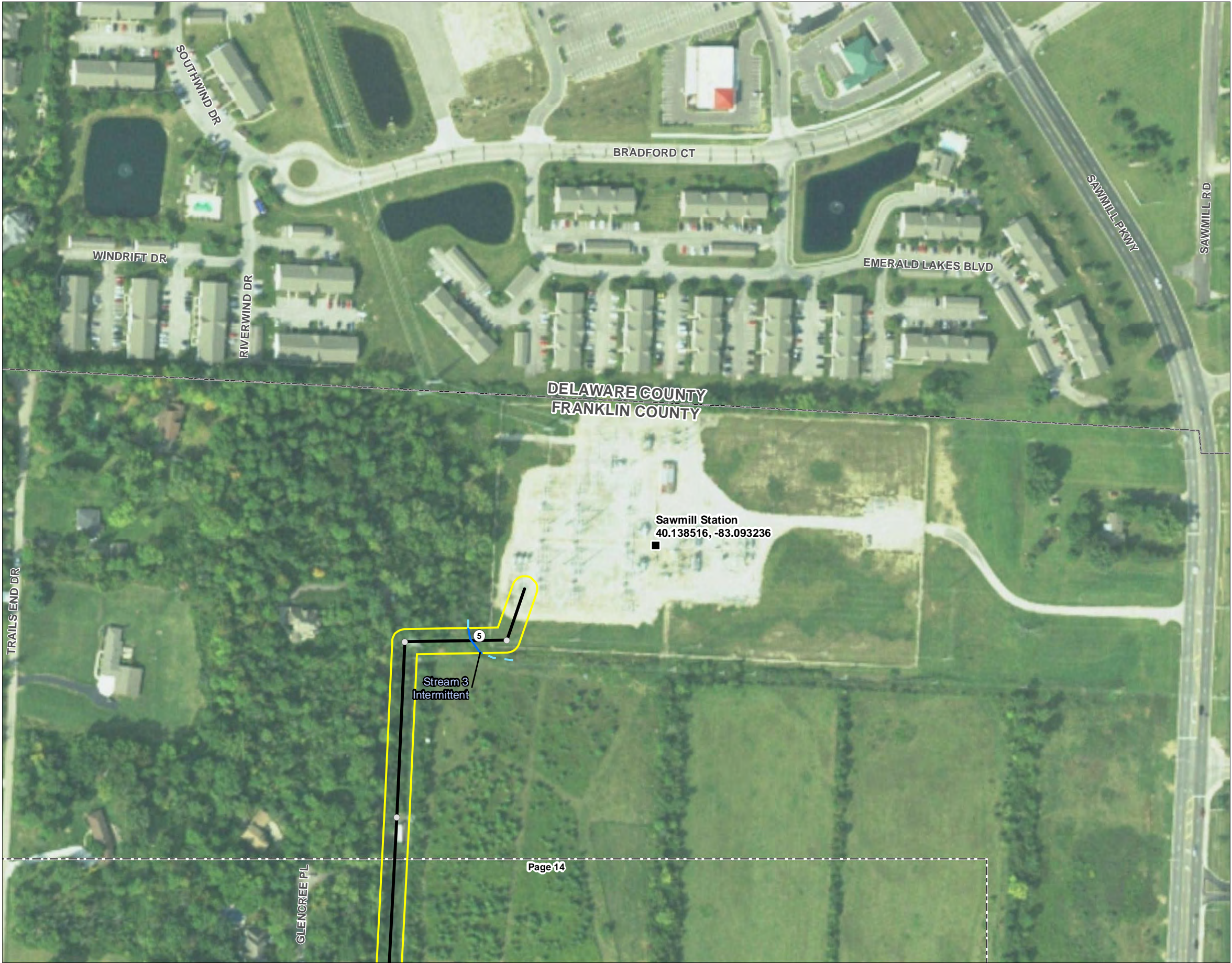


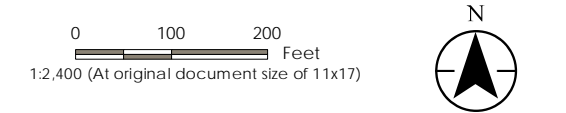
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Delineation Map

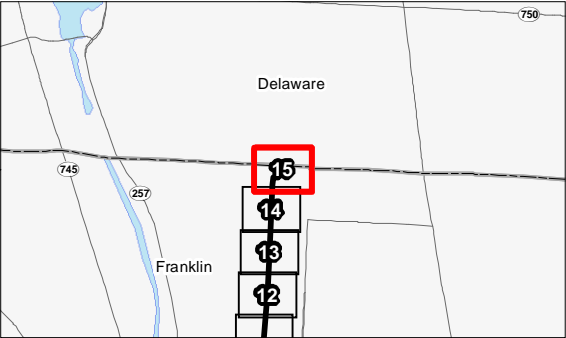
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Rebuild Project

Project Location
Franklin County, Ohio

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- Legend
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ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

A.3 FIGURE 3 – HABITAT ASSESSMENT MAP

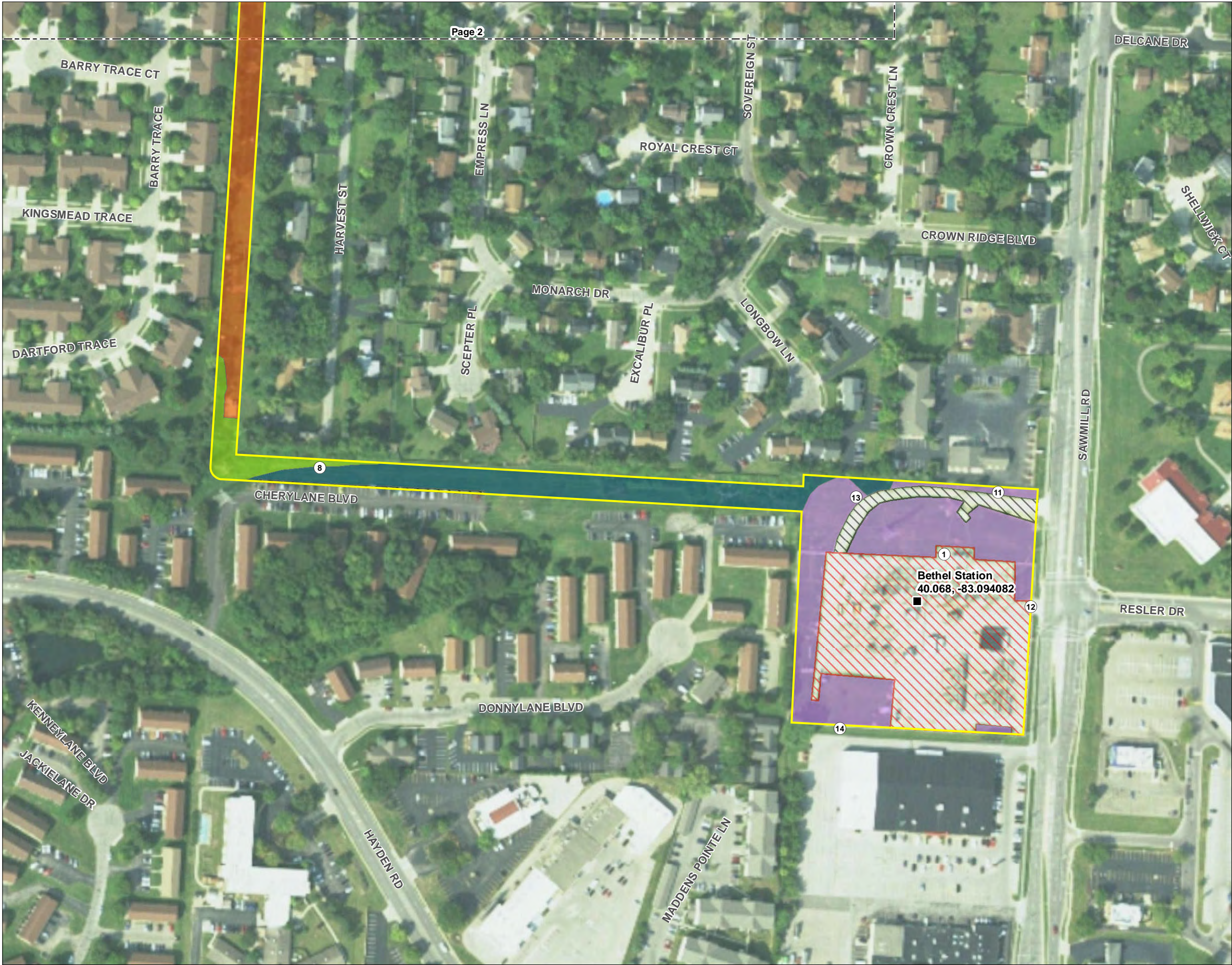


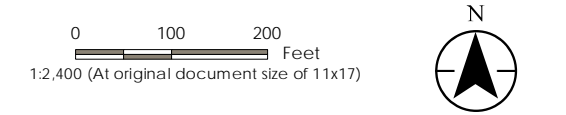
Figure No.
3

Title
Habitat Assessment Map

Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

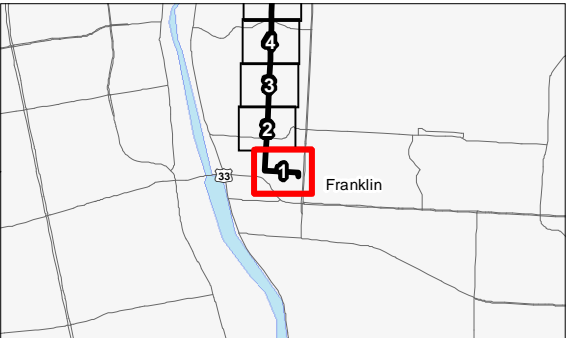
Project Location
Franklin County, Ohio

193706228
Prepared by J.L.H. on 2018-07-20
Technical Review by K.B. on 2018-07-26
Independent Review by D.J.G. on 2018-10-16



Legend

■ AEP Substation	Habitat Area
● Existing Structure to be Replaced	■ Agricultural Field
~ Existing 138 kV Transmission Line	■ Early Successional Deciduous Forest
□ Project Area	■ Early Successional Riparian Forest
○ Photo Location	■ Residential Lawn
~ Upland Drainage Feature	■ Mixed Early Successional/Second Growth Deciduous Forest
~ Approximate Upland Drainage Feature	■ New Field
~ Field Delineated Waterway	■ Old Field
~ Approximate Waterway	■ Planted Prairie
~ Field Delineated Emergent Wetland	■ Maintained Lawn
~ Approximate Wetland	■ Commercial
■ Existing Stormwater Detention Basin	■ Industrial
	■ Paved Surface



Notes

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2. Data Sources Include: Stantec, AEP, USGS, OGRIP, NADS
3. Orthophotography: 2017 NAIP



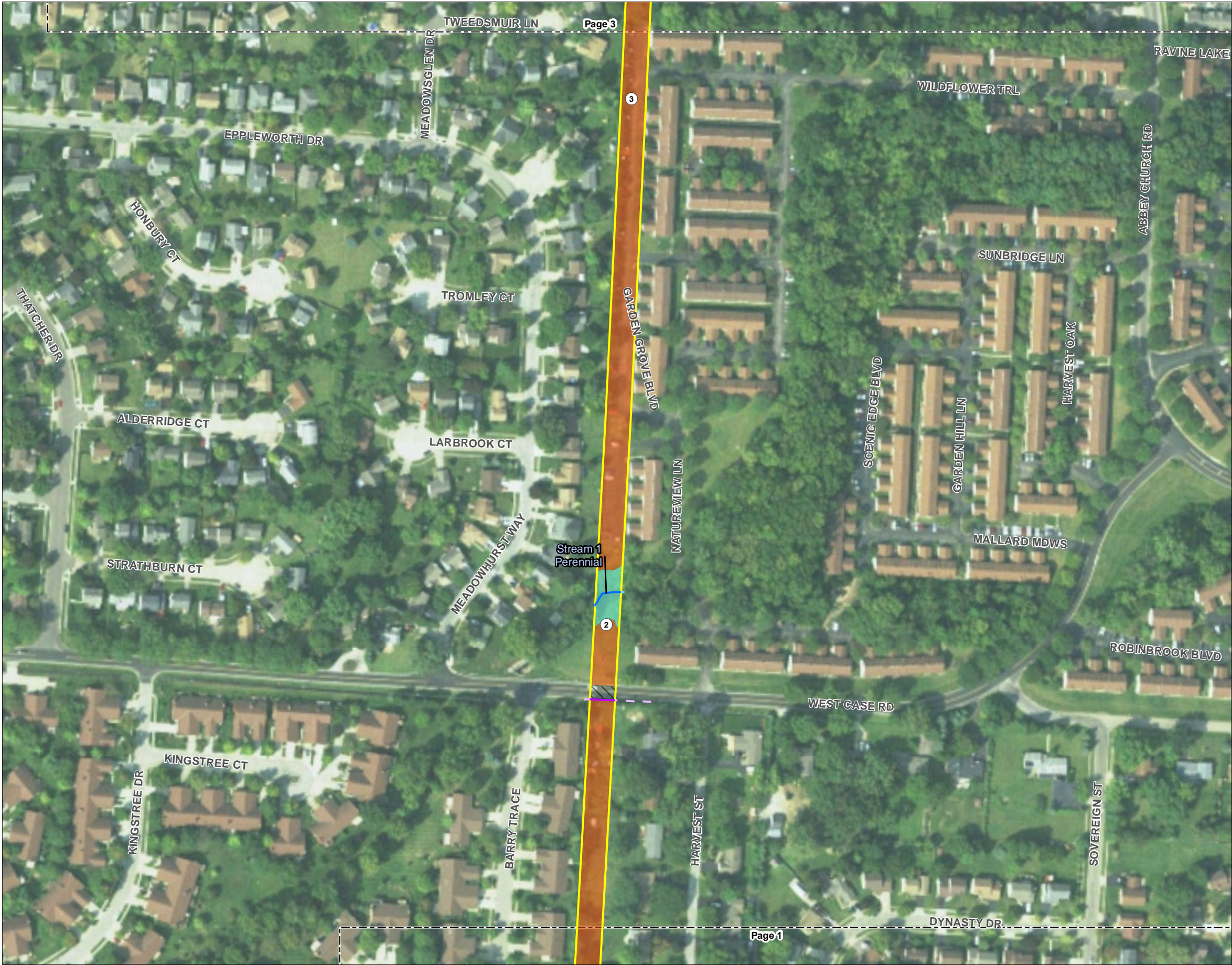
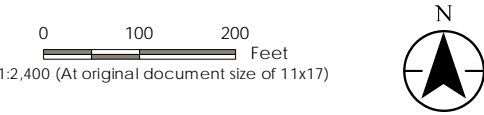


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Title
Habitat Assessment Map

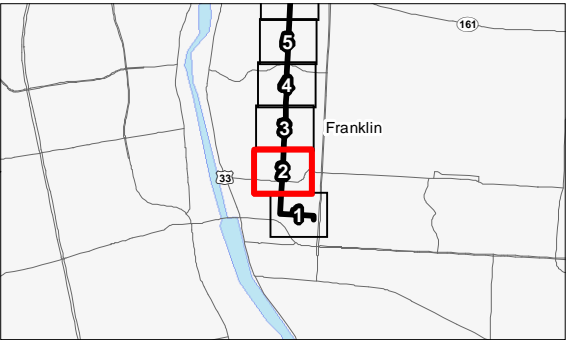
Client/Project
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Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
Independent Review by DJG on 2018-10-16



- Legend
- | | |
|---------------------------------------|---|
| ■ AEP Substation | Habitat Area |
| ● Existing Structure to be Replaced | ■ Agricultural Field |
| ~ Existing 138 kV Transmission Line | ■ Early Successional Deciduous Forest |
| □ Project Area | ■ Early Successional Riparian Forest |
| ○ Photo Location | ■ Residential Lawn |
| ~ Upland Drainage Feature | ■ Mixed Early Successional/Second Growth Deciduous Forest |
| ~ Approximate Upland Drainage Feature | ■ New Field |
| ~ Field Delineated Waterway | ■ Old Field |
| ~ Approximate Waterway | ■ Planted Prairie |
| ~ Field Delineated Emergent Wetland | ■ Maintained Lawn |
| ~ Approximate Wetland | ■ Commercial |
| ■ Existing Stormwater Detention Basin | ■ Industrial |
| | ■ Paved Surface |



Notes

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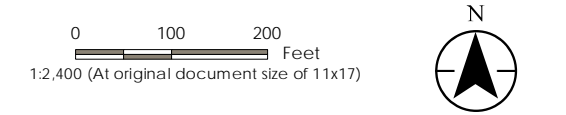
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Habitat Assessment Map

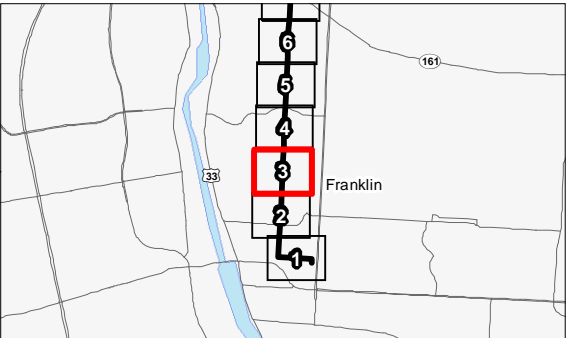
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Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by J.L.H. on 2018-07-20
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Legend	
	AEP Substation
	Existing Structure to be Replaced
	Existing 138 kV Transmission Line
	Project Area
	Photo Location
	Upland Drainage Feature
	Approximate Upland Drainage Feature
	Field Delineated Waterway
	Approximate Waterway
	Field Delineated Emergent Wetland
	Approximate Wetland
	Existing Stormwater Detention Basin
Habitat Area	
	Agricultural Field
	Early Successional Deciduous Forest
	Early Successional Riparian Forest
	Residential Lawn
	Mixed Early Successional/Second Growth Deciduous Forest
	New Field
	Old Field
	Planted Prairie
	Maintained Lawn
	Commercial
	Industrial
	Paved Surface



Notes

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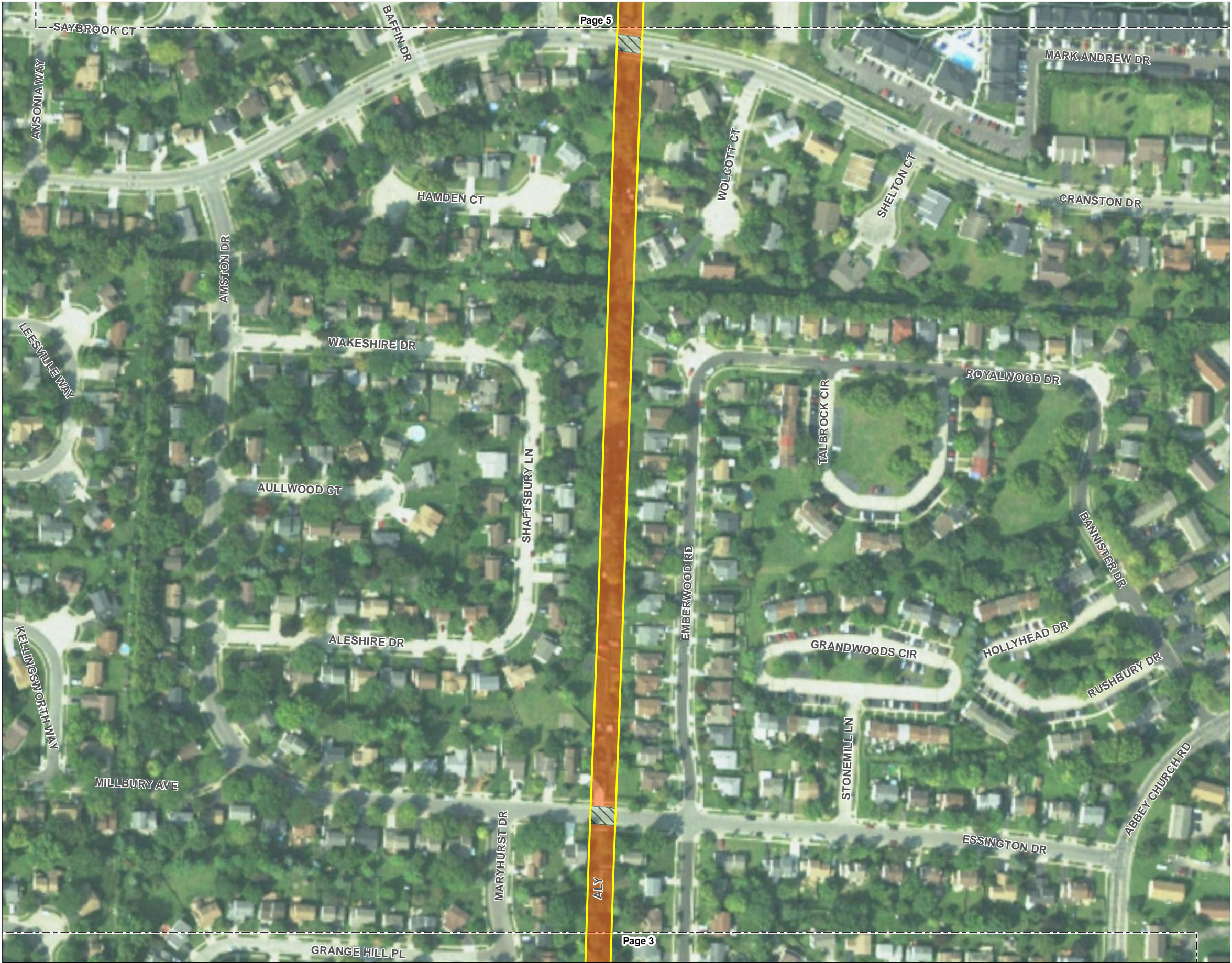


Figure No.
3

Title
Habitat Assessment Map

Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

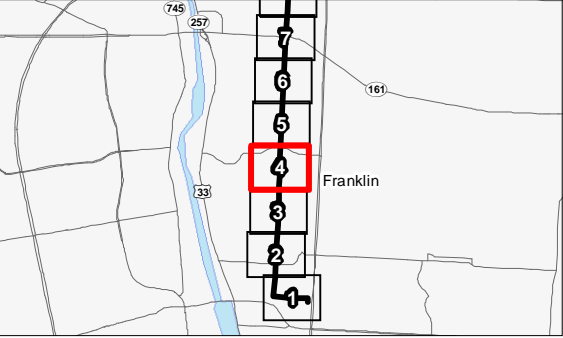
193706228
Prepared by J.L.H. on 2018-07-20
Technical Review by K.B. on 2018-07-26
Independent Review by D.J.G. on 2018-10-16

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Legend

■ AEP Substation	Habitat Area
● Existing Structure to be Replaced	■ Agricultural Field
~ Existing 138 kV Transmission Line	■ Early Successional Deciduous Forest
□ Project Area	■ Early Successional Riparian Forest
○ Photo Location	■ Residential Lawn
~ Upland Drainage Feature	■ Mixed Early Successional/Second Growth Deciduous Forest
~ Approximate Upland Drainage Feature	■ New Field
~ Field Delineated Waterway	■ Old Field
~ Approximate Waterway	■ Planted Prairie
~ Field Delineated Emergent Wetland	■ Maintained Lawn
~ Approximate Wetland	■ Commercial
■ Existing Stormwater Detention Basin	■ Industrial
	■ Paved Surface



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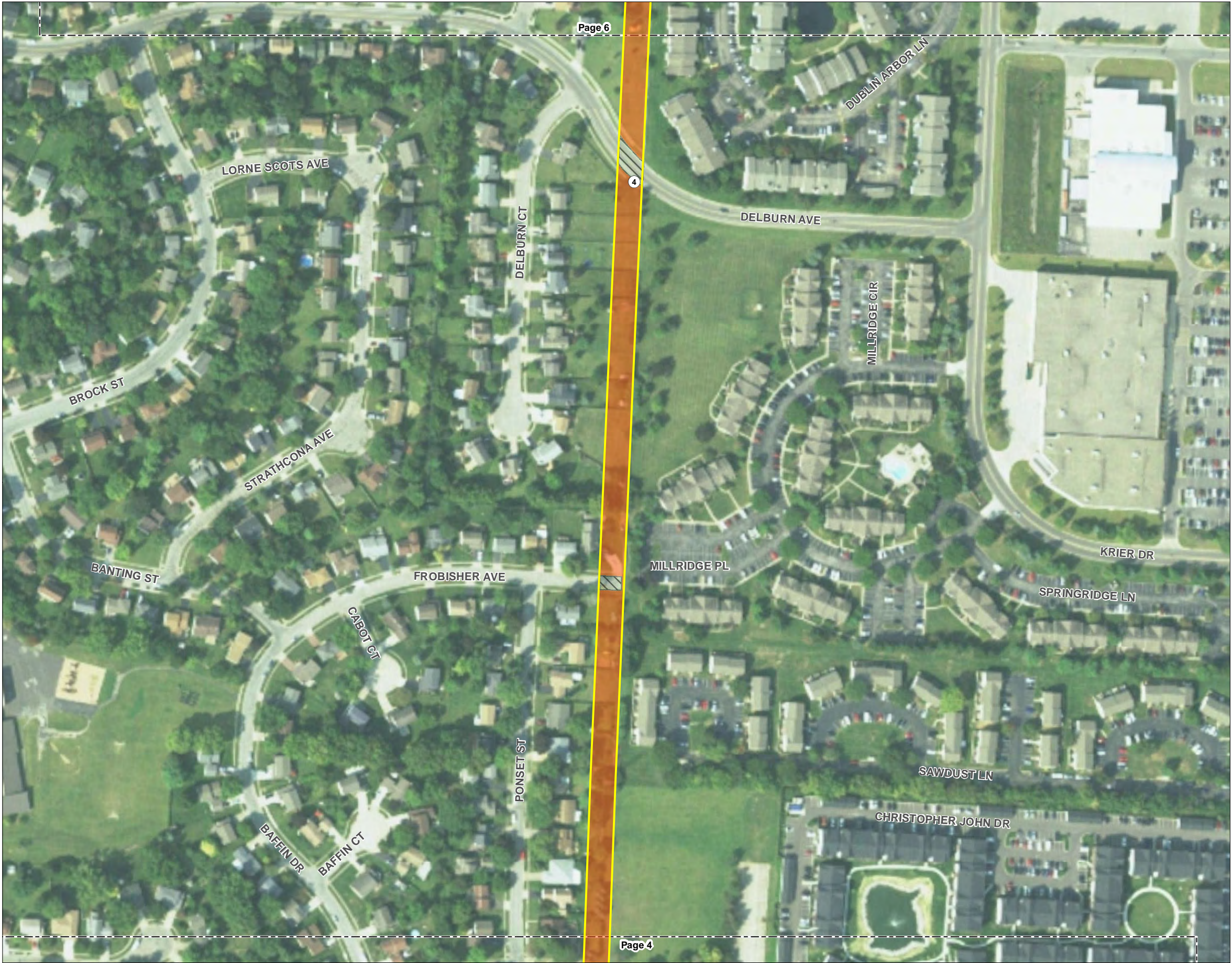
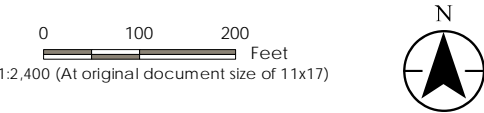


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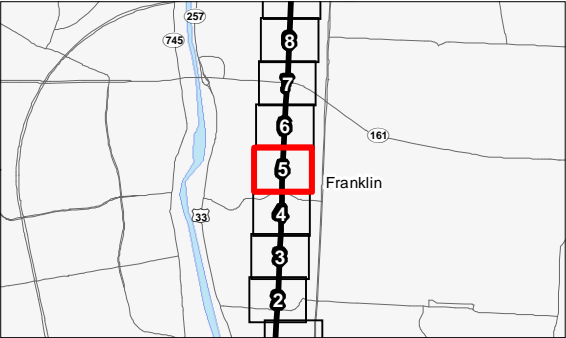
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193706228
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- Legend**
- | | |
|-------------------------------------|---|
| AEP Substation | Habitat Area |
| Existing Structure to be Replaced | Agricultural Field |
| Existing 138 kV Transmission Line | Early Successional Deciduous Forest |
| Project Area | Early Successional Riparian Forest |
| Photo Location | Residential Lawn |
| Upland Drainage Feature | Mixed Early Successional/Second Growth Deciduous Forest |
| Approximate Upland Drainage Feature | New Field |
| Field Delineated Waterway | Old Field |
| Approximate Waterway | Planted Prairie |
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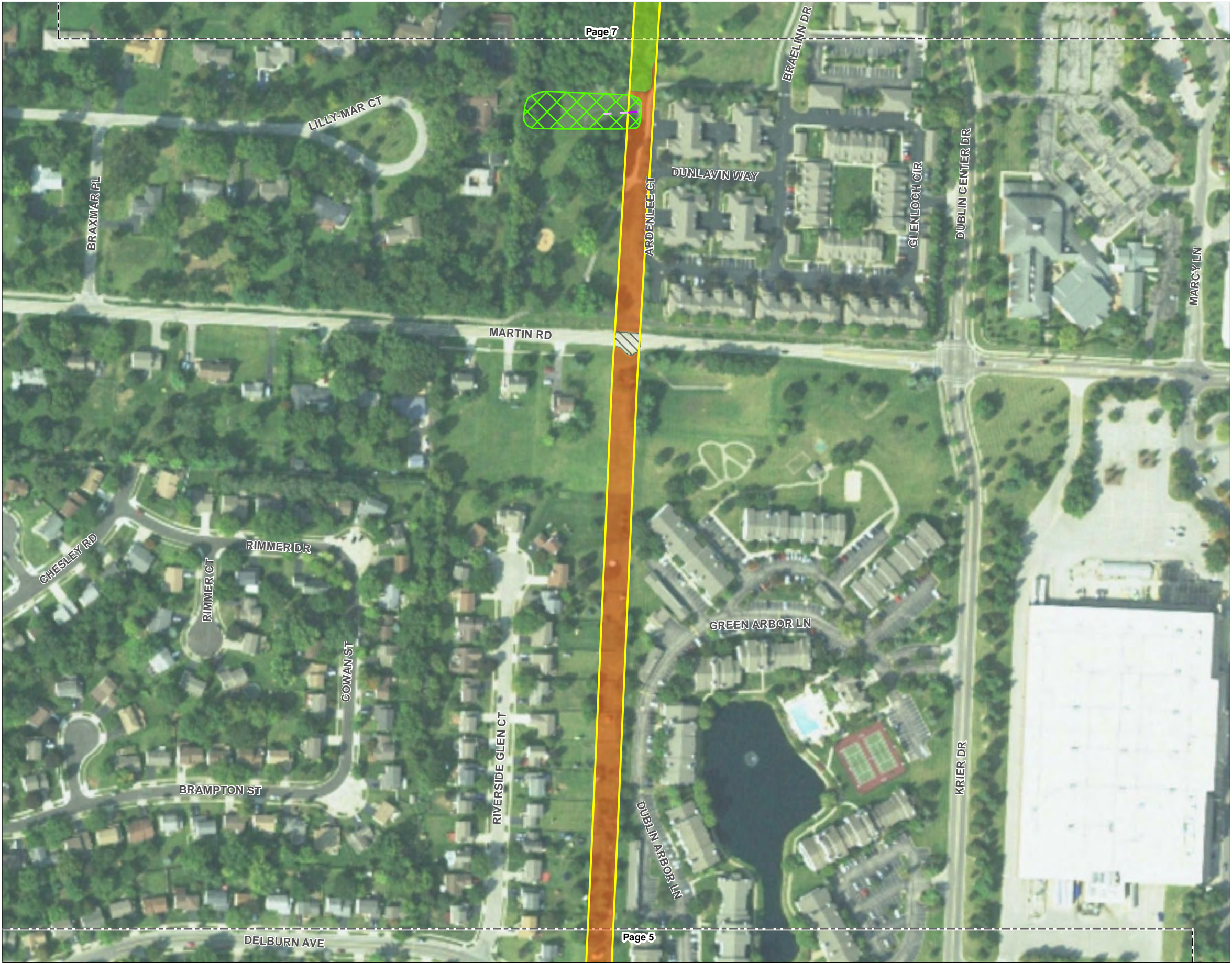
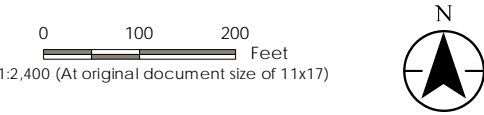
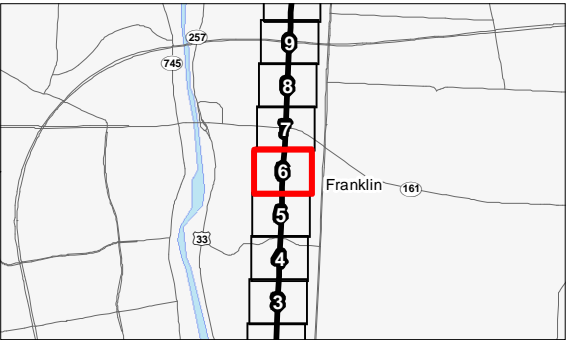


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AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project
Project Location
Franklin County, Ohio
193706228
Prepared by JLH on 2018-07-20
Technical Review by KB on 2018-07-26
Independent Review by DJG on 2018-10-16



- Legend
- | | |
|---------------------------------------|---|
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| □ Project Area | ■ Early Successional Riparian Forest |
| ○ Photo Location | ■ Residential Lawn |
| ~ Upland Drainage Feature | ■ Mixed Early Successional/Second Growth Deciduous Forest |
| ~ Approximate Upland Drainage Feature | ■ New Field |
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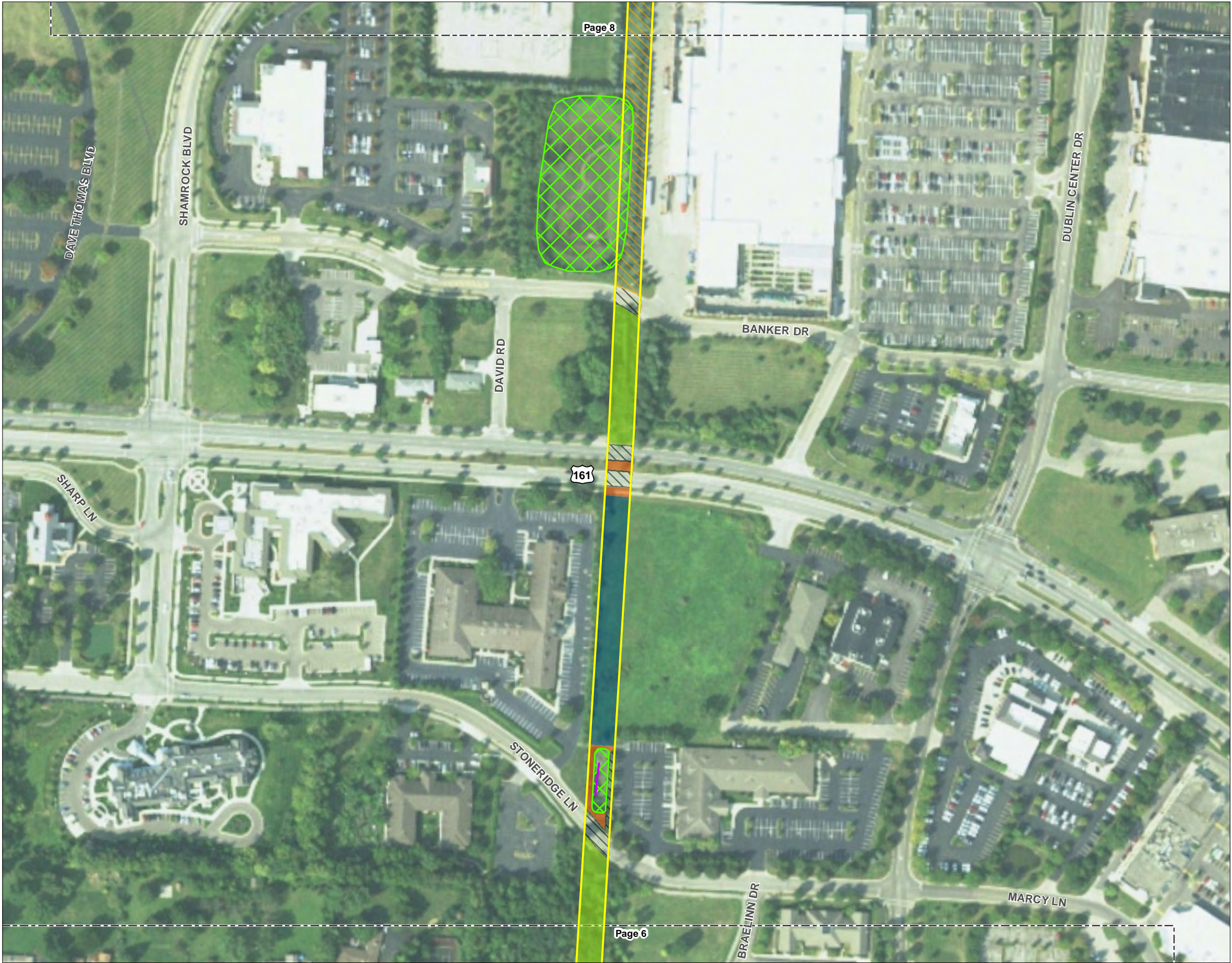
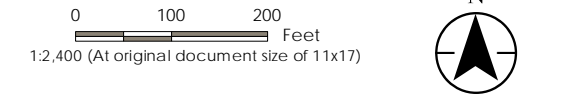


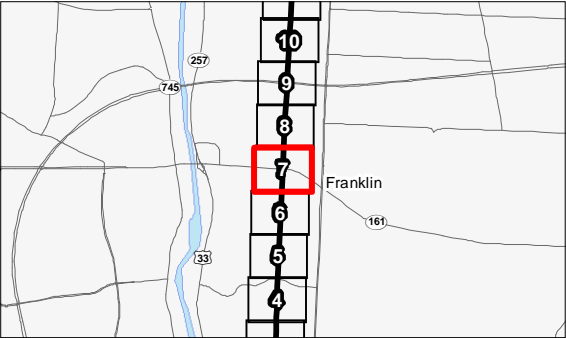
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Rebuild Project

Project Location
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Legend	
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	Existing Structure to be Replaced
	Existing 138 kV Transmission Line
	Project Area
	Photo Location
	Upland Drainage Feature
	Approximate Upland Drainage Feature
	Field Delineated Waterway
	Approximate Waterway
	Field Delineated Emergent Wetland
	Approximate Wetland
	Existing Stormwater Detention Basin
Habitat Area	
	Agricultural Field
	Early Successional Deciduous Forest
	Early Successional Riparian Forest
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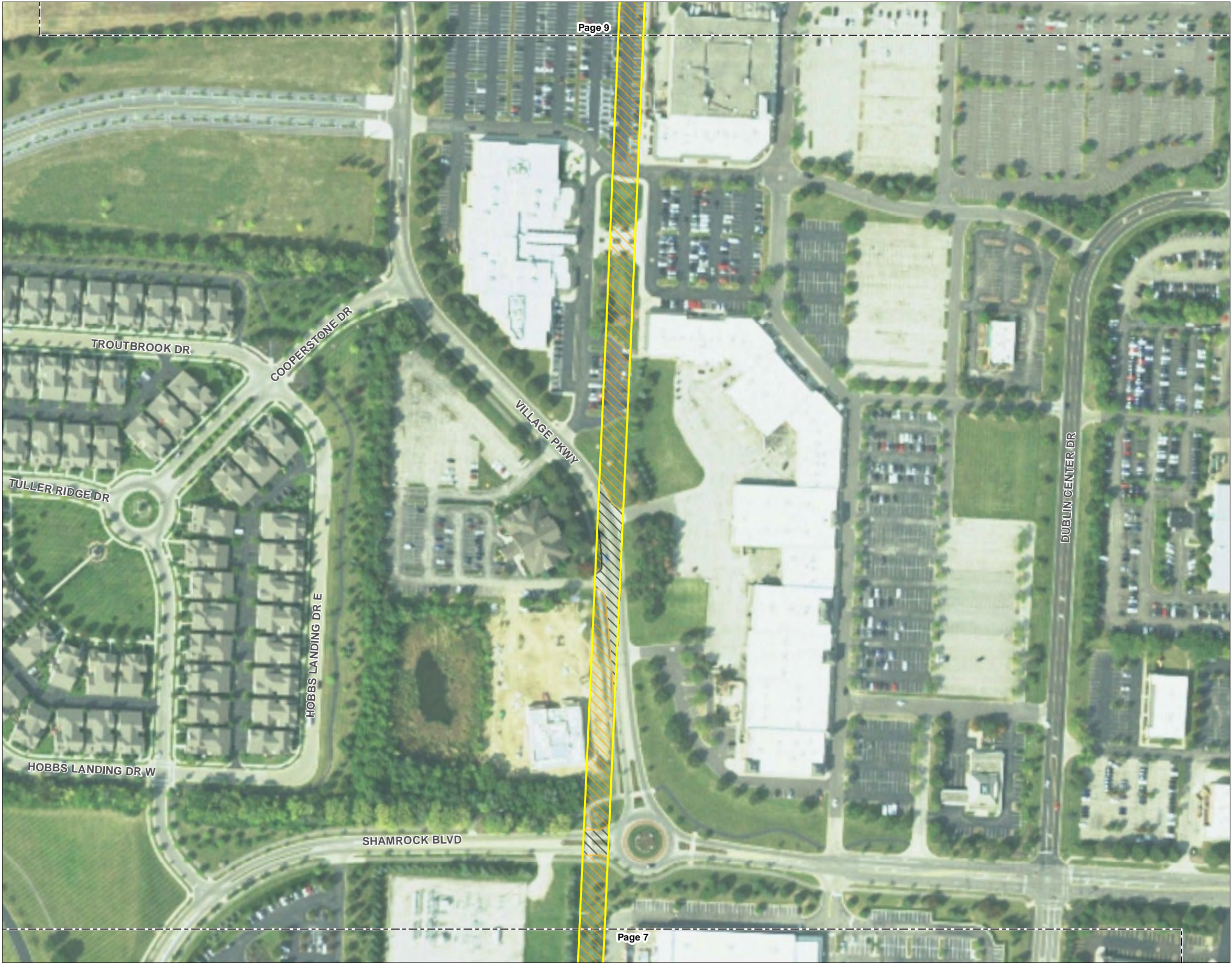
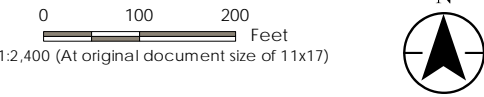


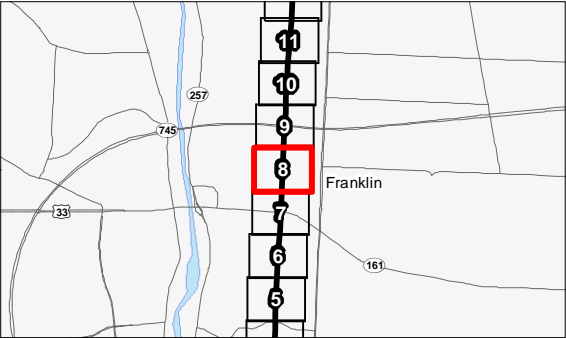
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	Existing 138 kV Transmission Line
	Project Area
	Photo Location
	Upland Drainage Feature
	Approximate Upland Drainage Feature
	Field Delineated Waterway
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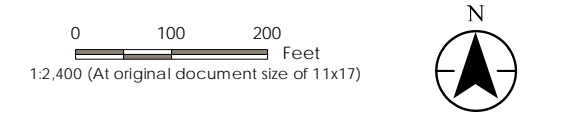
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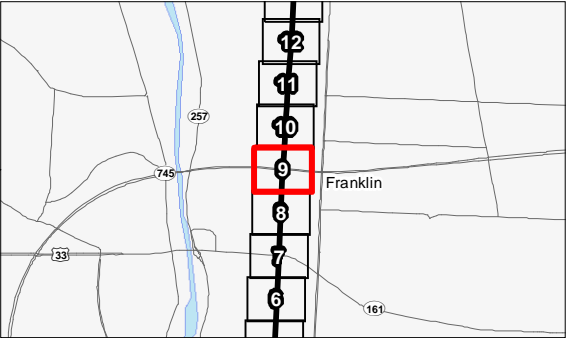


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Rebuild Project
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193706228
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	Existing 138 kV Transmission Line
	Project Area
	Photo Location
	Upland Drainage Feature
	Approximate Upland Drainage Feature
	Field Delineated Waterway
	Approximate Waterway
	Field Delineated Emergent Wetland
	Approximate Wetland
	Existing Stormwater Detention Basin
Habitat Area	
	Agricultural Field
	Early Successional Deciduous Forest
	Early Successional Riparian Forest
	Residential Lawn
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	New Field
	Old Field
	Planted Prairie
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	Commercial
	Industrial
	Paved Surface



Notes
1. Coordinate System: NAD 1983 StatePlane Ohio South FIPS 3402 Feet
2. Data Sources Include: Stantec, AEP, USGS, OGRIP, NADS
3. Orthophotography: 2017 NAIP



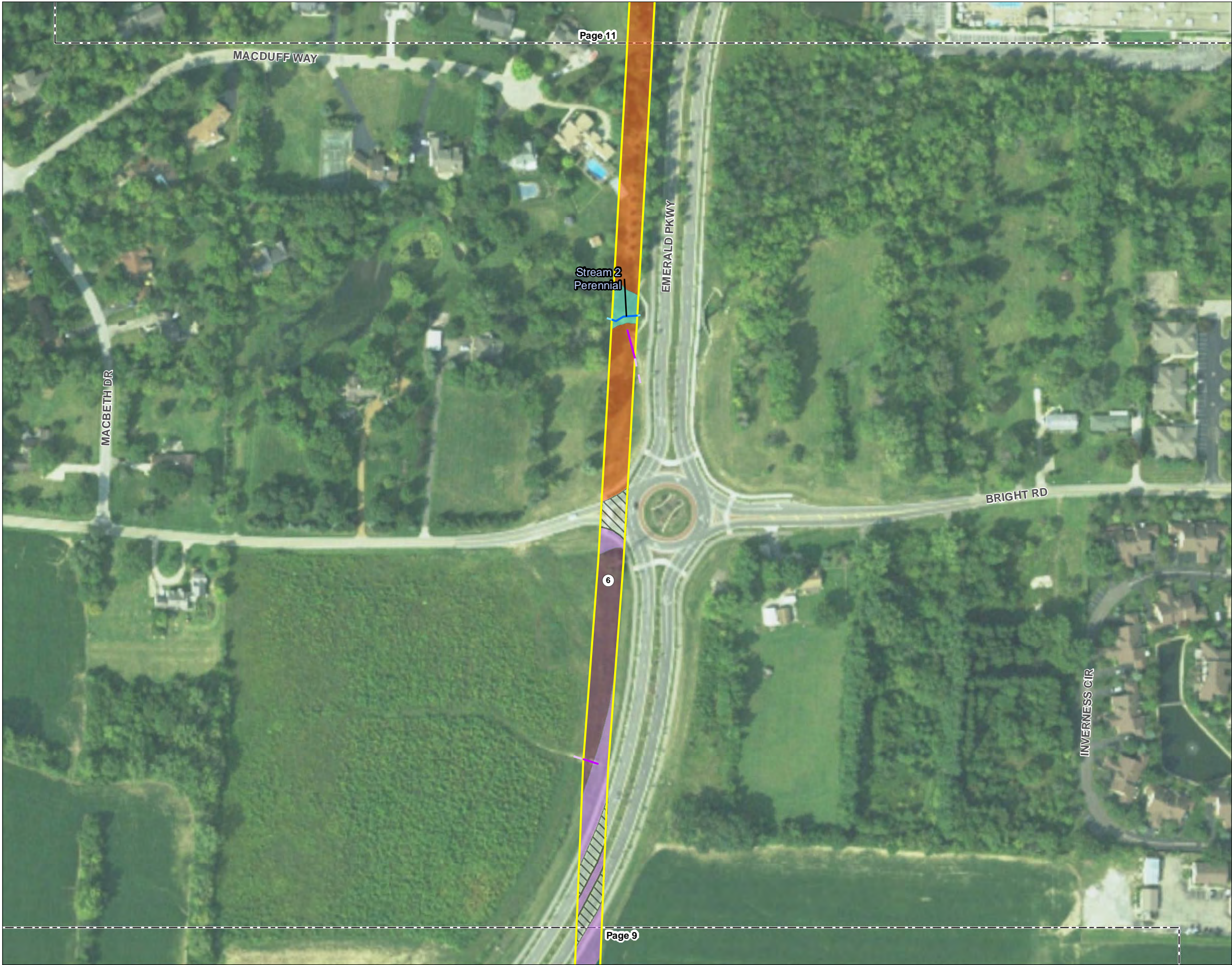
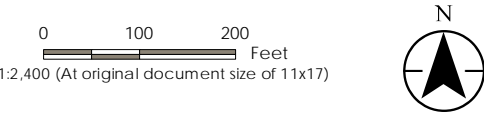


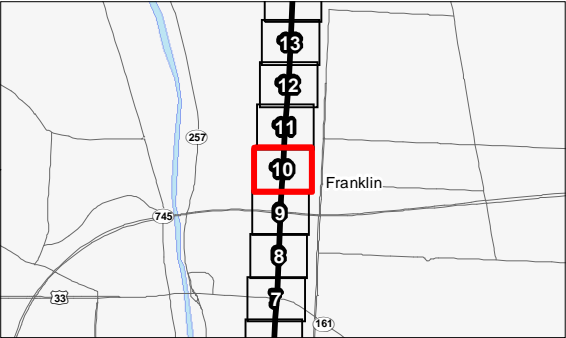
Figure No.
3
Title
Habitat Assessment Map

Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio
193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
Independent Review by DJG on 2018-10-16



Legend	
	AEP Substation
	Existing Structure to be Replaced
	Existing 138 kV Transmission Line
	Project Area
	Photo Location
	Upland Drainage Feature
	Approximate Upland Drainage Feature
	Field Delineated Waterway
	Approximate Waterway
	Field Delineated Emergent Wetland
	Approximate Wetland
	Existing Stormwater Detention Basin
Habitat Area	
	Agricultural Field
	Early Successional Deciduous Forest
	Early Successional Riparian Forest
	Residential Lawn
	Mixed Early Successional/Second Growth Deciduous Forest
	New Field
	Old Field
	Planted Prairie
	Maintained Lawn
	Commercial
	Industrial
	Paved Surface



Notes
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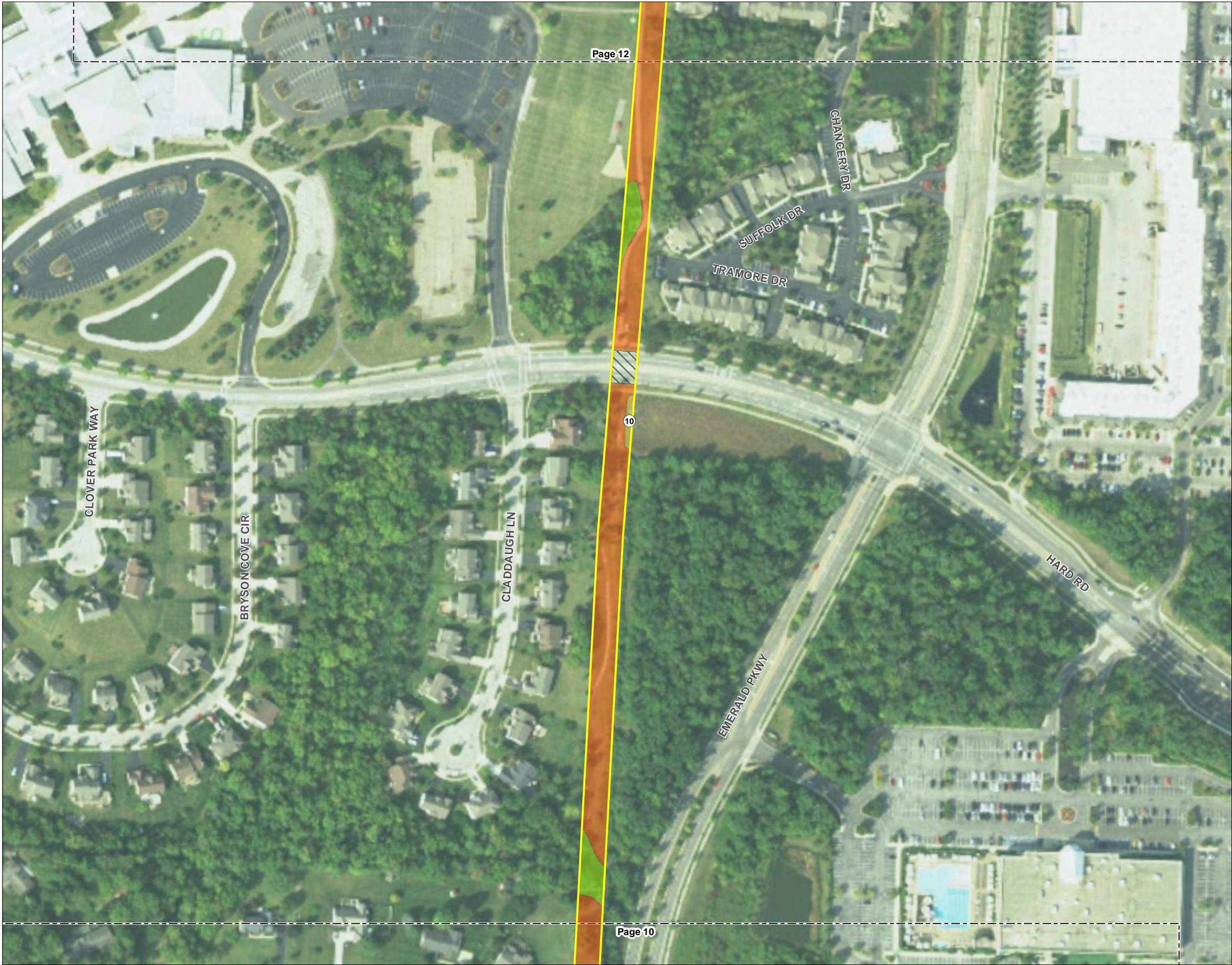
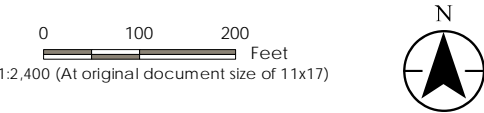


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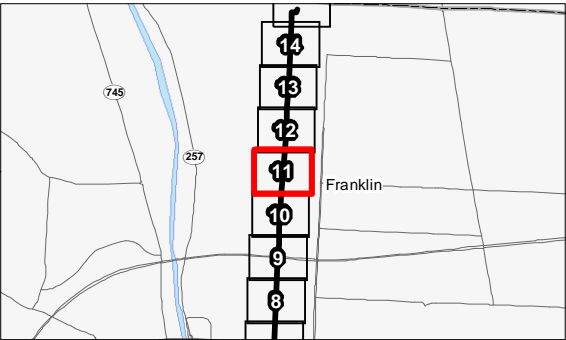
Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by J.L.H. on 2018-07-20
Technical Review by K.B. on 2018-07-26
Independent Review by D.J.G. on 2018-10-16



- Legend
- | | |
|---------------------------------------|---|
| ■ AEP Substation | Habitat Area |
| ● Existing Structure to be Replaced | ■ Agricultural Field |
| ~ Existing 138 kV Transmission Line | ■ Early Successional Deciduous Forest |
| □ Project Area | ■ Early Successional Riparian Forest |
| ○ Photo Location | ■ Residential Lawn |
| ~ Upland Drainage Feature | ■ Mixed Early Successional/Second Growth Deciduous Forest |
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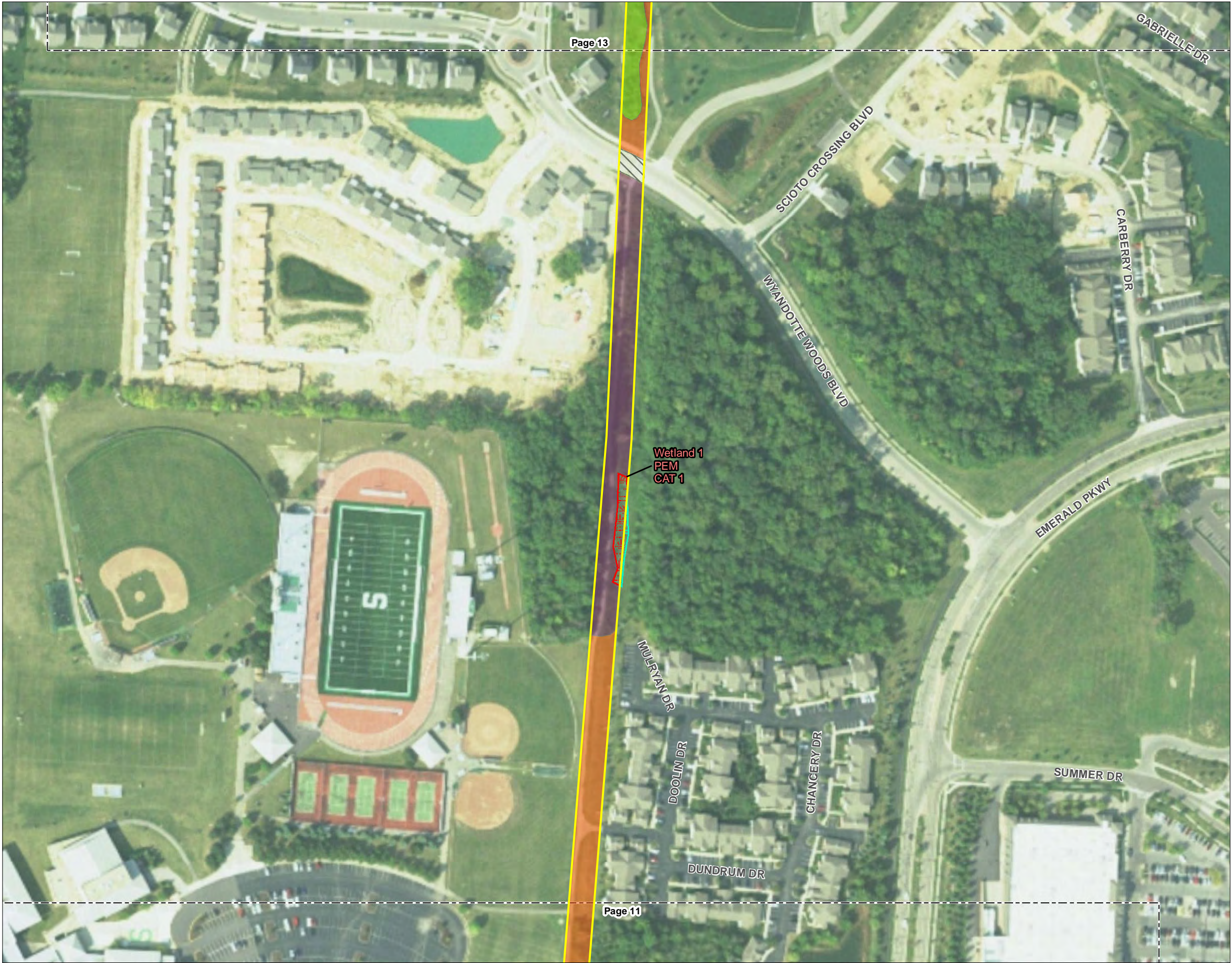
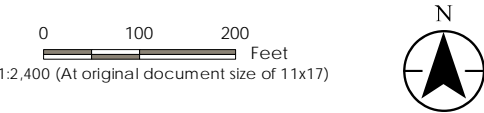


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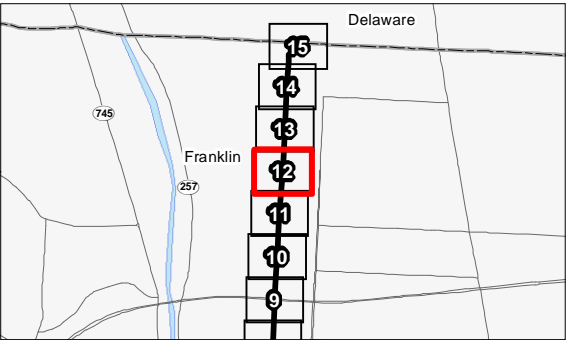
Client/Project
AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
Independent Review by DJG on 2018-10-16



- Legend
- | | |
|---------------------------------------|---|
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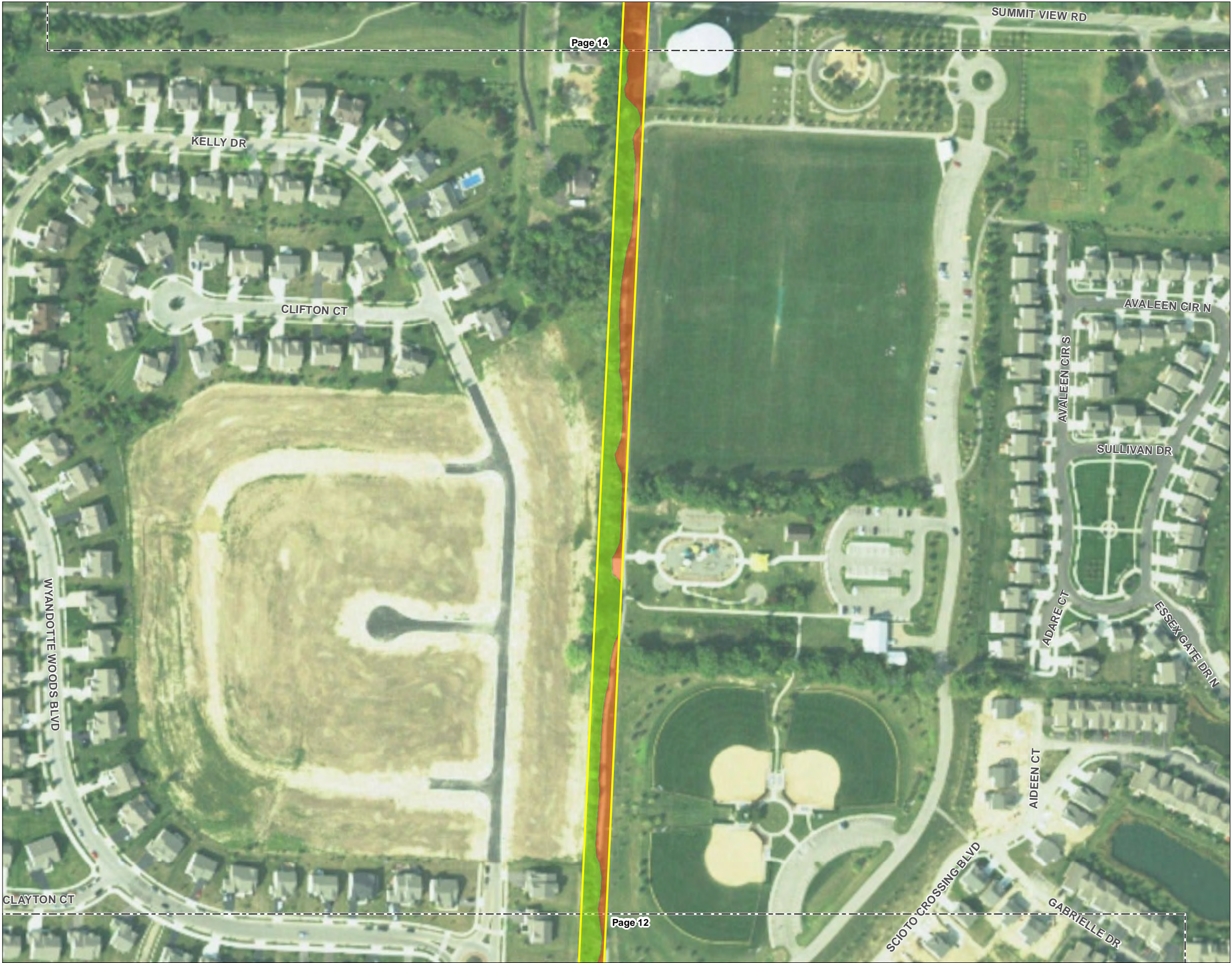
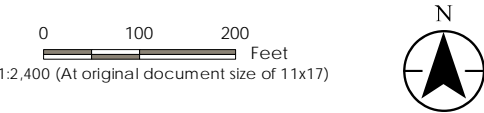


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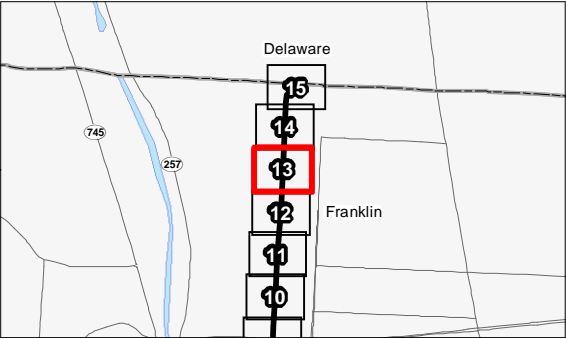
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Rebuild Project

Project Location
Franklin County, Ohio

193706228
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Technical Review by KB on 2018-07-26
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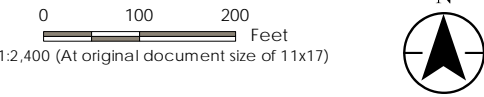




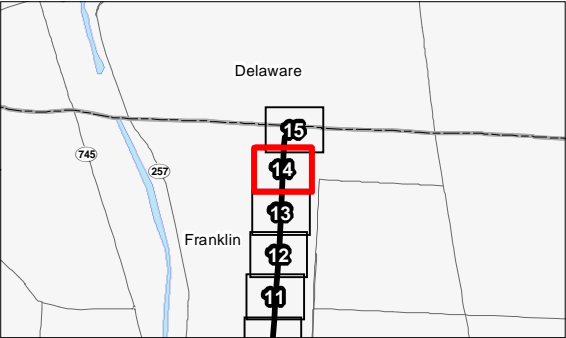
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AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio
193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
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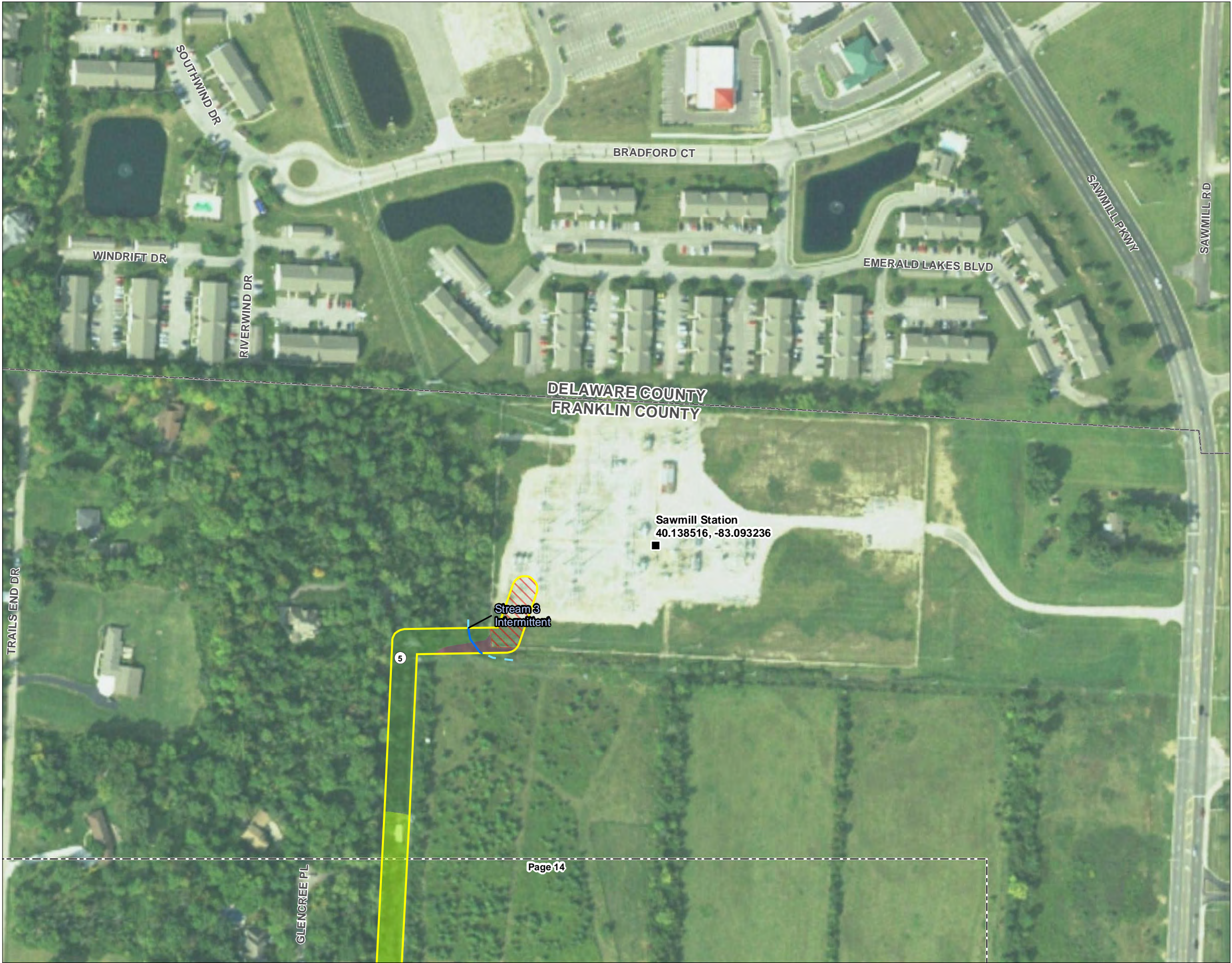


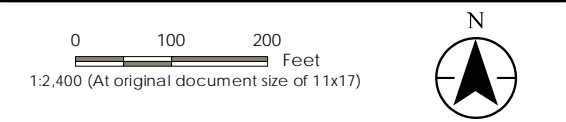
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Habitat Assessment Map

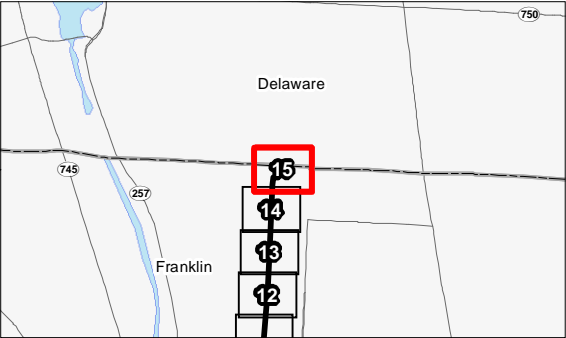
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AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line
Rebuild Project

Project Location
Franklin County, Ohio

193706228
Prepared by JH on 2018-07-20
Technical Review by KB on 2018-07-26
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3. Orthophotography: 2017 NAIP



Appendix B Agency Correspondence

From: susan_zimmermann@fws.gov on behalf of [Ohio, FW3](#)
To: [Teitt, Matthew](#)
Subject: AEP Bethel-Sawmill 138 kV Line Rebuild, Franklin County
Date: Tuesday, July 31, 2018 2:06:55 PM



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# 03E15000-2018-TA-1786

Dear Mr. Teitt,

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.

FEDERALLY LISTED, PROPOSED, AND CANDIDATE SPECIES COMMENTS: Due to the project, type, size, and location, we do not anticipate adverse effects to 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 U.S. Fish and Wildlife Service should be initiated to assess any potential impacts.

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.

Sincerely,

Scott Pruitt
Acting Field Office Supervisor



Ohio Department of Natural Resources

JOHN R. KASICH, GOVERNOR

JAMES ZEHRINGER, DIRECTOR

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

September 25, 2018

Matt Teitt
Stantec Consulting Services, Inc.
11687 Lebanon Road
Cincinnati, Ohio 45241-2012

Re: 18-900; AEP Bethel-Sawmill 138 kV Transmission Line Rebuild Project

Project: The proposed project involves the rebuilding approximately 5.5 miles of the existing Bethel- Sawmill 138 kV transmission line.

Location: The proposed project is in the Cities of Columbus, Dublin, and Powell, Franklin County, Ohio.

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

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

Spreading rock cress (*Arabis patens*), State endangered
Arbor vitae (*Thuja occidentalis*), State potentially threatened
Cave or cavern
Natural bridge or arch
Waterfall
Indian Run Falls Park – City of Dublin

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

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

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

The DOW recommends that impacts to 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 May 15 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 purple cat's paw (*Epioblasma o. obliquata*), a state endangered and federally endangered mussel, the clubshell (*Pleurobema clava*), a state endangered and federally endangered mussel, the northern riffleshell (*Epioblasma torulosa rangiana*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel species, the rabbitsfoot (*Quadrula cylindrica cylindrica*), a state endangered and federal candidate mussel, the snuffbox (*Epioblasma triquetra*), a state endangered and federal endangered mussel, the long solid (*Fusconaia maculata maculata*), a state endangered mussel, the Ohio pigtoe (*Pleurobema cordatum*), a state endangered mussel, the pocketbook (*Lampsilis ovata*), a state endangered mussel, the washboard (*Megaloniais nervosa*), a state endangered mussel, the elephant-ear (*Elliptio crassidens crassidens*), a state endangered mussel, the black sandshell (*Ligumia recta*), a state threatened mussel, the threehorn wartyback (*Obliquaria reflexa*), a state threatened mussel, the pondhorn (*Unio merus tetralasmus*), a state threatened mussel, and the fawnsfoot (*Truncilla donaciformis*), a state threatened mussel. Due to the location, and that there is no in-water work proposed in a perennial stream of sufficient size, this project is not likely to impact these species.

The project is within the range of the Scioto madtom (*Noturus trautmani*), a state endangered and federally endangered fish, the popeye shiner (*Notropis ariommus*), a state endangered fish, the northern brook lamprey (*Ichthyomyzon fossor*), a state endangered fish, the spotted darter (*Etheostoma maculatum*), a state endangered fish, the shortnose gar (*Lepisosteus platostomus*), a state endangered fish, the tonguetied minnow (*Exoglossum laurae*), a state threatened fish, the paddlefish (*Polyodon spathula*) a state threatened fish, and the Tippecanoe darter (*Etheostoma tippecanoe*), 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, 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.

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

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

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

Appendix C Representative Photographs

C.1 WETLAND AND WATERBODY PHOTOGRAPHS



Photo Location 1. View of Stream 1. Photograph taken facing upstream/east.



Photo Location 1. View of Stream 1. Photograph taken facing downstream/west.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 2. View of Stream 2. Photograph taken facing upstream/east.



Photo Location 2. View of Stream 2. Photograph taken facing downstream/west.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 3. View of Wetland 1. Photograph taken facing west.



Photo Location 3. View of Wetland 1. Photograph taken facing north.



Photo Location 3. View of Wetland 1. Photograph taken facing east.



Photo Location 3. View of Wetland 1. Photograph taken facing south.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 4. View of upland located at wetland sample point (SP 3). Photograph taken facing north.



Photo Location 5. View of Stream 3. Photograph taken facing upstream/north.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 5. View of Stream 3. Photograph taken facing downstream/southeast.



Photo Location 6. View of upland drainage feature within existing stormwater detention basin.
Photograph taken facing west.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 7. Representative view of an upland drainage feature. Photograph taken facing west.



Photo Location 7. Representative view of an upland drainage feature. Photograph taken facing east.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 8. Representative view of existing stormwater detention basin. Photograph taken facing south.



Photo Location 9. Representative view of existing stormwater detention basin. Photograph taken facing southwest.

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

C.2 HABITAT PHOTOGRAPHS

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 1. Representative view of maintained lawn habitat and industrial land (Bethel Station). Photograph taken facing south.



Photo Location 2. Representative view of early successional riparian forest habitat. Photograph taken facing north.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 3. Representative view of maintained lawn habitat. Photograph taken facing south.



Photo Location 4. Representative view of existing paved road. Photograph taken facing north.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio

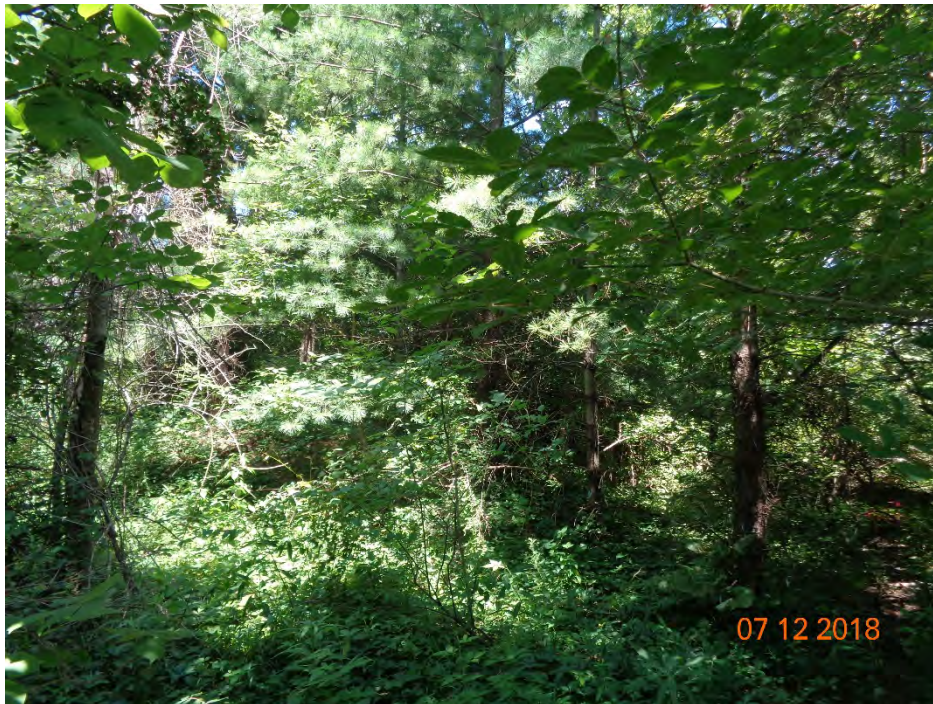


Photo Location 5. Representative view of mixed early successional/second growth deciduous forest habitat. Photograph taken facing east.



Photo Location 6. Representative view of maintained lawn habitat. Photograph taken facing northeast.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 7. Representative view of agricultural field habitat. Photograph taken facing south.



Photo Location 8. Representative view of early successional deciduous forest habitat and new field habitat. Photograph taken facing west.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 9. Representative view of old field habitat. Photograph taken facing northeast.



Photo Location 10. Representative view of prairie (planted) habitat. Photograph taken facing southeast.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 11. Representative view of maintained lawn habitat and industrial land (Bethel Station). Photograph taken facing south.



Photo Location 12. Representative view of industrial land (Bethel Station). Photograph taken facing west.

AEP Ohio Transmission Company, Inc.
Bethel-Sawmill 138 kV Transmission Line Rebuild Project
Franklin County, Ohio



Photo Location 13. Representative view of maintained lawn habitat and early successional deciduous forest habitat. Photograph taken facing northwest.



Photo Location 14. Representative view of maintained lawn habitat and industrial land (Bethel Station). Photograph taken facing east.

Appendix D Data Forms

D.1 WETLAND DETERMINATION DATA FORMS

Project/Site: Bethel-Sawmill 138 kV Transmission Line Rebuild Project		Stantec Project #: 193706228		Date: 07/12/18
Applicant: AEP Ohio Transmission Company, Inc.				County: Franklin
Investigator #1: Nate Noland		Investigator #2: Jody Nicholson		State: Ohio
Soil Unit: Blount silt loam, end moraine, 2 to 4 percent slopes	NWI/WWI Classification: NONE			Wetland ID: Wetland 1
Landform: Depression	Local Relief: Concave			Sample Point: SP 1
Slope (%): 0%	Latitude: 40.1241	Longitude: -83.095721	Datum: NAD83	Community ID: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				Section: --
Are Vegetation <input type="checkbox"/> , Soil <input checked="" type="checkbox"/> , or Hydrology <input checked="" type="checkbox"/> significantly disturbed?		Are normal circumstances present?		Township: --
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Range: -- Dir: --
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Remarks: PEM wetland within powerline ROW, potentially isolated				

HYDROLOGY

Wetland Hydrology Indicators (Check here if indicators are not present ☐):

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

Field Observations: Surface Water Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth: 0-1" (in.) Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Depth: -- (in.) Saturation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Depth: surface (in.)	Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
--	---

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

Remarks:

SOILS

Map Unit Name: **Blount silt loam, end moraine, 2 to 4 percent slopes**

Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)											
Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture (e.g. clay, sand, loam)	
			Color (Moist)		%	Color (Moist)		%	Type	Location	
0	1	--	10YR	2/1	100	--	--	--	--	--	muck
1	11	--	10YR	5/2	95	10YR	4/6	5	C	M	silt loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
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NRCS Hydric Soil Field Indicators (check here if indicators are not present <input type="checkbox"/>):		Indicators for Problematic Soils ¹
<input type="checkbox"/> A1- Histosol <input type="checkbox"/> A2 - Histic Epipedon <input type="checkbox"/> A3 - Black Histic <input type="checkbox"/> A4 - Hydrogen Sulfide <input type="checkbox"/> A5 - Stratified Layers <input checked="" type="checkbox"/> A10 - 2 cm Muck <input type="checkbox"/> A11 - Depleted Below Dark Surface <input type="checkbox"/> A12 - Thick Dark Surface <input type="checkbox"/> S1 - Sandy Muck Mineral <input type="checkbox"/> S3 - 5 cm Mucky Peat or Peat	<input type="checkbox"/> S4 - Sandy Gleyed Matrix <input type="checkbox"/> S5 - Sandy Redox <input type="checkbox"/> S6 - Stripped Matrix <input type="checkbox"/> F1 - Loamy Muck Mineral <input type="checkbox"/> F2 - Loamy Gleyed Matrix <input type="checkbox"/> F3 - Depleted Matrix <input type="checkbox"/> F6 - Redox Dark Surface <input type="checkbox"/> F7 - Depleted Dark Surface <input type="checkbox"/> F8 - Redox Depressions	<input type="checkbox"/> A16 - Coast Prairie Redox <input type="checkbox"/> S7 - Dark Surface <input type="checkbox"/> F12 - Iron-Manganese Masses <input type="checkbox"/> TF12 - Very Shallow Dark Surface <input type="checkbox"/> Other (Explain in Remarks)

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed)	Type: NA	Depth: NA	Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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Remarks:

Project/Site: Bethel-Sawmill 138 kV Transmission Line Rebuild Project

Wetland ID: Wetland 1

Sample Point: SP 1

VEGETATION (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 30 ft radius)				
	Species Name	% Cover	Dominant	Ind.Status
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		
Sapling/Shrub Stratum (Plot size: 15 ft radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
Total Cover =		0		
Herb Stratum (Plot size: 5 ft radius)				
1.	Leersia oryzoides	45	Y	OBL
2.	Scirpus atrovirens	20	Y	OBL
3.	Juncus effusus	5	N	OBL
4.	Eupatorium perfoliatum	15	N	OBL
5.	Dipsacus laciniatus	1	N	UPL
6.	Typha angustifolia	7	N	OBL
7.	Solidago gigantea	2	N	FACW
8.	Carex vulpinoidea	3	N	FACW
9.	Agrimonia parviflora	1	N	FACW
10.	Glyceria striata	1	N	OBL
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--
Total Cover =		100		
Woody Vine Stratum (Plot size: 30 ft radius)				
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
Total Cover =		0		

Remarks:

Additional Remarks:

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet

Total % Cover of: Multiply by:

OBL spp. 93 x 1 = 93

FACW spp. 6 x 2 = 12

FAC spp. 0 x 3 = 0

FACU spp. 0 x 4 = 0

UPL spp. 1 x 5 = 5

Total 100 (A) 110 (B)

Prevalence Index = B/A = 1.100

Hydrophytic Vegetation Indicators:

- ☐ Yes ☐ No Rapid Test for Hydrophytic Vegetation
- ☒ Yes ☐ No Dominance Test is > 50%
- ☒ Yes ☐ No Prevalence Index is ≤ 3.0 *
- ☐ Yes ☐ No Morphological Adaptations (Explain) *
- ☐ Yes ☐ No Problem Hydrophytic Vegetation (Explain) *

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.

Woody Vines - All woody vines greater than 3.28 ft. in height.

Hydrophytic Vegetation Present ☒ Yes ☐ No

Project/Site: Bethel-Sawmill 138 kV Transmission Line Rebuild Project		Stantec Project #: 193706228		Date: 07/12/18
Applicant: AEP Ohio Transmission Company, Inc.				County: Franklin
Investigator #1: Nate Noland		Investigator #2: Jody Nicholson		State: Ohio
Soil Unit: Blount silt loam, end moraine, 2 to 4 percent slopes	NW1/WW1 Classification: NONE			Wetland ID: Wetland 1
Landform: Side slope	Local Relief: Convex			Sample Point: SP 2
Slope (%): 2%	Latitude: 40.12399	Longitude: -83.095785	Datum: NAD83	Community ID: Upland
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks)				Section: --
Are Vegetation <input type="checkbox"/> , Soil <input checked="" type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present?		Township: --
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Range: -- Dir: --

SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Hydric Soils Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Wetland Hydrology Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is This Sampling Point Within A Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Remarks: Bike Path				

HYDROLOGY		
Wetland Hydrology Indicators (Check here if indicators are not present <input checked="" type="checkbox"/>):		
<u>Primary:</u>		<u>Secondary:</u>
<input type="checkbox"/> A1 - Surface Water	<input type="checkbox"/> B9 - Water-Stained Leaves	<input type="checkbox"/> B6 - Surface Soil Cracks
<input type="checkbox"/> A2 - High Water Table	<input type="checkbox"/> B13 - Aquatic Fauna	<input type="checkbox"/> B10 - Drainage Patterns
<input type="checkbox"/> A3 - Saturation	<input type="checkbox"/> B14 - True Aquatic Plants	<input type="checkbox"/> C2 - Dry-Season Water Table
<input type="checkbox"/> B1 - Water Marks	<input type="checkbox"/> C1 - Hydrogen Sulfide Odor	<input type="checkbox"/> C8 - Crayfish Burrows
<input type="checkbox"/> B2 - Sediment Deposits	<input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots	<input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery
<input type="checkbox"/> B3 - Drift Deposits	<input type="checkbox"/> C4 - Presence of Reduced Iron	<input type="checkbox"/> D1 - Stunted or Stressed Plants
<input type="checkbox"/> B4 - Algal Mat or Crust	<input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils	<input type="checkbox"/> D2 - Geomorphic Position
<input type="checkbox"/> B5 - Iron Deposits	<input type="checkbox"/> C7 - Thin Muck Surface	<input type="checkbox"/> D5 - FAC-Neutral Test
<input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery	<input type="checkbox"/> D9 - Gauge or Well Data	
<input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:	
Surface Water Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Water Table Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Saturation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Depth: -- (in.)	
Depth: -- (in.)	
Depth: -- (in.)	

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

SOILS											
Map Unit Name: Blount silt loam, end moraine, 2 to 4 percent slopes											
Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)											
Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Texture	
			Color (Moist)		%	Color (Moist)		%	Type	Location	(e.g. clay, sand, loam)
0	12	--	10YR	4/4	100	--	--	--	--	--	silt loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present <input checked="" type="checkbox"/>):			Indicators for Problematic Soils ¹		
<input type="checkbox"/> A1- Histosol	<input type="checkbox"/> S4 - Sandy Gleyed Matrix	<input type="checkbox"/> A16 - Coast Prairie Redox			
<input type="checkbox"/> A2 - Histic Epipedon	<input type="checkbox"/> S5 - Sandy Redox	<input type="checkbox"/> S7 - Dark Surface			
<input type="checkbox"/> A3 - Black Histic	<input type="checkbox"/> S6 - Stripped Matrix	<input type="checkbox"/> F12 - Iron-Manganese Masses			
<input type="checkbox"/> A4 - Hydrogen Sulfide	<input type="checkbox"/> F1 - Loamy Muck Mineral	<input type="checkbox"/> TF12 - Very Shallow Dark Surface			
<input type="checkbox"/> A5 - Stratified Layers	<input type="checkbox"/> F2 - Loamy Gleyed Matrix	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> A10 - 2 cm Muck	<input type="checkbox"/> F3 - Depleted Matrix				
<input type="checkbox"/> A11 - Depleted Below Dark Surface	<input type="checkbox"/> F6 - Redox Dark Surface				
<input type="checkbox"/> A12 - Thick Dark Surface	<input type="checkbox"/> F7 - Depleted Dark Surface				
<input type="checkbox"/> S1 - Sandy Muck Mineral	<input type="checkbox"/> F8 - Redox Depressions				
<input type="checkbox"/> S3 - 5 cm Mucky Peat or Peat					

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed)	Type: NA	Depth: NA	Hydric Soil Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Remarks:			

Project/Site: **Bethel-Sawmill 138 kV Transmission Line Rebuild Project**Wetland ID: **Wetland 1**Sample Point: **SP 2****VEGETATION** (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 30 ft radius)

	<u>Species Name</u>	<u>% Cover</u>	<u>Dominant</u>	<u>Ind.Status</u>
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--

Total Cover = **0**

Sapling/Shrub Stratum (Plot size: 15 ft radius)

1.	<i>Pyrus calleryana</i>	20	Y	UPL
2.	<i>Fraxinus pennsylvanica</i>	15	Y	FACW
3.	<i>Lonicera maackii</i>	10	N	UPL
4.	<i>Rubus allegheniensis</i>	10	N	FACU
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--

Total Cover = **55**

Herb Stratum (Plot size: 5 ft radius)

1.	<i>Solidago altissima</i>	10	N	FACU
2.	<i>Schedonorus arundinaceus</i>	60	Y	FACU
3.	<i>Cichorium intybus</i>	5	N	FACU
4.	<i>Plantago major</i>	2	N	FAC
5.	<i>Cirsium arvense</i>	5	N	FACU
6.	<i>Trifolium repens</i>	5	N	FACU
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--

Total Cover = **87**

Woody Vine Stratum (Plot size: 30 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--

Total Cover = **0**

Remarks:

Dominance Test WorksheetNumber of Dominant Species that are OBL, FACW, or FAC: **1** (A)Total Number of Dominant Species Across All Strata: **3** (B)Percent of Dominant Species That Are OBL, FACW, or FAC: **33%** (A/B)**Prevalence Index Worksheet**

Total % Cover of:

Multiply by:

OBL spp.	0	x 1 =	0
FACW spp.	15	x 2 =	30
FAC spp.	2	x 3 =	6
FACU spp.	95	x 4 =	380
UPL spp.	30	x 5 =	150

Total **142** (A) **566** (B)Prevalence Index = B/A = **3.986****Hydrophytic Vegetation Indicators:**

- | | | |
|------------------------------|--|--|
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Rapid Test for Hydrophytic Vegetation |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Dominance Test is > 50% |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Prevalence Index is ≤ 3.0 * |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Morphological Adaptations (Explain) * |
| <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | Problem Hydrophytic Vegetation (Explain) * |

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:**Tree** - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.**Sapling/Shrub** - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.**Woody Vines** - All woody vines greater than 3.28 ft. in height.**Hydrophytic Vegetation Present** ☐ Yes ☒ No

Project/Site: Bethel-Sawmill 138 kV Transmission Line Rebuild Project		Stantec Project #: 193706228		Date: 07/12/18
Applicant: AEP Ohio Transmission Company, Inc.				County: Franklin
Investigator #1: Nate Noland		Investigator #2: Jody Nicholson		State: Ohio
Soil Unit: Blount silt loam, end moraine, 2 to 4 percent slopes	NW1/WW1 Classification: NONE			Wetland ID: NA
Landform: Flat	Local Relief: Linear			Sample Point: SP 3
Slope (%): 0%	Latitude: 40.13587	Longitude: -83.095044	Datum: NAD83	Community ID: Upland
Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in remarks)				Section: --
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed?		Are normal circumstances present?		Township: --
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Range: -- Dir: --

SUMMARY OF FINDINGS			
Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Is This Sampling Point Within A Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Remarks:			

HYDROLOGY		
Wetland Hydrology Indicators (Check here if indicators are not present <input checked="" type="checkbox"/>):		
Primary:		Secondary:
<input type="checkbox"/> A1 - Surface Water	<input type="checkbox"/> B9 - Water-Stained Leaves	<input type="checkbox"/> B6 - Surface Soil Cracks
<input type="checkbox"/> A2 - High Water Table	<input type="checkbox"/> B13 - Aquatic Fauna	<input type="checkbox"/> B10 - Drainage Patterns
<input type="checkbox"/> A3 - Saturation	<input type="checkbox"/> B14 - True Aquatic Plants	<input type="checkbox"/> C2 - Dry-Season Water Table
<input type="checkbox"/> B1 - Water Marks	<input type="checkbox"/> C1 - Hydrogen Sulfide Odor	<input type="checkbox"/> C8 - Crayfish Burrows
<input type="checkbox"/> B2 - Sediment Deposits	<input type="checkbox"/> C3 - Oxidized Rhizospheres on Living Roots	<input type="checkbox"/> C9 - Saturation Visible on Aerial Imagery
<input type="checkbox"/> B3 - Drift Deposits	<input type="checkbox"/> C4 - Presence of Reduced Iron	<input type="checkbox"/> D1 - Stunted or Stressed Plants
<input type="checkbox"/> B4 - Algal Mat or Crust	<input type="checkbox"/> C6 - Recent Iron Reduction in Tilled Soils	<input type="checkbox"/> D2 - Geomorphic Position
<input type="checkbox"/> B5 - Iron Deposits	<input type="checkbox"/> C7 - Thin Muck Surface	<input type="checkbox"/> D5 - FAC-Neutral Test
<input type="checkbox"/> B7 - Inundation Visible on Aerial Imagery	<input type="checkbox"/> D9 - Gauge or Well Data	
<input type="checkbox"/> B8 - Sparsely Vegetated Concave Surface	<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:				Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Surface Water Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: -- (in.)			
Water Table Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: -- (in.)			
Saturation Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Depth: -- (in.)			
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: N/A					
Remarks:					

SOILS											
Map Unit Name: Blount silt loam, end moraine, 2 to 4 percent slopes											
Profile Description (Describe to the depth needed to document the indicator or confirm the absence of indicators.) (Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered/Coated Sand Grains; Location: PL=Pore Lining, M=Matrix)											
Top Depth	Bottom Depth	Horizon	Matrix			Redox Features				Location	Texture (e.g. clay, sand, loam)
			Color (Moist)		%	Color (Moist)		%	Type		
0	4	--	10YR	3/2	100	--	--	--	--	--	silt loam
4	16	--	10YR	4/1	95	10YR	4/6	5	C	M	silt loam
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--	--	--	--

NRCS Hydric Soil Field Indicators (check here if indicators are not present <input type="checkbox"/>):			Indicators for Problematic Soils ¹		
<input type="checkbox"/> A1- Histosol	<input type="checkbox"/> S4 - Sandy Gleyed Matrix	<input type="checkbox"/> A16 - Coast Prairie Redox			
<input type="checkbox"/> A2 - Histic Epipedon	<input type="checkbox"/> S5 - Sandy Redox	<input type="checkbox"/> S7 - Dark Surface			
<input type="checkbox"/> A3 - Black Histic	<input type="checkbox"/> S6 - Stripped Matrix	<input type="checkbox"/> F12 - Iron-Manganese Masses			
<input type="checkbox"/> A4 - Hydrogen Sulfide	<input type="checkbox"/> F1 - Loamy Muck Mineral	<input type="checkbox"/> TF12 - Very Shallow Dark Surface			
<input type="checkbox"/> A5 - Stratified Layers	<input type="checkbox"/> F2 - Loamy Gleyed Matrix	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> A10 - 2 cm Muck	<input checked="" type="checkbox"/> F3 - Depleted Matrix				
<input type="checkbox"/> A11 - Depleted Below Dark Surface	<input type="checkbox"/> F6 - Redox Dark Surface				
<input type="checkbox"/> A12 - Thick Dark Surface	<input type="checkbox"/> F7 - Depleted Dark Surface				
<input type="checkbox"/> S1 - Sandy Muck Mineral	<input type="checkbox"/> F8 - Redox Depressions				
<input type="checkbox"/> S3 - 5 cm Mucky Peat or Peat					

¹ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (If Observed)	Type: NA	Depth: NA	Hydric Soil Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Remarks:			

Project/Site: **Bethel-Sawmill 138 kV Transmission Line Rebuild Project**Wetland ID: **NA**Sample Point: **SP 3****VEGETATION** (Species identified in all uppercase are non-native species.)

Tree Stratum (Plot size: 30 ft radius)

	<u>Species Name</u>	<u>% Cover</u>	<u>Dominant</u>	<u>Ind. Status</u>
1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--

Total Cover = **0**

Sapling/Shrub Stratum (Plot size: 15 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--

Total Cover = **0**

Herb Stratum (Plot size: 5 ft radius)

1.	<i>Phalaris arundinacea</i>	100	Y	FACW
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--
6.	--	--	--	--
7.	--	--	--	--
8.	--	--	--	--
9.	--	--	--	--
10.	--	--	--	--
11.	--	--	--	--
12.	--	--	--	--
13.	--	--	--	--
14.	--	--	--	--
15.	--	--	--	--

Total Cover = **100**

Woody Vine Stratum (Plot size: 30 ft radius)

1.	--	--	--	--
2.	--	--	--	--
3.	--	--	--	--
4.	--	--	--	--
5.	--	--	--	--

Total Cover = **0**

Remarks:

Dominance Test WorksheetNumber of Dominant Species that are OBL, FACW, or FAC: **1** (A)Total Number of Dominant Species Across All Strata: **1** (B)Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)**Prevalence Index Worksheet**

Total % Cover of:

Multiply by:

OBL spp.	0	x 1 =	0
FACW spp.	100	x 2 =	200
FAC spp.	0	x 3 =	0
FACU spp.	0	x 4 =	0
UPL spp.	0	x 5 =	0

Total **100** (A) **200** (B)Prevalence Index = B/A = **2.000****Hydrophytic Vegetation Indicators:**

- | | | |
|---|-----------------------------|--|
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Rapid Test for Hydrophytic Vegetation |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Dominance Test is > 50% |
| <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Prevalence Index is ≤ 3.0 * |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Morphological Adaptations (Explain) * |
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | Problem Hydrophytic Vegetation (Explain) * |

* Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:**Tree** - Woody plants 3 in. (7.6cm) or more in diameter at breast height (DBH), regardless of height.**Sapling/Shrub** - Woody plants less than 3 in. DBH and greater than 3.28 ft. tall.**Herb** - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft. tall.**Woody Vines** - All woody vines greater than 3.28 ft. in height.**Hydrophytic Vegetation Present** ☒ Yes ☐ No

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

D.2 ORAM DATA FORMS

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

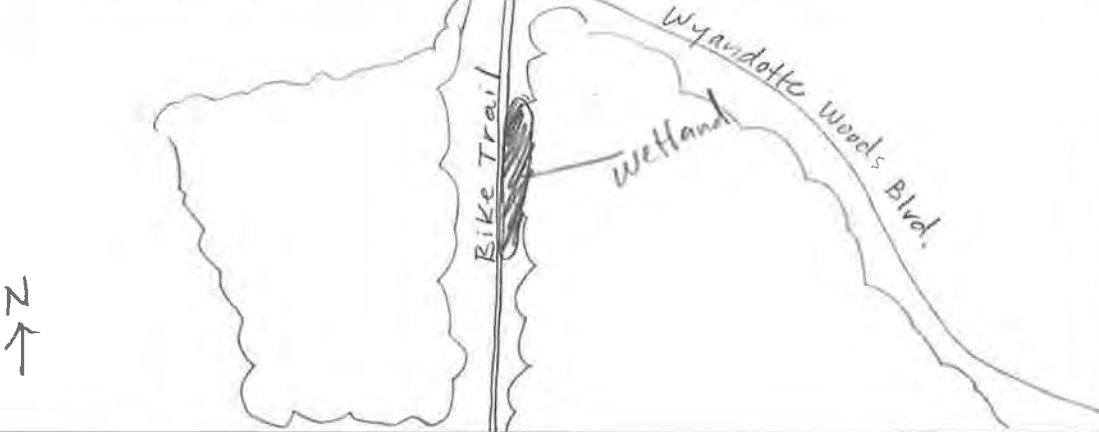
The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name:	Nathan Noland		
Date:	7/12/2018		
Affiliation:	Stantec Consulting		
Address:	11687 Lebanon Rd, Cincinnati, OH 45241		
Phone Number:	513-842-8200		
e-mail address:	nathan.noland@stantec.com		
Name of Wetland:	Wetland 1		
Vegetation Community(ies):	DEM		
HGM Class(es):	depressional		
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.			
Lat/Long or UTM Coordinate	40.123964°N, -83.095738°W		
USGS Quad Name	Northwest Columbus		
County	Franklin		
Township	N/A		
Section and Subsection	N/A		
Hydrologic Unit Code	050600011204		
Site Visit	7/12/2018		
National Wetland Inventory Map	N/A		
Ohio Wetland Inventory Map	N/A		
Soil Survey	Blount silt loam, end moraine, 2-4% slopes		
Delineation report/map	See Ecological Resources Inventory Report		

Name of Wetland: <u>Wetland 1</u>	
Wetland Size (acres, hectares): <u>~0.08 acres</u>	
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc.	
Comments, Narrative Discussion, Justification of Category Changes:	
Final score : <u>24</u>	Category: <u> </u>

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	✓	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	✓	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	✓	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	✓	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		✓
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	✓	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

Wetland 1

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral pH (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the graminaceous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinatum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: <u>Wetland 1</u>	Rater(s): <u>N. Neland</u>	Date: <u>7/12/18</u>
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23

subtotal first page

0

23

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 Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

1

24

max 20 pts.

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 to 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/tussocks
- ☒ 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 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 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 vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, 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
high	A predominance of native species, with nonnative spp 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

24

End of Quantitative Rating. Complete Categorization Worksheets.

Site: <u>Wetland 1</u>	Rater(s): <u>N. Noland</u>	Date: <u>7/12/2014</u>
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0	0
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

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)

9	9
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

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), shrub land, 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)

7	16
max 30 pts.	subtotal

Metric 3. Hydrology.

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 only one and assign score.

- ☐ >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

- ☐ ditch
- ☐ tile
- ☐ dike
- ☐ weir
- ☐ stormwater input

- ☐ point source (nonstormwater)
- ☒ filling/grading
- ☒ road bed/RR track
- ☐ dredging
- ☐ other bike trail

7	23
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

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

- ☐ mowing
- ☐ grazing
- ☐ clearcutting
- ☐ selective cutting
- ☐ woody debris removal
- ☒ toxic pollutants

- ☐ shrub/sapling removal
- ☐ herbaceous/aquatic bed removal
- ☐ sedimentation
- ☐ dredging
- ☐ farming
- ☐ nutrient enrichment

23
subtotal this page

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 4. Significant bird habitat	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 1.
	Question 6. Bogs	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 7. Fens	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8a. Old Growth Forest	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.
Question 10. Oak Openings	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, Category 3	
Question 11. Relict Wet Prairies	YES <input type="radio"/> NO <input checked="" type="radio"/>	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	0	
	Metric 2. Buffers and surrounding land use	9	
	Metric 3. Hydrology	7	
	Metric 4. Habitat	7	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	1	
	TOTAL SCORE	24	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc. and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category

Choose one	Category 1	Category 2	Category 3
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End of Ohio Rapid Assessment Method for Wetlands.

ECOLOGICAL RESOURCES INVENTORY REPORT, BETHEL-SAWMILL 138 KV TRANSMISSION
LINE REBUILD PROJECT, FRANKLIN COUNTY, OHIO

D.3 HHEI AND QHEI DATA FORMS



Primary Headwater Habitat Evaluation Form

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

70

SITE NAME/LOCATION Beckel-Sawyer Mill 158 KV Transmission Line Rebuild Project
Franklin Co/Ohio SITE NUMBER Stream 1 RIVER BASIN Scioto River DRAINAGE AREA (mi²) 0.68
LENGTH OF STREAM REACH (ft) ~166 LAT. 40.07307°N LONG. -83.0907°W RIVER CODE RIVER MILE
DATE 7/11/18 SCORER N. Roland COMMENTS

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

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

MODIFICATIONS: Channelized, Rip Rap boulders in stream

1. SUBSTRATE (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>15</u>
<input type="checkbox"/> BEDROCK [16 pt]	
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>20</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>30</u>
<input checked="" type="checkbox"/> SAND (<2 mm) [8 pts]	<u>30</u>

TYPE	PERCENT
<input type="checkbox"/> SILT [3 pt]	
<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	
<input type="checkbox"/> FINE DETRITUS [3 pts]	
<input type="checkbox"/> CLAY or HARDPAN [0 pt]	
<input type="checkbox"/> MUCK [0 pts]	
<input type="checkbox"/> ARTIFICIAL [3 pts]	<u>5</u>

Total of Percentages of
Bltr Slabs, Boulder, Cobble, Bedrock 35

(A) 15

(B) 5

HHEI
Metric
Points

Substrate
Max = 40

20

A + B

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

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

☐ > 30 centimeters [20 pts]
☒ > 22.5 - 30 cm [30 pts]
☐ > 10 - 22.5 cm [25 pts]

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

Pool Depth
Max = 30

30

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

25

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

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

☐ > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts]
☐ ≤ 1.0 m (≤ 3' 3") [5 pts]

Bankfull
Width
Max=30

20

COMMENTS TOR = 12' OHWM = 8'
Depth = 2.5' Depth = 0.8

AVERAGE BANKFULL WIDTH (meters)

2.7

This information must also be completed

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

RIPARIAN WIDTH

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

FLOODPLAIN QUALITY

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

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

COMMENTS

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

☒ Stream Flowing
☐ Subsurface flow with isolated pools (Interstitial)

☐ Moist Channel, isolated pools, no flow (Intermittent)
☐ Dry channel, no water (Ephemeral)

COMMENTS Perennial

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

☒ None
☐ 0.5

☐ 1.0
☐ 1.5

☐ 2.0
☐ 2.5

☐ 3.0
☐ >3

STREAM GRADIENT ESTIMATE

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

Stream 1

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

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

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Scioto River Distance from Evaluated Stream ~0.5 mi
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

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

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

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 7/5/2018 Quantity: 0.66 in

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 65%

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

Field Measures: Temp (°C) 20.3° Dissolved Oxygen (mg/l) — pH (S.U.) 8.2 Conductivity (µmhos/cm) _____

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

Additional comments/description of pollution impacts: Algal growth

BIOTIC EVALUATION

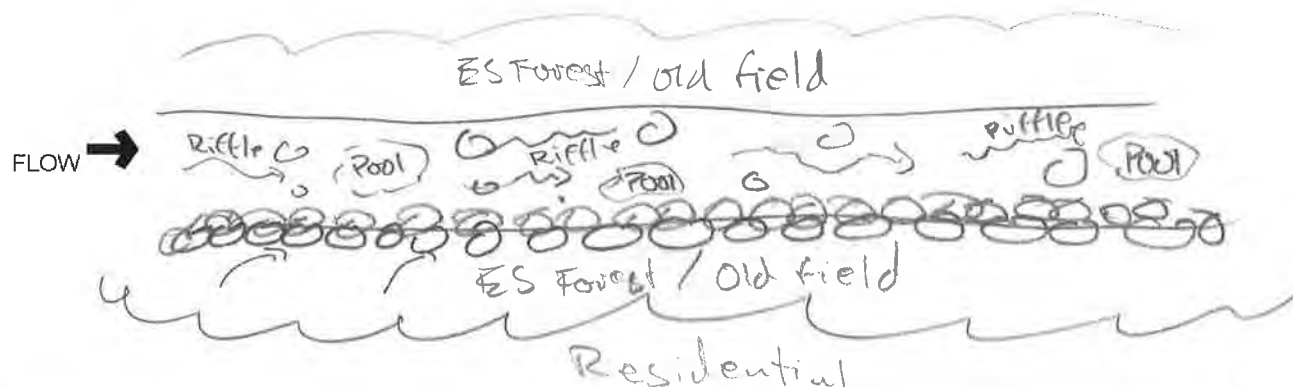
Performed? (Y/N): Y (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

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

Comments Regarding Biology: Pill bugs, Flat worms

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





Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI Score: **49**

Stream & Location: Stream 2 Bethel - Sawmill 138KV RM: Date: 7/12/08
Line Rebuild Franklin Co. OH Scorers Full Name & Affiliation: N. Noland Stantec
River Code: STORET #: Lat./ Long.: 40.11273°N 183.0967°W Office verified location ☐

1] **SUBSTRATE** Check **ONLY** Two substrate TYPE BOXES; estimate % or note every type present

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate <div>16 Maximum 20</div>
<input type="checkbox"/> BLDR / SLABS [10]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/>	<input type="checkbox"/> HEAVY [-2]	<input type="checkbox"/>	
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/>	<input type="checkbox"/> MODERATE [-1]	<input type="checkbox"/>	
<input checked="" type="checkbox"/> COBBLE [8]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/>	<input checked="" type="checkbox"/> NORMAL [0]	<input type="checkbox"/>	
<input checked="" type="checkbox"/> GRAVEL [7]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> SILT [2]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/>	<input type="checkbox"/> FREE [1]	<input type="checkbox"/>	
<input type="checkbox"/> SAND [6]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> ARTIFICIAL [0]	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/>	<input type="checkbox"/> EXTENSIVE [-2]	<input type="checkbox"/>	
<input type="checkbox"/> BEDROCK [5]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/> RIP/RAP [0]	<input type="checkbox"/>	<input checked="" type="checkbox"/> MODERATE [-1]	<input type="checkbox"/>	
								<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/>	<input checked="" type="checkbox"/> NORMAL [0]	<input type="checkbox"/>	
								<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/>	<input type="checkbox"/> NONE [1]	<input type="checkbox"/>	
								<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments

2] **INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

		AMOUNT	
<input checked="" type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/>	<input checked="" type="checkbox"/> EXTENSIVE >75% [11]	<input type="checkbox"/>
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/>	<input checked="" type="checkbox"/> MODERATE 25-75% [7]	<input type="checkbox"/>
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/>	<input checked="" type="checkbox"/> SPARSE 5-<25% [3]	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> NEARLY ABSENT <5% [1]	<input type="checkbox"/>

Comments

Cover
Maximum 20
9

3] **CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

SINUOSITY	DEVELOPMENT	CHANNELIZATION	STABILITY
<input type="checkbox"/> HIGH [4]	<input type="checkbox"/> EXCELLENT [7]	<input type="checkbox"/> NONE [6]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input checked="" type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments

Channel
Maximum 20
9.5

4] **BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for **EACH BANK** (Or 2 per bank & average)

River right looking downstream		RIPARIAN WIDTH		FLOOD PLAIN QUALITY			
<input checked="" type="checkbox"/> EROSION	<input type="checkbox"/>	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/>	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/>	<input type="checkbox"/> CONSERVATION TILLAGE [1]	<input type="checkbox"/>
<input checked="" type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/>	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/>	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/>	<input type="checkbox"/> URBAN OR INDUSTRIAL [0]	<input type="checkbox"/>
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/>	<input checked="" type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/>	<input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/>	<input type="checkbox"/> MINING / CONSTRUCTION [0]	<input type="checkbox"/>
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/>	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/>	<input type="checkbox"/> FENCED PASTURE [1]	<input type="checkbox"/>	Indicate predominant land use(s) past 100m riparian.	
2.5	<input type="checkbox"/>	<input type="checkbox"/> NONE [0]	<input type="checkbox"/>	<input type="checkbox"/> OPEN PASTURE, ROWCROP [0]	<input type="checkbox"/>	Riparian	

Comments

Riparian
Maximum 10
5.5

5] **POOL / GLIDE AND RIFFLE / RUN QUALITY**

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	
Check ONE (ONLY!)	Check ONE (Or 2 & average)	Check ALL that apply	
<input type="checkbox"/> > 1m [6]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	<input checked="" type="checkbox"/> SLOW [1]
<input type="checkbox"/> 0.7-<1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> VERY FAST [1]	<input type="checkbox"/> INTERSTITIAL [-1]
<input type="checkbox"/> 0.4-<0.7m [2]	<input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [0]	<input type="checkbox"/> FAST [1]	<input type="checkbox"/> INTERMITTENT [-2]
<input checked="" type="checkbox"/> 0.2-<0.4m [1]		<input checked="" type="checkbox"/> MODERATE [1]	<input checked="" type="checkbox"/> EDDIES [1]
<input type="checkbox"/> < 0.2m [0]		Indicate for reach - pools and riffles.	

Comments

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on back)

Pool /
Current
Maximum 12
6

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input checked="" type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input type="checkbox"/> NONE [2]
<input type="checkbox"/> BEST AREAS 5-10cm [1]	<input checked="" type="checkbox"/> MAXIMUM < 50cm [1]	<input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input checked="" type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments

Riffle /
Run
Maximum 8
5

6] **GRADIENT** (32.6 ft/mi) ☐ VERY LOW - LOW [2-4]
DRAINAGE AREA (1.1 mi²) ☐ MODERATE [6-10]
☒ HIGH - VERY HIGH [10-6]

%POOL: 30 %GLIDE: 25
%RUN: 10 %RIFFLE: 35

Gradient
Maximum 10
8

A) SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☒ WADE
☐ L. LINE
☐ OTHER

STAGE

1st -sample pass-- 2nd

- ☐ HIGH
☐ UP
☐ NORMAL ☒
☐ LOW
☐ DRY

DISTANCE

- ☐ 0.5 Km
☐ 0.2 Km
☐ 0.15 Km
☐ 0.12 Km
☐ OTHER

meters

CANOPY

- ☐ > 85%- OPEN
☒ 55%-<85%
☐ 30%-<55%
☐ 10%-<30%
☐ <10%- CLOSED

CLARITY

1st --sample pass-- 2nd

- ☐ < 20 cm
☐ 20-<40 cm
☐ 40-70 cm
☐ > 70 cm/ CTB
☐ SECCHI DEPTH

1st _____ cm

2nd _____ cm

C) RECREATIONAREA DEPTH
POOL: ☐ >100ft² ☐ >3ft**B) AESTHETICS**

- ☒ NUISANCE ALGAE
☒ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOs/SSOs/OUTFALLS

D) MAINTENANCE

PUBLIC / PRIVATE / BOTH / NA
 ACTIVE / HISTORIC / BOTH / NA
 YOUNG-SUCCESSION-OLD
 SPRAY / SNAG / REMOVED
 MODIFIED / DIPPED OUT / NA
 LEVEED / ONE SIDED
 RELOCATED / CUTOFFS
 MOVING-BEDLOAD-STABLE
 ARMoured / SLUMPS
 ISLANDS / SCoured
 IMPOUNDED / DESICCATED
 FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

E) ISSUES

WWTP / CSO / NPDES / INDUSTRY
 HARDENED / URBAN / DIRT&GRIME
 CONTAMINATED / LANDFILL
 BMPs-CONSTRUCTION-SEDIMENT
 LOGGING / IRRIGATION / COOLING
 BANK / EROSION / SURFACE
 FALSE BANK / MANURE / LAGOON
 WASH H₂O / TILE / H₂O TABLE
 ACID / MINE / QUARRY / FLOW
 NATURAL / WETLAND / STAGNANT
 PARK / GOLF / LAWN / HOME
 ATMOSPHERE / DATA PAUCITY

F) MEASUREMENTS

\bar{x} width
 \bar{x} depth
 max. depth
 \bar{x} bankfull width
 bankfull \bar{x} depth 0.6
 W/D ratio
 bankfull max. depth
 floodprone x^2 width
 entrench. ratio

Legacy Tree:

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Leeches & flatworms within stream. High quantities of
 nuisance algae.

Stream Drawing:

See HHEI Evaluation



Primary Headwater Habitat Evaluation Form

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

40

SITE NAME/LOCATION Kethel - Sawmill 138 kV Transmission Line Rebuild Project
Franklin Co., OH SITE NUMBER Stream 3 RIVER BASIN Scioto River DRAINAGE AREA (mi²) 0.09
LENGTH OF STREAM REACH (ft) 159' LAT. 40.13798°N LONG. 83.0945°W RIVER CODE / RIVER MILE /
DATE 7/12 SCORER N. NOLAN COMMENTS

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

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

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check ONLY two predominant substrate TYPE boxes (Max of 40). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

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

Total of Percentages of
Bltr Slabs, Boulder, Cobble, Bedrock 3

(A) 15

(B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI
Metric
Points

Substrate
Max = 40

20

A + B

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

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

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

7cm

Pool Depth
Max = 30

15

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

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

COMMENTS

OHWH 2.5' Tot 3.0'

AVERAGE BANKFULL WIDTH (meters)

2.6

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

COMMENTS

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

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

COMMENTS

Intermittent

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

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

STREAM GRADIENT ESTIMATE

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

ADDITIONAL STREAM INFORMATION (This information Must Also be Completed):QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score _____ (If Yes, Attach Completed QHEI Form)

DOWNSTREAM DESIGNATED USE(S)

☒ WWH Name: Scioto River Distance from Evaluated Stream ~1.5 mi
☐ CWH Name: _____ Distance from Evaluated Stream _____
☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: Powell NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____
 County: Franklin Township / City: _____

MISCELLANEOUS

Base Flow Conditions? (Y/N): Y Date of last precipitation: 7/5/18 Quantity: 0.66 in
 Photograph Information: _____
 Elevated Turbidity? (Y/N): N Canopy (% open): 60%
 Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id, and attach results) Lab Number: 1
 Field Measures: Temp (°C) 23.2 Dissolved Oxygen (mg/l) 1 pH (S.U.) 8.3 Conductivity (µmhos/cm) _____
 Is the sampling reach representative of the stream (Y/N) Y If not, please explain: _____

Additional comments/description of pollution impacts: _____

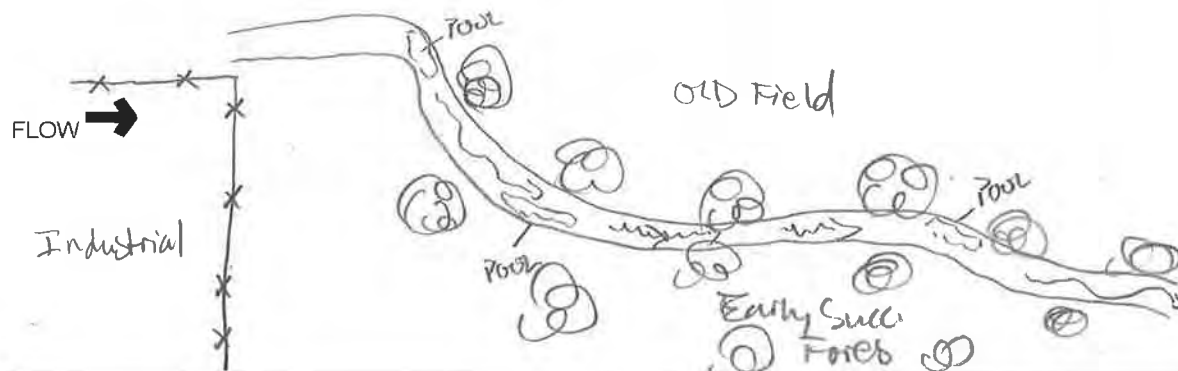
Biotic Evaluation

Performed? (Y/N): Y (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) Y Voucher? (Y/N) N
 Comments Regarding Biology: Crayfish, Pillbugs, snails

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



This foregoing document was electronically filed with the Public Utilities

Commission of Ohio Docketing Information System on

11/5/2019 4:06:09 PM

in

Case No(s). 19-1974-EL-BLN

Summary: Letter of Notification LON for THE BETHEL-SAWMILL 138 kV TRANSMISSION LINE PROJECT (BROOKSIDE-SAWMILL) electronically filed by Tanner Wolfram on behalf of AEP Ohio Transmission Company, Inc.