



February 1, 2019

Chairman Asim Z. Haque
The Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215-3793

The Ohio Power Siting Board
Docketing Division
180 East Broad Street
Columbus, Ohio 43215-3793

RE: Case No. 18-1259-EL-BTX
In the matter of the application of the Dayton Power and Light Company for a Certificate of Environmental Compatibility and Public Need for the West Milton-Eldean 138 kV Transmission Line Project.

Dear Chairman Haque,

Attached, please find a copy of the Application of Dayton Power and Light Company for a Certificate of Environmental Compatibility and Public Need ("Application") for the above-referenced project. This filing is made pursuant to Ohio Administrative Code 4906-5-01, *et seq.* and 4906-2-01, *et seq.*

Filing of the Application is effected electronically pursuant to O.A.C 4906-2-02(A) and (D). Five printed copies and ten additional electronic copies (CDs) of this filing will also be submitted to the Staff of the Ohio Power Siting Board for its use.

The following information is included pursuant to O.A.C 4906-2-04(A)(3):

(a) Applicant:

Dayton Power and Light Company
1900 Dryden Road
Dayton, Ohio 45439


(b) Facilities to be Certified:

West Milton-Eldean 138 kV Transmission Line Project

(c) Applicant's Authorized Representative with respect to this Application:

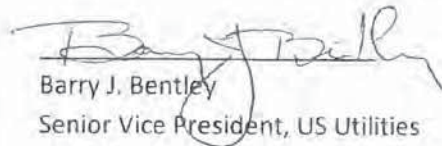
Greg Tokar
Project Manager
1900 Dryden Road
Dayton, Ohio 45439

If you have any questions, please do not hesitate to contact me.



Randall V. Griffin (0080499), Counsel of Record
Chief Regulatory Counsel
The Dayton Power and Light Company

Now comes Barry J. Bentley and states that the information contained in the Application is complete and correct to the best of his knowledge, information, and belief.



Barry J. Bentley
Senior Vice President, US Utilities
AES, as agent for
The Dayton Power and Light Company, an Ohio
Corporation

Sworn to and subscribed before me this 25th day of JANUARY, 2019.



CLAUDIUS R WALKER III, Notary Public
In and for the State of Ohio
My Commission Expires Sept. 28, 2021



Notary Public

Cc: Jon Whitis, OPSB Staff



**Application for Certificate of Environmental
Compatibility and Public Need
for the**

**WEST MILTON-ELDEAN 138 kV
TRANSMISSION LINE PROJECT**

OPSB CASE NO. 18-1259-EL-BTX

Submitted pursuant to O.A.C. 4906-5

The Dayton Power and Light Company

February 2019

BEFORE THE OHIO POWER SITING BOARD

Certificate Application for Electric Transmission Facilities

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4906-5-02 PROJECT SUMMARY AND APPLICANT INFORMATION**(A) PROJECT SUMMARY**

The Dayton Power and Light Company (“DP&L” or “Company”), a wholly owned indirect subsidiary of AES Corporation (“AES”), is proposing the West Milton-Eldean 138 kilovolt (“kV”) Transmission Line Project (“Project”) located in Miami County, Ohio. The scope of the proposed Project involves the construction of a single circuit 138 kV transmission line. DP&L will construct, maintain, operate, and own the transmission line. The proposed Preferred and Alternate Routes for the Project, both of which are 16.7 miles in length, are described in this application for a Certificate of Environmental Compatibility and Public Need from the Ohio Power Siting Board (“OPSB” or “Board”).

(1) General Purpose of the Facility

The purpose of the Project is to allow for adequate transmission system voltages to be maintained in the northwest area of the DP&L transmission system under various outage conditions, as required to comply with the mandatory North American Electric Reliability Corporation (“NERC”) reliability standards. The State of Ohio is located in the Reliability First (“RF”) region, one of seven region entities comprising the NERC, and DP&L is a member of RF. The NERC and RF are empowered by the Federal Energy Regulatory Commission to enforce utility industry compliance with the mandatory reliability standards for the integrity of the bulk electric system. DP&L is also a member of PJM Interconnection (“PJM”), a regional transmission organization, which coordinates the movement of wholesale power in all or parts of 13 states, including Ohio, and the District of Columbia. PJM conducts a Regional Transmission Expansion Planning (“RTEP”) process annually to document that its transmission footprint, including the DP&L system, is in compliance with the mandatory NERC reliability standards. Both PJM and the member companies collaboratively conduct studies to identify potential violations of the mandatory NERC reliability standards and evaluate projects to resolve the violations. Ultimately, PJM is responsible for approval of the proposed projects. The projects are then filed with FERC to obtain its approval.

It was through the PJM Regional Transmission Organization’s planning process that the need for the Project was identified. Specifically, the RTEP contingency analysis show that under the multiple contingency of DP&L’s Shelby-Sidney 138 kV circuit and DP&L’s Miami-Eldean 138 kV circuit, voltages would be below the minimum acceptable level per NERC reliability criteria at multiple transmission buses. This contingency scenario would effectively leave the northwest area of the DP&L transmission system without a 138 kV source. The proposed new 138 kV circuit will mitigate this situation and allow for compliance with the mandatory NERC reliability standards. Thus, the purpose of the Project is to improve the reliability of electric service for DP&L’s northwest service territory area. Additional details can be found in this application’s Review of Need and Schedule, in Section 4906-5-03.

(2) General Location, Size, and Operating Characteristics

The Project will originate at the existing West Milton Substation located just south of the Village of West Milton, in Union Township, Miami County, Ohio. The transmission line would extend along the west side of the Village of West Milton to a point south of the Village of Ludlow Falls, then head east adjacent to State Route 55, leave Union Township and enter Concord Township, north near Forest Hill Road, and then across agricultural land toward the northeast until the route reaches the existing Eldean Substation located on Experiment Farm Road. Both the Preferred and Alternate Routes are 16.7 miles in length.

The Project is located partially within the Village of West Milton and City of Troy, and unincorporated Union and Concord Townships, Miami County, Ohio. The Project will require a 75-foot-wide permanent right-of-way ("ROW"), but where parallel to road ROW only a 30-foot-wide permanent ROW will be required. The typical height of transmission structures will be approximately 70 feet with an anticipated maximum of 90 feet. Figure 2-1, Project Overview, shows the Project end points and the Preferred and Alternate Routes, and common routes, identified by DP&L.

Some portions of the proposed transmission line will have a 12.47 kV electric distribution line underbuild where the proposed route is co-located with an existing overhead electric distribution line (primarily along public road ROW).

(3) Suitability of Preferred and Alternate Routes

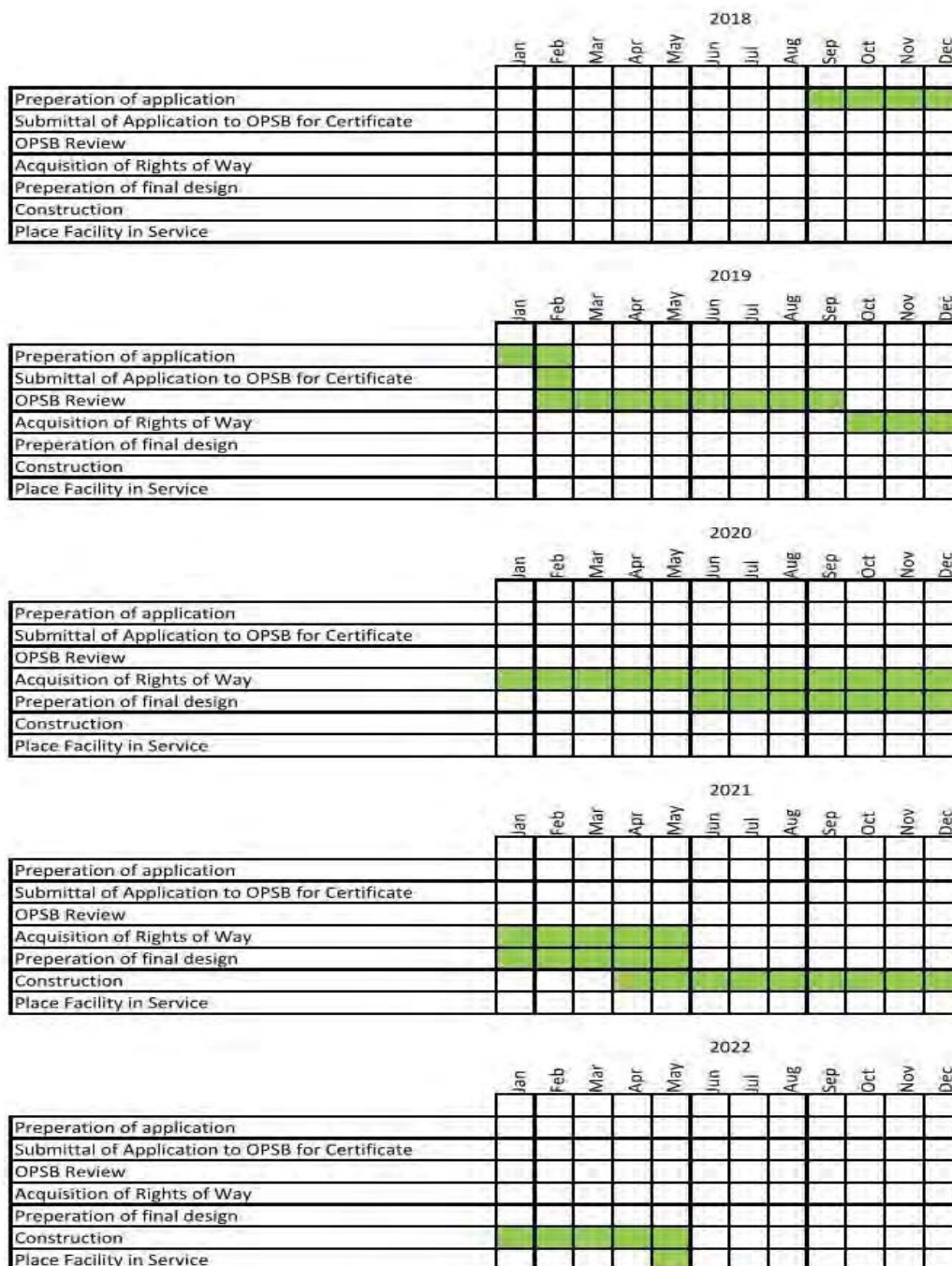
GAI Consultants, Inc. ("GAI") was contracted by DP&L to conduct the Route Selection Study ("RSS") to identify generally broad route corridors, specify route alternatives within the general corridors, and define and quantify the physical attributes (land use, ecological, cultural, and engineering), systematically score and rank the route alternatives, and select a Preferred and Alternate Route. The objective of the RSS was to identify and evaluate potential route alternatives between the two existing substations and ultimately select the alternative route having the least impact on the overall human environment and sensitive ecological resources while being cost effective and technically feasible to construct and operate. DP&L and GAI incorporated public input received during and after three public informational meetings and meetings with individual landowners which further optimized the routes. The Preferred and Alternate Routes are both constructible and were selected by DP&L for consideration by the OPSB in this application.

The location of the Preferred and Alternate Route is shown on Figure 2-1. The RSS is included as Appendix 4-1 and documents the selection process of the routes and is discussed in detail in Section 4906-5-04 of this application. The RSS Addendum is included as Appendix 4-2.

Per Ohio Administrative Code ("OAC") 4906-3-05, the Preferred Route and the Alternate Route cannot be more than 20 percent in common to be considered as alternatives. On September 20, 2018, the Administrative Law Judge ordered that DP&L's waiver to meet this requirement be granted. The Preferred and Alternate Routes are approximately 37 percent in common.

(4) Project Schedule

The current Project schedule is illustrated in the diagram below.



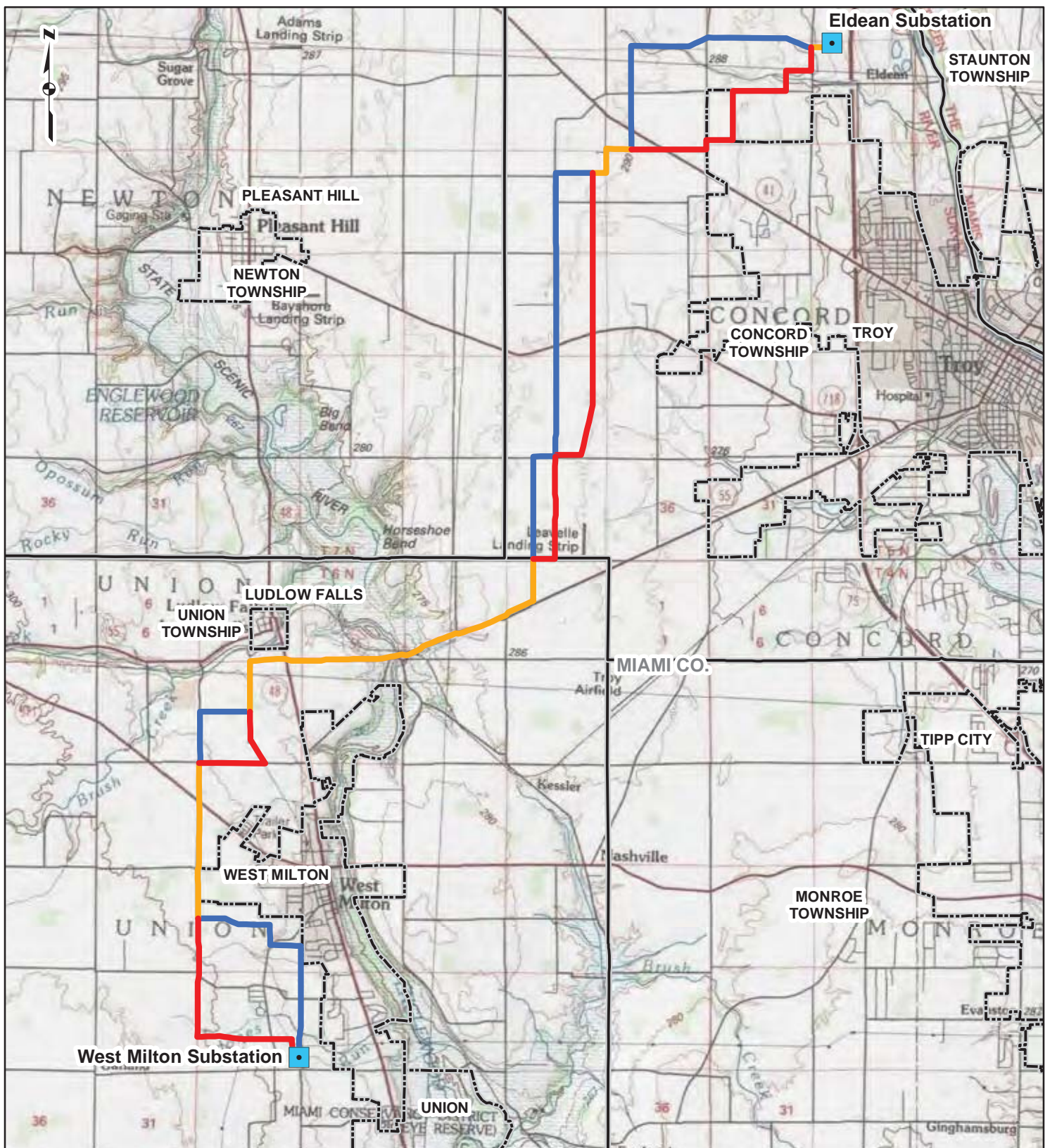
(B) APPLICANT INFORMATION**Company History**

DP&L is a public utility incorporated in 1911 under the laws of Ohio.

Current Operations and Affiliate Relationships

DP&L is the principal subsidiary of DPL Inc., a regional energy provider and an AES company. DPL Inc.'s other significant subsidiaries include AES Ohio Generation, LLC, Miami Valley Insurance Company, and Miami Valley Lighting, LLC. DP&L, a regulated electric utility, provides service to over 520,000 customers in West Central Ohio. DPL Inc., through its subsidiaries, including DP&L, owns 111 MW of coal-fired generation. DP&L's headquarters are in Dayton, Ohio. News and information about DP&L can be found at www.dpandl.com.

DP&L will construct, own, operate, and maintain the transmission line for this Project.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- Substation
- Preferred Route
- Common Route
- Alternate Route
- Municipal Boundary
- Township Boundary
- County Boundary

0 3,500 7,000 14,000 Feet

FIGURE 2-1

PROJECT OVERVIEW

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 1/29/2019

CHECKED: MBW

APPROVED: MRW

REFERENCE: USGS 30' X 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/29/2019. OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.

4906-5-03 REVIEW OF NEED AND SCHEDULE**(A) NEED FOR PROPOSED FACILITY**

It was through the PJM RTEP process that the need for the proposed Project was identified. Specifically, RTEP contingency analysis showed that under the multiple contingency of DP&L's Shelby-Sidney 138 kV circuit and DP&L's Miami-Eldean 138 kV circuit, voltages would be below the minimum acceptable level per NERC reliability criteria at the following eight transmission buses: Halterman 138 kV, Springcreek 138 kV, Eldean 138 kV, Eldean 69 kV, Sidney 138 kV, Sidney 69 kV, Amsterdam 138 kV, and Amsterdam 69 kV. This multiple contingency would effectively leave the northwest area of the DP&L transmission system without a 138 kV source. The proposed new 138 kV circuit will mitigate this situation and allow for compliance with the mandatory NERC reliability standards. The Project has been approved by both the PJM Board and FERC.

The proposed Project is referenced on page 77 of Section 4901:5-5-04 of DP&L's 2018 Long-Term Forecast Report ("LTFR"; Appendix 3-1).

(1) Purpose of the Proposed Facility

The purpose of the proposed Project is to provide the northwest area of the DP&L transmission system with another reliable 138 kV source.

(2) System Conditions, Local Requirements, and Other Pertinent Factors

The PJM RTEP process is based on a five-year projection of transmission system conditions. The proposed Project was identified during the 2010 RTEP process based on projected conditions for 2015, including the 2010 PJM Load Forecast for 2015. All projects identified through prior years' RTEP processes were reflected in the analyses for 2015. However, DP&L requested that PJM re-evaluate the needed timing for the Project, in light of the much lower recent PJM load projections for the Dayton zone, as compared to those that PJM had assumed when it originally identified the need for the Project in 2010. Based on the re-evaluation, PJM moved the required in-service date for the Project to June 1, 2022. Below is the link to the PJM website showing the revised PJM-required in-service date for the Project – baseline upgrade ID b1572.

<http://www.pjm.com/planning/rtep-upgrades-status/construct-status.aspx>

(3) Load Flow Studies and Contingency Analyses

Table 3-1 provides a summary of the load flow analysis results with and without the proposed Project, based on PJM's updated load forecast.

TABLE 3-1. Load Flow Analysis Results With and Without the Proposed Transmission Line

Issue	Contingency	Limiting Facility	kV	Without Proposed Project (% voltage)	With Proposed Project (% voltage)
Voltage	Shelby-Sidney 138 + Miami-Eldean 138	Amsterdam	138	95.9	99.8
		Eldean	138	78.1	100.4
		Halterman	138	78.2	99.5
		Sidney	138	78.6	98.8
		Springcreek	138	78.3	99.4

(4) System Performance Transcription Diagrams

An electronic copy of DP&L's transcription diagrams with and without the proposed facility, can be provided upon request under a seal to the OPSB staff. Transcription diagrams could contain Critical Energy Infrastructure Information and must be kept confidential.

(B) REGIONAL EXPANSION PLANS**(1) Proposed Facility in Long-Term Forecast****(a) Reference in Recent Long-Term Forecast**

The proposed Project is referenced on page 77 of Section 4901:5-5-04 of DP&L's 2018 LTFR (Appendix 3-1).

(b) Explanation if Not Referenced

Not applicable.

(c) Reference to Regional Expansion Plans

As referenced above in (a), the proposed Project is a result of the PJM RTEP process, which ensures regional coordination and compliance with the mandatory NERC reliability standards.

(C) SYSTEM ECONOMY AND RELIABILITY

The proposed Project will ensure that the northwest area of DP&L's transmission system complies with the mandatory NERC reliability standards. As noted in Table 2-1 above, the Project will ensure transmission system voltages are maintained near 1.0 per unit thus indicating this is an effective solution of solving the reliability issues in this area.

(D) OPTIONS TO ELIMINATE THE NEED FOR THE PROPOSED PROJECT

The addition of capacitor banks was considered as an option to eliminate need; however, this option is

not feasible due to space and other constraints, and it would not provide an effective means to address the voltage issues noted above.

(E) FACILITY SELECTION RATIONALE

The proposed Project was selected because it is the best option to resolve the potential voltage issues noted above from both transmission system performance and cost perspectives.

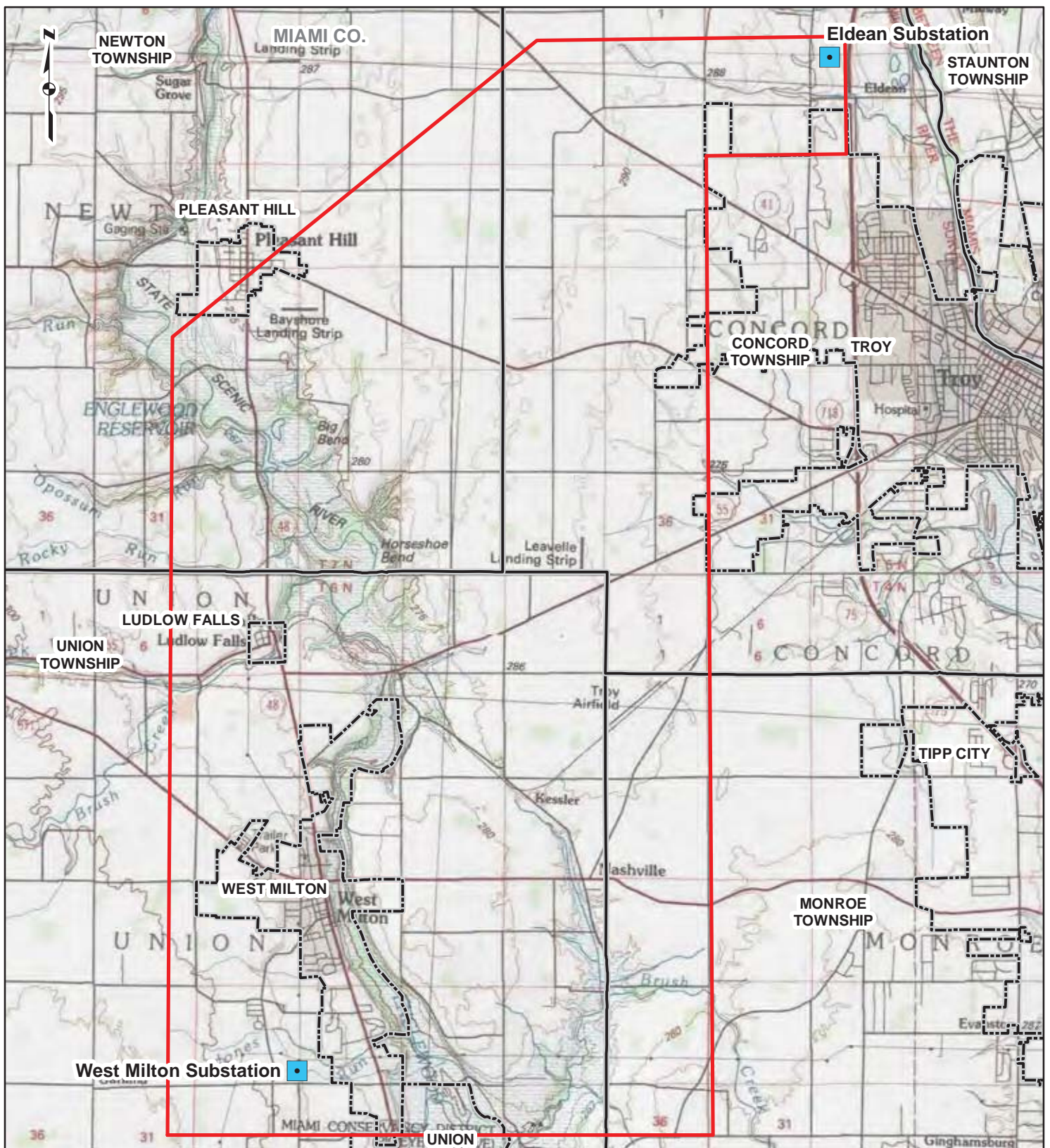
(F) PROJECT SCHEDULE

(1) Schedule Gantt Chart

A schedule Gantt chart of the proposed Project is presented in Section 4906-5-02(4) of this application.

(2) Impact of Critical Delays

Any critical delays in the major activities outlined for the Project would further delay compliance with the NERC regulations and the in-service date of the transmission line.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- Existing Substation
- Study Area
- Municipal Boundary
- Township Boundary
- County Boundary

0 3,500 7,000 14,000 Feet

FIGURE 4-1

PROJECT STUDY AREA

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



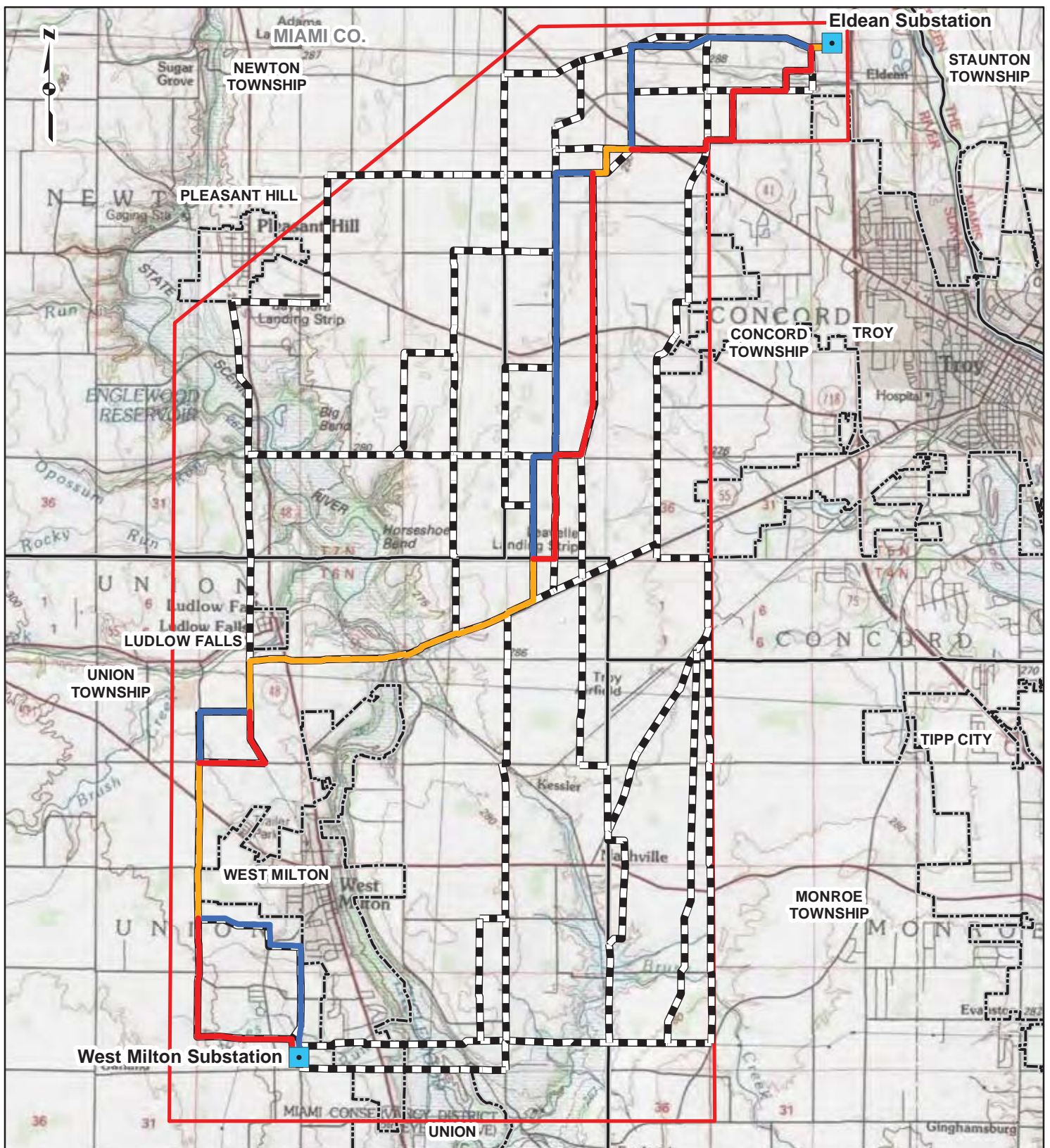
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DATE: 1/29/2019

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APPROVED: MRW

REFERENCE: USGS 30' X 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/29/2019. OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.



PROJECT LOCATION



MIAMI COUNTY, OHIO

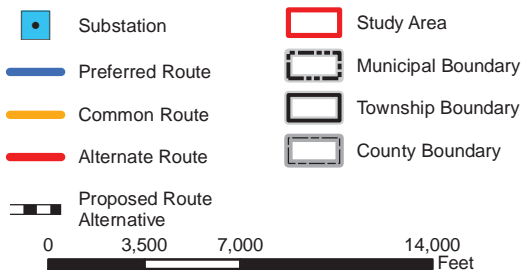


FIGURE 4-2

STUDY AREA AND ROUTES

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 1/29/2019

CHECKED: MBW

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REFERENCE: USGS 30' X 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/29/2019. OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.

4906-5-04 ROUTE ALTERNATIVES ANALYSIS**(A) ROUTE SELECTION STUDY**

This section presents a summary of the Route Selection Study (“RSS”) for the Project. As required by OAC 4905-5-04(A) and (B), the RSS defines the geographic boundaries of the area studied for potential route alternatives, identifies the potential transmission line route alternatives on maps, defines and reports on the attribute data for each route alternative evaluated, and describes the siting criteria and methods employed to rank the routes and determine the most feasible routes including the Preferred and Alternate Routes.

DP&L retained GAI to prepare the transmission line RSS Report for the Project (Appendix 4-1). The goal of the RSS was to identify and evaluate potential route alternatives to connect the existing West Milton Substation located south of the Village of West Milton, Ohio to the existing Eldean Substation located northwest of the City of Troy, Ohio and identify a Preferred and Alternate Route for the Project, while ultimately selecting the transmission route that has the least, or among the least, impact on the human environment and sensitive ecological resources while also achieving Project requirements of technical feasibility and cost effectiveness in terms of construction and long-term operation. The RSS Addendum is provided as Appendix 4-2. DP&L and GAI utilized the results of the RSS, as well as input received from public informational meetings, to establish the Preferred and Alternate Routes.

(1) Study Area Description and Rationale

The Project is located in the southwest-central portion of Miami County, OH, running south to north. Review of the U.S. Geological Survey (“USGS”) 7.5-minute topographic maps of the area indicates that Stillwater River and Great Miami River are the prominent drainage features associated with the Project area. The Project area is characterized by nearly level terrain with greater topographic relief near large bodies of water. The Project area supports perennial, intermittent, and ephemeral waterways. Large bodies of water are generally absent from the Project area. Elevation in the Project area ranges from approximately 920 to 990 feet above mean sea level.

The Project area is largely cultivated agricultural row crops, with minor amounts of developed land, pasture/hay, forest, and grassland/herbaceous open areas. There are no commercial lands within the Project area, however a section of the Preferred Route abuts and crosses an open and active surface mine. A section of the common route also abuts the surface mine. Additional information can be found in the RSS Report provided in Appendix 4-1.

The first step in the siting process involved the identification of a study area encompassing the existing West Milton and Eldean Substations, the fixed endpoints, and intervening areas. The 53-square-mile study area, measuring 10.7 miles (north-south) by 7.3 miles (east-west) based on the longest sides of the study area, generally encompasses the Village of West Milton, a portion of the Stillwater River watershed, sparsely populated communities to the south, and largely rural land to the north. Based on the fixed endpoints, this study area covered a sufficient amount of area for which route alternatives were considered.

(2) Study Area Map

Figure 4-1 illustrates the approximate study area boundary of the Project. Figure 7-6 depicts land use and siting constraints utilized for the RSS.

(3) Map of Study Area, Routes, and Sites Evaluated

Figure 4-2 illustrates the Study Area, Preferred Route, and Alternate Route, as well as Route Segments evaluated.

(4) Siting Criteria

The list and description of the quantitative siting criteria and data utilized in the RSS are presented in Table 3-1 of the RSS Report (Appendix 4-1) and can be seen on Figure 7-6. The quantitative siting criteria consisted of constraint and attribute data, including but not limited to, locations of individual residences, property boundaries, institutional land uses, forested lands, wetlands, perennial streams, existing ROW, roads, and other land use features.

The siting criteria employed for establishing route segments and complete route alternatives were as follows:

- Avoidance or minimization with existing and proposed future land uses (e.g., by utilizing existing transmission line or road corridors where possible);
- Avoidance or minimization of effects on human, natural, visual, and cultural resources;
- Avoid or minimize visibility from densely populated areas;
- Minimize impacts to construction and maintenance costs by selecting shorter, more direct routes;
- Locate routes through terrain where economical construction and mitigation techniques can be employed; and
- Consistency with DP&L's transmission needs, schedule, regulatory directives, and environmental regulations.

The qualitative criteria considered by the siting team in the assessment of the Preferred and Alternate Route included overall constructability factors (i.e., terrain and access) and an emphasis on minimizing impacts to undeveloped land by paralleling or using existing ROW to the extent feasible. In addition, feedback from property owners received during the public informational meetings and early ROW discussions were also considered.

(5) Siting Process for Preferred and Alternate Route

After defining the limits of the study area, various geographical and aerial imagery were assembled and organized using a geographic information system (“GIS”) program to produce maps consisting of readily available data sources (e.g., locations of rivers and streams, National Wetland Inventory data, floodplains, forests, scenic or public preservation areas, regulatory-protected species, residences, airports, churches, cemeteries, cultural resource and historic sites, and public-use areas such as golf courses, etc.).

DP&L’s guidelines in commissioning this RSS included both road or existing transmission line ROW corridors and “cross-country” corridors (largely agricultural fields), where land use may be suitable, for potential siting of a transmission line in terms of construction, operation, and maintenance. Major constraints and opportunities were reviewed in GIS as well as the completion of windshield surveys to verify desktop data and collect additional information as needed. Based on this information, unique potential route corridors were identified. These corridors were selected to provide a full range of options for analysis, including paralleling of road ROW, and crossing through agricultural lands aligning with property boundaries to the extent practical. Route segments that would form the basis of the full routes were generally developed within the route corridors and assigned a node for each end of the segment as a system to track and identify route segments.

After potential route segments were created, segment combinations were then assembled to create individual route alternatives to span between the two substations. Segment combinations were assigned a route identification number. During the initial scoring process, route alternatives were analyzed and scored through a comparative analysis process. DP&L staff then reviewed several of the top ranked routes for qualitative aspects that were not necessarily fully considered in the route analysis and scoring process. DP&L then selected the two most viable and feasible routes to be presented to the public open house for soliciting input.

Following the initial comparative analysis process and public open house, particularly based on comments received, edits to segments and route alternatives were made. The new routes were then analyzed, scored, and ranked as done originally. Again, DP&L staff then reviewed the top ranked routes for qualitative aspects that were not necessarily fully considered in the route analysis and scoring process (i.e., routes that bisect agricultural fields and parallel Greentree Road). DP&L then selected the two most viable and feasible routes to be presented to the public at a second open house for soliciting input.

During the review of each iteration of the comparative analysis the highest ranking, but least in common with the first selected alternative route, was chosen as the second alternative route. Early in the RSS, DP&L and GAI recognized that the <20 percent in common requirement between the Preferred and Alternate Route would be difficult to achieve for the Project and in Docket No. 14-0469-EL-BTX requested and received a waiver of the rule. Subsequently Docket No. 14-0469-EL-BTX was closed and the Project was reopened under the current docket (Docket No. 18-1259-EL-BTX). DP&L filed a new waiver request to the <20 percent in common requirement pursuant to OAC 4906-3-05, which was granted by the Board.

Based on the results of the comparative analyses, comments received at the public open house, and a qualitative review of the route alternatives, the Preferred and Alternate Routes were selected by the DP&L siting team. The primary qualitative factors considered in the final section were the minimization of route lengths that bisect land parcels (mainly agricultural fields) to the extent practical, minimization of routes proximal to residences along road ROW, and the feasibility of construction and maintenance of the transmission line.

Following the selection of the Preferred and Alternate Routes, DP&L responded to certain landowners' request for meetings to discuss the proposed transmission line alignment on their properties. These requests for changing the alignment, exclusively within an individual landowner's property, were evaluated on a case-by-case basis to determine the impact on ecological features, land use, socioeconomics, and engineering design and constructability. These changes in alignment are referred to as route optimizations.

As part of the Project's filing with OPSB under a new docket number, DP&L held a third open house to present the current preferred and alternate routes to the public and to solicit public feedback. Comments received were summarized and reviewed. Where deemed feasible, route adjustments and/or optimizations were made to finalize the Preferred and Alternate Routes presented in this application. Route adjustments were made near West Milton Substation with a segment of the Preferred Route to convert an existing single circuit 138 kV line (West Milton-Greenville) to a double circuit with the second circuit being the West Milton-Eldean 138 kV line. The double circuit route paralleled the prior Alternate Route from the West Milton Substation to Davis Road. Another route adjustment was made by switching the Preferred and Alternate Routes along and west of Forest Hill Road between Horseshoe Bend Road and Fenner Road.

During the third open house some comments received from the public may be due to a misunderstanding or misinterpretation of the proposed routes. Some landowners brought letters from legal firms with map and route information that were outdated and/or incorrect. Also, other comments received from the public that were not incorporated into this application may be addressed during permanent easement negotiations after a route is approved by OPSB. Any modifications resulting from easement negotiations are not expected to affect additional landowners or occur outside of the 2,000 foot corridor of the Preferred or Alternate Routes.

The entire siting process, methodology, and results are described in further detail in the RSS Report in Appendix 4-1 and the RSS Addendum in Appendix 4-2.

(6) Route Descriptions and Rationale for Selection

The Project proposes a Preferred and an Alternate Route, both of which are 16.7 miles in length and traverse mostly agricultural fields either adjacent to rural county roads or across fields (following property lines where feasible). Each route is briefly described below, originating from the West Milton Substation and ending at the Eldean Substation.

Preferred Route

The Preferred Route parallels 10.3 miles of either existing transmission line ROW (2.3 miles) or public road ROW (8.0 miles). The remainder of the route (6.4 miles) primarily consists of open agricultural fields. The Preferred Route will also convert the existing single circuit West Milton-Greenville 138 kV transmission line to double circuit with new structures for approximately 2.3 miles from West Milton Substation to Davis Road. Prior to the second public meeting, the Preferred Route was the third highest scoring route overall. The higher ranked routes were not selected as the Preferred Route because they unfavorably bisect several agricultural field parcels or paralleled Greenlee Road. As described below, when initially proposed in Docket No. 14-0469-EL-BTX, siting along Greenlee Road generated substantial public opposition. At the second public meeting the Preferred Route received comments of support, however, at the third public meeting comments were received in favor of and against. Following the third public open house, approximately three miles of the Alternate Route were swapped with the Preferred Route based on landowner comments.

Alternate Route

The Alternate Route parallels 8.0 miles of public road ROW; the Alternate Route does not parallel any existing transmission line ROW. The remainder of the route (8.7 miles) primarily consists of open agricultural fields. The initial selection of the Alternate Route was selected primarily on the route being the highest ranking but the least in common with the Preferred Route. Initially the Alternate Route was 28 percent in common with the Preferred Route, which was the highest-ranking route with the least in common, but after addressing comments received at public open houses and optimizations, the Alternate Route is 37 percent in common with the Preferred Route. On September 20, 2018, DP&L received a waiver of the 20 percent in common requirement under OAC 4906-3-05 for the Project.

(B) COMPARISON TABLE OF ROUTES, ROUTE SEGMENTS, AND SITES

Tables 3-2 and 3-3 of the RSS Report (Appendix 4-1) provide normalized scores and ranks for the four comparative analysis categories as well as a total route score and rank for routes analyzed prior to the third public open house. Table 3-2 provides data on the initial route alternatives prior to the open houses, whereas Table 3-3 provides data on the supplemental and updated route alternatives following the first two open houses. Table 3-3 also provides data on the optimized route developed in 2015. Reranking routes based on changes following the third open house was determined to not be of value for the siting of the transmission line; route optimizations incorporated in 2018 are not included in the RSS or RSS Addendum.

(C) PUBLIC INVOLVEMENT

DP&L conducted an informational program to communicate Project planning details, seek feedback from landowners and residents, media and local elected officials, and generally raise awareness of

the Project. The program involved conducting public informational meetings (i.e., open house forum) to seek feedback from the community on the Project and the routes being considered. Prior to the public informational meetings, DP&L mailed invitation letters to residents, tenants, and officials, and issued a newspaper public notice. A Project website (available at <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west-milton/>) was also created with Project mapping and a summary description. At the public information open houses, DP&L representatives were available to answer questions, listen, and receive and document feedback from the public. Maps were also provided at the open houses for the public to review and comment on. A summary of the public information open houses and process is provided below.

A public informational meeting was held on March 25, 2014 to present two of the most viable routes, based on quantitative scores and the consideration of qualitative factors. The vast majority of comments received by DP&L during the meeting, and the comments received afterwards by DP&L and the Board, were opposed to the route that utilized the Greenlee Road corridor. Residents cited the adverse effect of views of the landscape horizon where no overhead lines currently exist (but are rather underground), including the view toward, and from, the 150-acre Brukner Nature Center (privately owned) west of Greenlee Road, and the adverse effect on a historic “Bicentennial Farm” (as designated by the Ohio Department of Agriculture) immediately adjacent to the route alternative. The Brukner Nature Center is located 2,600 feet west of the Greenlee Road route alternative and the nature center property extends for a length of 1.0-mile along this route alternative (separated by flat agricultural fields). The nature center land contains six miles of hiking trails. Other residents (other than Greenlee Road residents) opposed sections of the two route alternatives crossing agricultural land which bisects parcels – instead they preferred that the routes follow existing property lines more closely if properties having such land use must be part of the routes.

The siting team fully considered the public’s comments from the March 2014 meeting, from the majority opinion on the Greenlee Road route to individual landowner requests for minor route adjustments and devised several new route alternatives that utilized the Forest Hill Road corridor (where existing overhead distribution lines parallel the majority of the roadway), as well as routes that utilize the immediate surrounding lands and property lines. Five new routes were developed, as well as minor adjustments to selected previous routes as landowners suggested, bringing the total number of routes to undergo a second round of quantitative scoring and ranking to 110 route alternatives. Based on the updated quantitative score coupled with DP&L’s consideration of a limited amount of qualitative route selection criteria, the newly selected route alternatives, one of which included a variation, were selected for the public’s review at a second public open house.

The second public open house was held on July 9, 2014 to present the newly selected route alternatives, including a variation to one of those routes, in order to solicit the public’s input. The vast majority of the members of the public in attendance submitted written and verbal comments in favor of the blue route over the blue route with the variation and the red route (routes are depicted on Figure 4 of the RSS in Appendix 4-1). Based on the overall positive feedback received regarding the blue route, DP&L proceeded with that route as its Preferred Route and the red route as its Alternative

Route.

Subsequent to the public meetings held in 2014, three requests were made of DP&L by landowners to consider adjustments to the alignment of the Preferred Route, the Alternate Route, and/or common route specifically on their properties to which, in their view, optimize the route alignments for planned uses of the land. These route optimizations are further discussed in Section 3.6 and shown on Figures 5 through 7 of the RSS included as Appendix 4-1.

Subsequent to the original submission of the Project's application to OPSB (Docket No. 14-0469-EL-BTX) in March 2015, DP&L decided to switch (substitute) a 1.6-mile section of the Preferred Route with a parallel segment of the Alternate Route. This substitution of route segments was made by DP&L to alleviate a major landowner's objection to placing transmission facilities over a 1.0-mile length of crop land. These route adjustments are further discussed in Section 3.6 and shown on Figure 8 of the RSS included as Appendix 4-1.

Due to changes in the Project schedule and to meet regulatory requirements, a third public open house was held on November 7, 2018 to present the current Preferred and Alternate Routes, including an additional route adjustment (Harter Road optimization) not included in the RSS or previously presented to the public. The Harter Road optimization is further discussed in the RSS Addendum included as Appendix 4-2. The third public open house received positive and negative comments on both routes, with most landowners preferring the route that would not affect them. DP&L solicited comments at the public open house by the use of comment cards and received 39 written comment cards. Additional comments were verbally received at the public open house, some were the same as those provided on written comment cards, and more than 12 additional comment cards were mailed in, received, and documented following the open house. There were four general areas for which comments were received, 1) routes within the first few miles of the West Milton Substation, 2) the common route along State Route 55, 3) Forest Hill Road, and 4) the routes north of McCurdy Road to Eldean Substation. Based upon a review of those comments and the need to balance Project and public needs as well as the Project schedule, DP&L implemented changes to the routes within the first few miles of the West Milton Substation by double circuiting an existing 138 kV transmission line (West Milton-Greenville) with new structures and changed the route preferences along Forest Hill Road. During the third open house some comments received from the public may be due to a misunderstanding or misinterpretation of the proposed routes. Some landowners brought letters from legal firms with map and route information that was outdated and/or incorrect. Also, other comments received from the public that were not incorporated into this application may be addressed during easement negotiations after a route is approved by OPSB. Information pertaining to route changes following the third open house are included in the RSS Addendum (Appendix 3-2).

4906-5-05 PROJECT DESCRIPTION**(A) PROJECT AREA DESCRIPTION****(1) Project Area Map**

Figure 5-1 at a 1:12,000-scale, shows the Preferred and Alternate Routes for the Project, including a 1,000-foot buffer on each side of the proposed transmission centerlines (hereafter referred to as the 2,000-foot corridor). These maps depict the proposed transmission line, roads and railroads, parks or other publicly owned recreational area, existing gas pipeline (Vectren Energy Delivery of Ohio) and electric transmission (DP&L, Duke Energy, and unknown) routes, waterways and waterbodies, and population centers and legal boundaries of cities, villages, townships, and counties.

(2) Proposed Right-of-Way, Transmission Length, and Properties Crossed

The Project will require a 75-foot-wide permanent ROW, but where parallel to road ROW only a 30-foot-wide permanent ROW will be required. Table 5-1 provides information about the Preferred and Alternate Route ROW acreage, length, and properties crossed based on the proposed centerline.

TABLE 5-1. Right-of-way Area, Length, and Number of Properties Crossed

	Route Alternatives	
	Preferred	Alternate
Proposed ROW area (in acres)¹	107.6	109.9
Length (in miles)	16.7	16.7
Number of Properties Crossed (by ROW)²	111	94

Note:

- ¹ Excludes acreage of off-ROW access roads, which are temporary and only to be used during construction.
- ² This value represents the number of parcels crossed, not the number of landowners crossed, which may own one or more parcels.

(B) ROUTE OR SITE ALTERNATIVE FACILITY LAYOUT AND INSTALLATION**(1) Site Clearing, Construction Methods, and Reclamation Operations**

The following paragraphs provide information on the proposed site clearing, construction methods, and reclamation operations for the Project.

(a) Surveying and Soil Testing

The selected transmission line route will be civil surveyed to establish the centerline, ROW, and structure locations. The surveying will be completed using conventional and/or aerial methods (e.g., LIDAR). The location of significant topographic features and manmade structures along or near

the centerline of the transmission line that may affect the design will be identified during the civil survey. Minimal clearing of small trees and brush may be required if the civil surveyor's line of sight is obstructed. Offsets will be used to survey around large trees and other large obstructions as allowable. Profile measurements of the topography will be obtained by conventional and/or aerial methods. Structure locations will be staked prior to construction to aid in Project planning. The centerline and ROW will be staked prior to construction.

Soil testing will only be performed for the transmission line angle structure locations requiring foundations for the new steel pole structures. Wood pole structures are planned for the vast majority of the route. The types of structures used under various conditions of use and configuration are further described below in 4905-05(C)(1)(b). Where necessary, soil tests will be performed using a drop hammer to drive a sampler tube for laboratory analysis of the soil. Soil capacity is determined by the number of blows required to drive the tube 12 inches into the ground. Soil samples taken with a split-spoon will be used to determine soil type. Typically, the testing will be performed to a depth of 20-40 feet. If rock is encountered, a carbide-tipped bit will be drilled 5-10 feet into the rock.

(b) Grading and Excavation

No significant grading is anticipated to construct the transmission line on either route. The existing terrain within the Preferred and Alternate Routes is fairly level, and much of the route distance is adjacent to road ROW (8.0 miles and 8.0 miles of the Preferred and Alternate Route, respectively), which is anticipated to provide a mostly suitable surface for some construction vehicle operations (e.g., from roadway and road shoulder).

Each wood and/or steel pole (structure) installation requires a machine-excavated hole for placement of the structure. The excavation for these structures will average three feet in diameter and nine to 12 feet deep. A portion of the excavated soil will be used of backfill. The excess material will be placed around the structure or hauled off-site.

(c) Construction of Temporary and Permanent Access Roads and Trenches

No permanent access roads are anticipated for transmission line construction or maintenance purposes. Temporary access to the construction areas of the Preferred and Alternate Route will occur from existing township, county or state roads adjacent to or crossed by the transmission line ROW. Access roads will require the landowner's input and approval. Note that these access roads are preliminary and cannot be fully planned and identified until after a final route is approved and contacts with affected landowners for transmission line easements has been completed by DP&L. Where possible, existing access routes along existing ROWs used by crews during routine transmission line maintenance of existing transmission lines will be utilized to construct the proposed line along the Preferred or Alternate Route. If field conditions necessitate the modification of the finalized access road locations during construction, the concurrence of the property owner will be obtained, necessary environmental field studies will be completed, and necessary permits will be obtained. Proposed temporary access roads to be used during construction of the Preferred or Alternate Route are shown

on Figure 5-1.

(d) Stringing of Cable

Conductor installation for the proposed line will be accomplished using the tension stringing method. Lightweight guy cables or ropes will be fed through the stringing sheaves of the sections of line that require stringing. Conductors will then be pulled through under sufficient tension to keep the conductor “in the air”. This protects the conductor from surface damage.

Temporary guard of clearance poles will be used as a safety precaution at locations where the conductors could create a hazard to either crew members or the public. The locations and heights of clearance poles will be such that the conductors are held clear of power and communication circuits, vehicular traffic, and other structures. The stringing operation will always be under the observation of crew members. The observers will be in radio and/or visual contact with the operator of the stringing equipment.

(e) Installation of Electric Transmission Line Poles and Structures, Including Foundations

Installation of each pole will require a machine-drilled hole and where applicable a reinforced concrete foundation. A portion of the excavated soil may be used for backfill which would be tamped around the pole in layers. Crushed rock backfill will be predominately used for all direct embedded poles. Topsoil at pole excavations will be stockpiled and protected from erosion. Topsoil will be redistributed over disturbed areas to foster re-vegetation following construction. Restoration, including temporary and permanent seeding, will be coordinated with the construction activities to provide re-vegetation and soil stabilization at the earliest reasonable time. Following construction, pole locations will be seeded with a suitable grass seed mixture as specified in the erosion and sediment control plan.

(f) Post-Construction Reclamation

After construction, drainage, fencing and erosion control aspects of the transmission line ROW will be restored to conditions as good as or better than those that existed prior to construction. This includes the restoration of drainage ditches, fencing, field drainage tiles, fertilizing, seeding, and mulching of disturbed non-cultivated areas, and the removal of temporary soil erosion and sedimentation control measures after vegetative cover has been established per the project-specific Stormwater Pollution Prevention Plan (“SWPPP”).

Disturbed areas adjacent to streams and wetlands will be revegetated using methods to minimize soil erosion and degradation of water quality. Where stream banks are disturbed, they will be restored by reseedling of low-growing species, where necessary, to reduce bank erosion. Lawn or garden areas, or paved areas damaged during the construction of the transmission line, will be restored to original condition. Landscaping or landscape plantings damaged during construction will also be restored to

original condition or replaced as directed by the affected property owner as long as the vegetation does not pose a safety issue to the line or structures. After restoration is complete, DP&L will periodically inspect the ROW to identify areas of erosion, sediment accumulation, and inadequate re-vegetation conditions, if any. If such conditions are identified, corrective actions will be implemented.

(2) Facility Layout

(a) Facilities Layout Map

No new associated facilities such as substations or switch stations are proposed for the Project. Figure 5-2 is a 1:12,000-scale map of the Preferred and Alternate Routes. This map illustrates the data required by OAC 4906-5-05(B)(2)(a) (for example, pole structure locations and temporary versus permanent access roads) but is preliminary and will not be finalized until a final route is approved by the OPSB and the final engineering design is complete. No permanent access roads are proposed, only temporary access roads. DP&L is currently identifying staging areas and laydown areas for the Project, however the layout of the limits of disturbance along the ROW is shown on Figure 5-2. To date, no staging or laydown yards have been identified within the Project area. After sites are identified, DP&L will provide final locations that support this Project. No fenced-in or secured areas are planned for the transmission line Project.

(b) Proposed Layout Rationale

A detailed description of the reasons for the proposed layout (i.e., the Preferred and Alternate Routes) are presented in the RSS (Appendix 4-1) and the RSS Addendum (Appendix 4-2). There are no unusual features within the Project area beyond the generally undeveloped land use.

(c) Plans for Future Modifications

There are no other plans for future modifications that would impact the proposed layout of the Project.

(C) DESCRIPTION OF PROPOSED TRANSMISSION LINES

(1) Electric Power Transmission Line

(a) Design Voltage

The transmission line will be designed and constructed to operate at 138 kV with a 12.47 kV underbuild for some portions of the line.

(b) Tower Designs, Pole Structures, Conductor Size and Number per Phase, and Insulator Arrangement

Most of the Project will be installed on single wood and/or steel poles dependent on span length and/or configuration. The proposed new transmission line will be supported on multiple structure types. Where new structures are installed, they will be designed to support one 138 kV transmission line, with the exception of the double circuit route proposed to contain one circuit of the West Milton-Greenville line and one circuit of the West Milton-Eldean line. Some structures will be designed to also support a 12.47 kV underbuild. Where the route of the transmission line is located along road ROW, the transmission line poles may be designed to support distribution circuits, either on cross arms or on horizontal post insulators, depending on the voltage of the distribution circuit. Additionally, DP&L will coordinate with communication utility companies having existing communication cables on or near the planned transmission route for transfer of such cables to the new transmission line pole structures where practicable. A description of proposed structure types is listed below.

- For tangent configurations, single wood or steel pole tangent suspension structures, shown conceptually on Figure 5-3, will be utilized. These typical tangent structures will consist of a single pole with three horizontal post insulators to support the transmission conductors on each side of the pole.
- For structures with a light angle configuration, shown conceptually on Figure 5-4, single wood or steel pole light angle suspension structures with horizontal line posts on one side of the structure will be utilized. This structure will most likely be guyed.
- For structures with a heavy angle configuration, shown conceptually on Figure 5-5, single wood or steel heavy angle suspension structure, with three strain/suspension insulators, installed in a pull-off configuration, will be utilized. This structure will be guyed.
- For tangent configurations with long span construction, a single pre-engineered steel pole structure will be utilized. This structure is shown conceptually on Figure 5-6. These typical tangent structures will consist of three braced post insulators to support the transmission conductors in a delta configuration on either side of the pole.
- For dead-end configurations and/or locations where a self-supporting structure is needed, a single pre-engineered steel pole suspension structure with a concrete foundation will be utilized. This structure is shown conceptually on Figure 5-7.
- For tangent configurations along the proposed double-circuit section of the Preferred Route between the West Milton Substation and Davis Road, single wood or steel pole tangent suspension structures, shown conceptually on Figure 5-8, will be utilized. These typical double circuit tangent structures will consist of a single pole with three sets of opposing horizontal post insulators to support the transmission conductors on each side of the pole.

- For dead-end configurations and/or locations where a self-supporting structure is needed along the proposed double-circuit section of the Preferred Route between the West Milton Substation and Davis Road, a single pre-engineered steel pole suspension structure with a concrete foundation will be utilized. This structure is shown conceptually on Figure 5-9.

Although it is not anticipated, the design or ROW conditions may dictate that other types of structures need to be utilized. If these unanticipated conditions arise, they will be addressed on a case-by-case basis.

The conductor used will be designed and constructed for 138 kV operation and will be single 1351.5 kcmil AAC per phase. This conductor has a maximum strength of approximately 23,400 pounds. The overhead ground wire to be installed will be 3/8-inch' EHS steel, or equivalent OPGW (Optical Ground Wire). The conductor used for the 12.47 kV construction will be 477 kcmil ACSR per phase. This conductor has a maximum strength of approximately 11,800 pounds. The neutral wire to be installed will be 4/0 AWG ACSR with a maximum strength of approximately 8,350 pounds. The phase conductors for both the 138 kV and 12.47 kV as well as the overhead ground wires and neutral will be installed in accordance with the latest version of the National Electrical Safety Code. The conductors will be supported by aluminum clamps attached to the polymer horizontal post and polymer strain/suspension insulators. Steel clamps will support the overhead ground wire. At dead-ends, bolted-type dead-end clamps will be used on the conductor and on the ground wire.

(c) Base and Foundation Design

Each wood pole and/or engineered steel pole will be set in an approximately three-foot-diameter hole, nine to 12 feet deep. Crushed rock backfill will be used as backfill for all direct-embed structures. Custom steel poles, if installed, will be supported on reinforced concrete foundations designed for the specific loading conditions of the structures.

(d) Cable Type and Size, where Underground

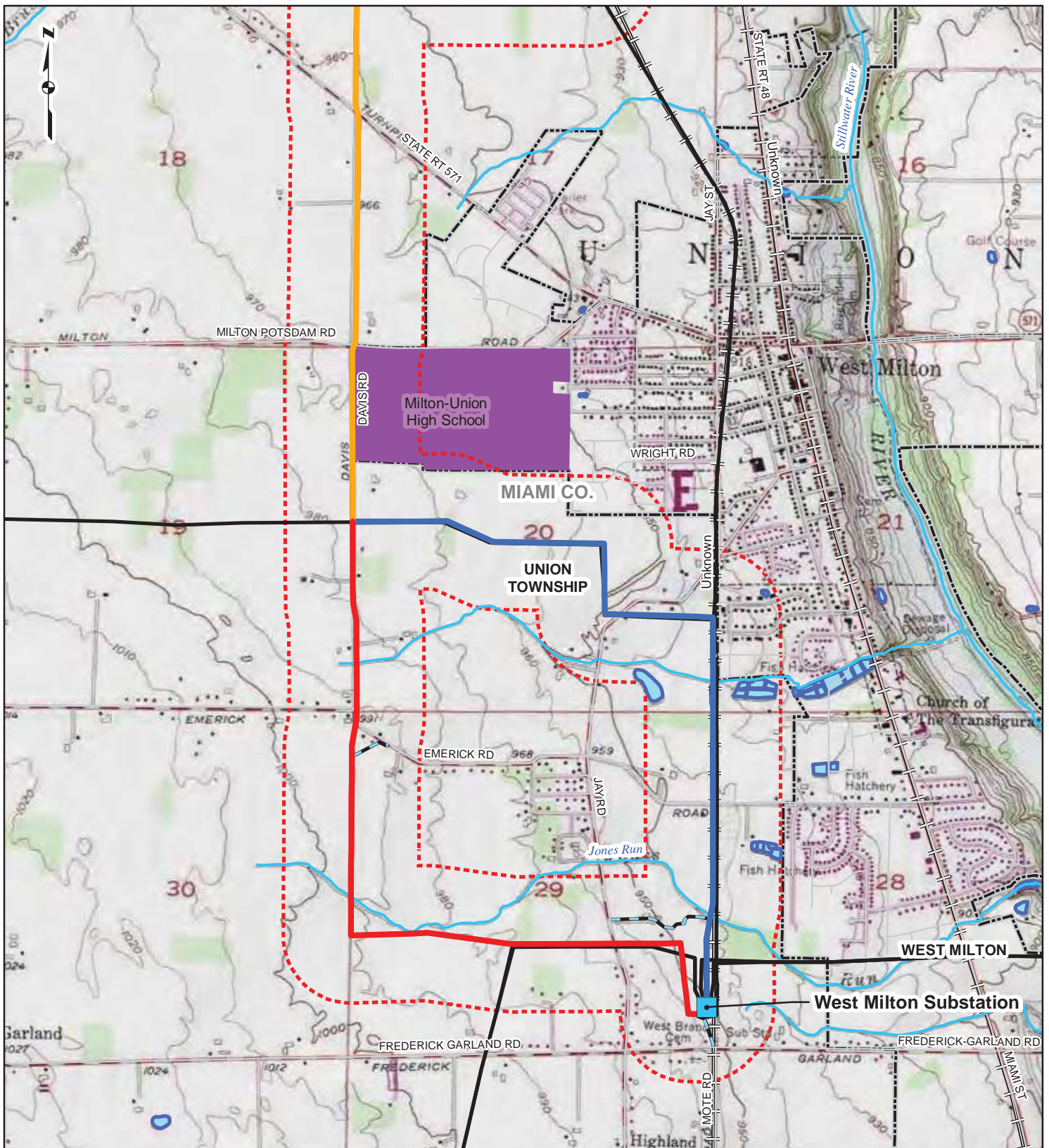
There are no underground cables associated with the proposed transmission line; therefore, this section does not apply.

(e) Other Major Equipment or Special Structures

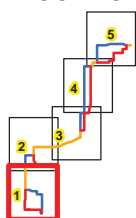
No other major equipment or special structures are required for the Project.

(2) Diagram of Electric Power Transmission Substations

No new electric power transmission substations are proposed for this Project.



PROJECT LOCATION



MIAMI COUNTY, OHIO

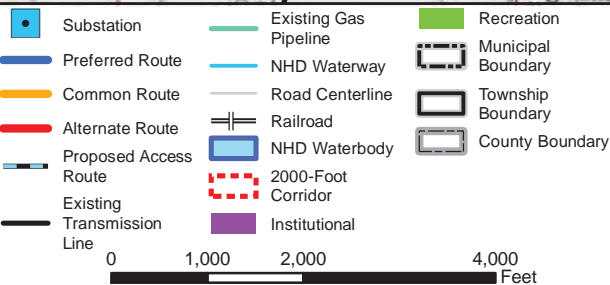


FIGURE 5-1 PROJECT DESCRIPTION SHEET 1 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

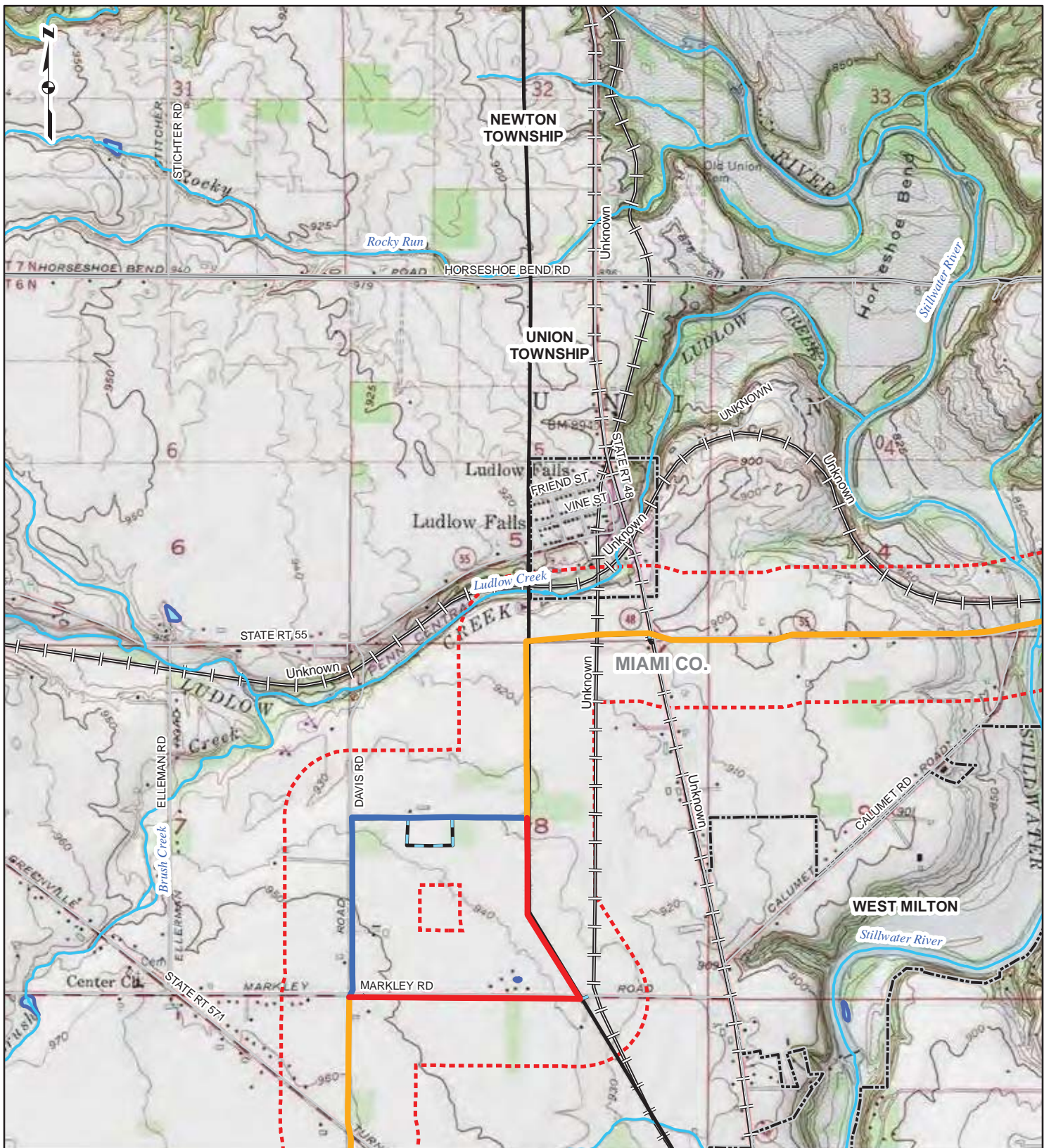
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CHECKED: MBW

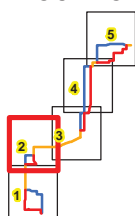
APPROVED: MRW

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PROJECT LOCATION



MIAMI COUNTY, OHIO

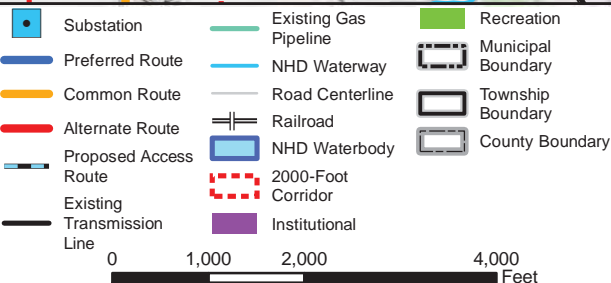


FIGURE 5-1 PROJECT DESCRIPTION SHEET 2 OF 5

WEST MILTON - ELDEAN 138 kV



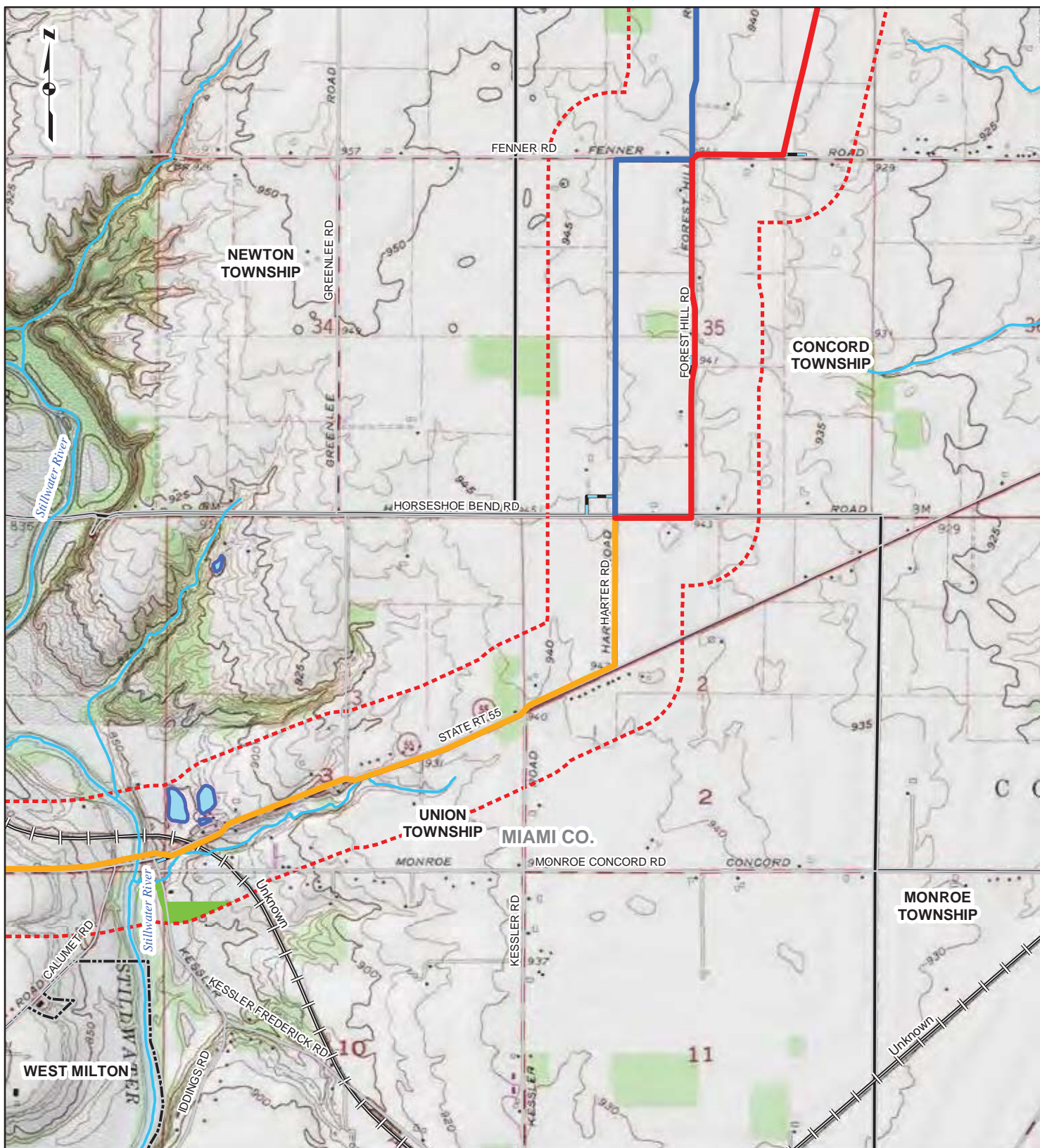
DAYTON POWER & LIGHT



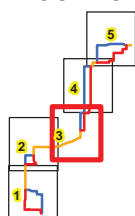
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CHECKED: MBW

DATE: 1/29/2019
APPROVED: MRW

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PLEASANT HILL (1984), TROY (1982), WEST MILTON (1983), OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/2019. USGS NHD, 2018; MIAMI COUNTY, 2018; USGS NHD, 2018; ODOT, 2018; OHPO, 2018.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|----------------------------|-----------------------|--------------------|
| Substation | Existing Gas Pipeline | Recreation |
| Preferred Route | NHD Waterway | Municipal Boundary |
| Common Route | Road Centerline | Township Boundary |
| Alternate Route | Railroad | County Boundary |
| Proposed Access Route | NHD Waterbody | |
| Existing Transmission Line | 2000-Foot Corridor | |
| | Institutional | |

0 1,000 2,000 4,000 Feet

FIGURE 5-1 PROJECT DESCRIPTION SHEET 3 OF 5

WEST MILTON - ELDEAN 138 kV



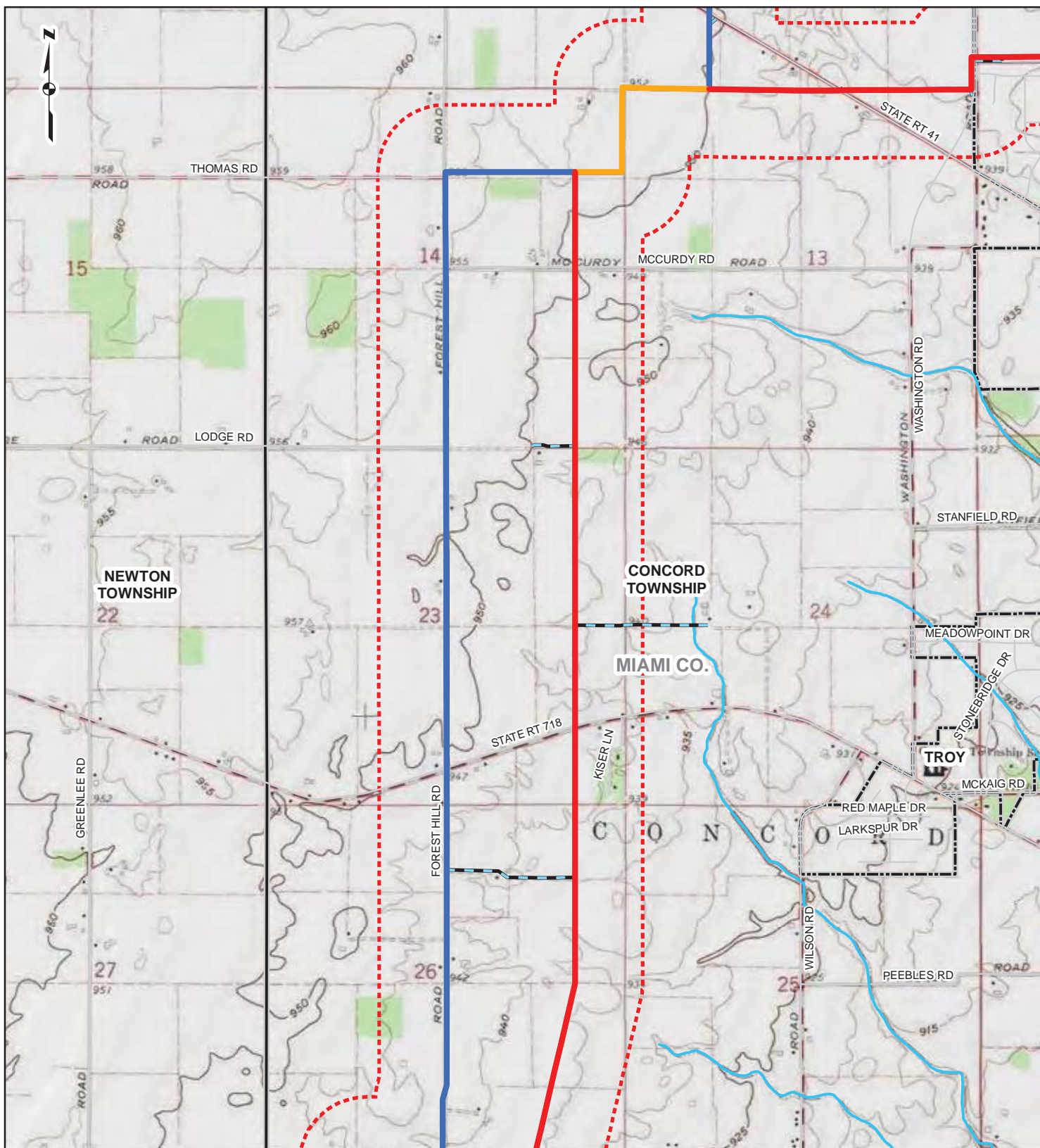
DAYTON POWER & LIGHT



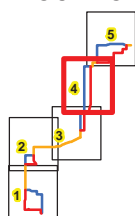
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DATE: 1/29/2019
APPROVED: MRW

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PLEASANT HILL (1984), TROY (1982), WEST MILTON (1983), OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/2019. USGS NHD, 2018; MIAMI COUNTY, 2018; USGS NHD, 2018; ODOT, 2018; OHPO, 2018.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|----------------------------|-----------------------|--------------------|
| • Substation | Existing Gas Pipeline | Recreation |
| Preferred Route | NHD Waterway | Municipal Boundary |
| Common Route | Road Centerline | Township Boundary |
| Alternate Route | Railroad | County Boundary |
| Proposed Access Route | NHD Waterbody | |
| Existing Transmission Line | 2000-Foot Corridor | |
| | Institutional | |

0 1,000 2,000 4,000 Feet

FIGURE 5-1 PROJECT DESCRIPTION SHEET 4 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



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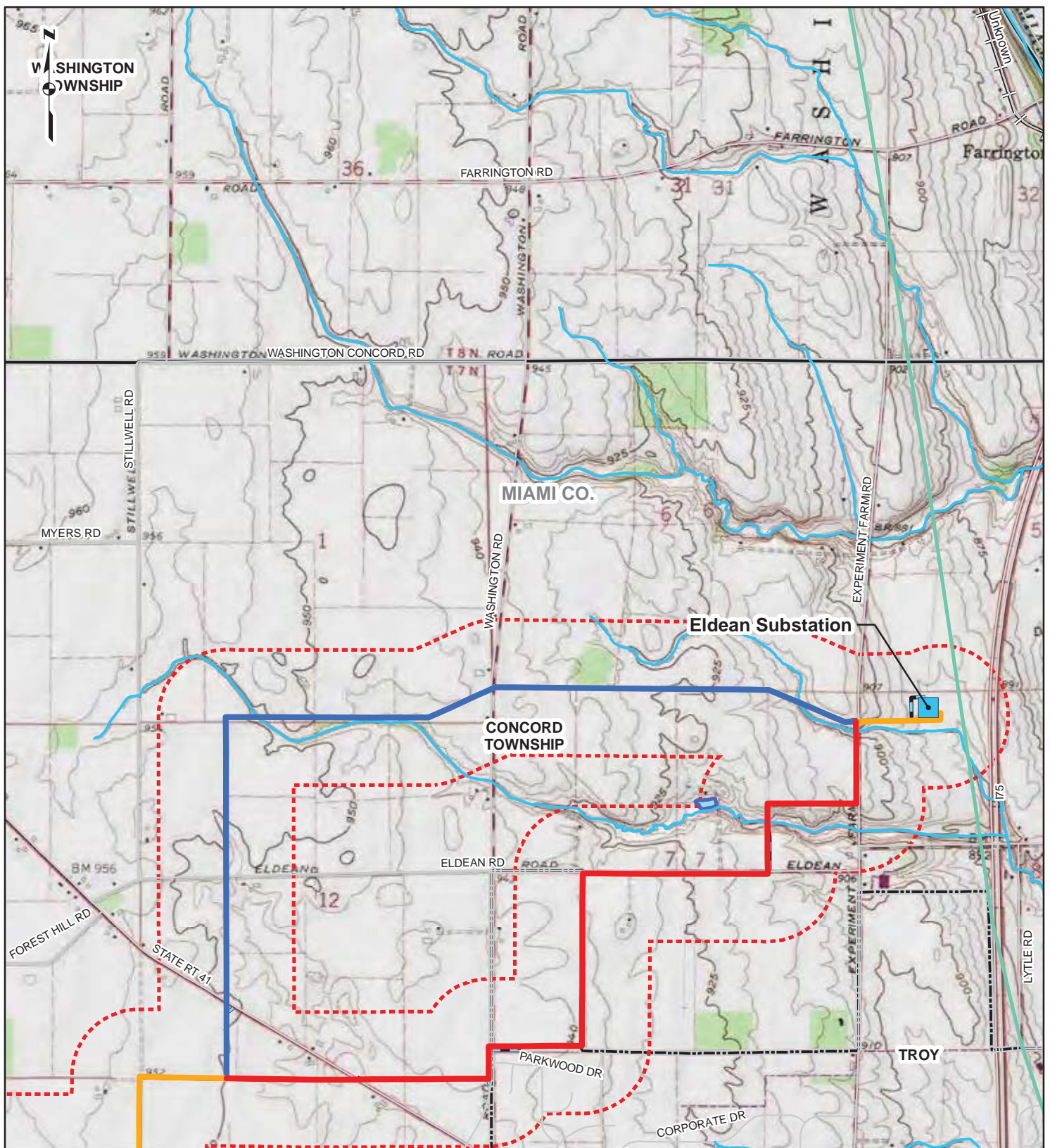
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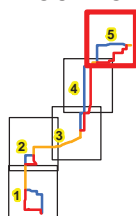
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PROJECT LOCATION



MIAMI COUNTY, OHIO

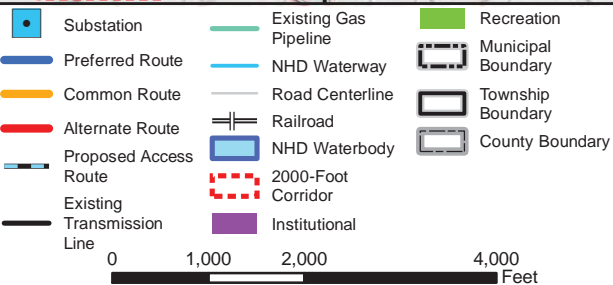


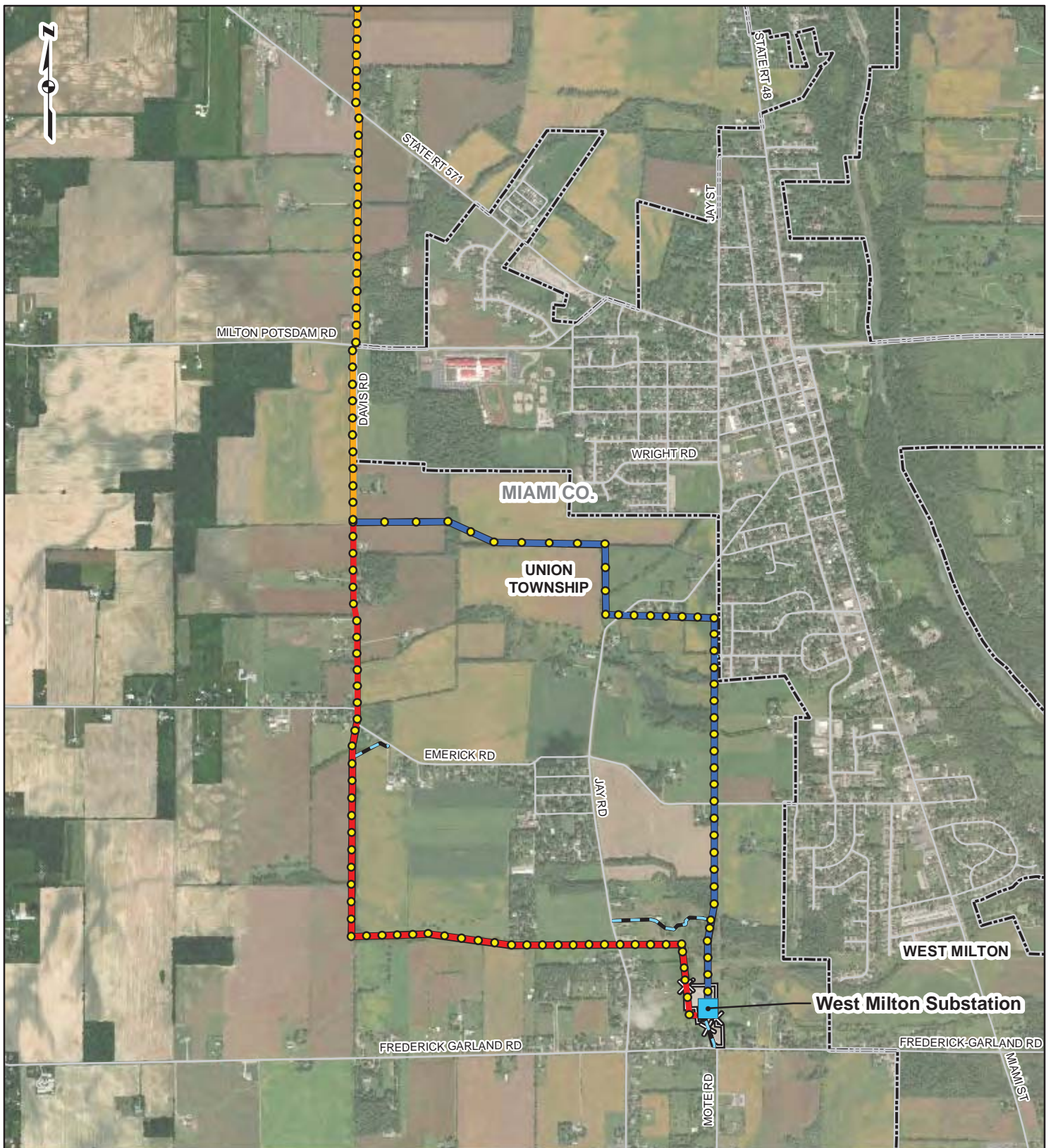
FIGURE 5-1 PROJECT DESCRIPTION SHEET 5 OF 5

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

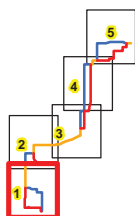
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\\srvp\p16\BUP\Projects\GIS\Projects\G121196.01 - GIS\MXD\OPSB_Application\G121196_01_DPL_West_Milton_Eldean_Project_Description_Fig_5_1_2019_01_29.mxd



PROJECT LOCATION



MIAMI COUNTY, OHIO

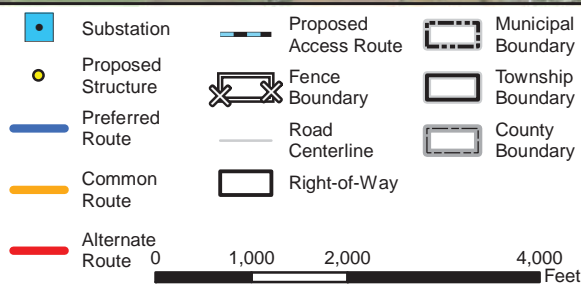


FIGURE 5-2
FACILITIES LAYOUT
SHEET 1 OF 5

WEST MILTON - ELDEAN 138 kV



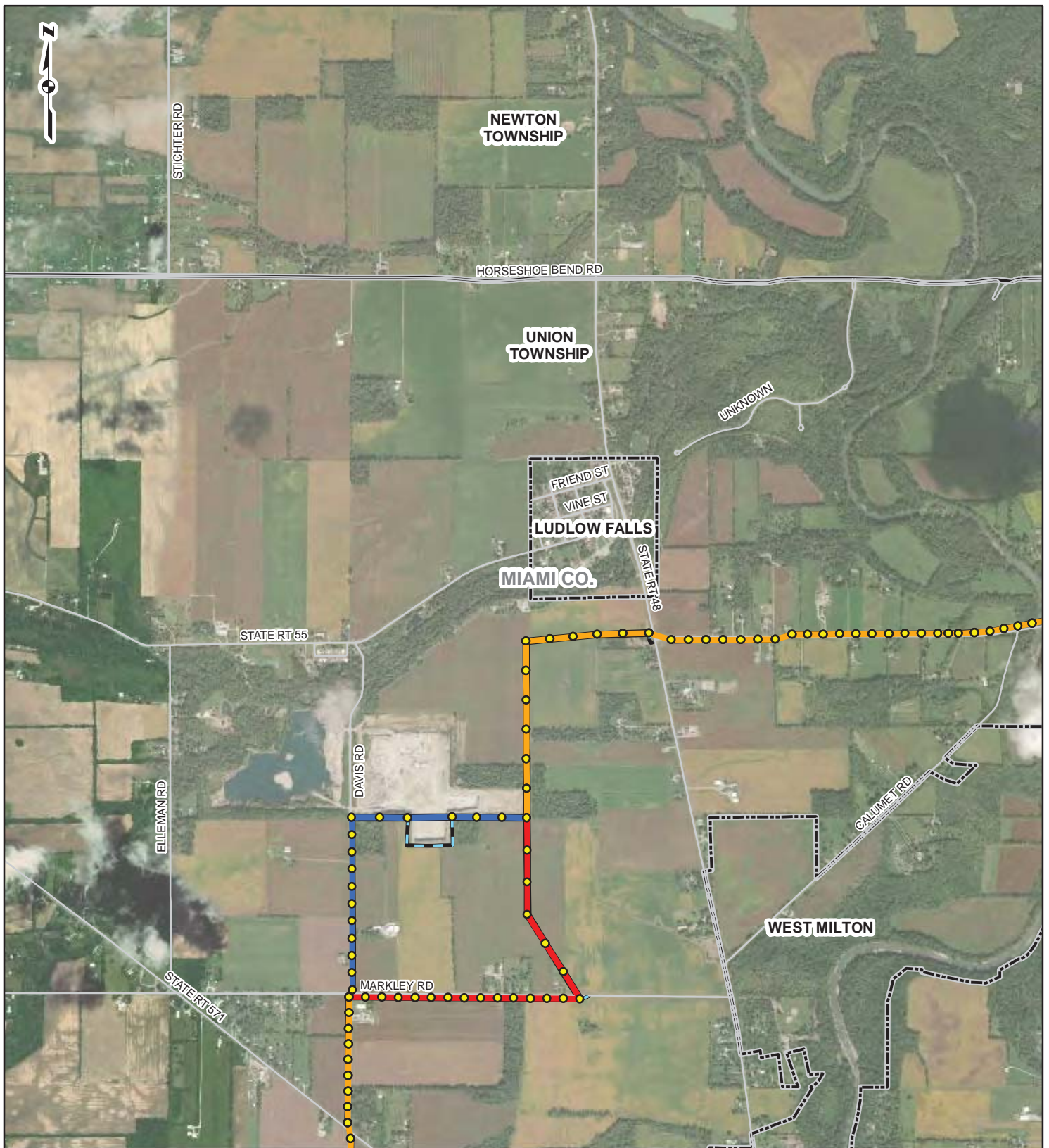
DAYTON POWER & LIGHT



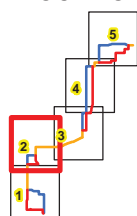
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DATE: 1/29/2019
APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.



PROJECT LOCATION



MIAMI COUNTY, OHIO

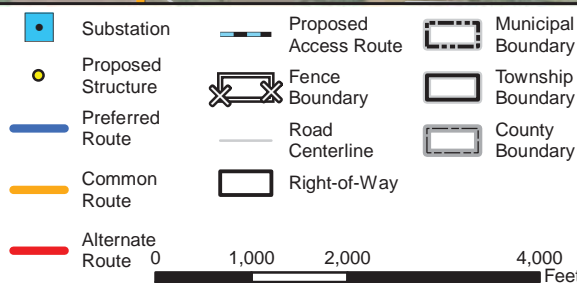
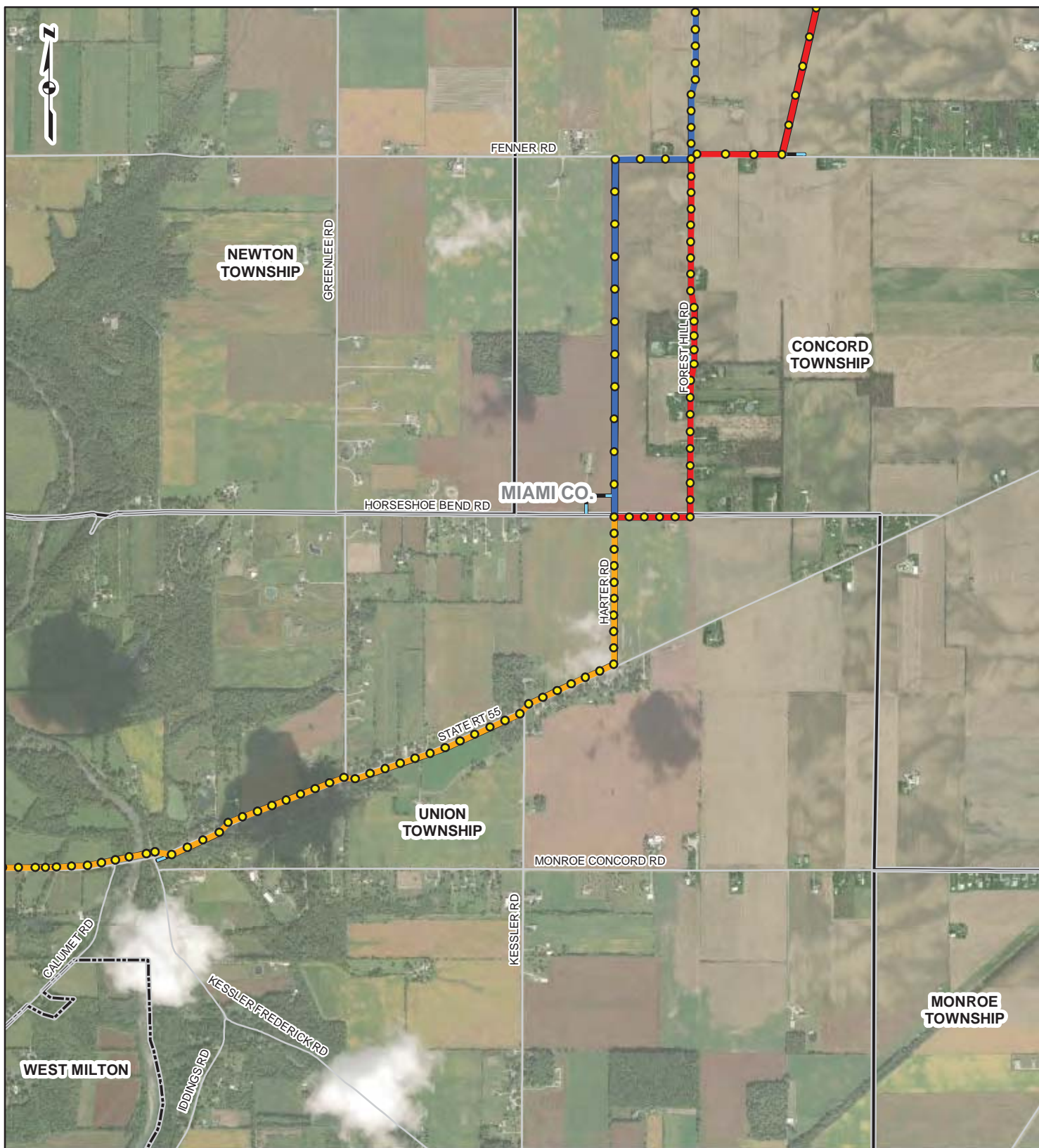


FIGURE 5-2 FACILITIES LAYOUT SHEET 2 OF 5

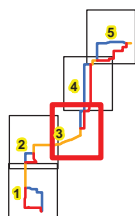
WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.



PROJECT LOCATION



MIAMI COUNTY, OHIO

Substation

Proposed Structure

Preferred Route

Common Route

Alternate Route

0 1,000 2,000 4,000 Feet

Proposed Access Route

Fence Boundary

Road Centerline

Right-of-Way

Municipal Boundary

Township Boundary

County Boundary

FIGURE 5-2
FACILITIES LAYOUT
SHEET 3 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



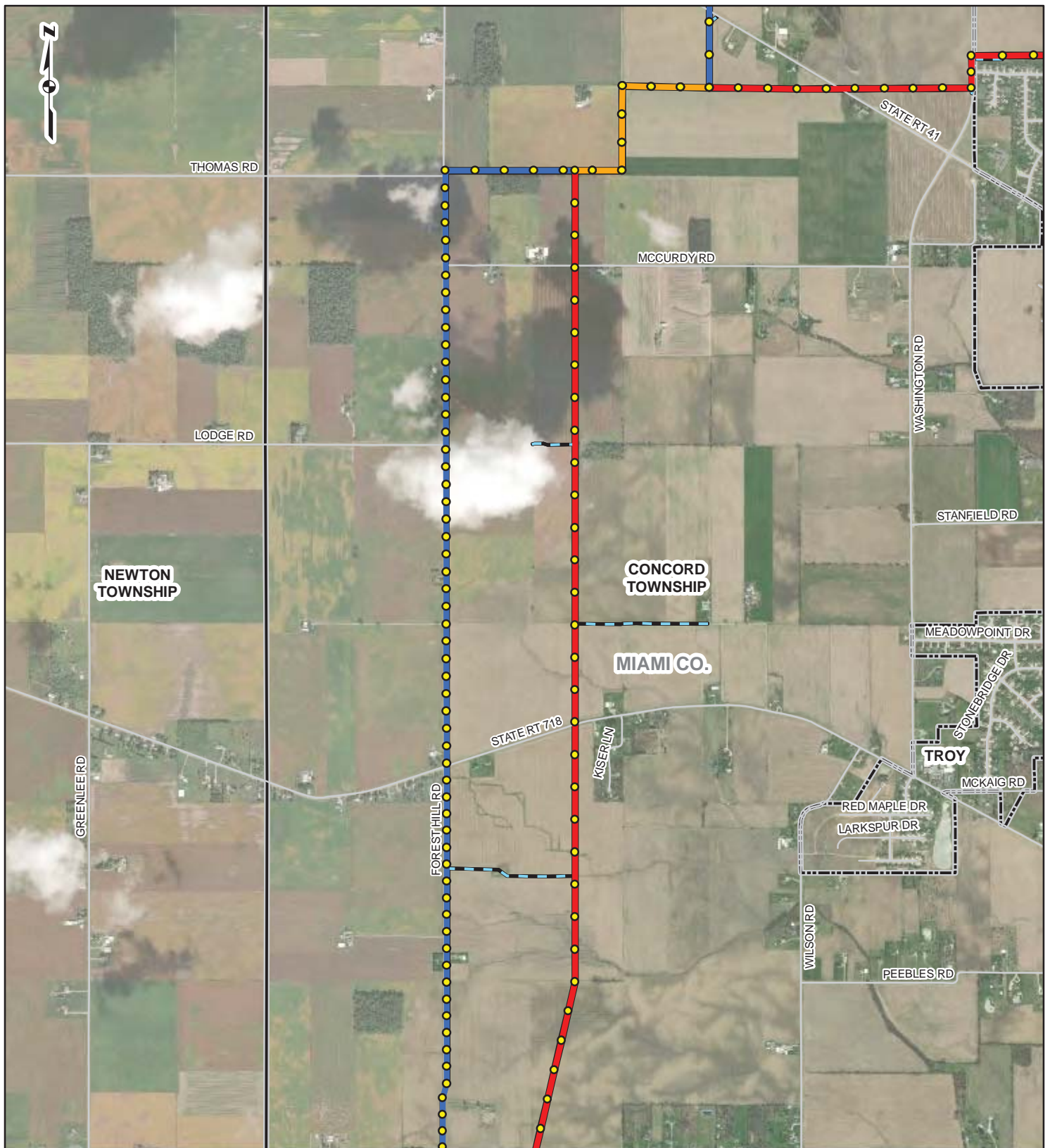
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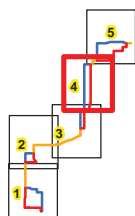
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PROJECT LOCATION



MIAMI COUNTY, OHIO

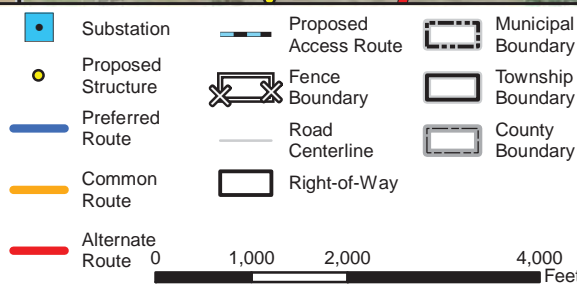
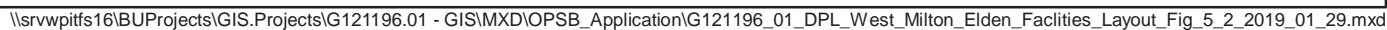


FIGURE 5-2 FACILITIES LAYOUT SHEET 4 OF 5

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.



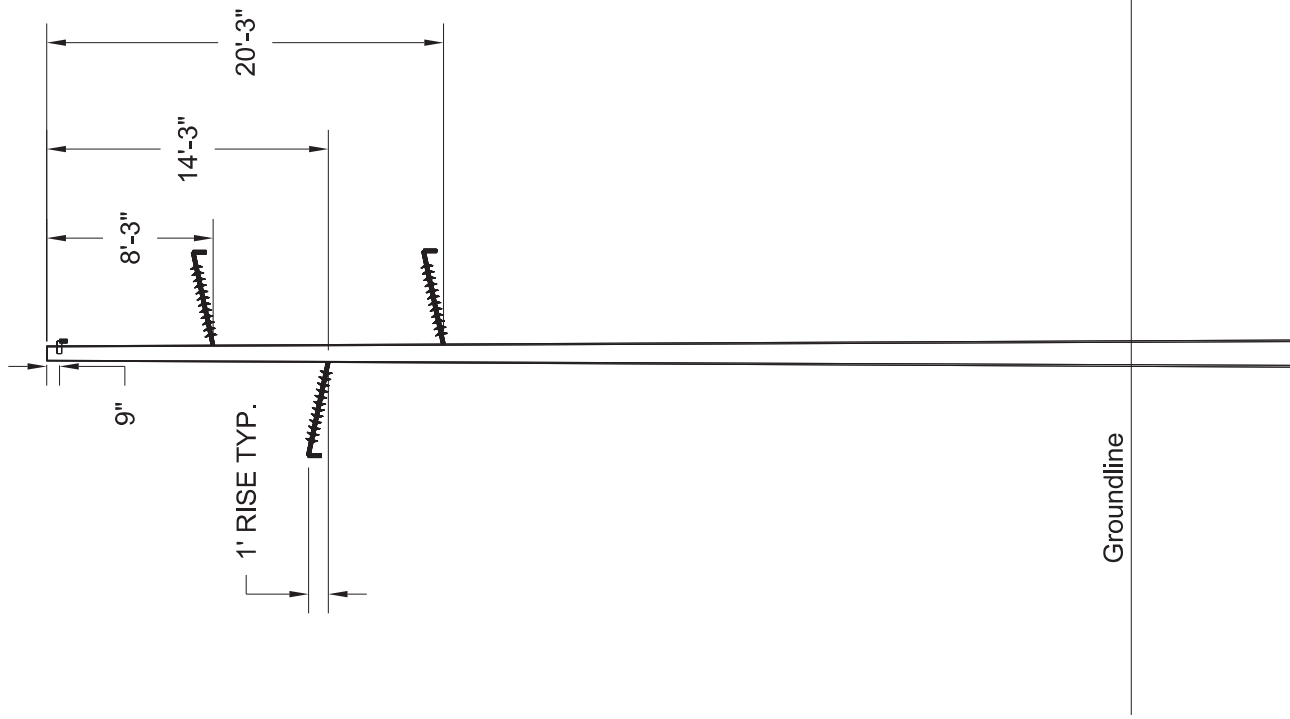


FIGURE 5-3

TITLE		Typical 138kV Tangent Suspension Structure (Wood or Steel)	
FOR		West Milton to Eldean 138kV Transmission	
SCALE	PROJECT	FILE	
DRAWN		APPROVED	
CHECKED		APPROVED	
ENGINEER		PLOT DATE: 10/25/18 HR:	

DP&L

The Dayton
Power and Light
Company

1 of 1

SHEET OF SHEETS

DP&L

The Dayton
Power and Light
Company

1 of 1

SHEET OF SHEETS

REVISIONS

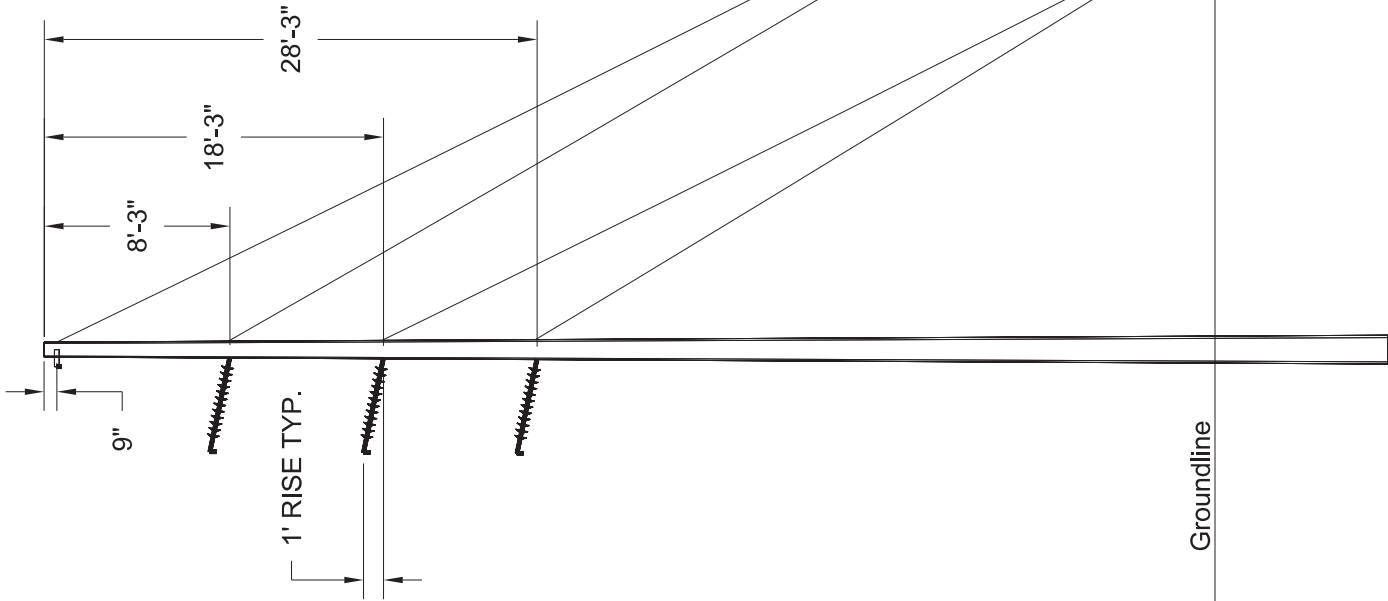
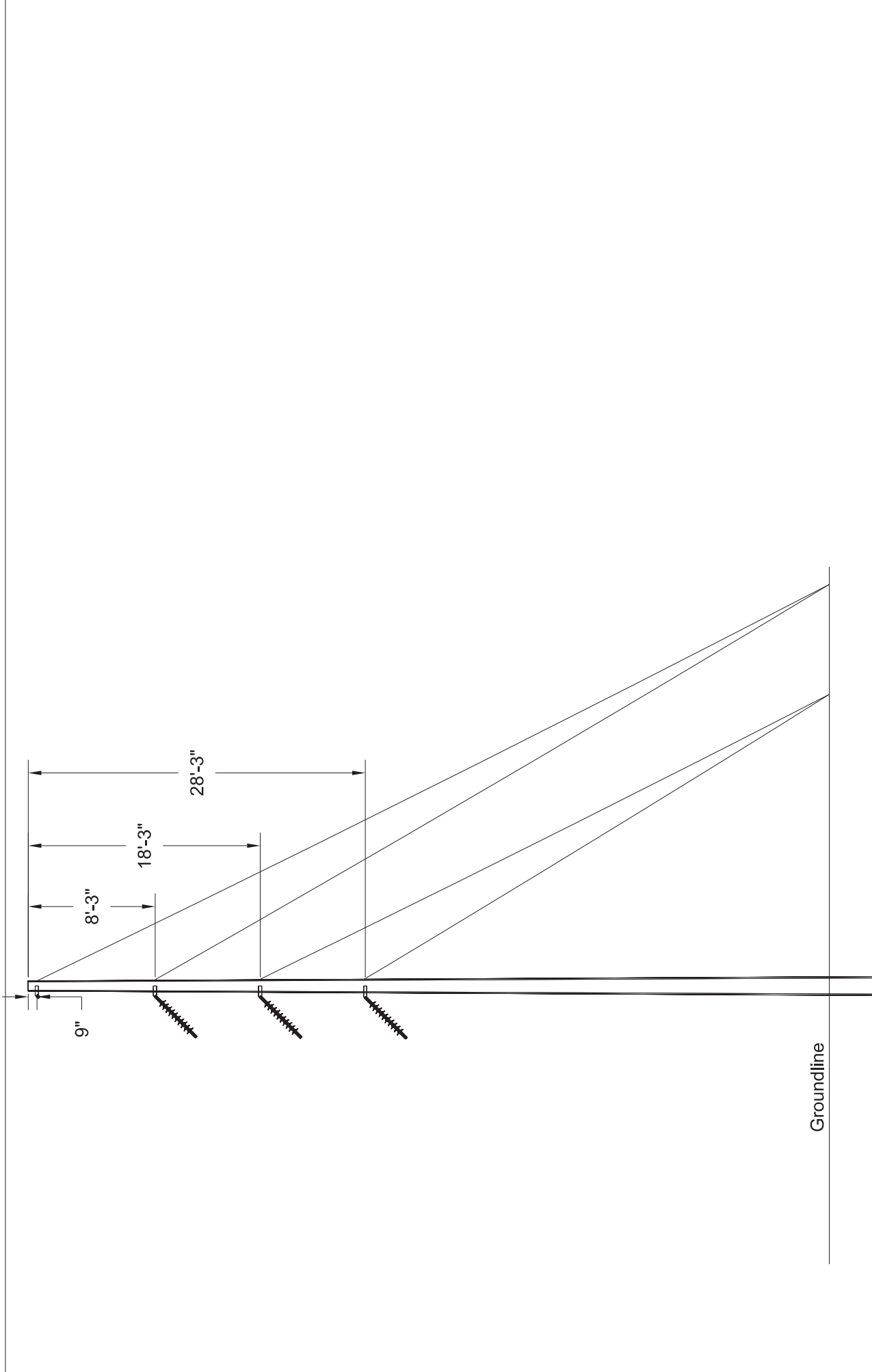


FIGURE 5-4

TITLE		Typical 138kV Light Angle Suspension Structure (Wood or Steel)	
FOR		West Milton to Eldean 138kV Transmission	
SCALE	PROJECT	FILE	
DRAWN		APPROVED	
CHECKED		APPROVED	
ENGINEER		PLOT DATE: 10/25/18	HR:

DP&L

The Dayton Power and Light Company



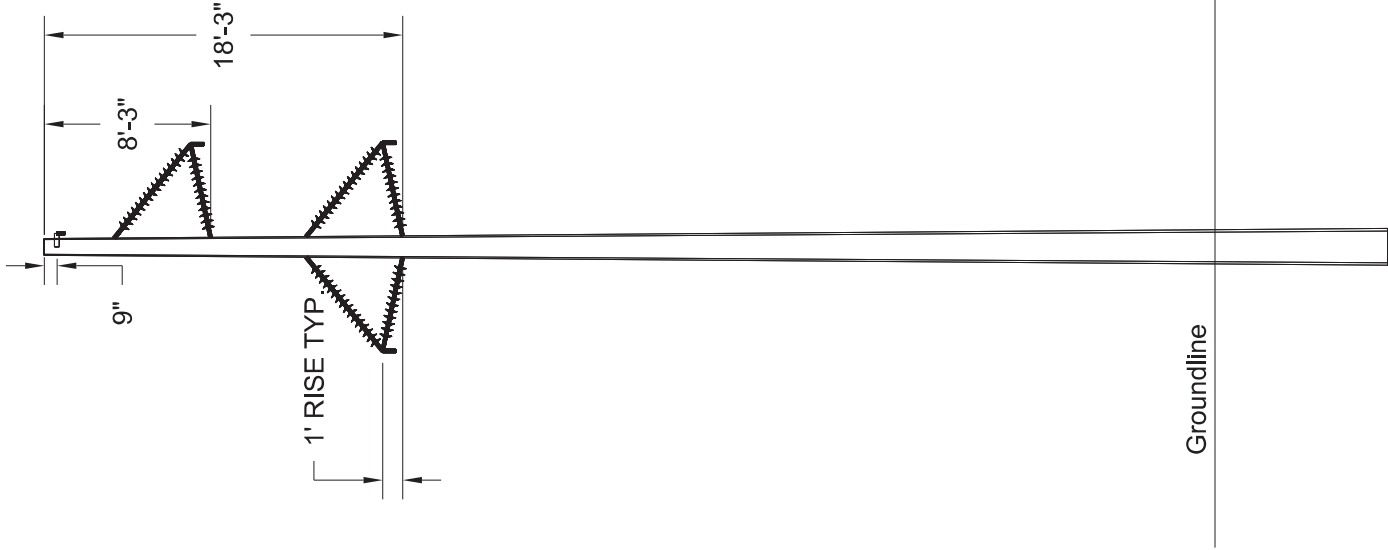
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FOR		West Milton to Eldean 138kV Transmission			
SCALE	PROJECT	FILE			
DRAWN		APPROVED			
CHECKED		APPROVED			
ENGINEER		PLOT DATE: 10/25/18		HR:	

DP&L

The Dayton
Power and Light
Company

REVISIONS

FIGURE 5-5



REVISIONS

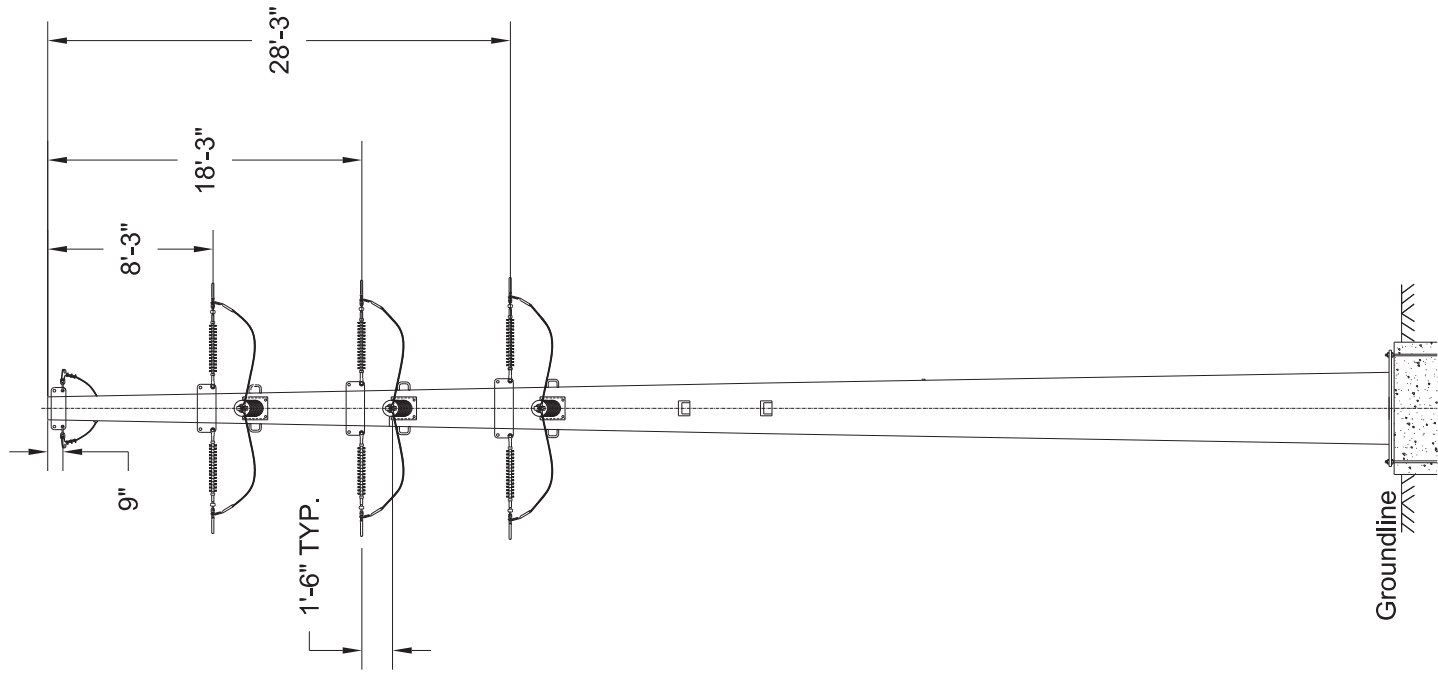
TITLE		Typical 138kV Long Span Tangent Suspension Structure (Steel)	
FOR		West Milton to Eldean 138kV Transmission	
SCALE	PROJECT	FILE	
DRAWN		APPROVED	
CHECKED		APPROVED	
ENGINEER		PLOT DATE: 10/25/18	HR:

The Dayton Power and Light Company

1 of 1

SHEET OF SHEETS

FIGURE 5-6



REVISIONS

TITLE Typical 138kV Self-Supporting Dead End Structure (Steel with Foundation)			
FOR West Milton to Eldean 138kV Transmission			
SCALE	PROJECT	FILE	
DRAWN		APPROVED	
CHECKED		APPROVED	
ENGINEER		PLOT DATE: 10/25/18	HR:

DP&L

The Dayton
Power and Light
Company

1 of 1
SHEET OF SHEETS

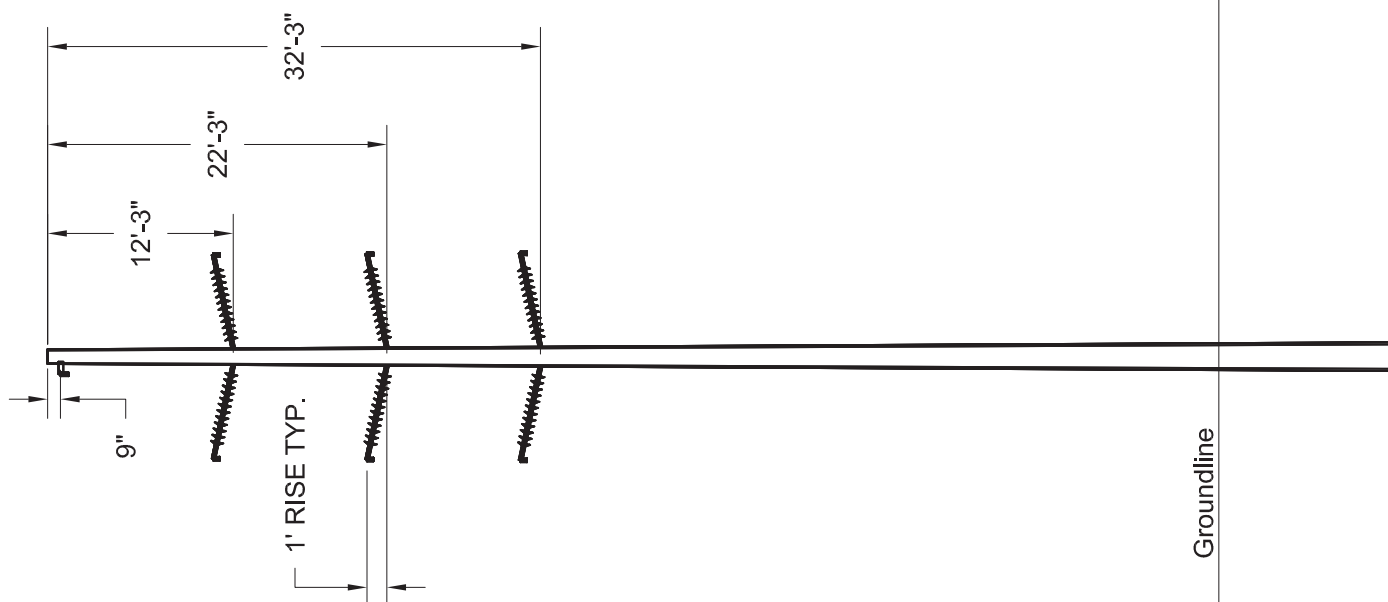
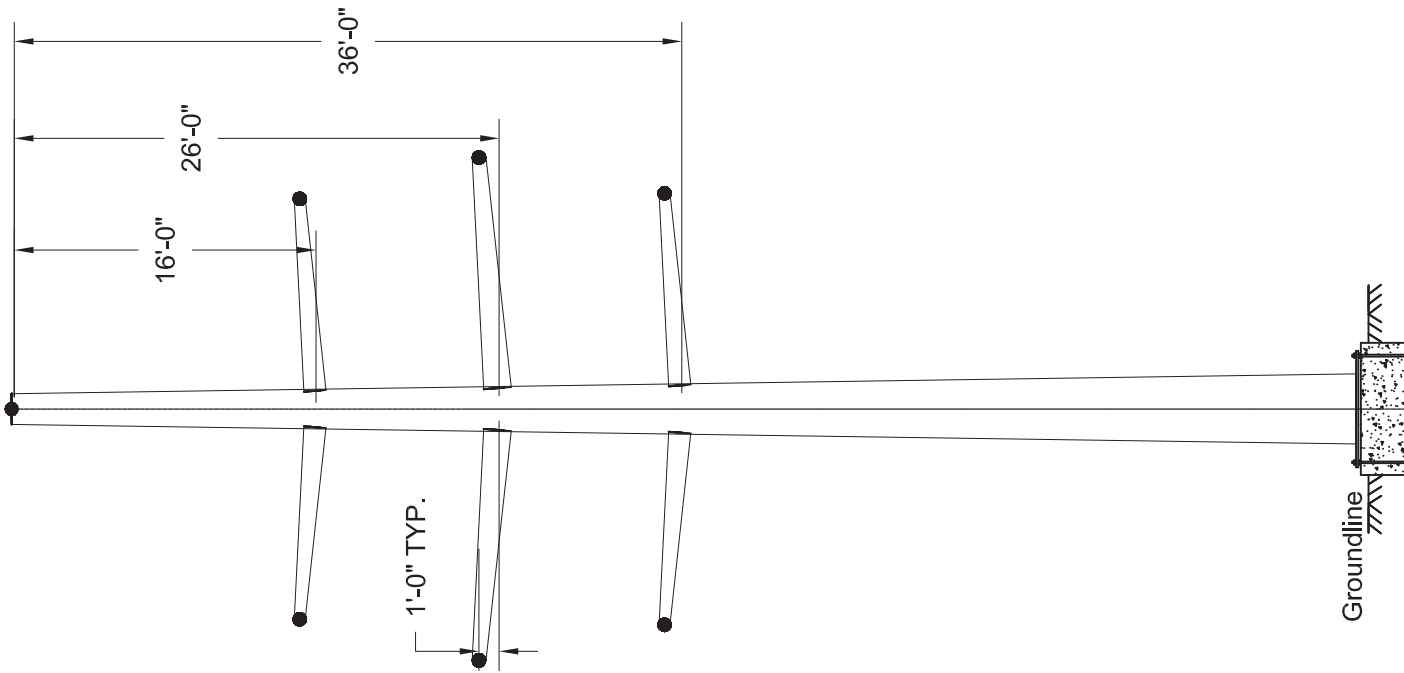


FIGURE 5-8

<div> <div>DP&L</div> <div>The Dayton Power and Light Company</div> </div>				1 of 1	
<div> <div>TITLE</div> <div>Typical 138kV Double-Circuit Tangent Structure (Wood or Steel)</div> </div>					
<div> <div>FOR</div> <div>West Milton to Eldean 138kV Transmission</div> </div>					
SCALE	PROJECT	FILE			
DRAWN		APPROVED			
CHECKED		APPROVED			
ENGINEER		PLOT DATE: 01/04/19		HR:	

REVISIONS



REVISIONS

TITLE Typical 138kV Double-Circuit Self-Supporting Dead End Structure (Steel with Foundation)			
FOR West Milton to Eldean 138kV Transmission			
SCALE	PROJECT	FILE	
DRAWN		APPROVED	
CHECKED		APPROVED	
ENGINEER		PLOT DATE: 01/15/19	HR:



FIGURE 5-9

4906-5-06 ECONOMIC IMPACT AND PUBLIC INTERACTION**(A) OWNERSHIP OF PROPOSED FACILITY**

DP&L will construct, own, operate, and maintain the proposed West Milton-Eldean 138 kV transmission line. Both the Preferred Route and the Alternate Route are 16.7 miles long and will connect the existing West Milton Substation with the existing Eldean Substation.

Both routes would consist of new construction in mostly new ROW or easement corridors. Where the transmission line would be co-located with an existing DP&L transmission line, existing easements would be negotiated with landowners for additional width where needed. DP&L would negotiate for easements for new ROW with landowners for the transmission line route that is selected.

The Preferred and Alternate Routes are aligned adjacent to road ROW for approximately 8.0 miles and 8.0 miles, respectively, out of the total route length of 16.7 miles. Where the proposed transmission line coincides with overhead electric distribution lines (DP&L and others) and communication cables, DP&L plans to transfer the electric distribution lines owned and operated by DP&L onto the new pole structures being installed for the proposed transmission line where reasonable. For distribution circuit lines and communication cables owned and operated by others, DP&L will negotiate with those entities concerning transfer of these utilities to the new transmission poles, where necessary and feasible.

It is possible that some landowners may not agree to easements for ROW after negotiation attempts by DP&L. As necessary, where DP&L cannot reach an easement agreement with landowners located on the transmission line route approved by the OPSB, DP&L will evaluate the feasibility and potential for minor route adjustments with landowners in some cases. DP&L may also utilize appropriation to obtain the necessary ROW to construct the transmission line.

**(B) CAPITAL AND INTANGIBLE COSTS ESTIMATE FOR ELECTRIC POWER TRANSMISSION
FACILITY ALTERNATIVES**

The applicable capital and intangible costs for a variety of components of the Project are included below. Each of the enumerated components is included in Table 6-1. The table also includes estimates of applicable intangible and capital costs for both the Preferred and Alternate Routes of the Project. The items marked as not applicable (“NA”) are components that do not apply to this Project.

TABLE 6-1. Estimates of Applicable Intangible and Capital Costs

FERC Account Number	Description	Preferred Route	Alternate Route
350	(1) Land and Land Rights	\$1,300,000	\$1,300,000
352	(2) Structures and Improvements	NA	NA
353	(3) Substation Equipment	\$520,000	\$520,000
355	(4) Poles and Fixtures	\$6,240,000	\$6,500,000
354	(5) Towers and Fixtures	NA	NA
356	(6) Overhead Conductors and Devices	\$4,550,000	\$4,550,000
357	(7) Underground Conductors and Insulation	NA	NA
358	(8) Underground-to-Overhead Conversion Equipment	NA	NA
359	(9) ROW Clearing and Roads, Trails or Other Access	\$292,500	\$260,000
TOTAL		\$12,902,500	\$13,130,000

FERC = Federal Energy Regulatory Commission

(C) CAPITAL AND INTANGIBLE COSTS ESTIMATE FOR GAS TRANSMISSION FACILITY ALTERNATIVES

This application is for an electric transmission line therefore this section is not applicable.

(D) PUBLIC INTERACTION AND ECONOMIC IMPACT

This section of the application provides information regarding public interaction and the economic impact for each of the route alternatives.

(1) Counties, Townships, Villages, and Cities within 1,000 feet

Miami County and the Townships of Concord and Union are located within 1,000 feet of both the Preferred and Alternate Routes. The City of Troy is within 1,000 feet of the Alternate Route. There are no cities within 1,000 feet of any portion of the Preferred Route. The Villages of Ludlow Falls and West Milton are within 1,000 feet of both the Preferred and Alternate Routes.

(2) Public Officials Contacted

DP&L public outreach staff has contacted several local officials including the Village of West Milton Mayor, City of Troy Mayor, Miami County Board of Commissioners, and township trustees (Concord and Union) to inform them of the Project need and plans. Appendix 6-1 provides a list of the local public officials, including their office addresses and office telephone numbers, who received notification via a letter of the scheduled November 7, 2018 open house and pending application submission. Pursuant to 4906-3-07(A)(1) a copy of the accepted, complete application, will be served either electronically or by disk, on the chief executive office of each municipal corporation, county, township and the head of each public agency charged with the duty of protecting the environment or of planning land use in the area in which the project is located in lieu of all those identified in Appendix 6-1.

(3) Planned Public Interaction

DP&L held public information meetings on March 25, 2014 at the West Milton-Union High School and July 9, 2014 in the Concord Elementary School located in western Troy, Ohio. The public was invited to review the route maps depicting the Preferred and Alternate Routes as well as information concerning construction and operational requirements. Public notices in local newspapers were developed and published; the notices fully described the Project and met the OPSB regulatory requirements. DP&L and GAI representatives facilitated the informational meetings which were designed as an open house format. The Project summary, including a route alternatives map and Project need information, that was made available to the public in the form of handouts are included as Appendix 6-2.

To adhere to the requirements of this section, DP&L held a third public information meeting on November 7, 2018 at the Crystal Room in Troy, Ohio. The public was invited to review the route maps depicting the Preferred and Alternate Routes as well as information concerning construction, structure types, and operational requirements. The public was notified in local newspapers, Troy Daily News and Dayton Daily News, per OAC 4906-3-03(B)(1), and fully described the Project and met the OPSB regulatory requirements. Letters were also sent to affected land owners and tenants, either crossed or contiguous to the preferred and alternate routes per OAC 4906-3-03(B)(2). DP&L and GAI representatives facilitated the additional informational meeting which was designed as an open house format. Copies of informational materials available at the public open house as well as the newspaper notices and mailed letters are included in Appendix 6-3.

DP&L also created a Project website. During the construction of this Project, DP&L will maintain Project updates on its website, retain ROW land agents to discuss Project timelines, construction and restoration activities, and convey this information to affected owners and tenants.

During any phase of this Project, the public is able to contact DP&L at 937-331-4314, or westmiltoneldeanteam@aes.com to ask questions or provide comments. Interested parties may also send written comments or questions to: The Dayton Power and Light Company, ATTN: West Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439.

Information is also available at the Project's website at <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west-milton/>.

For copies of this application, the public can do any of the following:

- Go to the local Library (Troy-Miami County Public Library or Milton-Union Public Library);
- Go to <http://opsb.ohio.gov/> and search for this Project's case number (Case No. 18-1259-EL-BTX); or
- Access the Project's website on <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west-milton/> and follow the directions to obtain a copy.

DP&L is logging comments and information provided through its public interaction program. This information will be shared with the OPSB Staff.

At least seven days prior to any construction activities, a DP&L ROW agent will notify the affected landowners or the tenant by mail, telephone, or in person, depending on landowner/tenant preference.

(4) Liability Insurance or Compensation

DP&L will maintain insurance against claims and liability for personal injury, death, and property damage arising from the operation of the transmission line and facilities. The insurance policy or policies will insure DP&L to the extent of their interests. DP&L maintains excess Commercial General Liability insurance covering indemnity to at least \$5,000,000. This insurance is on a per occurrence basis and is established to include automobile and contractual liability.

(5) Tax Revenues

The Preferred and Alternate Routes are located within Miami County and Concord and Union Townships and the Village of West Milton and City of Troy. The proposed Project will have a significant positive impact on the local tax base, including local school districts and other taxing districts that service the area where the proposed transmission line will be located. DP&L will pay property taxes on utility facilities in each township.

Based on 2018 tax rates, the estimated property taxes to be distributed by township (a portion of which includes Miami County) over the first year after the Project are as follows:

Preferred Route

Union Township	\$ 582,480
Concord Township	<u>\$ 448,265</u>
Total:	\$1,030,745

Alternate Route

Union Township	\$ 621,667
Concord Township	<u>\$ 441,508</u>
Total:	\$1,063,175

4906-5-07 HEALTH AND SAFETY, LAND USE, AND REGIONAL DEVELOPMENT**(A) HEALTH AND SAFETY****(1) Compliance with Safety Regulations**

The construction and operation of the Project will comply with the requirements specified in the NERC mandatory Reliability Standards, the National Electrical Safety Code, the Public Utilities Commission of Ohio, and will meet all applicable safety standards established by the Occupational Health and Safety Administration. DP&L's safety policies comply with federal, state, and local regulations and policies. DP&L's policies are developed by DP&L's management under the guidance of AES management and board of directors. All parties are responsible to ensure that DP&L's policies meet or exceed the requirements set forth by all DP&L's regulating entities.

The first priority of all DP&L operating areas is to ensure the safety of all our employees, contractors, and the public. DP&L takes this priority very seriously and incorporates safety into all aspects of operations. Safety takes precedence over all other utility operations and is listed first amongst the mission and values of AES.

(2) Electric and Magnetic Fields

In accordance with the OPSB requirements specified in OAC 4906-5-07(A)(2), the following subsections discuss the analysis of electric and magnetic fields ("EMF") associated with the Project. Any revision required to the included EMF information resulting from the proposed double-circuit line configuration optimization, which includes a single circuit of an existing line (West Milton-Greenville) and a section of the proposed Preferred Route (West Milton-Eldean) between the West Milton Substation and Davis Road will be provided to OPSB if the revision is warranted when available.

(a) Calculated Electric and Magnetic Field Strength Levels

EMF magnitudes were calculated for the two representative cross-sections of the transmission line design as on Figure 7-1. The first cross-section (left; Section 1) is the 138 kV circuit in an alternating configuration with a 12.47 kV distribution underbuild on a horizontal cross-arm, and the second cross-section (right; Section 2) is the 138 kV circuit by itself, in an alternating configuration.

For both cross-section models, the 138 kV circuit consists of three 1.340-inch-diameter 1351.5 kcm AAC conductors with a 0.375-inch-diameter galvanized steel ground wire at the top of the pole. The 12.47 kV distribution circuit (beneath the 138 kV circuit in Section 1) consists of 0.814-inch-diameter 477 kcm ACSR conductors—three phase conductors on the cross-arm and a neutral on the steel pole.

The 12.47 kV system is stepped down from 138 kV via delta-wye connected transformers, and thus, the 138 kV circuit is assumed to lead the 12.47 kV circuit by 30 degrees.

Calculations described herein were performed using the Corona and Field Effects Program developed by engineers at the Bonneville Power Administration (“BPA”). The BPA program utilizes exact electric and magnetic field solutions for two-dimensional cross-section models that assume infinite straight line conductors at a constant height. The approximate lowest sag height for each cross-section span is used for the calculations to arrive at estimates of worst-case field magnitudes; electric and magnetic field magnitudes generally decrease moving toward the pole structures because of increasing conductor height from the ground.

Table 7-1 lists the coordinates for each of the phase conductors, shield wire, and neutral as modeled in the two representative cross-sections. Dimensions are in feet with horizontal (x) values relative to the pole center line and with conductor heights (y) relative to ground level for the section being modeled based on calculated conductor sag. Calculations were performed for a 12.47 kV underbuild with a single-phase conductor (Model Section 1A) and also with three phase conductors (Model Section 1B). Dashes in the table indicate that the conductor is not included in that specific cross-section model.

**TABLE 7-1. Conductor Position Coordinates for each Modeled Cross-Section
(Relative to centerline and Ground Level)**

Model	138kV Circuit Conductors								12.47kV Underbuild Conductors							
	A phase		B phase		C phase		shield wire		A phase		B phase		C phase		neutral	
	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)	x (ft)	y (ft)
Section 1A	5.33	48.75	-5.33	43.00	5.33	36.83	0.50	63.00	-4.25	26.00	--	--	--	--	0.50	22.17
Section 1B	5.33	48.75	-5.33	43.00	5.33	36.83	0.50	63.00	-4.25	26.00	-1.25	26.00	4.25	26.00	0.50	22.17
Section 2	5.33	39.92	-5.33	34.00	5.33	27.83	0.50	54.42	--	--	--	--	--	--	--	--

Electric and magnetic field magnitudes are calculated for each of the cross-sections at two-foot intervals along paths crossing beneath the line at a height of 3.28 feet (one-meter) aboveground level. For the purpose of EMF calculations, the ROW was assumed to be approximately 37.5 feet to either side of the pole center line (x=0); calculations are shown 40 feet to both sides of the center line. Electric and magnetic field results are presented in the next two sections.

Electric Field Strength Results

Electric fields are calculated assuming phase-to-phase voltages at 105% of the 138 kV rating (144.9 kV) for the transmission conductors, and a maximum of 15 kV for distribution circuit. Figure 7-2 shows the calculated root mean square (“rms”) electric field magnitude as a function of position along paths that cross beneath the lines at a height of 3.28 feet (1m) above ground level.

The largest electric fields occur beneath the 138 kV circuit alone (Section 2 in Figure 7-1), with a maximum of 1.3 kV/m. One can see that the electric fields from the 138 kV circuit are shielded to some extent by the underbuild conductors as evidenced by lower electric field peaks with a maximum of approximately 0.5 kilovolts per meter (kV/m) for both the single-phase (Section 1A) and

three-phase (Section 1B) underbuild configurations. Electric field calculations results are summarized in Table 7-2 which lists the electric field magnitudes (kV/m) at EROW (both sides) and the maximum beneath the lines.

TABLE 7-2. Electric and magnetic field results summary listing of the calculated rms field magnitudes; electric fields in kV/m and magnetic fields in units of milligauss (mG) at both sides EROW and maximum beneath the line

Model		Electric Field (kV/m)	Magnetic Field (mG)		
Cross-Section	Description	105% Nominal Voltage	Summer Normal Load	Short-Term Emergency Load	Winter Normal Load
1A	138kV w/ 1-ph 12.47kV	0.36/0.50/0.33	44/123/54	56/157/67	61/173/74
1B	138kV w/ 3-ph 12.47kV	0.34/0.52/0.34	46/125/57	57/158/71	63/175/78
2	138kV alone	0.44/1.27/0.41	50/138/57	63/171/71	86/234/96
		EROW/MAX/EROW	EROW/MAX/EROW	EROW/MAX/EROW	EROW/MAX/EROW

Magnetic Field Strength Results

Magnetic field calculations were performed for the two cross-sections models under three load scenarios: summer normal, short-term emergency, and winter normal. The power flow ratings for these three load scenarios are listed in Table 7-3. Balanced three-phase currents are assumed for all calculations except for the single-phase underbuild scenario (Section 1A) in which all single-phase current is assumed to return on the neutral conductor.

TABLE 7-3. Circuit Power Ratings for Three Load Scenarios Used for Magnetic Field Calculations

Load Condition	138kV Circuit	12.47kV Circuit
Summer Normal	307 MVA	13 MVA
Short-Term Emergency	382 MVA	17 MVA
Winter Normal	419 MVA	19 MVA

Figures 7-3, 7-4, and 7-5 show calculated magnetic fields from the two cross-section models for the Table 7-3 load scenarios. Magnetic fields are largest with the 138 kV circuit by itself with the larger phase-to-phase spacing and lower height without the underbuild. The 138 kV circuit load scenarios of 307, 382, and 419 MVA correspond to 1284, 1598, and 1753 amperes of three-phase load current, respectively, while the 13, 17, and 19MVA scenarios at 12.47 kV correspond to 602, 787, and 880 amperes of three-phase load.

Magnetic field results from the two cross-section models for both sides of the ROW (EROW) and maximum values beneath the lines are summarized in Table 7-2 for the three load scenarios.

(b) Current State of EMF Health Knowledge

Humans are all continually exposed to a wide variety of natural and man-made electric and magnetic fields. They are generated anywhere there is a flow of electricity including appliances and power equipment. Electric fields are associated with the voltage of a source. Magnetic fields are associated

with the flow of current in a wire. The strength of these fields decreases rapidly with distance from the source. Electricity is a beneficial part of our daily lives, but whenever electricity is generated, transmitted, or used, and electric and magnetic fields are created. A large volume of research and analysis on the question of health effects related to EMF exposure has been generated over many decades (with an increase of interest over the past 25 years).

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program ("EMF-RAPID") in the Energy Policy Act (PL 102-486). In the RAPID program, the National Institute of Environmental Health Sciences ("NIEHS"), National Institutes of Health and the Department of Energy were designated to fund, direct, and manage research and analysis aimed at providing scientific evidence to clarify the potential for health risks from exposure to power-line EMF.

Solid and relevant EMF results were generally obtained under the research supported by the NIEHS (through the EMF-RAPID program). The NIEHS program supported research in the task of determining what, if any, aspects of EMF interactions with biological systems were (1) real and reproducible, and (2) had the potential to increase the risk of cancer. In 1999, the NIEHS submitted its report to the U.S. Congress: "NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields." The report concluded the following:

"The scientific evidence suggesting that extremely low frequency fields (ELF)-EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults...In contrast, the mechanistic studies and the animal toxicology literature fail to demonstrate any consistent pattern across studies...No indication of increased leukemias in animals have been observed...virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between ELF-EMF at environmental levels and changes in biological function or disease status. The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern...The NIEHS does not believe that other cancers or non-cancer outcomes provide sufficient evidence of a risk to currently warrant concern." (NIEHS, 1999, 9-10)

The following federal government agencies' websites provide additional information on EMF:

1. Centers for Disease Control and Prevention/National Institute of Occupational Safety and Health: <http://www.cdc.gov/niosh/topics/emf>
2. National Institute of Environmental Health Sciences/National Institute of Health: <http://www.niehs.nih.gov/health/topics/agents/emf/>

(c) Line Design Considerations

DP&L designs its transmission line facilities according to National Electrical Safety Code specifications, engineering parameters and cost. DP&L proposes to install the 138 kV transmission line primarily on wood tangent structures (steel structures at select locations) supported on horizontal post insulators. Reverse phasing of circuits is not an option for this Project since it consists of constructing a single circuit. The sections of transmission line that will have distribution lines underbuild is estimated to have lower EMF strengths.

(d) EMF Public Inquiries Policy

Information on electric and magnetic fields is available on DP&L's website (<http://www.dpandl.com/education/electricity-information/electric-and-magnetic-fields/>).

It describes the basics of electric fields and magnetic fields, scientific research efforts, and DP&L's commitment to safety and sharing information on any new research findings on this topic.

(3) Estimate of Radio, Television, and Communications Interference

Radio interference can be experienced in the AM broadcast band (535-1605 kHz) and FM band (88-108 megahertz MHz), caused by transmission line gap-type discharge (1-1000 MHz). Dielectric discharge due to air ionization, known as "corona", is not a concern with 138 kV transmission lines planned in this Project. Gap-type discharge, such as that emitted by loose or defective transmission hardware, typically is localized and can be readily detected and corrected, or additional mitigation measures can be applied to eliminate the interference source.

DP&L does not have any formal policy for radio & television interference other than investigation of any complaints. With the advent of digital television broadcasts, complaints of interference from electric lines are very rare.

(4) Noise from Construction, Operations, and Maintenance

Construction, operation, and maintenance activities will typically be completed during daylight hours. Construction noise can be created from on-site and off-site sources. On-site noise sources would principally consist of the operation of heavy-duty diesel and gasoline-powered construction equipment. Off-site noise sources would include vehicles commuting to and from the job site, as well as from trucks transporting material to the staging areas or construction ROW. The following site and ground disturbing construction activities would be required to construct the new transmission line; 1) centerline surveyed and staked; 2) existing access roads improved only where necessary; 3) work areas cleared of vegetation and debris as needed; 4) materials distributed along the centerline; 5) pole holes and/or foundations installed, and poles erected; 6) ground wire, conductors installed; and 7) the site would be cleaned-up and reclaimed.

The operation of powerlines can generate a small amount of sound energy. The audible noise from line sources is composed of two components:

1. A broadband (random) component characterized as having high frequency content (different from more common environmental noises).
2. Pure tone (hum) components, most noticeably second and fourth harmonics of the power frequency are superimposed on the broadband noise.

No significant noise impacts are anticipated from the operation of the proposed transmission line. Noise impacts from maintenance operations will primarily be related to vegetation management within the ROW and infrequent repairs to the structures, insulators, and conductors. Vegetation management activities will be short in duration and typically occur on a five-year cycle. Overall, noise impacts generated by operation and maintenance activities are not anticipated to be significant.

As the primary source of noise for the proposed Project will be a result of construction activities, emphasis will be placed upon maintaining construction equipment in proper working condition with functioning mufflers and performing construction activities during daylight hours. No additional mitigation is planned beyond what is described here.

(a) Blasting Activities

Dynamiting and blasting activities are not anticipated during construction of the Project.

(b) Operation of Earth Moving and Excavating Equipment

Noise levels from the equipment at distances of 50 feet are shown in Table 7-3. The maximum intermittent land-based construction noise levels would range from approximately 80 to 90 dB(A) at 50 feet for supporting structure assembly and tamping operations. Direct noise impacts would result from construction activities occurring adjacent to sensitive receptors, such as houses and churches. However, this noise would be short-term, occurring mostly during daylight hours. It should be noted that noise levels are calculated based on the assumption that noise from a localized source is reduced by approximately 6 dB(A) with each doubling of distance from the source of the noise. Noise impacts resulting from construction will be temporary. The anticipated duration of the entire project is approximately 14 months, with noise generating activities during construction limited to one to two weeks maximum at any location.

TABLE 7-3. Typical Construction Noise Sources

Construction Activity	Average Construction Activity Sound Level at 50 Feet from Source [dB(A)]
Compactors (Rollers)	74
Front Loaders	78
Backhoes	83
Tractors	86
Scrapers, Graders	87
Pavers	87
Trucks	88
Concrete Mixers	81
Concrete Pumps	82
Cranes (Moveable)	81
Cranes (Derrick)	87
Pumps	70
Generators	77
Compressors	81
Pneumatic Wrenches	86
Jack Hammers and Rock Drills	89
Pile Drivers (Peak)	100
Vibrators	75
Saws	77
Front Loaders	78

Note: Sound level with all pertinent equipment operating (Bolt et al., 1971)

In comparison to these construction noise levels, the following are some typical levels for noise sources (standing adjacent to these sources) in a residential environment¹:

- Refrigerator 42 dB(A)
- Microwave 67 dB(A)
- Kitchen Exhaust Fan 70 dB(A)
- Hairdryer 87 dB(A)
- Washing Machine 67 dB(A)

¹ Noise Pollution Clearinghouse Online Library, Typical Noise Levels, www.nonoise.org

- Lawnmower 91 dB(A)
- Circular Saw 102 dB(A)

(c) Driving of Piles, Rock Breaking or Hammering, and Horizontal Directional Drilling

Driving of piles is not anticipated during construction of the Project. If required, there will be a temporary increase in noise during construction only.

(d) Erection of Structures

Pole structures will be installed by vehicle-mounted cranes or equivalent equipment. Self-supporting steel poles will require delivery of concrete for foundation construction, including excavation work for the foundation. There will be a temporary increase in noise during construction only.

(e) Truck Traffic

An increase in truck traffic is anticipated during the construction of the Project for equipment access and material delivery. No other additional traffic is anticipated for the Project beyond periodic mowing or removal of dangerous trees from the ROW during maintenance activities.

(f) Installation of Equipment

The equipment will be installed using standard practices and equipment. There will be a temporary increase in noise during construction only.

(B) LAND USE

(1) Map of the Site and Route Alternatives

An applicant for a Certificate of Environmental Compatibility and Public Need for electric transmission facilities is required to evaluate both the Preferred and Alternate Route for the transmission line within the application. Maps at 1:12,000-scale, including the area 1,000 feet on either side of the centerline (also referred to as the 2,000-foot corridor), are presented as Figure 7-6 and include the following information:

- Centerline and 2,000-foot corridor for the Preferred and Alternate Route;
- DP&L facilities including existing substation, and interconnect locations;
- Land use types;
 - Land use categories were created using Miami County's 2018 parcel data and their land type code in their 2018 County Assessors data. This data was reviewed and adjusted accordingly where necessary. For instance, aerial imagery was reviewed and

woodlots were identified based on current publicly available aerial imagery. Due to the limited amount of aquatic resources within the 2,000-foot corridor the aquatic resource land use category presented is a combination of National Wetland Inventory ("NWI") wetlands, National Heritage Database ("NHD") waterbodies and waterways, and aquatic resources delineated for the Project.

- Road names, residences, commercial centers or buildings, industrial buildings and installations, schools, hospitals, churches, civic buildings, and other occupied places; and
- Incorporated areas and population centers.

According to the Miami County Comprehensive Plan², the Project predominately crosses existing land use of general agricultural use and vacant land as well as residential. In addition, the Project crosses a section of industrial land use and abuts open space/recreational.

(2) Impact on Identified Land Uses

Comparisons of potential land use impacts for both routes are included in Table 7-4. The acreage estimates of each land use type was determined using GIS software calculations. The potential disturbance area during construction activities (e.g., vegetation clearing, pole installations, etc.) consists of the 75-foot-wide construction ROW where the route is cross-country, the 30-foot-wide construction ROW where the route is along road ROW, and the 15-foot-wide access roads. Operational impacts will be the same as construction impacts except for access road impacts which are only construction as they are temporary. The ROW will be restored through soil grading, seeding, and mulching, thus the permanent impact to the operational ROW is primarily limited to the removal of existing trees and other vegetation. Access roads will be restored similarly but would be allowed to fully revegetate. Property owners may continue to utilize most of the ROW area for general uses that will not affect the safe and reliable operation of the transmission line such as lawn maintenance, agricultural crop production, pasture, or use as a hayfield.

² Miami Valley Regional Planning Commission. 2006. Comprehensive Plan 2006 Update. Available at <https://www.co.miami.oh.us/DocumentCenter/View/560/Comprehensive-Plan?bidId=>

TABLE 7-4. Land Use Impacts During Construction and Operation

Land Use	Preferred Route ¹		Alternate Route ¹	
	Construction (Acreage)	Operation (Acreage)	Construction (Acreage)	Operation (Acreage)
Agricultural	94.2	91.1	98.3	95.6
Aquatic Resources ²	0.9	0.9	0.4	0.4
Industrial/Commercial	5.5	5.1	3.5	3.1
Institutional ³	0.1	0.1	0.0	0.0
Open Land/Pasture	4.0	3.7	5.2	4.9
Residential	3.1	2.7	3.9	3.5
Woodlot	3.9	3.8	2.6	2.4
Total	111.7	107.6	113.9	109.9

Notes:

- ¹ The permanent ROW is the same as the construction ROW and access roads are temporary and to be used during construction only. The difference between construction and operation acreages are due to off ROW access roads only to be used during construction and not operation.
- ² Since wetland, open water, and streams make up a minor component of the land use, a combination of NHD waterbodies and waterways, NWI wetlands, and field delineated aquatic resources were used to define these values.
- ³ Institutional may include but is not limited to schools, hospitals, churches, government facilities, etc.

(3) Impact on Identified Structures

(a) Structures within 200 Feet of Proposed Right-of-way

There are 64 and 98 single-family residences within 200 feet of the ROW of the Preferred and Alternate Routes, respectively. For the Preferred Route, three residences are within 50 feet of the ROW, 15 residences are between 51-100 feet of the ROW, 30 residences within 101-150 feet of the ROW, and 16 residences within 151-200 feet of the ROW. For the Alternate Route, three residences are within 50 feet of the ROW, 20 residences are between 51-100 feet of the ROW, 39 residences within 101-150 feet of the ROW, and 36 residences within 151-200 feet of the ROW.

There are three and two commercial buildings within 200 feet of the ROW of the Preferred and Alternate Routes, respectively. For the Preferred Route, one commercial building is within 50 feet of the ROW, one commercial building between 101-150 feet of the ROW, and one commercial building between 151-200 feet of the ROW. For the Alternate Route, one commercial building between 101-150 feet of the ROW, and one commercial building between 151-200 feet of the ROW.

There are no industrial buildings and installations, schools, hospitals, churches, civic buildings, or other occupied places within 200 feet of the Preferred and Alternate Route ROW.

(b) Destroyed, Acquired, or Removed Buildings

The potential removal of structures within the proposed ROW was mitigated during the RSS of the Preferred and Alternate Route by designing route options that avoid structure impacts to the extent feasible. It is unlikely that construction of the Preferred Route or Alternate Route will require the removal of a structure.

(c) Mitigation Procedures

Mitigation for the prohibition of the future installation of structures within the ROW and vegetative clearing and maintenance activities for the transmission line will be determined as part of DP&L's acquisition of the ROW for this Project, as part of the negotiated settlement between DP&L and the property owner, or as determined in appropriation proceedings. If an existing septic system, or other structure, located in the transmission line ROW is impacted by construction, operation, or maintenance of the proposed Project, the septic system will be repaired or replaced by DP&L as necessary to meet the appropriate installation requirements.

(C) AGRICULTURAL LAND IMPACTS

The potential impacts of the Project on agricultural land use include damage to crops that may be present, disturbance of underground field drainage systems, compaction of soils and potential for temporary reduction of crop productivity.

Soil compaction resulting from construction activities is typically a temporary issue and is resolved within a few seasons of plowing and tilling. DP&L will work with the agricultural landowners to resolve conflicts with drainage tiles and irrigation systems that are affected by the Project where necessary.

(1) Agricultural Land Map

The various categories of agricultural land and agricultural districts are depicted on Figure 7-7 for both the Preferred and Alternate Routes. The Miami County Auditor – Real Estate Department was contacted to obtain information on current Agricultural District Land records; current data was received on January 4, 2019.

(2) Impacts to Agricultural Lands and Agricultural Districts

(a) Acreage Impacted

Table 7-5 provides the acreage impacted for agricultural land uses and agricultural districts. The agricultural land use was based on aerial imagery. The Preferred Route crosses 16 parcels (for a total distance of 4.71 miles) designated as Agricultural Districts and the Alternate Route crosses 18 parcels (for a total of 4.00 miles) designated as Agricultural Districts.

TABLE 7-5. Impacts to Agricultural Lands and Agricultural Districts

Agricultural Land Use	Preferred Route ¹		Alternate Route ¹	
	Construction (Acreage)	Operation (Acreage)	Construction (Acreage)	Operation (Acreage)
Cultivated Land	94.2	91.4	98.3	95.6
Pasture Land	3.3	3.0	4.0	3.7
Managed Woodlots	-	-	-	-
Orchards	-	-	-	-
Nurseries	-	-	-	-
Livestock and Poultry Confinement Areas	-	-	-	-
Other	-	-	-	-
Total	97.5	94.4	102.3	99.3
Agricultural District	31.4	31.1	29.9	29.5

Note:

- ¹ The permanent ROW is the same as the construction ROW and access roads are temporary and to be used during construction only.

(b) Evaluation of Construction, Operation, and Maintenance Impacts

The following subsections include an evaluation of the impact of the construction, operation, and maintenance of the proposed transmission line and the following agricultural facilities and practices within the Project area where present.

(i) Field Operations

Field operations such as plowing, planting, cultivating, spraying, and harvesting of cultivated crops will only be interrupted for a portion of the growing season or a portion of the dormant season during construction. Potential impacts to agricultural use resulting from Project construction include temporary damage to crops (one season at most) during the growing season, minor and temporary disturbance of drainage patterns, disruption of plow/harvest patterns, and a reduction of tillable land at the pole structure locations. Property owners will be compensated for crop damages resulting from DP&L's construction activities. No significant impacts to livestock operations or grazing areas are anticipated. Property owners may continue to utilize most of the ROW area for general use (e.g., lawn maintenance, crop cultivation, livestock) after construction but is contingent upon the use having no adverse impact on the safe and reliable operation of the transmission line. Crop production would be allowed immediately adjacent to the pole structures and guys wires where applicable.

(ii) Irrigation

There are no known irrigation systems within the proposed ROW for either route. DP&L will identify the presence of any such systems through contact with landowners once the final route is approved. Any system that must be relocated will be coordinated with the landowner to avoid affecting the irrigation system's operation and avoid any cost incurred by the landowner.

(iii) Field Drainage Systems

Damage to field drainage tile systems is unlikely given the installation of mostly direct-embed steel pole structures, but DP&L will restore damaged systems to their pre-construction condition. DP&L will also work with the agricultural landowners to resolve conflicts with field drainage systems and other facilities that may be impacted by the Project where necessary.

(iv) Structures Used for Agricultural Operations

There are 8 and 13 agricultural barns within 200 feet of the ROW of the Preferred and Alternate Routes, respectively. For the Preferred Route, one agricultural barn is within 50 feet of the ROW, one agricultural barn between 101-150 feet of the ROW, and 6 agricultural barns between 151-200 feet of the ROW. For the Alternate Route, no agricultural barns are within 50 feet of the ROW, three agricultural barns between 50-100 feet of the ROW, one agricultural barn between 101-150 feet of the ROW, and nine agricultural barns between 151-200 feet of the ROW. Agricultural barns are not anticipated to be impacted by the Project.

(v) Agricultural Land Viability for Agricultural Districts

Agricultural Districts are crossed by the Project, as identified and quantified previously, but the viability of the Agricultural Districts identified and crossed are not anticipated to be affected.

(c) Mitigation Procedures

DP&L will use existing public roads and farm roads where available to limit the amount of crop area disturbed during construction. Restoration of disturbed agricultural fields will be accomplished by de-compacting the soil, removing rocks, and re-spreading stockpiled topsoil, as necessary. Any drainage ditches, field drainage tiles, or fencing damaged by construction activities will be repaired. Payment to the property owner may also be provided for damages as part of the easement negotiations, or as determined in appropriation proceedings.

(i) Avoidance or Minimization of Damage

As previously mentioned, DP&L will restore damaged field tile drainage systems in agricultural areas to their pre-construction condition. DP&L will also work with the agricultural landowners to resolve conflicts with field drainage systems that may be impacted by the Project where necessary.

In order to minimize damage to agricultural land, DP&L, to the extent practical, will place poles beyond or at the edges of agricultural fields where the engineering design of the line and structure placement allows. This mitigation effort should limit disruption of plow patterns and minimize the creation of areas where weeds and other non-crops can grow in relation to construction of the transmission line. In instances where there is damage in the ROW, compensation for this limited impact will be provided to the property owner.

(ii) Field Tile System Damage Repairs

Concerns over interference with irrigation systems will be addressed on a case-by-case basis with the individual property owner. In general, DP&L will provide mitigation for damage to underground drainage systems from construction, operation, and maintenance activities by repairing or replacing damaged sections of the drainage systems as necessary.

(iii) Segregation and Restoration of Topsoil

Excavated topsoil will be segregated and stockpiled where necessary to maintain long-term agricultural uses. Top soil will also be de-compacted and restored to original conditions, unless otherwise agreed to by the landowner.

(D) LAND USE PLANS AND REGIONAL DEVELOPMENT

This section of the application provides information regarding land use plans and regional development.

(1) Impacts to Regional Development

This Project is expected to support regional development in Miami County through increased reliability and availability of electric power to residential, commercial, institutional, and industrial users throughout the region. No negative impacts on regional development are foreseen for this Project. A more detailed discussion of the need for this Project and how it will affect regional development is included in Section 4906-5-03 of this application.

(2) Compatibility of Proposed Facility with Current Regional Land Use Plans

The Miami County Department of Development – Planning and Zoning website³ was reviewed in January 2019. The Miami County Planning and Zoning Department administers county zoning for eight of the twelve townships in the county, including Concord and Union Townships where the Project is located. Zoning areas crossed by the Project are primarily agriculture (domestic and general) and one family residential. If applicable, DP&L will apply for zoning variances with Miami County upon approval of a route by OPSB.

³ <https://www.co.miami.oh.us/146/Planning-Zoning>

The Project routes were developed with the existing land use configuration upon which future development is added, which aligns with the Miami Valley Regional Planning Commission Comprehensive Plan. In general, the Preferred and Alternate Routes adhere to the objectives, goals, and future needs for the Project area by aligning Project infrastructure with existing road infrastructure, existing utilities, parcel boundaries and use of existing crossings of Stillwater River, a State Scenic River and avoiding high density and environmentally sensitive areas.

(E) CULTURAL AND ARCHAEOLOGICAL RESOURCES

POWER Engineers, Inc. (“POWER”) conducted a cultural resources records review in 2014 of online resources from the Ohio Historic Preservation Office (“OHPO”) as well as a literature review. GAI reviewed the OHPO database in 2018 and confirmed that the initial review completed by POWER Engineers is still applicable. The results of the cultural resource literature review were submitted to OHPO on June 5, 2015 requesting a review and comment of the literature review and a response as to the need for additional cultural resource field studies. The OHPO responded in a letter dated July 27, 2015 recommending that additional archaeological and architectural field work be conducted on the Preferred and Alternate Routes. DP&L will apply this recommendation with respect to the modified Preferred and Alternate Routes presented in the current Docket. Upon completion of the additional archaeological and architectural field work as well as completion of additional correspondence with OHPO the OPSB will be provided the appropriate documentation. Copies of OHPO correspondence are provided in Appendix 7-1. The Cultural Resource Management Literature Review Report prepared by POWER will be provided to OPSB under separate cover based on the inclusion of sensitive and confidential cultural resource information.

(1) Recreational and Cultural Resources Map

A recreational and cultural resources map is presented as Figure 7-8 and includes recreational areas and trails, scenic rivers, scenic routes or byways, and cultural resources within 1,000 feet of the Preferred and Alternate Routes.

The Preferred and Alternate Route, specifically a common section along State Route 55, crosses the Stillwater River, which is designated as a scenic river under The Ohio Scenic Rivers Program. Per correspondence with the Ohio Department of Natural Resources (“ODNR”), the ODNR Scenic Rivers Program would prefer that the existing crossing of the Route 55 bridge southeast of the Village of Ludlow Falls over the Stillwater State Scenic River be utilized. ODNR indicated that every attempt should be made to “overbuild” the wires vertically on an existing tower at the actual river crossing location, thus spanning the river valley. Based on the voltage of the proposed line and the age and condition of the existing structures, that option poses issues from a safety and reliability standpoint, therefore new poles are required to be installed. However, if possible the existing lines will be underbuilt on the new pole.

Based on the recreational and cultural resources desktop study, there are no scenic routes/byways [as defined by the ODNR and/or the Ohio Department of Transportation (“ODOT”)] or registered (i.e., NRHP listed) landmarks of historic, religious, archaeological, scenic, natural, or other cultural significance within 1,000 feet of the proposed routes. Cultural resources already in the public domain [churches, cemeteries, and Ohio Historic Inventory (“OHI”) structures] are identified on Figure 7-8.

(2) Cultural Resources in Study Corridor

The purpose of the cultural resources literature review completed by POWER was to identify known cultural resources in the vicinity of the Project so that impacts to these resources can be minimized. Cultural resources include archaeological and historical sites, such as cemeteries, buildings, structures, objects, and districts. The literature review included the following resources consulted online:

1. Archaeological Atlas of Ohio, William C. Mills, 1915
2. USGS 7.5’ series topographic maps
3. Ohio Archaeological Inventory files (“OAI”)
4. OHI
5. National Register of Historic Places (“NRHP”) on OHI files
6. Determinations of Eligibility files on OHI
7. State Historic Preservation Office Cultural Resource Management/contract archaeology files (OHI)

There is one cemetery listed on the OHI within 1,000 feet of the Project. The West Branch Friends Cemetery is located approximately 654 feet south of the existing West Milton Substation.

Four Phase 1 Cultural Resource Management Surveys are listed within 1,000 feet of route centerlines. These surveys were performed for the following projects: the West Milton Substation Upgrade (1990); the Transportation Project No. MIA-55-4.15 (1979); the Proposed 5.67-Mile Eldean 138 kV Transmission Project (1998); and the Proposed West Milton Low-Head Dam Removal and Stillwater River Restoration Project (2011).

Results of the records review indicate that there are several prehistoric archaeological sites and historic structures near the Project corridor.

Preferred Route: Specific to the Preferred Route, there are no known archeological or historical structures within 1,000 feet. No NRHP-listed properties have been recorded within 1,000 feet of the Common Route.

Alternate Route: Specific to the Alternate Route, there are no known archeological sites within 1,000 feet of the Alternate Route. However, one historic structure (MIA0151905), identified as a single dwelling structure and barn constructed circa 1880 in a colonial revival style along Eldean Road. No NRHP-listed properties have been recorded within 1,000 feet of the Alternate Route.

Common Route: Seven prehistoric archaeological sites and one historical archaeological site are located within 1,000 feet of the Common Route. All seven prehistoric archaeological sites are near where State Route 55 crosses the Stillwater River (MI0072, MI0073, MI0074, MI0075, MI0076, MI0077, and MI0078). The one historic archaeological site (MI0127) is located near the West Milton Substation.

Three historic structures are listed on the OHI within 1,000 feet of the Common Route. One of these structures (MIA0137801) is thought to be State Route 55 itself, or a demolished structure formerly adjacent to the highway, as it is identified as “transportation” for historical use. Another structure (MIA0069301) is the State Route 55 bridge itself. The other structure (MIA0069201) is located approximately 611 feet south of the Common Route near the Stillwater River crossing. This structure was constructed circa 1880 in an Italianate architectural style. No NRHP-listed properties have been recorded within 1,000 feet of the Common Route.

The Section 106 Review and Cultural Resource Management Literature Review Report (Appendix 7-2) is being provided to the OPSB under separate cover.

(3) Construction, Operation, and Maintenance Impacts on Cultural Resources

No direct impacts to above ground cultural resources (i.e., cemeteries or historic structures) are anticipated from Project construction. Indirect impacts may result from visual effects. These potential effects are described in Section 4906-5-07(E)(5)(c). Most of the Project Study Area lies within previously disturbed contexts including road ROW, existing utility ROW, and cultivated agricultural fields. The proposed Project has the potential to impact unknown prehistoric archaeological sites and correspondence with OHPO is ongoing.

(4) Mitigation Procedures

Based on the results of the desktop review, no impacts to known historic properties are anticipated because of the Project; therefore, no mitigation is proposed at this time, however archaeological and architectural field work is to be completed and the results of that field work discussed with OHPO.

(5) Aesthetic Impact

(a) Visibility of the Proposed Facility

Direct and indirect visual resource impacts are difficult to distinguish because the effects occur at the same time and place but simultaneously occur at a further removed distance (e.g., impacts as a result of views from sensitive recreation area and scenic quality impacts on vegetation and landform).

Impacts may be considered short-term and long-term.

The proposed Project has the potential to result in three basic types of impacts to visual resources. Construction impacts are considered temporary and result from the presence of construction vehicles and equipment that cause ground disturbance, equipment structure contrasts, and air emissions. Operations and maintenance impacts may be short-term or long-term. Maintenance activities are also considered short-term (and periodic) and are also related to the presence of construction vehicles and equipment and associated ground and air disturbances. Operations impacts are primarily associated with the long-term use and presence of the Project (transmission lines, structures, and access roads) in the landscape. Visual contrast, including the effects of light and glare, are produced during construction, operations, and maintenance of the Project.

The general types of impacts caused by the construction, operations, and maintenance of the Project include:

- Introduction of visually dominant transmission structures (wood/steel single pole) that contrast with the developed or natural landscape;
- Potential glare created by the presence of the conductors (wires) and associated marker balls (if used for avian mitigation or air traffic safety);
- Landform and vegetation contrasts (grading and vegetation removal) caused by the construction of access roads or road improvements, pulling and tensioning sites, work areas, and laydown areas; and
- Structure contrast caused by construction equipment, helicopter conductor stringing, and staging areas.

The viewsheds of both the Preferred and Alternate Routes from residences, through-travelers, and recreational users may be altered by the transmission line. Local residents and commuters will likely be most sensitive to the visual impacts resulting from the Project. The primary vantage points would be along State Route 55 where the Common Route runs adjacent to the roadway for 2.9 miles and the Preferred Route extends another 0.2-mile beyond Harter Road, and along Forest Hill Road and Davis Road. State Route 55 is also where the Common Route crosses the Stillwater River which is part of a registered State Scenic River System. Visual impacts along State Route 55 would be lessened because there are existing distribution lines and communication cables in the road ROW.

The Preferred and Alternate Routes also cross State Route 41, State Route 48, State Route 718, and State Route 571. Visual impacts may be less significant in these locations because the viewer would be crossing under the transmission lines as opposed to traveling parallel to them, thus reducing the overall duration of viewing. Also, existing utility lines are present in many of these locations.

The use of a single pole design as opposed to a lattice tower with a larger footprint will reduce visual impacts. Additionally, much of the Proposed and Alternate Routes are conterminous with existing distribution lines and communication cables. DP&L proposes to relocate those distribution lines it owns onto the new transmission line poles, where feasible, to minimize the number of pole structures within the utility ROW. DP&L would coordinate with owners of other distribution lines and communication cables to determine the feasibility of utilizing the same approach where such utility lines are owned and maintained by others.

(b) Facility Effect on Site and Surrounding Area

As described above, the proposed Project would increase the number of structures and conductors to the rural agricultural landscape. It will be visible from public roads and nearby residences. Vegetation management required for safe operation would likely have minimal impacts on aesthetics because both Routes are less than 3.5% forested.

(c) Visual Impact Minimization

The degree of visual minimization of the Project is largely limited by engineering constraints and uniform elevations in the area. As discussed above, visual impacts have been minimized through the use of single tangent wooden poles, co-locating with existing transmission line corridors when practical, co-locating adjacent to road ROW where feasible, and siting routes in open land where the need for vegetation management is minimal. Additionally, angle structures that are required at turns or bends in the transmission line alignment will be single poles with foundations where feasible. Longer spans will be incorporated in the design as well when cost-effective and technically feasible.

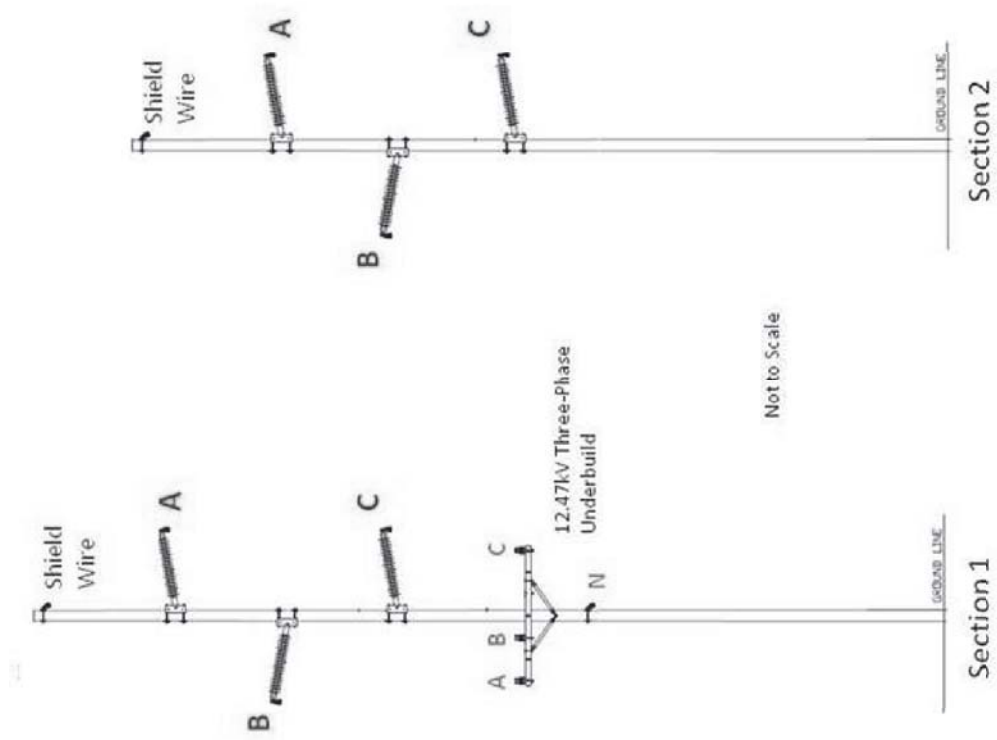


FIGURE 7-1

TITLE	Typical Cross-Section Models Used to Calculate Electric and Magnetic Fields			
	FOR West Milton to Eldean 138kV Transmission			
SCALE	PROJECT	FILE		
DRAWN		APPROVED		
CHECKED		APPROVED		
ENGINEER		PLOT DATE: 11/05/18	HR:	

The Dayton Power and Light Company

1 of 1

SHEET OF SHEETS

REVISIONS

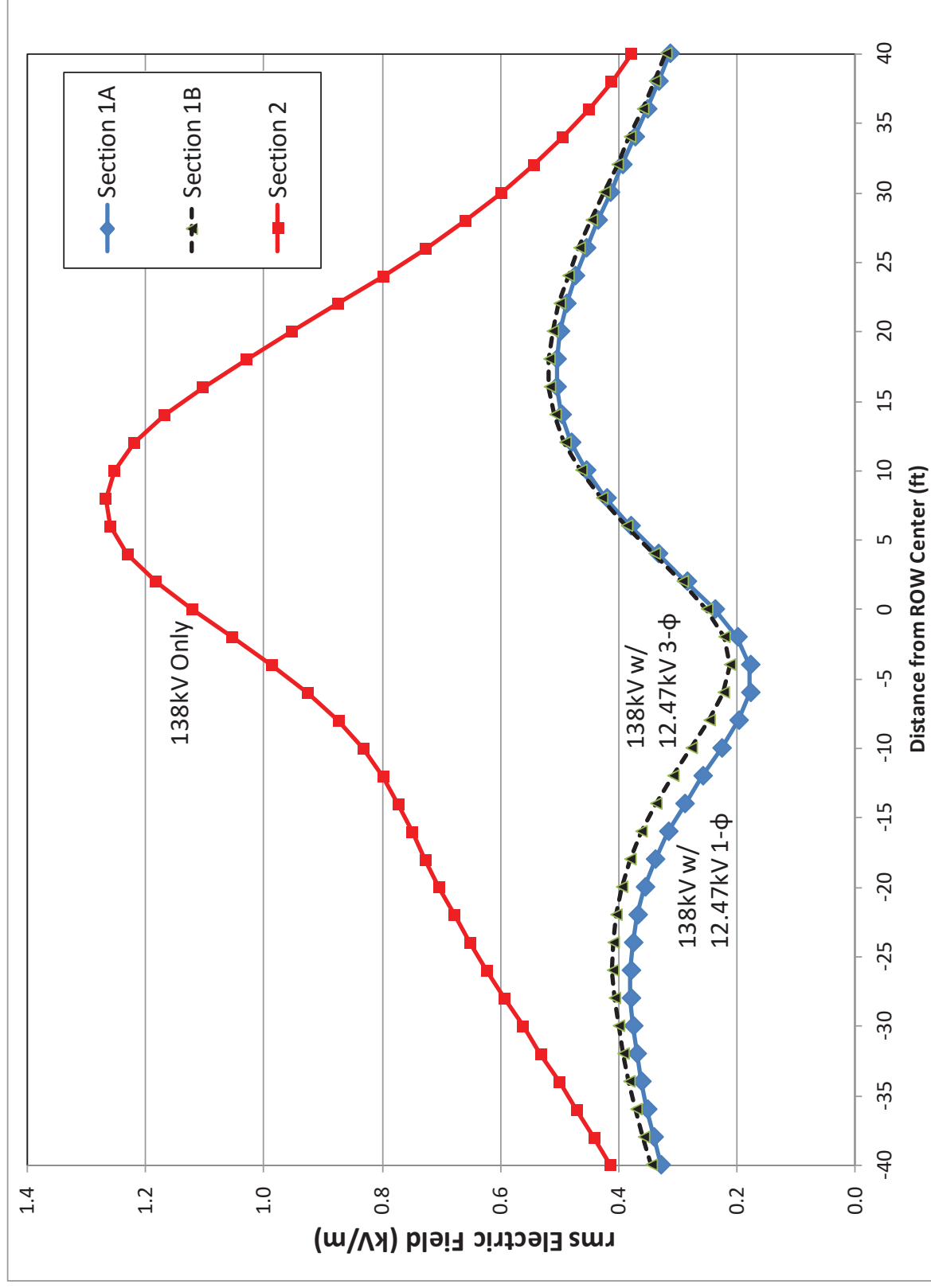


Figure 7-2. Calculated rms electric field magnitudes for the three representative cross-sections, at one-meter height.

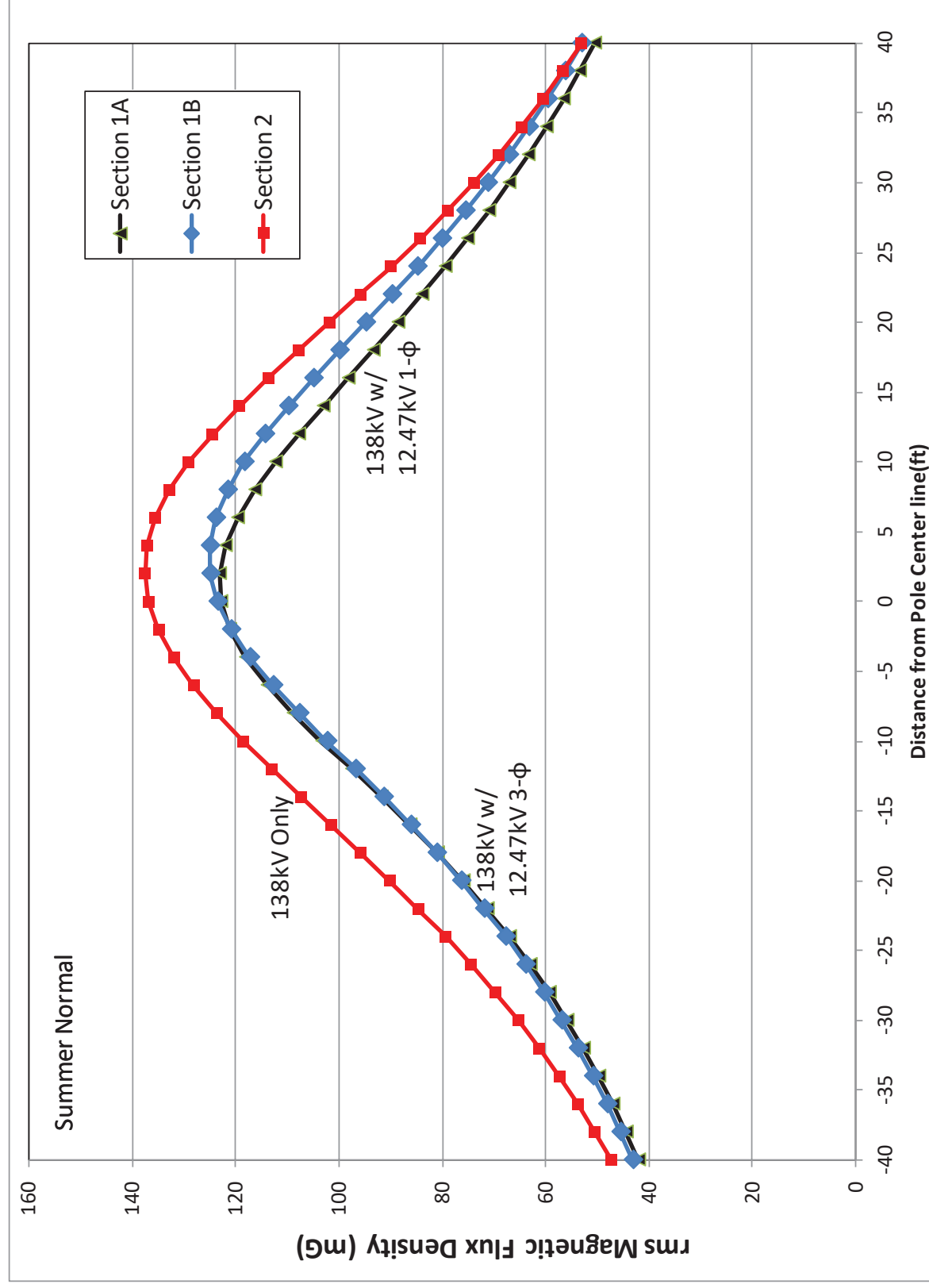


Figure 7-3. Calculated magnetic fields from three cross-sections under the summer normal load scenario

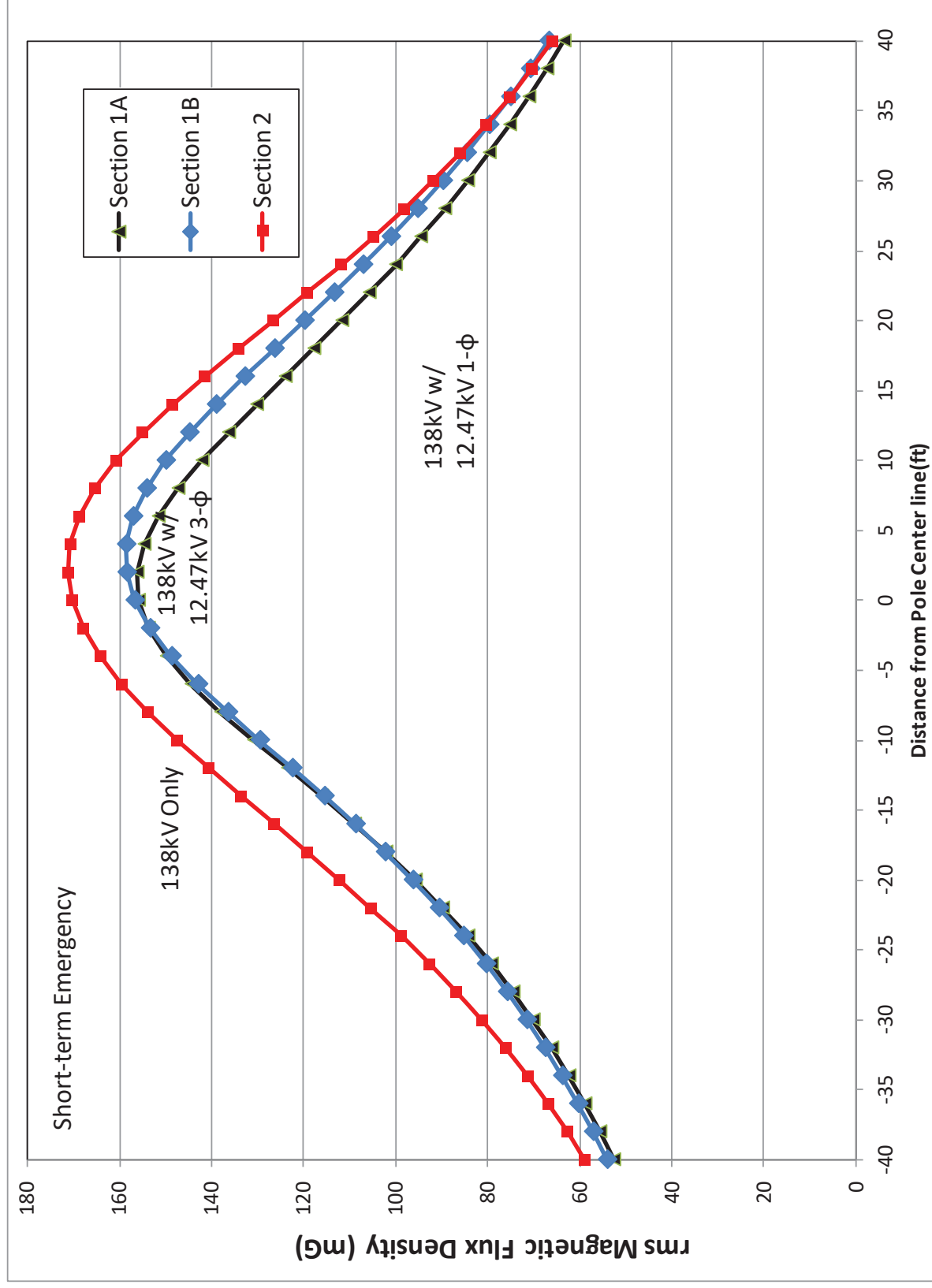


Figure 7-4. Calculated magnetic fields from three cross-sections under short-term emergency load scenario

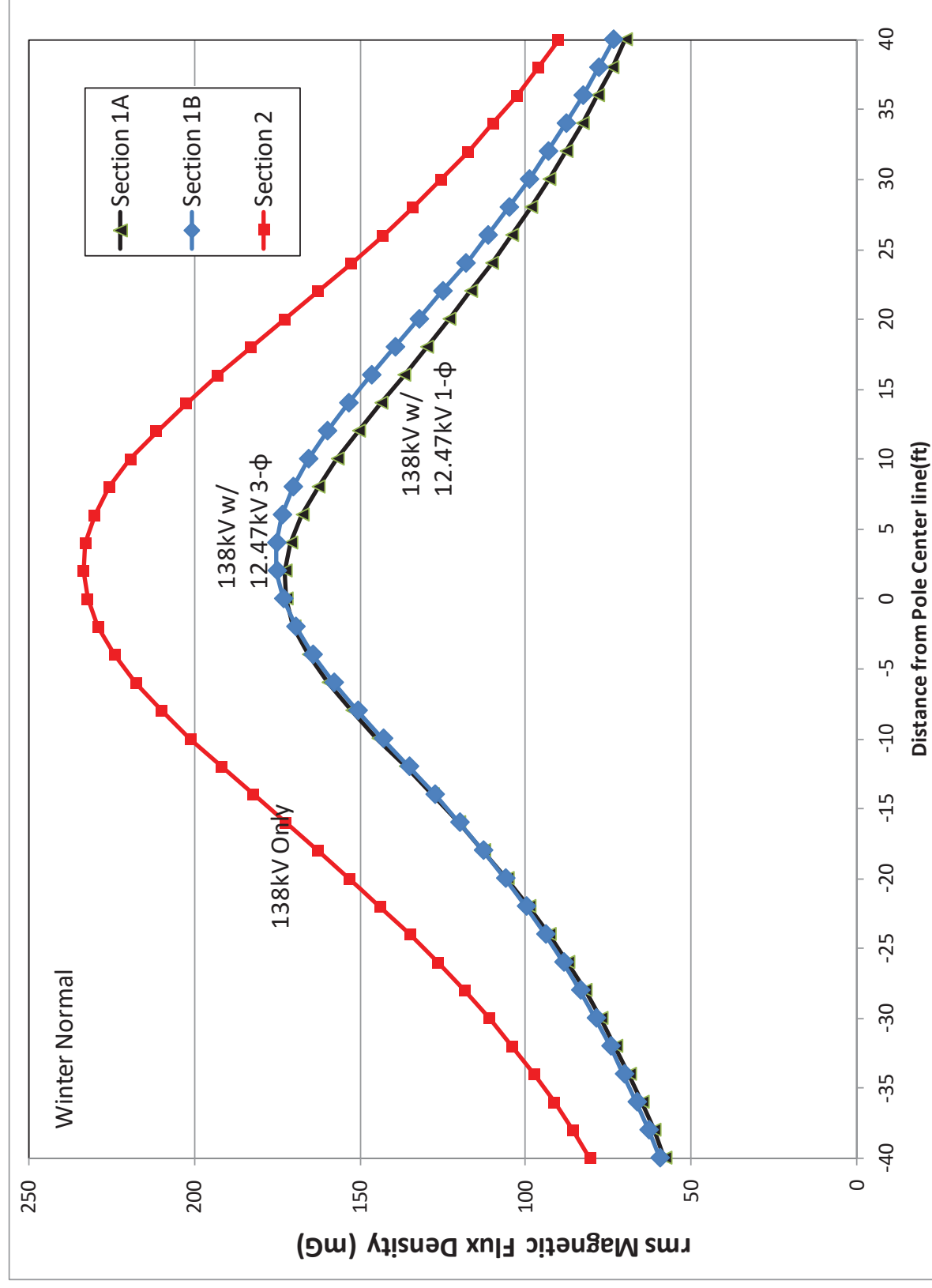
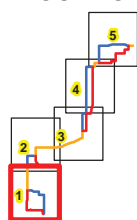


Figure 7-5. Calculated magnetic fields from three cross-sections under the winter normal load scenario

PROJECT LOCATION



MIAMI COUNTY, OHIO

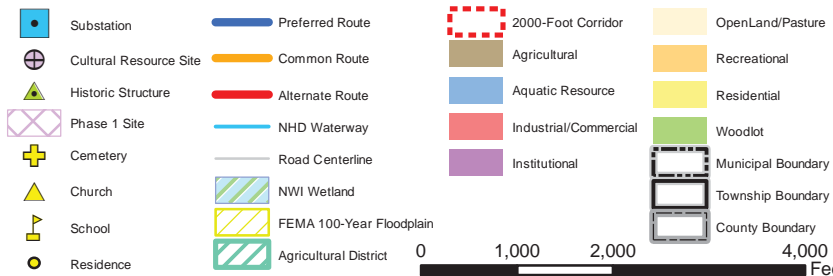
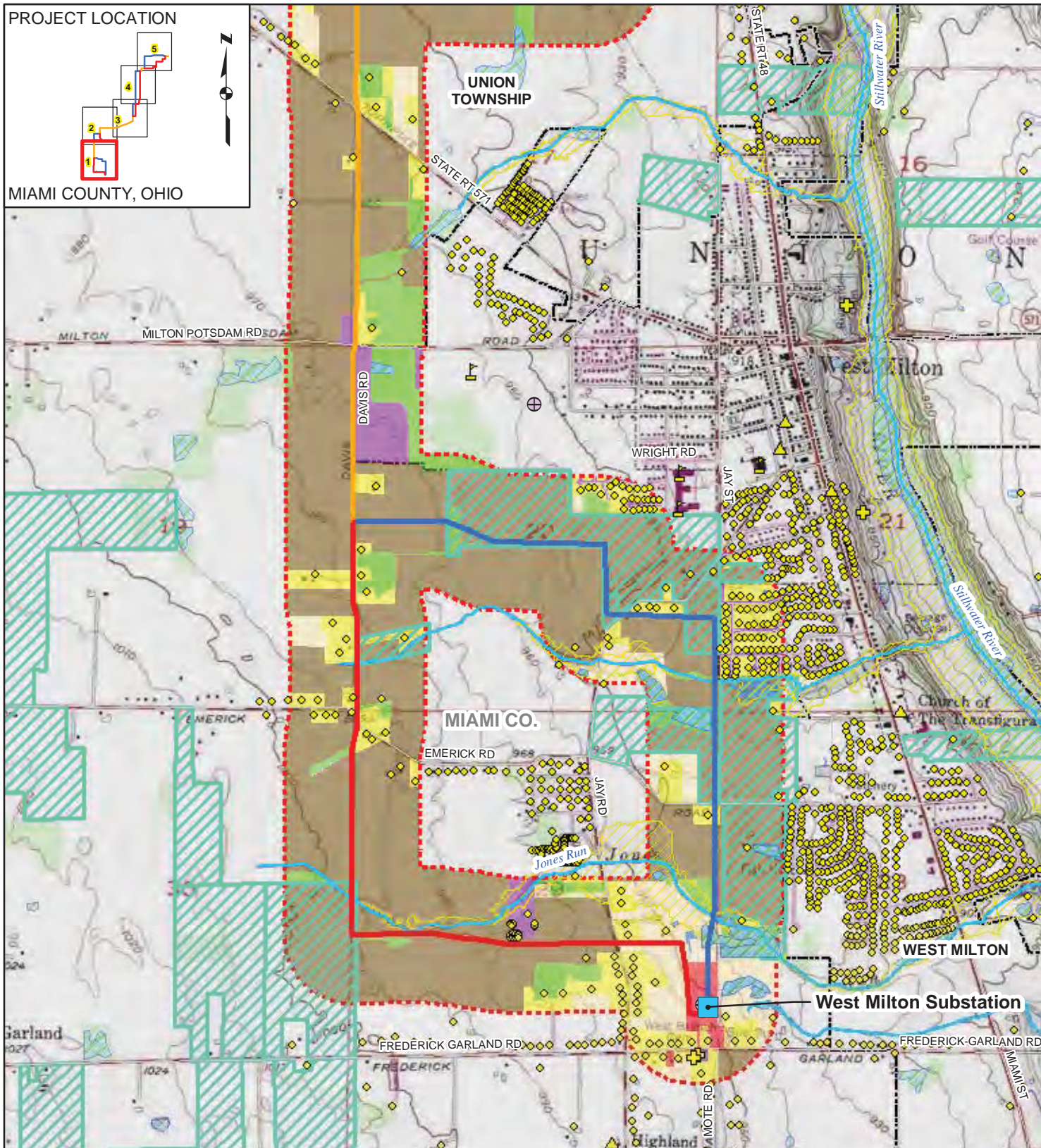


FIGURE 7-6
LAND USE AND CONSTRAINTS
SHEET 1 OF 5

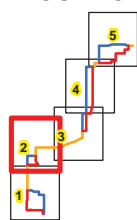
WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

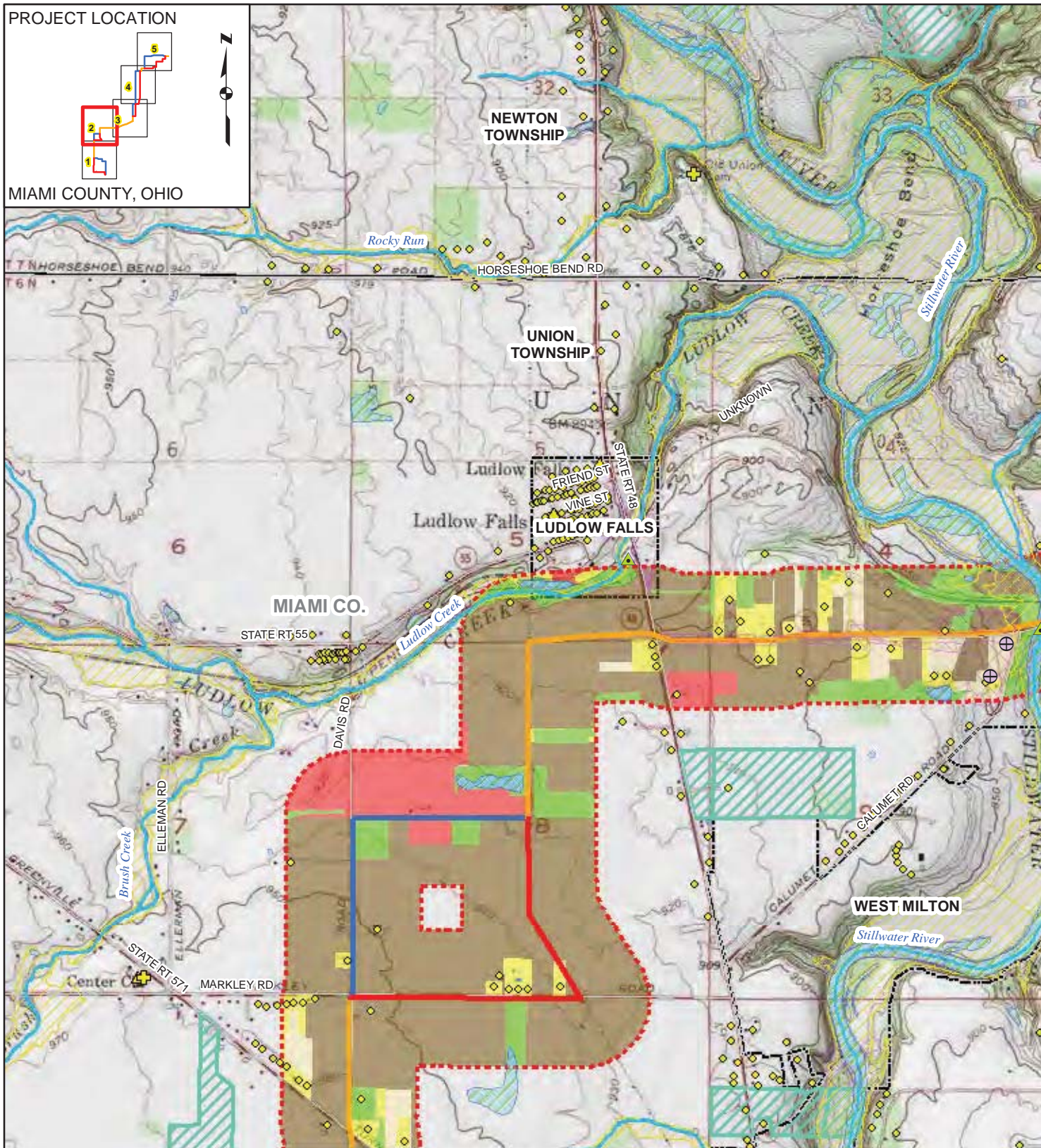
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PROJECT LOCATION



MIAMI COUNTY, OHIO



- | | | | |
|------------------------|--------------------------|-----------------------|--------------------|
| Substation | Preferred Route | 2000-Foot Corridor | OpenLand/Pasture |
| Cultural Resource Site | Common Route | Agricultural | Recreational |
| Historic Structure | Alternate Route | Aquatic Resource | Residential |
| Phase 1 Site | NHD Waterway | Industrial/Commercial | Woodlot |
| Cemetery | Road Centerline | Institutional | Municipal Boundary |
| Church | NWI Wetland | Township Boundary | County Boundary |
| School | FEMA 100-Year Floodplain | | |
| Residence | Agricultural District | | |

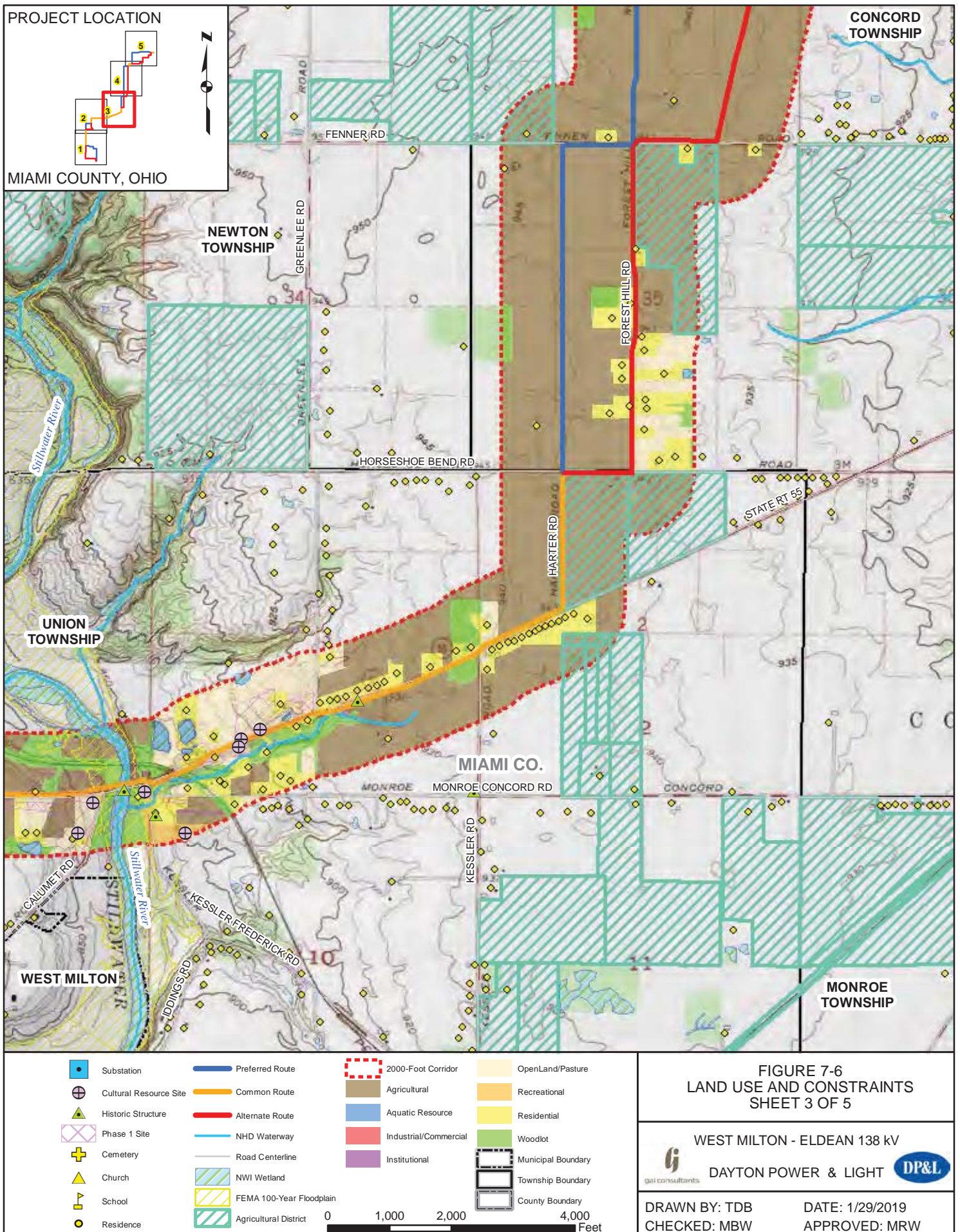
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FIGURE 7-6
LAND USE AND CONSTRAINTS
SHEET 2 OF 5

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

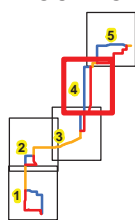
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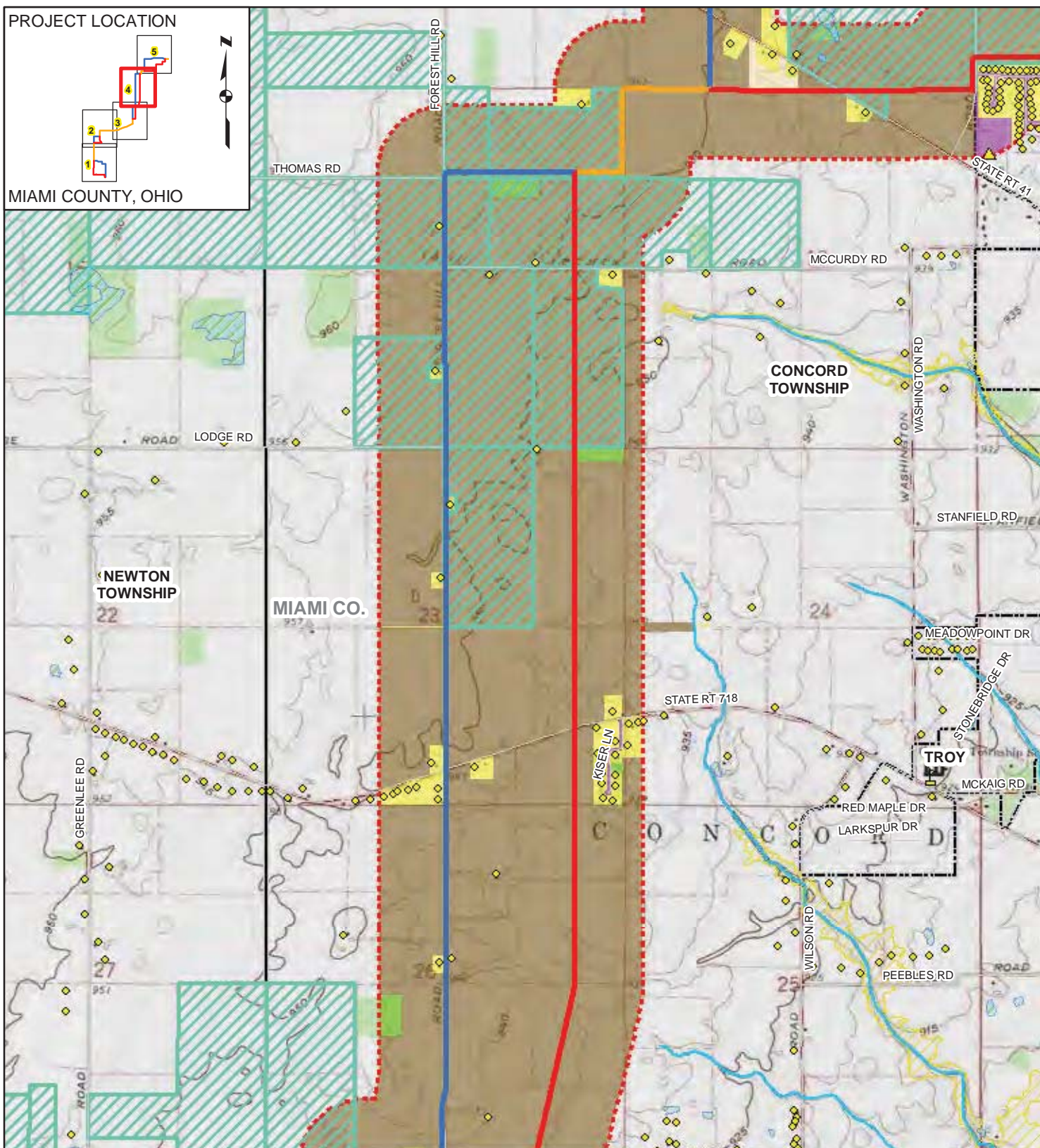
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PROJECT LOCATION



MIAMI COUNTY, OHIO



- | | | | |
|------------------------|--------------------------|-----------------------|--------------------|
| Substation | Preferred Route | 2000-Foot Corridor | OpenLand/Pasture |
| Cultural Resource Site | Common Route | Agricultural | Recreational |
| Historic Structure | Alternate Route | Aquatic Resource | Residential |
| Phase 1 Site | NHD Waterway | Industrial/Commercial | Woodlot |
| Cemetery | Road Centerline | Institutional | Municipal Boundary |
| Church | NWI Wetland | Township Boundary | County Boundary |
| School | FEMA 100-Year Floodplain | | |
| Residence | Agricultural District | | |

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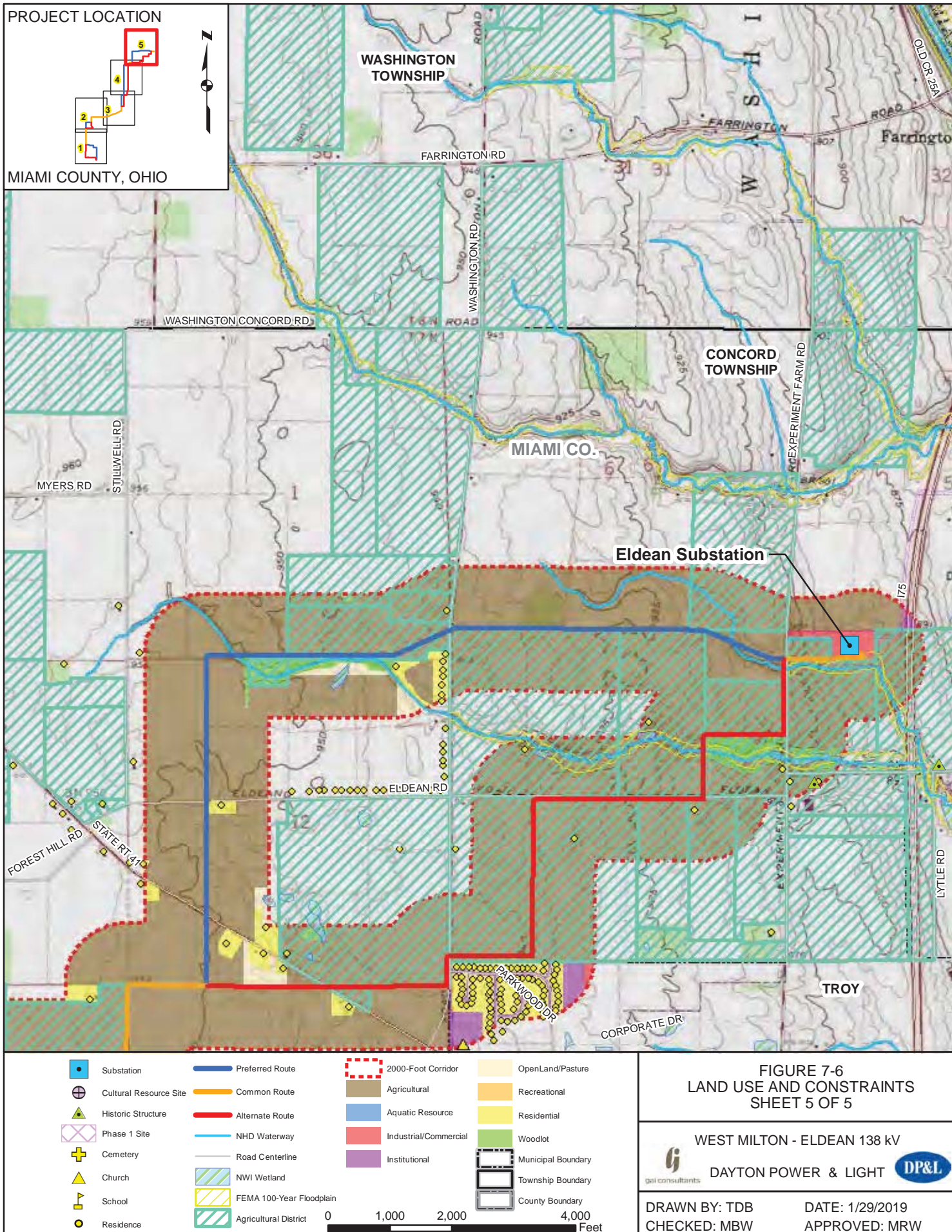
FIGURE 7-6
LAND USE AND CONSTRAINTS
SHEET 4 OF 5

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLES: PLEASANT HILL (1984), TROY (1982), WEST MILTON (1983), OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 1/2019. USGS NHD, 2018; MIAMI COUNTY, 2018; USGS NHD, 2018; ODOT, 2018; OHPO, 2018.

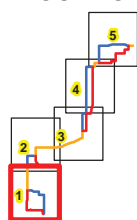
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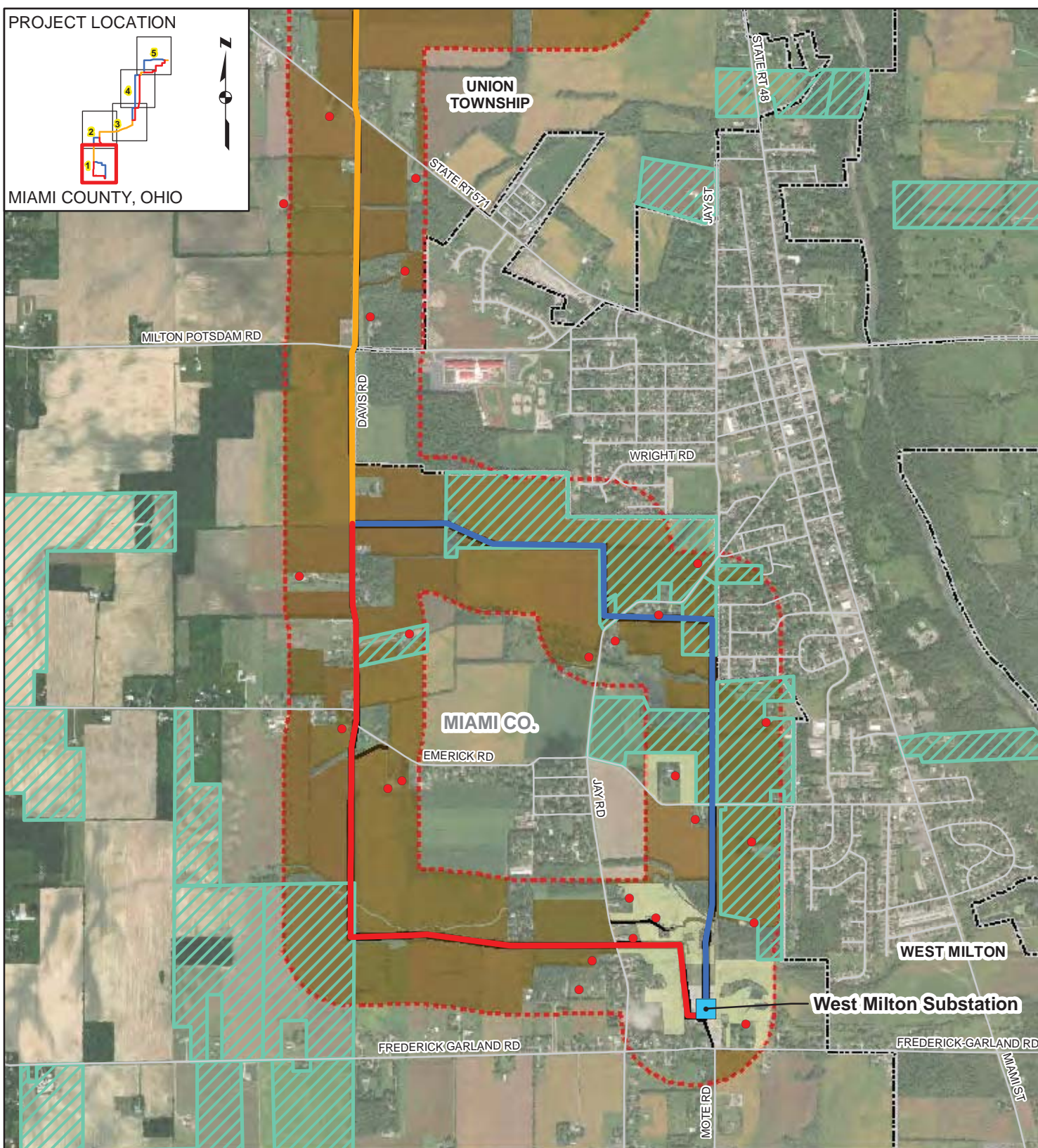
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PROJECT LOCATION



MIAMI COUNTY, OHIO



Substation

Preferred Route

Common Route

Alternate Route



Agricultural Structure

Agricultural

Pasture

2000-Foot Corridor

Agricultural District

Road Centerline

Right-of-Way

Municipal Boundary

Township Boundary

County Boundary

0 1,000 2,000 4,000 Feet

FIGURE 7-7
AGRICULTURAL LANDS
SHEET 1 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT

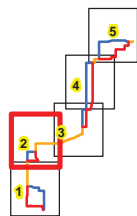


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DATE: 1/29/2019
APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; MIAMI COUNTY, 2018; ODOT, 2018.

PROJECT LOCATION



MIAMI COUNTY, OHIO



NEWTON
TOWNSHIP

HORSESHOE BEND RD

UNION
TOWNSHIP

UNKNOWN

FRIEND ST
VINE ST
STATE RT 48
LUDLOW FALLS

MIAMI CO.

STATE RT 65

DAVIS RD

ELDEAN RD

MARKLEY RD

STATE RT 571

GAUMET RD

WEST MILTON



Substation



Preferred Route



Common Route



Alternate Route



Agricultural
Structure



Agricultural



Pasture



2000-Foot Corridor



Agricultural District



Road Centerline



Right-of-Way



Municipal
Boundary



Township Boundary



County Boundary

0 1,000 2,000 4,000 Feet

FIGURE 7-7
AGRICULTURAL LANDS
SHEET 2 OF 5

WEST MILTON - ELDEAN 138 kV



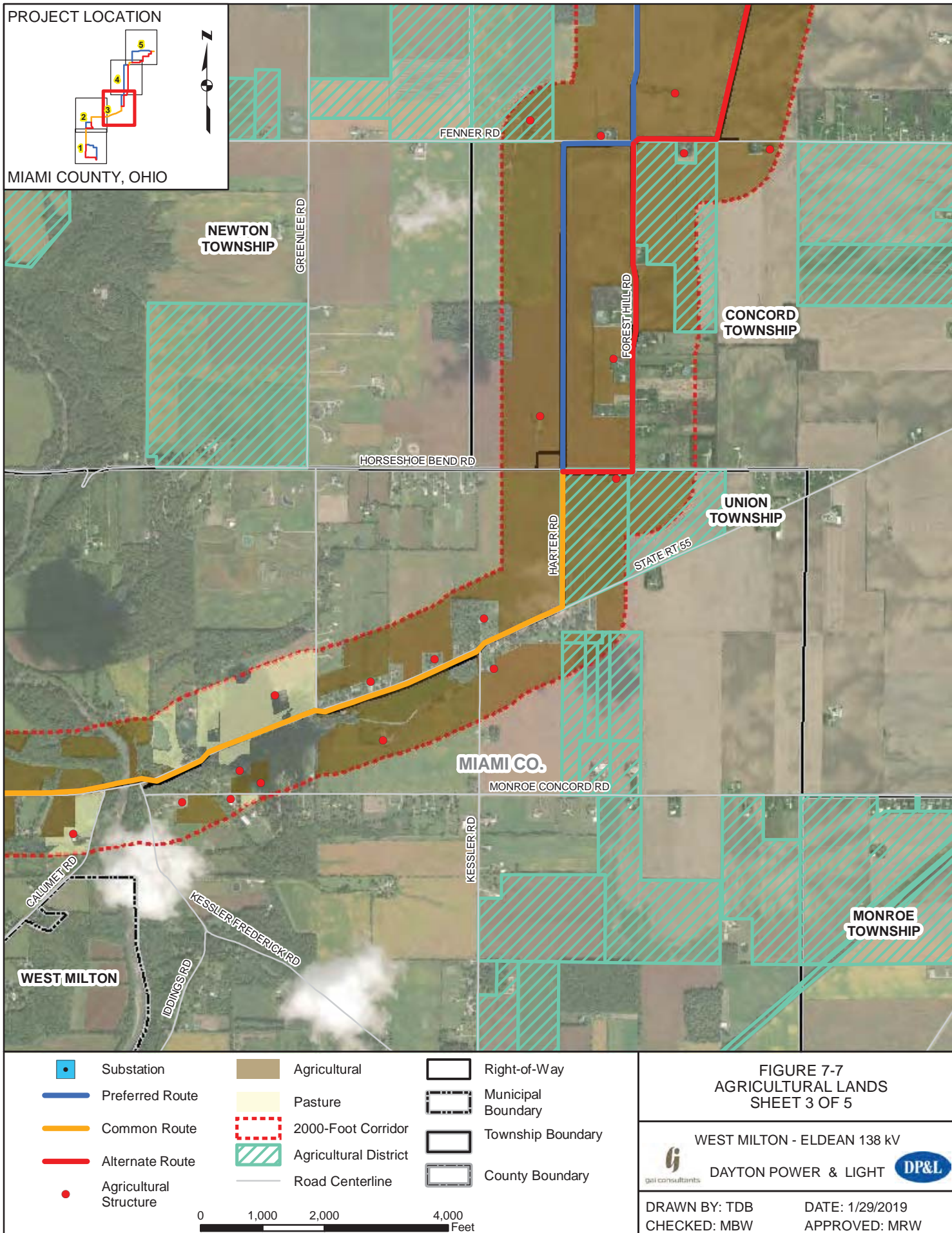
DAYTON POWER & LIGHT



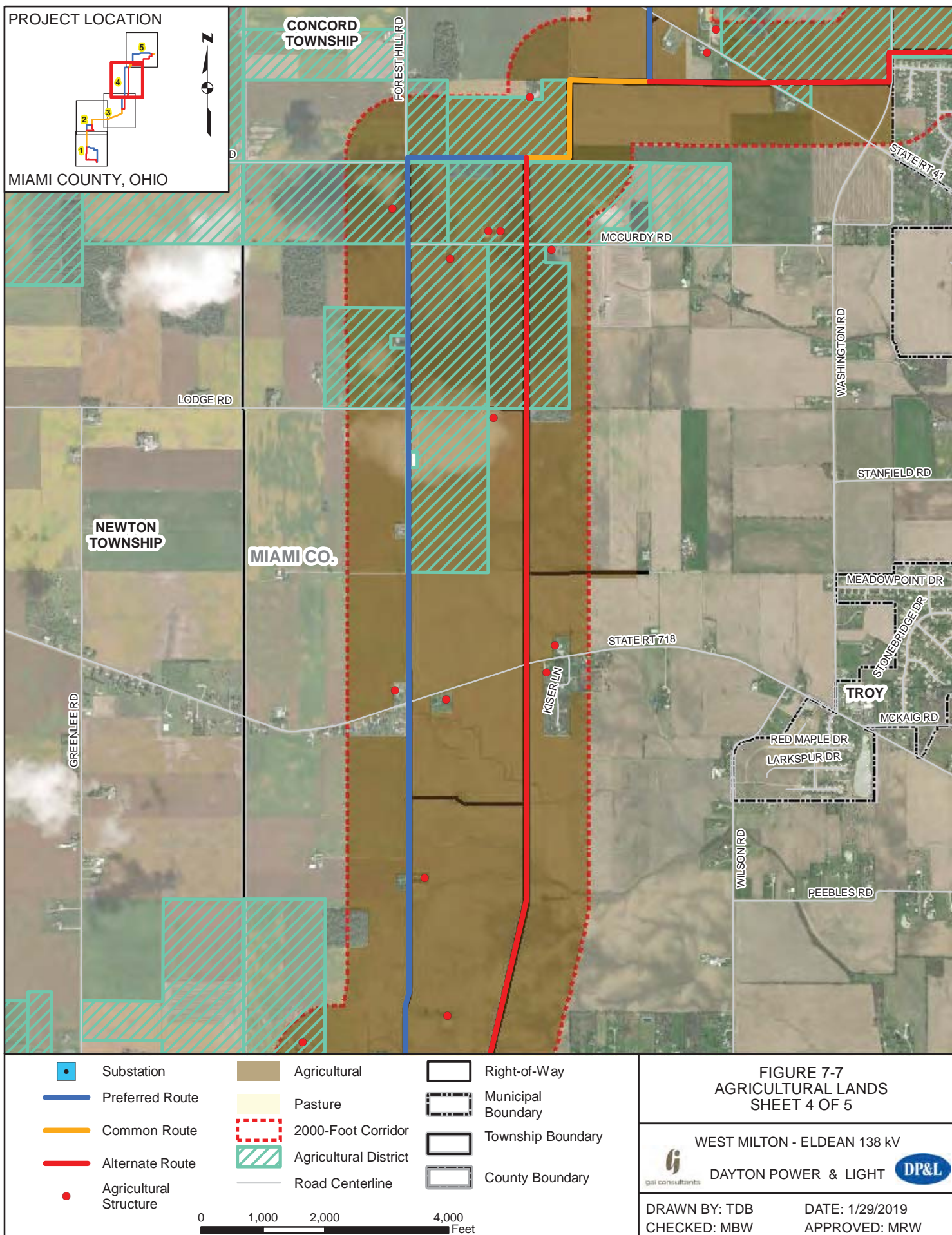
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APPROVED: MRW

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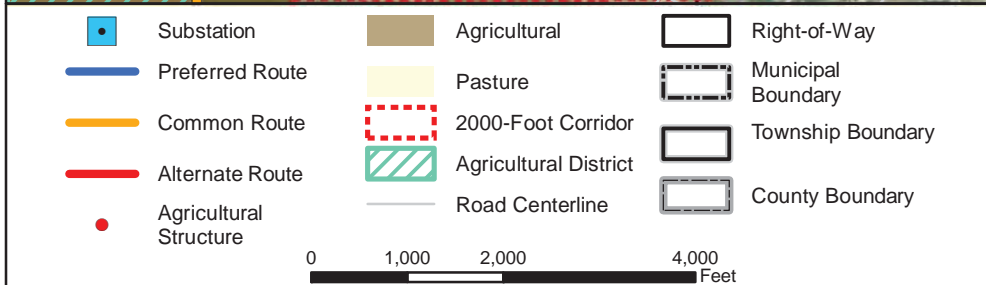
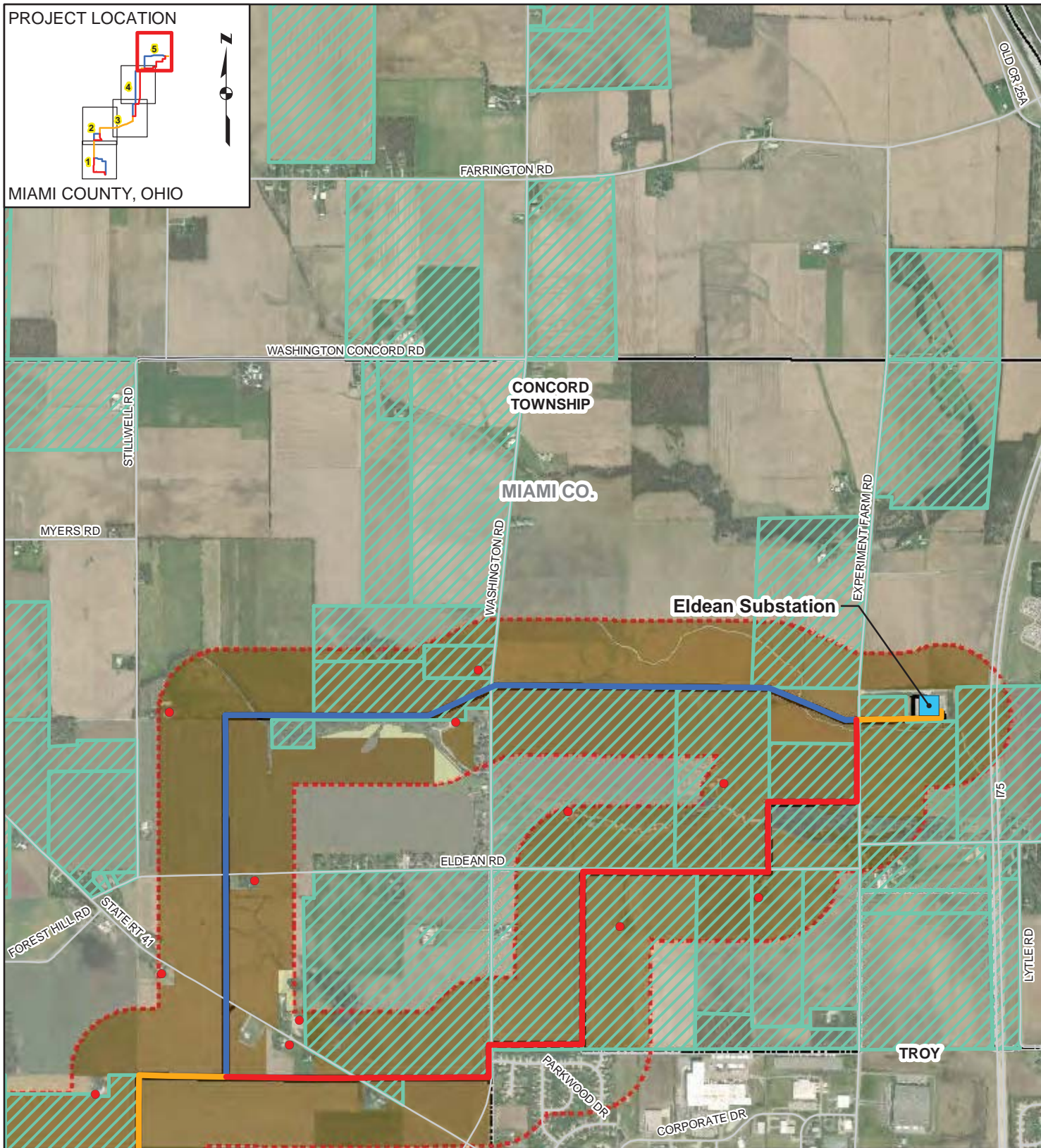
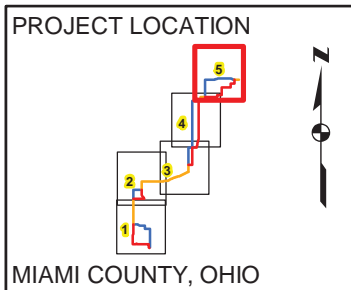


FIGURE 7-7
AGRICULTURAL LANDS
SHEET 5 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT

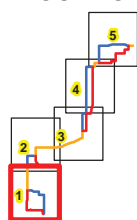


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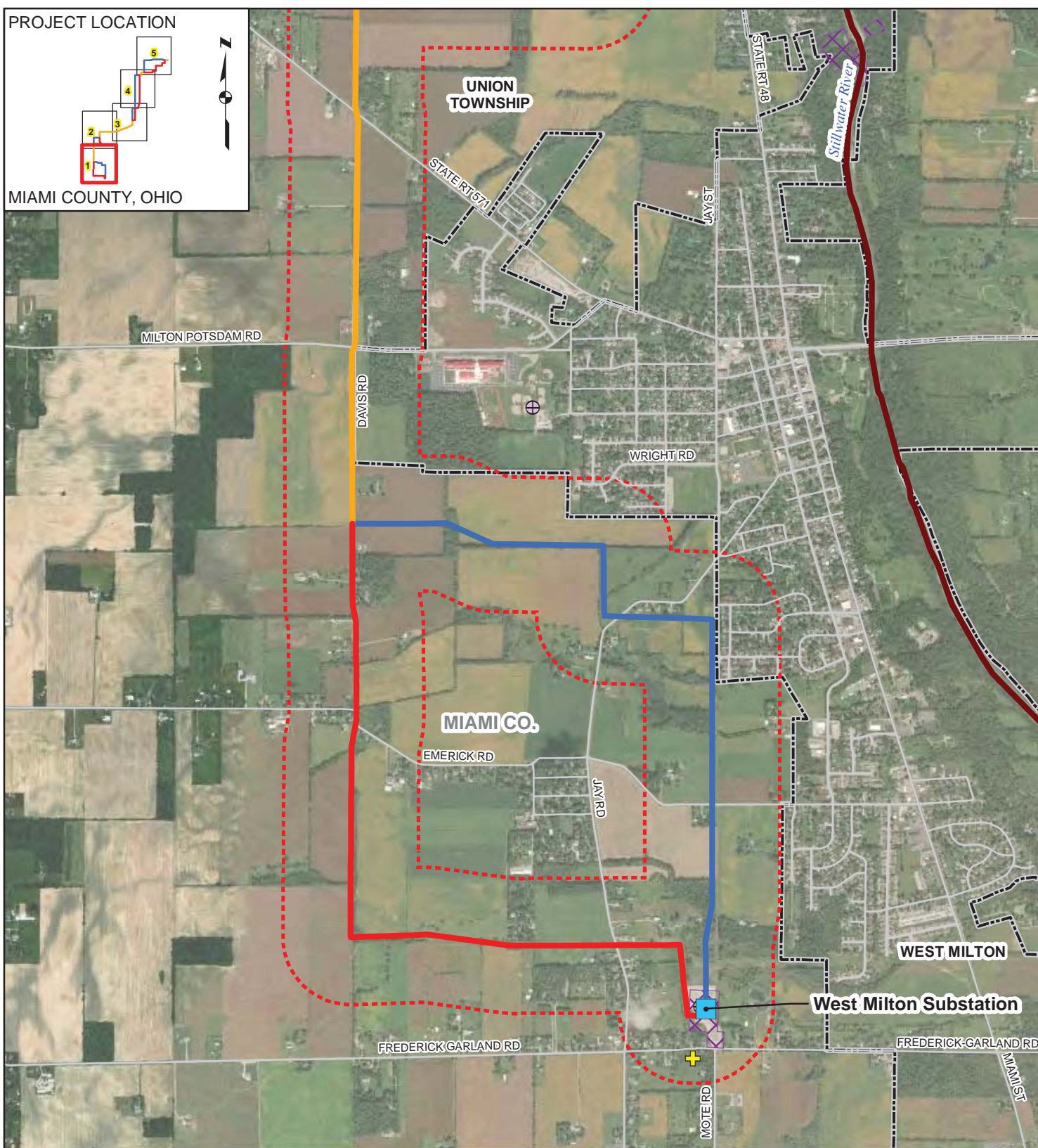
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REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; MIAMI COUNTY, 2018; ODOT, 2018.

PROJECT LOCATION



MIAMI COUNTY, OHIO



- | | | | | | | | |
|--|------------------------|--|-----------------|--|--------------------|--|--------------------|
| | Substation | | Preferred Route | | Road Centerline | | Township Boundary |
| | Cultural Resource Site | | Common Route | | 2000-Foot Corridor | | County Boundary |
| | Historic Structure | | Alternate Route | | Phase 1 Site | | Municipal Boundary |
| | OGS Cemeteries | | Park | | Nature Preserve | | |
| | State Scenic River | | | | | | |

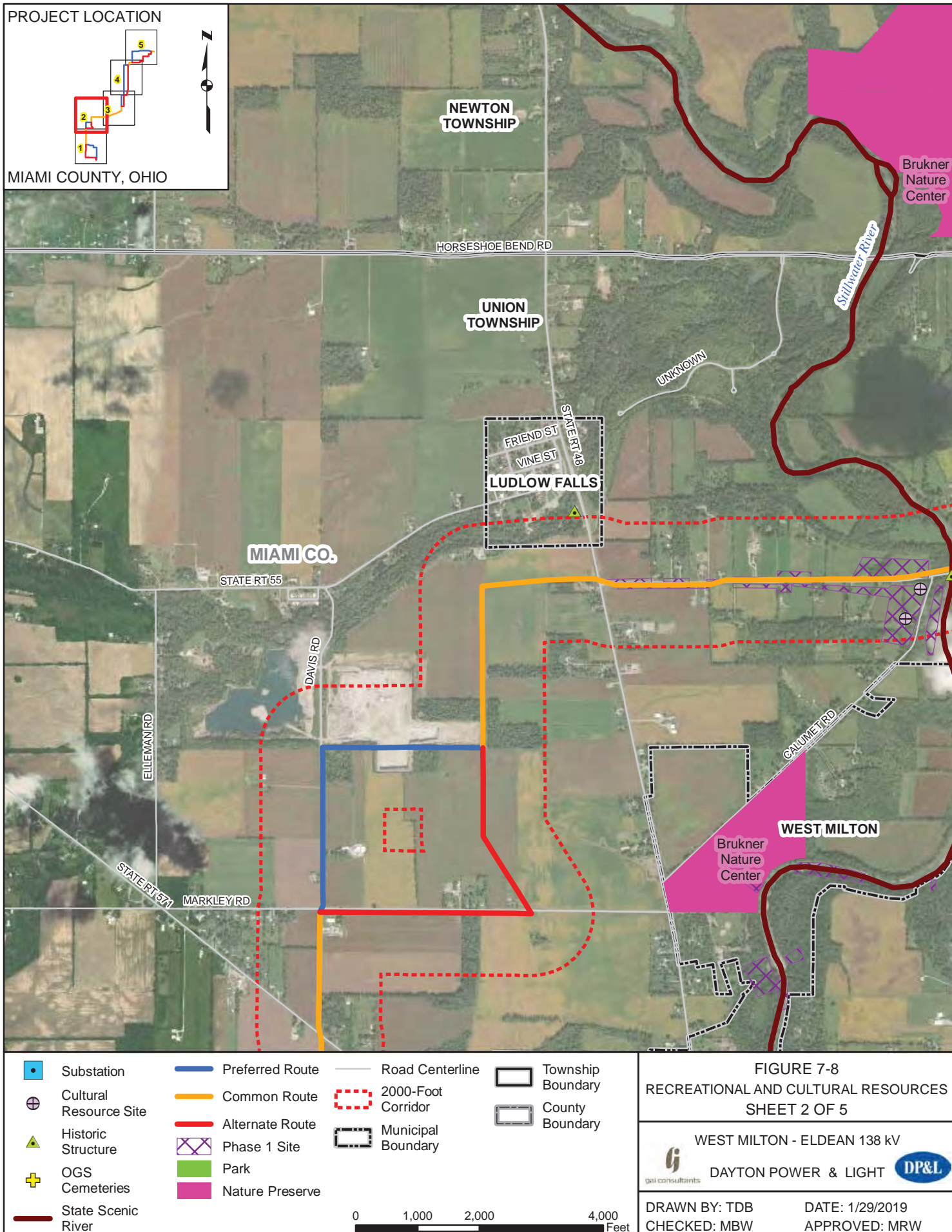
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FIGURE 7-8
RECREATIONAL AND CULTURAL RESOURCES
SHEET 1 OF 5

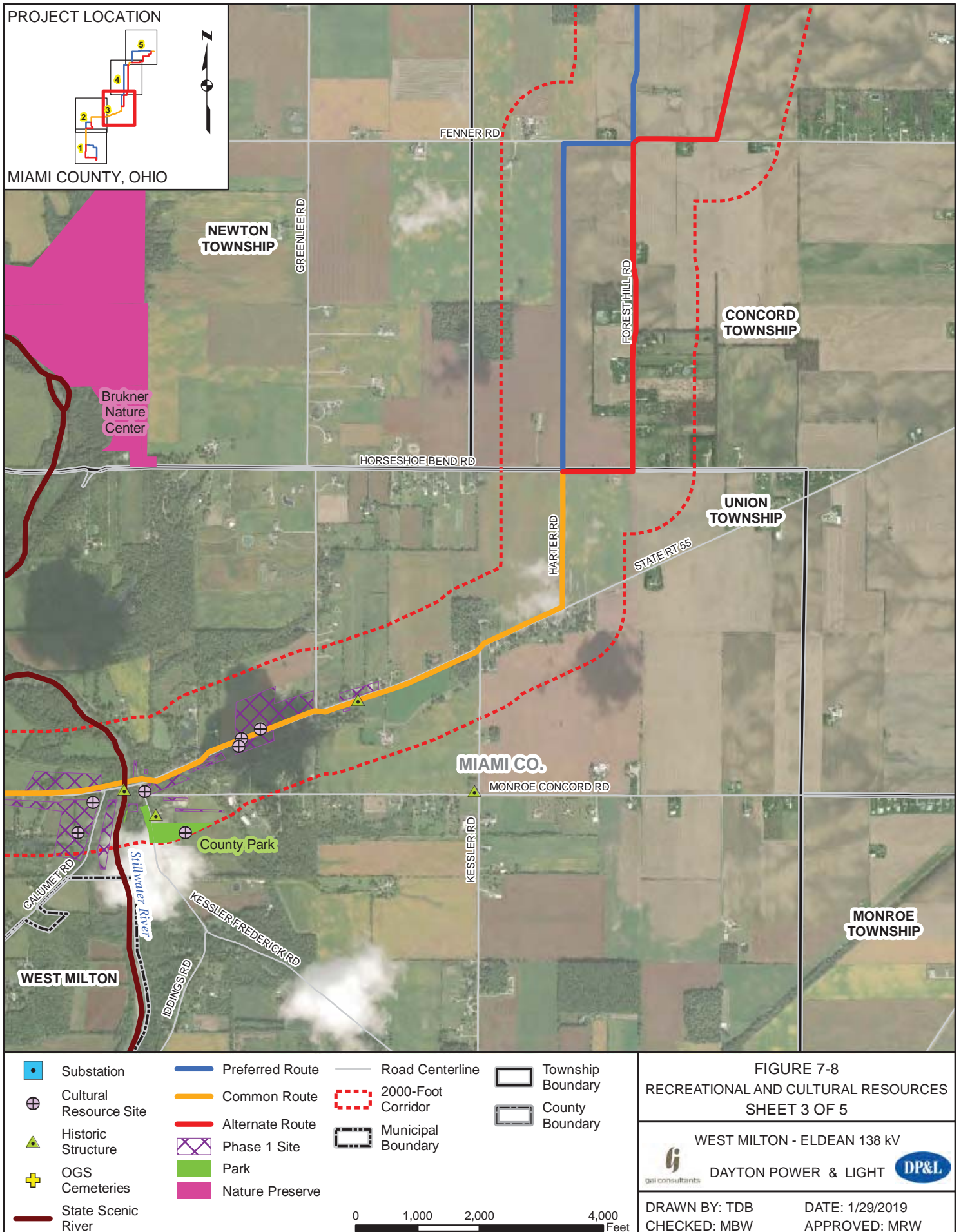
WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

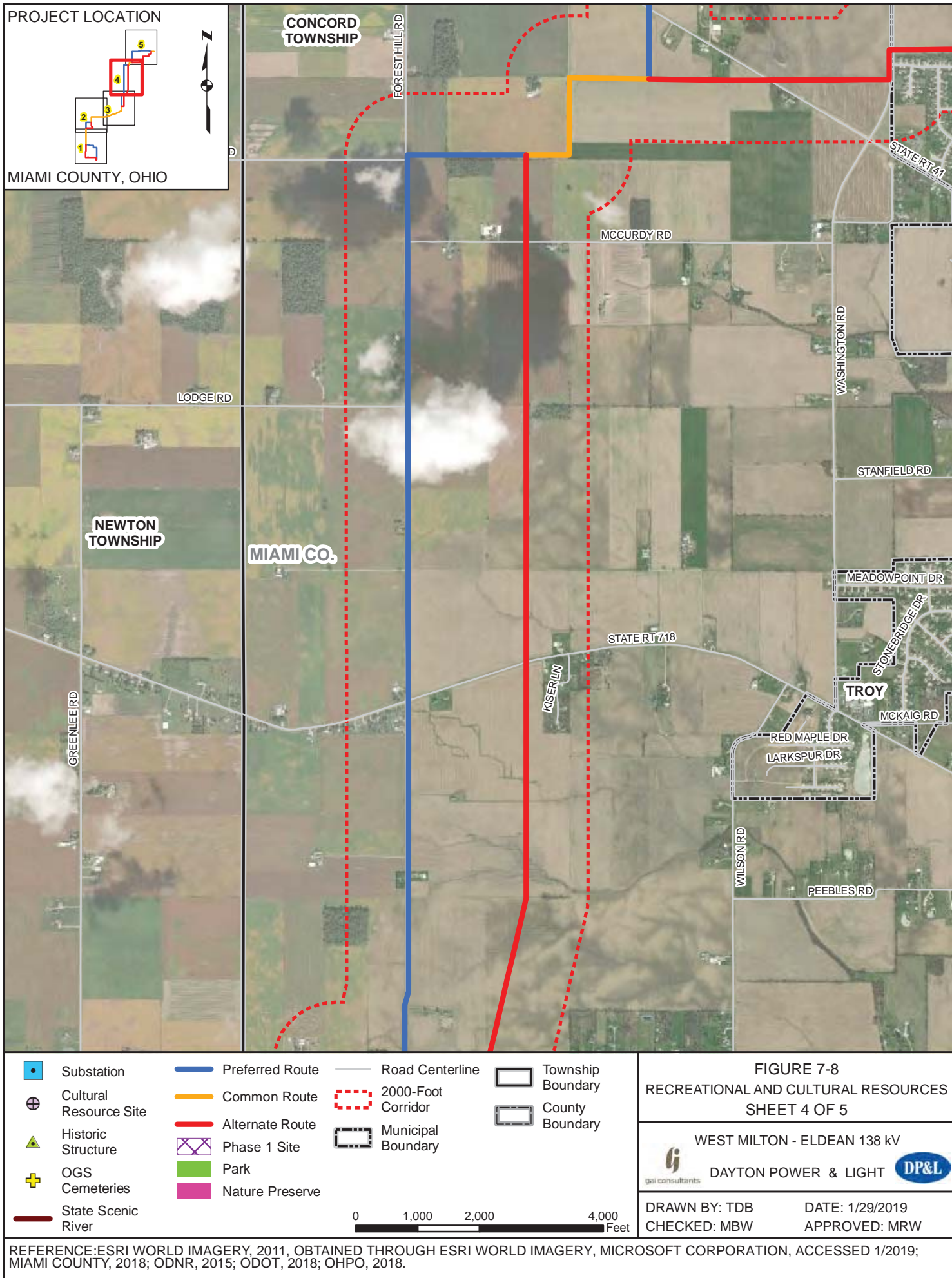
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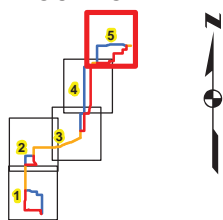


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PROJECT LOCATION



MIAMI COUNTY, OHIO

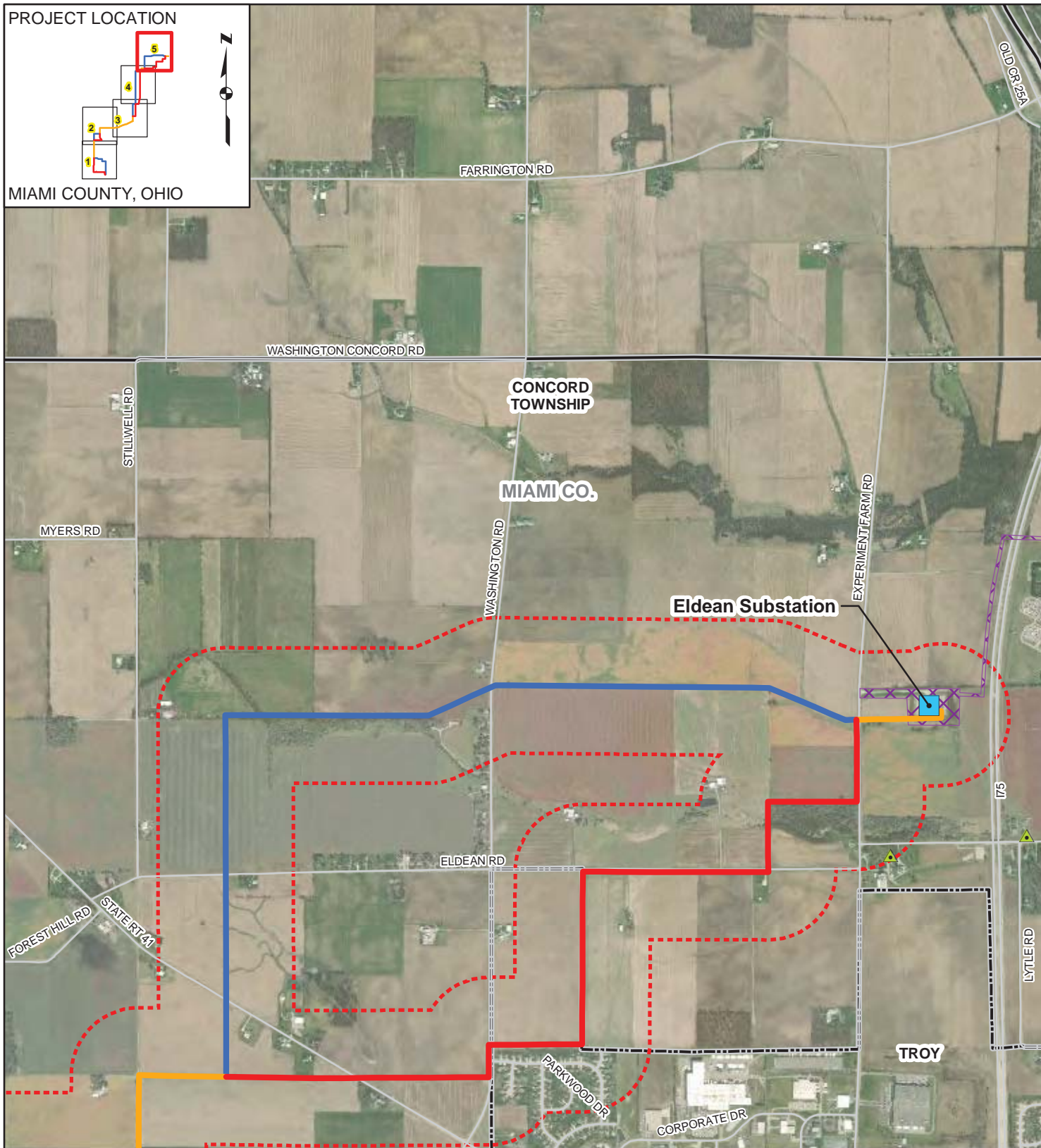


FIGURE 7-8
RECREATIONAL AND CULTURAL RESOURCES
SHEET 5 OF 5

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB
CHECKED: MBW

DATE: 1/29/2019
APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019;
MIAMI COUNTY, 2018; ODNr, 2015; ODOT, 2018; OHPO, 2018.

4906-5-08 ECOLOGICAL INFORMATION AND COMPLIANCE WITH PERMITTING REQUIREMENTS

This section summarizes the results of a desktop assessment and on-site investigations of ecological resources within the study area of the proposed Project. A map and literature search was conducted for a corridor 1,000 feet on either side of the Preferred and Alternate Route centerlines. A field study was conducted for a 200-foot corridor (within 100 feet of either side of the centerline) for the Preferred and Alternate Routes. Access to all properties crossed by the Project were not available and therefore some sections of the routes have not had a field study completed. Additionally, off-ROW access roads outside of the study area have also not yet been reviewed for aquatic resources. Upon OPSB selecting an approved route, DP&L will complete the necessary field work, approximately 1,800 feet along the Preferred Route, 6,100 feet along the Alternate Route, and 100 feet along the Common Route. Additionally, approximately 12,675 feet of access roads outside of the 200-foot corridor will also need to be studied for aquatic resources. The sections below provide ecological information for the Preferred Route and the Alternate Route separately unless the two routes share a common segment. Where the Preferred Route and Alternate Route share a common alignment they are referred to as the “common” route.

(A) ECOLOGICAL MAP

A map at a scale of 1:12,000 (one-inch = 1,000 feet) including the corridor 1,000 feet on either side of the centerline (referred to as the 2,000-foot corridor) of the Preferred and Alternate Route is presented as Figure 8-1. This map depicts the Preferred and Alternate Routes, streams, lakes, ponds, and reservoirs, NWI wetlands, highly-erodible soils, and slopes of 12 percent or greater. Also shown on Figure 8-1 are wildlife areas, nature preserves, and publicly identified conservation areas that are managed by a public body or a recognized nonprofit organization where present. Data presented on Figure 8-1 was compiled from publicly available published data.

(B) FIELD SURVEY REPORT FOR VEGETATION AND SURFACE WATERS

From October 2014 through October 2015, POWER ecologists, at the request of DP&L, conducted an ecological field study to quantify the occurrence and quality of wetlands and streams and document vegetation and wildlife within the review corridor of 100 feet on either side of the Preferred Route centerline (200 feet total width; “Field Survey Area”). Additionally, POWER ecologists performed ecological field studies within the 200-foot review corridor of the Alternate Route to the extent permissible from June 2015 through October 2015. Results and findings from this field study are described in greater detail in the sections below.

(1) Vegetation Communities, Wetlands, and Streams in Study Area**Vegetation Communities**

Vegetation communities and land use types within the Field Survey Area include: agricultural and pasture fields, old fields, scrub-shrub, palustrine emergent (“PEM”) wetland, existing utility ROW,

small woodlots and tree lines, and riparian woodland.

Agricultural and Pasture Fields

Portions of both the Preferred Route and Alternate Route cross agricultural row crops and/or pasture fields. Pastures were dominated by grasses maintained by grazing.

Old Field and Scrub-Shrub

Herbaceous cover exists in successional old field communities. Old-field plant communities are at the earliest stages of recolonization following disturbance. This community type is typically short-lived (less than 10 years), progressively giving way to shrub and forest communities unless periodically re-disturbed, in which case they remain as old fields. Old-field and scrub-shrub areas are located within a small portion of the Project area, usually in inactive pastures or clear-cut areas. Portions of both the Preferred and Alternate Route immediately north of the West Milton Substation have old-field and scrub-shrub communities.

Wetlands

Wetlands were observed and delineated within and beyond the Preferred Route and Alternate Route. Dominant plant species typically found in wetlands crossed by the Project are listed below.

Dominant plant species observed within PEM wetlands include the following:

- skunk cabbage (*Symplocarpus foetidus*);
- fox sedge (*Carex vulpinoidea*);
- Short's sedge (*Carex shortiana*);
- black willow (*Salix nigra*);
- red elm (*Ulmus americana*);
- tatarian dogwood (*Cornus alba*);
- reed canary grass (*Phalaris arundinacea*);
- narrow-leaf cattail (*Typha angustifolia*);
- spotted touch-me-not (*Impatiens capensis*);
- indian hemp (*Apocynum cannabinum*);

- sweet flag (*Acorus calamus*);
- dark-green bulrush (*Scirpus atrovirens*); and
- boneset (*Eupatorium perfoliatum*).

Utility ROW

The primary utility ROW within the Field Survey Area is the existing West Milton-Greenville 138 kV transmission line ROW that will be converted to a double circuit with the Preferred line for this Project. Other numerous utility line ROWs exist along the Project routes but the vegetation within those ROWs is generally dominated by the adjacent off-ROW vegetation. However, where the vegetation is different, utility ROWs are maintained by mowing and typically consisted of grasses, herbaceous plants, and scrub-shrub vegetation. Vegetation with tall growth potential that poses a risk to the operation and maintenance of overhead electric lines is typically removed periodically from the ROW.

Small woodlots, tree lines, and riparian corridors

Small woodlots and tree lines occur throughout the Field Survey Area. Riparian corridors are typically constrained to the crossing of Stillwater Creek. Tree species typical of these locations include the following:

- sugar maple (*Acer saccharum*);
- black walnut (*Juglans nigra*);
- green ash (*Fraxinus pennsylvanica*);
- black locust (*Robinia pseudoacacia*);
- red oak (*Quercus rubra*); and
- shagbark hickory (*Carya ovata*).

Wetlands

According to the United States Army Corps of Engineers (“USACE”), a wetland is defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation (hydrophytic) typically adapted for life in saturated (hydric) soil conditions. DP&L’s consultant, POWER, used the on-site methodology described in the 1987 Technical Report Y-87-1, USACE Wetlands Delineation Manual, and subsequent guidance documents including the 2012 Regional Supplement to the USACE Wetland Delineation Manual: Midwest Region (Version 2.0). Additionally, each identified wetland was evaluated in accordance with the Ohio Rapid Assessment Method (“ORAM”) developed by Ohio

Environmental Protection Agency ("OEPA") (Mack, 2001⁴). Wetland categorizations were conducted in accordance with the latest quantitative score calibration procedure (Mack, 2001).

Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, according to the OEPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower category (Mack, 2001).

Four wetlands were identified and delineated within the Field Survey Area. The delineated wetlands were all PEM wetlands with a delineation size of 0.02 to 0.33 acres; wetlands may extend beyond the Field Survey Limits. Three wetlands received an ORAM rating of Category 2. Wetland C received an ORAM rating of Category 1. Wetland and corresponding upland data forms along with completed ORAM data forms are provided in Appendix 8-1. Wetland photographs are provided in Appendix 8-3.

⁴ Mack, John J. 2001. Ohio Rapid Assessment Methods for Wetlands Manual for Using Version 5.0. Ohio EPA Technical Bulletin Wetland/2001-1-1. Ohio Environmental Protection Agency, Division of Surface Water, 401 Wetland Ecology Unit, Columbus, Ohio.

Streams and Waterbodies

Field evaluations were conducted on streams within the Field Survey Area of the Preferred and Alternate Routes. Three streams that drain areas greater than one-square-mile were assessed using the OEPA's Qualitative Habitat Evaluation Index ("QHEI") method. Within the QHEI scoring convention, streams are classified based on their drainage area. QHEI streams that drain an area greater than 20 square miles are classified as "large streams", and streams that drain an area less than 20 square miles are classified as "headwater streams." QHEI-classified streams are assigned a narrative rating based upon their score. The narrative rating gives a general indication of aquatic assemblages that may be found at any given site. Five narrative ratings scale the 100 point scoring system. Very poor streams have a QHEI score of less than 30. Poor streams have a QHEI score between 30 and 42. Fair streams have a QHEI score between 43 and 54. Good streams have a QHEI score between 55 and 69. Streams that have a QHEI score greater than or equal to 70 are classified as excellent (OEPA, 2006⁵).

QHEI evaluations were conducted on the Stillwater River (Stream 5), a State Scenic River, and two additional streams [Jones Run (Stream 9), a tributary to the Stillwater River and an unnamed tributary (Stream 6) to the Great Miami River]. The evaluations were conducted at or near the proposed transmission line crossing of the streams. According to the OAC rule 3745-1-21 (OEPA Beneficial Use Designations for streams), the Stillwater River is classified as exceptional warm water habitat and scored 69 on the QHEI scale. The Jones Run stream is classified as warm water habitat and scored 52.5 for QHEI and the unnamed tributary of the Great Miami River scored 57.5 for the QHEI (no Ohio stream use designation).

Streams with a drainage basin less than one-square-mile were evaluated using the OEPA's Headwater Habitat Evaluation Index ("HHEI") method. The HHEI is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat ("PHWH") streams. Headwater streams are typically considered to be first and second-order streams, meaning streams that have no upstream tributaries and those that have only first-order tributaries, respectively. Headwater streams are scored on the basis of channel substrate composition, bank full width, and maximum pool depth. Assessed areas result in a score (0 to 100) that is converted to a specific PHWH stream class. Streams that are scored from 0 to 29.9 are typically grouped into "Class I PHWH Streams", 30 to 69.9 are "Class II PHWH Streams", and 70 to 100 are "Class III PHWH Streams". Evidence of anthropogenic alterations to the natural channel resulted in a "Modified" qualifier for the stream (OEPA, 2012⁶).

⁵ Ohio Environmental Protection Agency. 2006. Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Division of Surface Water, Columbus, Ohio.

⁶ Ohio Environmental Protection Agency. 2012. Field Evaluation Manual for Ohio's Primary Headwater Habitat Streams. Version 3.0. Ohio EPA Division of Surface Water, Columbus, Ohio.

HHEI evaluations were conducted on four streams. The evaluations were conducted at or near the proposed transmission line crossing of each stream.

Copies of the QHEI and HHEI forms for the streams delineated within 100 feet of the Preferred and Alternate Routes are included in Appendix 8-2. Stream photographs are provided in Appendix 8-3.

A total of 11 streams were identified within the Field Survey Area, one stream, Stream 6, was identified three times. Of these streams, 13 stream segments in total, 8 were evaluated using the HHEI method and five were evaluated using OEPA's QHEI method for streams with drainage areas greater than one-square-mile or maximum pool depths of greater than 40 cm.

No major lakes or reservoirs were observed within the Field Survey Area. However, one Pond (Pond 1) was identified within the Field Survey Area and has a total estimated acreage of 0.27-acre, with 0.08-acre within the Field Survey Area. A photograph of Pond 1 is provided in Appendix 8-3.

(2) Map of Facility, Right-of-Way, and Delineated Aquatic Resources

Detailed maps at 1:12,000 scale depicting the delineated features and proposed ROW for the Preferred and Alternate Routes are provided as Figure 8-2.

(3) Construction Impacts on Vegetation and Surface Waters

Construction Impacts on Vegetation

The construction impacts on woody and herbaceous vegetation along both the Preferred and Alternate Route will be limited to the initial clearing of vegetation within the 75-foot-wide ROW where routes are cross-country and within the 30-foot-wide ROW where routes are roadside for the proposed transmission line and the 15-foot-wide ROW for the temporary access roads. Preliminary locations for temporary access roads have been identified and will be confirmed at the time of DP&L's transmission line easement acquisition process. No permanent access roads are proposed. Trees and woody vegetation will be removed from the ROW and subsequent grading is anticipated to be minimal due to the nearly level terrain. Trees adjacent to the ROW that are dead, dying, diseased, leaning, significantly encroaching, or prone to failure may require clearing to allow for safe construction and operation of the transmission line. Vegetation waste (e.g., tree limbs and trunks) generated during the construction phase will be windrowed or chipped and disposed of appropriately depending on individual landowner requests. The approximate vegetation impacts along the Preferred and Alternate Route ROWs are provided in Table 8-1. Figure 7-1, Land Use, depicts the land use types within the ROW.

TABLE 8-1. Approximate Vegetation Impacts From Transmission Line ROW Construction¹

Land Use Type	Length of Route (in feet)	Length of Route (in miles)	Acreage within ROW
Preferred Route			
Agricultural	73,649	13.9	90.0
Aquatic Resources ²	274	0.1	0.4
Industrial/Commercial	1,097	0.2	2.1
Institutional ³	-	-	<0.0
Open Land/Pasture	2,919	0.6	2.3
Residential	2,365	0.4	2.4
Road/Railroad ROW	1,573	0.3	1.6
Utility ROW	3,378	0.6	5.5
Woodlot	2,977	0.6	3.2
Alternate Route			
Agricultural	74,806	14.2	93.9
Aquatic Resources ²	288	0.1	0.4
Industrial/Commercial	1	<0.0	<0.0
Institutional ³	-	-	<0.0
Open Land/Pasture	3,763	0.7	4.5
Residential	3,488	0.7	3.1
Road/Railroad ROW	1,920	0.4	1.9
Utility ROW	2,385	0.5	3.9
Woodlot	1,913	0.4	2.0

Notes:

- ¹ Vegetation impacts associated with off ROW access roads are not included.
- ² Since wetland, open water, and streams make up a minor component of the land use, a combination of NHD waterbodies and waterways, NWI wetlands, and field delineated aquatic resources were used to define these values.
- ³ Institutional may include but is not limited to schools, hospitals, churches, government facilities, etc.

Construction Impacts on Streams and Waterbodies

The Preferred Route crosses eight streams, with 376 linear feet within the proposed ROW. The Alternate Route crosses five streams, with a total of 253 linear feet within the proposed construction corridor. While access roads have not been studied for streams or waterbodies, one identified stream within the Field Survey Area does cross a temporary access road that would only be used for the Preferred Route, Stream 11. Stream 11 has 16 linear feet within the proposed temporary access road corridor. No ponds or other waterbodies are proposed to be impacted based on completed field surveys. No major lakes or reservoirs were observed within the proposed ROW of the Preferred or Alternate Routes. Impacts to ponds or other waterbodies (i.e., lakes, reservoirs, etc.) are not anticipated by the construction of the transmission line ROW. The approximate stream and waterbody impacts along the Preferred and Alternate Route ROWs are provided in Table 8-2. The locations and approximate extents of these streams are shown on Figure 8-2.

DP&L will not perform mechanized clearing within 25 feet of any stream and will hand cut only trees in these areas that could potentially interfere with safe construction and operation of the line. Field investigations indicated that no streams would need to be filled or permanently impacted. However, one stream will need to be crossed by construction vehicles along a temporary access road for the Preferred Route only based on completed field studies. Construction crews will access pole installation locations primarily by utilizing existing farm roads and fields. Should a stream crossing need to occur, and an existing culvert or bridge does not currently exist, construction crews will utilize a temporary culvert or temporary access bridge.

Culvert stream crossings are proposed for crossing marginal quality perennial, ephemeral, and intermittent streams with a drainage basin of less than one mile. These crossings will be removed as no permanent access roads are proposed.

- Disturbance of the stream will be kept to a minimum, stream bank vegetation will be preserved to the maximum extent practical, and the stream crossing width will be kept as narrow as possible. Clearing will be done by hand-cutting techniques rather than grubbing. Roots and stumps will be left in place to aid stabilization and to accelerate re-vegetation.
- Sediment laden runoff will be controlled to minimize flow from the access road directly into the stream. Diversions and swales will be used to direct runoff to storm water management locations. Silt fence will be used as needed according to local topographic conditions.
- Culvert pipes will be placed on the existing streambed to avoid a drop or waterfall at the downstream end of the pipe, which would be a barrier to fish migration. Crossings will be placed in shallow areas rather than pools.
- Culverts will be sized to be at least three times the depth of the normal stream flow at the crossing location. The minimum diameter culvert that will be used is 18 inches.
- There will be a sufficient number of culvert pipes to cross the stream completely with no more than a 12-inch space between each one.
- Stone, rock, or aggregate of ODOT number 1 as a minimum size will be placed in the channel, and between culverts. To prevent washouts, larger stone may be used with gabion mattresses. No soil will be placed in the stream channel.
- After completion of construction, some rock aggregate and structures such as culvert pipes used for the crossing will be left in place if approved by the landowner. Care will be taken so that aggregate does not create an impoundment or impede fish passage. Structures such as gabion mattresses will be removed.
- Stream banks will be stabilized and revegetated as appropriate.

Temporary access bridges or culvert stream crossings will be used for high quality perennial, ephemeral, and intermittent streams and streams with a drainage basin greater than one square mile.

- Disturbance of the stream will be kept to a minimum, stream bank vegetation will be preserved to the maximum extent practical, and the stream crossing width will be kept as narrow as possible. Clearing will be done by hand cutting rather than grubbing. Roots and stumps will be left in place to aid stabilization and to accelerate re-vegetation.
- Sediment laden runoff will be controlled to minimize flow from the access road directly into the stream. Diversions and swales will be used to direct runoff to storm water management locations. Silt fence will be used as needed according to local topographic conditions.
- Bridges will be constructed to span the entire channel. If the channel width exceeds eight feet, then a floating pier or bridge support may be placed in the channel. No more than one pier, footing, or support will be allowed for every eight feet of span width. No footings, piers, or supports will be allowed for spans of less than eight feet.
- No fill other than clean stone, free from soil, will be placed within the stream channel.

Additional details related to any necessary temporary access bridges will be detailed in the Project's Stormwater Pollution Prevention Plan ("SWPPP").

TABLE 8-2. Approximate Stream and Waterbody Impacts From Transmission Line ROW Construction¹

Stream ID	Route	Flow Regime	Stream Form	Score	Narrative	Length (ft) within Field Survey Area	Length (ft) within ROW
1	Alternate	Ephemeral	HHEI	36	Modified Class II	96	35
2	Common	Ephemeral	HHEI	50	Modified Class II	107	35
3	Common	Ephemeral	HHEI	45	Modified Class II	239	38
4	Common	Intermittent	HHEI	70	Class III	23	0
5	Common	Perennial (Stillwater River)	QHEI	69	Good	209 ²	39 ²
6	Alternate	Perennial	QHEI	57.5	Good	279	106
6-A	Preferred	Intermittent	QHEI	37	Poor	288	103
6-B	Preferred	Intermittent	QHEI	48.5	Fair	998	0
7	Preferred	Intermittent	HHEI	39	Class II	120	30
8	Preferred	Intermittent	HHEI	65	Class II	172	71
9	Preferred	Perennial (Jones Run)	QHEI	52.5	Fair	183	36
10	Preferred	Intermittent	HHEI	61	Modified Class II	237	24
11	Temporary Access Road for Preferred Route Only	Ephemeral	HHEI	53	Modified Class II	166	16

Notes:

¹ Stream and waterbody impacts associated with off ROW access roads outside of the Field Survey Area are not included.

² Right bank measurement utilized for reference length, as it was the longer of the two banks.

Construction Impacts on Wetlands

The Preferred Route crosses one PEM wetland (Wetland D – Category 2), with 0.01-acre of wetland within the ROW. However, based on the location of the wetland within the ROW and the location of the proposed temporary access road within the ROW, impacts to Wetland D are anticipated to be avoided and therefore it will not be impacted. No wetlands are located within the proposed transmission line ROW for the Alternate Route. Delineated wetlands within the Field Survey Area are mapped on Figure 8-2 and the approximate ROW impacts are summarized in Table 8-3.

No permanent impacts to wetlands are anticipated during the construction process. In order to reduce potential sedimentation impacts to nearby wetlands, Best Management Practices (“BMPs”) such as silt fences and construction matting will be implemented. Due to the nature of the topography along the routes, sedimentation runoff potential into wetlands will be minimal. Construction equipment will only cross wetlands using construction matting, if necessary, and appropriate permits are obtained.

Soil disturbance within wetlands during construction is not anticipated. No fill material will be placed in any wetland areas along the routes. No structures would be placed in wetlands along the Preferred or Alternate Routes. Wetlands will be marked with stakes before any clearing activities occur in order to avoid incidental vehicle impacts.

TABLE 8-3. Approximate Wetland Impacts From Transmission Line ROW Construction¹

Wetland ID	Route	Cowardin Wetland Type ²	ORAM Score	ORAM Category	Acreage within Field Survey Area	Acreage within ROW
Wetland A	Alternate	PEM	42.5	Category 2	0.33	0.00
Wetland B	Common	PEM	38	Category 2	0.05	0.00
Wetland C	Alternate	PEM	26	Category 1	0.02	0.00
Wetland D	Preferred	PEM	44	Category 2	0.06	0.01

Notes:

- ¹ Wetland impacts associated with off ROW access roads outside the Field Study Area are not included.
- ² Cowardin, L.M., F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, US Fish and Wildlife Service, US Department of the Interior, Washington, DC. 103 p.

(4) Operation and Maintenance Impacts on Vegetation and Surface Water

The potential impacts on woody and herbaceous vegetation along either of the proposed routes for maintenance and operation activities will be limited to the proposed transmission line ROW for safe and reliable operation of the transmission line. Undeveloped non-forested land not significantly

disturbed by construction should retain its current vegetation composition. Periodic cutting along the proposed 30/75-foot-wide transmission line ROW is not expected to result in a significant environmental impact to the vegetation in these types of areas, particularly due to most of the land use being agricultural for the Preferred and Alternate Routes. Trees adjacent to the proposed transmission line ROW, that are dead, dying, diseased, leaning, significantly encroaching, or prone to failure may require clearing to allow for safe operation of the transmission line. This type of woody vegetation removal will only be periodic; maintenance activities along ROWs are completed every five years. Vegetation waste (such as tree limbs and trunks) that is generated during the maintenance and operation will be windrowed or chipped and disposed of appropriately depending on individual landowner requests.

No impacts to streams, waterbodies, or wetlands are anticipated once the transmission line is in operation. No lakes, ponds, or other waterbodies will be affected by the operation or maintenance of the Preferred or Alternate Routes. It is anticipated that operation and maintenance activities would not result in erosion or water quality degradation.

(5) Mitigation Procedures

The Project's SWPPP and BMPs will be implemented during all construction stages in order to reduce sediment runoff and soil erosion. Seeding and mulching will occur in disturbed areas and be monitored until restoration is complete.

(a) Site Restoration and Soil Stabilization

A SWPPP will be developed specifically for the Project and specified BMPs will be implemented during construction to control erosion and sedimentation. Areas where soil has been disturbed will be seeded and mulched to prevent soil erosion and sedimentation. Experience shows that seeding in non-wetland and non-agricultural areas is advantageous to control erosion on areas disturbed by construction activities. Seeding and mulching and, if needed, erosion control blankets or other specified BMP in the Project's SWPPP will be implemented along riparian areas to stabilize and restore vegetation as quickly as possible. In lightly disturbed wetland areas, existing seed banks are quite often capable of quickly reestablishing vegetation that is compatible with the surrounding wetland. If any unanticipated significant disturbance occurs in wetlands, topsoil will be segregated and replaced so that the existing seed banks will be allowed to revegetate the areas initially. Additional seeding will only take place if the existing seed bank does not repopulate an area. These measures should preserve the aesthetic qualities along the ROW, prevent erosion, and promote habitat diversity.

Construction access routes and staging areas will be selected to avoid or minimize impacts to wetlands and streams to the extent practical. Following construction, pole locations, material storage sites, and temporary access roads will be seeded with a suitable grass seed mixture as specified in the SWPPP for restoring these disturbed areas or as directed by individual landowners, particularly in agricultural fields.

(b) Frac-out Contingency Plan Stream and Wetland Crossings

The Project does not include a stream or wetland crossing by horizontal direction drill. Therefore, a detailed frac-out contingency plan will not be required for the Project.

(c) Demarcation and Protection Methods

Wetlands, streams, waterbodies, and any other environmentally sensitive areas will be clearly staked, flagged, or fenced in accordance with the SWPPP prior to the commencement of any clearing in order to minimize incidental impacts. BMPs such as utilization of silt fences and orange construction netting will be implemented as required during construction.

(d) Procedures for Inspection and Repair of Erosion Control Measures

Procedures for inspection and repair of erosion control measures, especially after rainfall events will be outlined in the SWPPP.

(e) Stormwater Runoff Measures

BMPs, including utilization of silt fence or filter socks, will be used as appropriate during construction to minimize runoff and sedimentation of streams/waterbodies and wetlands. Measures to divert stormwater runoff away from fill slopes and other exposed surfaces will be outlined in the SWPPP.

(f) Methods to Protect Proximal Vegetation

The Project construction boundaries will be clearly demarcated through the use of BMPs, orange construction netting, flagged stakes, or other method as detailed in the Project's SWPPP.

(g) Clearing Methods

DP&L will not conduct mechanized clearing within 25 feet of any stream and will only clear (using hand cutting techniques) those trees in this area that are tall enough to or have the potential to interfere with safe and reliable construction and operation of the transmission line. Vegetation and woody vegetation clearing equipment will make all reasonable attempts to make a single pass through the Project ROW to clear vegetation. Following the cutting equipment, heavy machinery to assist with vegetation clean-up will also make all reasonable attempts to make a single pass through the Project ROW to prepare vegetation debris for on-site or off-site disposal. Given the limited amount of woody vegetation to be removed, DP&L anticipates minimal effort by heavy equipment to prepare the ROW for construction of the proposed line, thus the movement of heavy equipment and other vehicles within the Project areas for removing trees and other vegetation will be limited. Vegetative waste (such as tree limbs and trunks) that is generated during the construction phase will be windrowed or chipped and disposed of appropriately depending on landowner requests.

(h) Expected Use of Herbicides

DP&L does not anticipate the use of herbicides on the Project.

(C) LITERATURE SURVEY OF PLANT AND ANIMAL LIFE POTENTIALLY AFFECTED**(1) Project Vicinity Species Descriptions****Rare, Threatened, and Endangered Species**

Coordination with the United States Fish and Wildlife Service (“USFWS”) and the ODNR was initiated during preliminary planning of the Project. Consultation letters were sent to each agency in 2013, a second request for updates was made in April 2015, a third request was sent in February 2017, and a fourth request was sent in August 2018.

The recent response from the ODNR’s Office of Real Estate, in conjunction with the ODNR Division of Fish and Wildlife (“DOW”) and The Ohio Scenic Rivers Program, on October 12, 2018, indicated that according to the NHD three species have records within one-mile of the project area; wood’s hellebore (*Melanthium woodii*; state threatened), creek heelsplitter (*Lasmigona compressa*; state species of concern); and Indiana bat (*Myotis sodalis*; federally endangered and state endangered). The response also indicated that per the NHD the following are also located within a one-mile radius of the project area: Waterfall (geologic feature), Stillwater State Scenic River, Francis Scenic River Easement – ODNR Scenic Rivers Program, Twin Arch Reserve – Miami County Park District, and Brukner Nature Center – Brukner Nature Center; all of which, except for the Stillwater State Scenic River, are distant enough from the Project to not be impacted. The response also indicated, per the DOW, that the Project was within the range of three state endangered and federally endangered mussel species including the club shell (*Pleurobema clava*), the rayed bean (*Villosa fabalis*), and the snuffbox (*Epioblasma triquerta*). The DOW also indicated that the Project is within the range of a state endangered fish, the Iowa darter (*Etheostoma exile*). Additionally, the DOW indicated that the Project is within the vicinity of records for the Indiana bat. Presence of the Indiana bat has been established in the area and therefore additional summer surveys would not constitute presence/absence in the area.

The recent USFWS response, dated August 21, 2018, indicated that the proposed Project is within the range of four federally protected species including two bat species [Indiana bat (federally endangered) and northern long-eared bat (*Myotis septentrionalis*); federally threatened]] and two mussel species [rayed bean (federally endangered) and snuffbox (federally endangered)]. The proposed project is in the vicinity of one or more confirmed records of Indiana bats. Since Indiana bat presence has already been confirmed in the Project vicinity, any additional summer surveys would not constitute presence/absence surveys for this species.

Correspondence letters from the USFWS and ODNR are included as Appendix 8-4. Table 8-4 identifies state and federally rare, threatened or endangered species that may occur, or are known to occur, within the Project area.

TABLE 8-4. ODNR and USFWS Rare, Threatened or Endangered Species

Common Name	Scientific Name	Taxon	State Status	Federal Status
Indiana bat	<i>Myotis sodalis</i>	Mammal	Endangered	Endangered
northern long-eared bat	<i>Myotis septentrionalis</i>	Mammal	-	Threatened
rayed bean	<i>Villosa fabalis</i>	Mussel	Endangered	Endangered
snuffbox	<i>Epioblasma triquetra</i>	Mussel	Endangered	Endangered
club shell	<i>Pleurobema clava</i>	Mussel	Endangered	Endangered
Iowa darter	<i>Etheostoma exile</i>	Fish	Endangered	-
creek heelsplitter	<i>Lasmigona compressa</i>	Mussel	Species of Concern	-
wood's-hellebore	<i>Melanthium woodii</i>	Plant	Threatened	-

Commercial Species

The commercially important species along the proposed routes consist of those hunted or trapped for fur or other by-products, including the following species:

- Coyote (*Canis latrans*): Historically coyotes prefer open territory, but in Ohio they have adapted to various habitat types. Coyotes are a very adaptable species that has prospered despite the expanding presence of human impact. This species is expected to inhabit the proposed routes and indications of this species in the area were observed during field surveys.
- Gray Fox (*Urocyon cinereogenteus*): Gray fox habitat is generally dominated by wooded areas with some partially open brush land with little human presence. This species is expected to inhabit the proposed routes but was not observed.
- Long-tailed weasel (*Mustela frenata*): The long-tailed weasel is found throughout the state of Ohio in areas adjacent to rivers, lakes, streams, or marshes, where they feed on small mammals. This species is expected to inhabit the proposed routes but was not observed.
- Mink (*Mustela vison*): The mink is almost invariably found near water, both running water of streams and rivers and the standing waters of marshes and lakes. This animal is drawn to areas of cluttered vegetation or wooded banks that offer protection and is expected to inhabit the proposed routes but was not observed.

- Muskrat (*Ondatra zibethicus*): The muskrat is abundant throughout Ohio and prefers areas near intermittent streams, drainage courses, and farm ponds. It is the most extensively trapped furbearer in the State of Ohio. This species is likely to inhabit aquatic habitats within the proposed routes but was not observed.
- Red fox (*Vulpes vulpes*): The red fox occurs throughout Ohio and is most prevalent in areas of maximum interspersed woodland, cropland, brush, pastures, and edges of open areas that provide suitable hunting ground. It is likely that the species inhabits the proposed routes but was not observed.
- Raccoon (*Procyon lotor*): The raccoon is abundant and widespread in Ohio, even in many suburban areas. Raccoons are found principally around aquatic and woodland habitats, with occasional foraging into croplands. This species is expected to inhabit the proposed routes near wooded and residential areas. Indications of this species were observed during field surveys.
- Striped skunk (*Mephitis mephitis*): The striped skunk prefers a semi-open habitat of mixed woods, brush, farmland, open grassland, and small caves in proximity to water. This mammal is common statewide. This species is expected to inhabit the proposed routes but was not observed.
- Virginia opossum (*Didelphis virginiana*): The Virginia opossum's preferred habitat is an area interspersed with woods, wetlands, and farmland. This species is expected to inhabit the proposed routes but was not observed.

Recreational Species

Recreational terrestrial species consist of those hunted as game. Recreational species expected to inhabit areas along the proposed routes include the following species:

Mammals

- Eastern cottontail rabbit (*Sylvilagus floridanus*): Eastern cottontail rabbit are abundant in both rural and urban areas and prefers field borders, brushy areas, and thickets that occur along the proposed routes.
- Gray, red, and fox squirrels (*Sciurus carolinensis*, *Tamiasciurus hudsonicus*, and *Sciurus niger*, respectively): These tree squirrel species occur throughout the State of Ohio. The fox squirrel is primarily an inhabitant of small, typically isolated woodlots. Indications of this species were observed along the proposed routes. The gray squirrel and red squirrel prefer more extensive woodland areas. Gray squirrels were observed during field surveys.

- White-tailed deer (*Odocoileus virginianus*): White-tailed deer occur throughout Ohio. Deer are a very adaptable animal that can be found in almost all habitats in the region. Signs and several sightings of this species were observed along the proposed routes.
- Woodchuck (*Marmota monax*): The woodchuck or groundhog is a common rodent found throughout Ohio. It prefers sloped areas at the fringe of wooded and open areas.

Avian

- Wild Turkey (*Meleagris gallopavo*): Wild Turkeys are very adaptable animals. Although they prefer mature forests, with substantial cover and suitable food sources, they can live successfully in areas with as little as 15 percent forest cover.
- Wood Duck (*Aix sponsa*): The Wood Duck prefers mature riparian corridors along streams, quiet backwaters of lakes and ponds bordered by large trees, and secluded wooded swamps as ample areas to raise young. They feed on acorns, berries, and grapes on the forest floor. This species was not observed, but the quality of the riparian corridor along the Still Water River or nearby ponds could support wood ducks.
- American Woodcock (*Scolopax minor*): American Woodcock are native Ohio shorebirds that prefer a combination of wet, early successional understory and drier uplands. They prefer to nest in northeast and northwest Ohio along Lake Erie, or wherever habitat is suitable. Typical nests in Ohio are found in reverting brushy fields or in young, second growth woods.

Fish

Based upon the nature of the surface waters crossed, various game fish are anticipated to inhabit the streams that are crossed by the proposed routes.

- Bluegill sunfish (*Lepomis macrochirus*): Bluegill sunfish are found throughout the state in nearly every stream and waterbody. Their preferred habitat is clear, warm lakes with some rooted vegetation. This species is likely to occur in the Stillwater River and ponds along the routes.
- Green sunfish (*Lepomis cyanellus*): Green sunfish are present in most lakes, reservoirs, and streams. They are tolerant of turbid water unlike most other sunfish species. They appear to have no preference for a particular bottom type but are usually associated with some type of structure such as brush, vegetation, or rocks. This species is likely to occur in perennial streams and ponds along the routes.
- Longear sunfish (*Lepomis megalotis*): Longear sunfish favor sluggish, clear streams of moderate size with beds of aquatic vegetation to seek shelter in. This species is likely to occur in perennial streams and ponds along the routes.

- Smallmouth bass (*Micropterus dolomieu*): Smallmouth bass are native to Ohio and are found in every county of the state. Smallmouth bass thrive in streams with gravel or rock bottoms with a visible current. This species is likely to occur in larger perennial streams and possibly ponds along the routes.

(2) Construction Impacts on Identified Species

Rare, Threatened, and Endangered Species

According to location information provided by ODNR, the NHD records for wood's-hellebore and creek heelsplitter are not proximal to the Project to the extent which impacts may occur. Impacts to these species are not anticipated.

According to the ODNR in their response letter dated October 12, 2018, the club shell, rayed bean, and snuffbox mussel species are not likely to be impacted by the Project as there is no in-water work proposed in a perennial stream of sufficient size.

For the Iowa darter, the ODNR DOW recommended that no in-water work in perennial streams takes place from April 15 to June 30 to reduce the impacts to this species and other indigenous aquatic species and their habitat. As no in-water work is proposed in a perennial stream during this time-period, the Project is not likely to impact the Iowa darter.

To avoid direct impacts to the Indiana bat and northern long-eared bat roosting and foraging habitat, the DOW and USFWS recommends that tree clearing (trees ≥ 3 inches diameter at breast height) be performed between October 1 and March 31. DP&L proposes to limit tree removal activities to that time-period. In the event tree removal must occur during the seasonal restriction, DP&L will coordinate with ODNR and USFWS to obtain guidance.

Commercial Species

Impacts to commercial species are not anticipated during Project construction activities.

Recreational Species

Impacts to recreational species are not anticipated during Project construction activities.

(3) Operation and Maintenance Impacts on Identified Species

Rare, Threatened, and Endangered Species

Impacts to rare, threatened, and endangered species are not anticipated during operation and maintenance of the Project. During routine maintenance activities that involve tree limb removal or clearing, will only be done between October 1 and March 31 to avoid impacts to roosting or foraging

Indiana bat or northern long-eared bat. In-water work during operation and maintenance is also not anticipated and therefore impacts to aquatic species are not anticipated.

Commercial Species

Impacts to commercial species are not anticipated during Project operation and maintenance activities.

Recreational Species

Impacts to recreational species are not anticipated during Project operation and maintenance activities.

(4) Mitigation Procedures

Rare, Threatened, and Endangered Species

By virtue of only completing tree clearing for construction, operation, and maintenance activities between October 1 and March 31, impacts to roosting or foraging Indiana bat or northern long-eared bat will be mitigated. Similarly, no in-water work during construction, operation, or maintenance also mitigates impacts to rare, threatened, and endangered species.

Commercial Species

Mitigation procedures to commercial species during Project construction, operation, or maintenance activities are not necessary as impacts are not anticipated.

Recreational Species

Mitigation procedures to recreational species during Project construction, operation, or maintenance activities are not necessary as impacts are not anticipated.

(D) SITE GEOLOGY

The proposed route is located within the Southern Ohio Loamy Till Plain physiographic province (ODNR, 1998⁷). The region is characterized by elevations between 530 – 1,150 feet above mean sea level.

A typical soil profile will transition from silt loam, to clay loam, to loam, to bedrock or silt loam, to silty clay, to bedrock. Very gravelly clay loam may be encountered in some regions.

⁷ ODNR. 1998. Physiographic Regions of Ohio
https://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/Misc_State_Maps&Pubs/physio.pdf. Accessed January 2019.

For the Southern Ohio Loamy Till Plain, the restrictive feature of the region consists of lithic bedrock. This bedrock along the Preferred and Alternate Routes consists of Ordovician and Silurian-aged specimens. The typical minimum depth is between 40-80 inches with some regions experiencing minimum bedrock depths at 20-39 inches and some experiencing depths greater than 80 inches. Sloped areas may have exposed bedrock (USDA, NRCS, January 2019⁸)

Soils consist of the Cincinnati Group as used by Wickstrom (1990⁹). The major lithologic constituents are sedimentary in nature including shale, dolomite and limestone, interbedded.

Along the Preferred and Alternate Routes, the subsurface soils in the Southern Ohio Loamy Till Plain region mostly consists of loamy, high lime Wisconsin-age till (State of Ohio DNR, 2011¹⁰). End and recessional moraines, commonly associated with boulder belts, are present between relatively flat-lying ground moraines. The region features steep-valleyed, large streams and stream valleys are filled with outwash and alternate between broad floodplains and narrows. Paleozoic-age carbonate rocks may also be present (USGS Digital Map 2005¹¹).

The soils drainage class varies widely across the region from “well drained” to “very poorly drained”. Nearly a third of the soils in this region are associated with the Crosby silt loam type. Almost 20% are associated with Brookston silty clay loam (0 to 2 percent slopes).

The water table along the proposed routes varies from a maximum depth of 80+ inches to a minimum of 0 inches. The typical static water level varies along the proposed routes. However, a few locations along the proposed routes may encounter a seasonal high-water table according to the Web Soil Surveys of Miami County, Ohio. Some areas of perennial water and some wet spots may be present.

Slopes exceeding 12 percent, obtained from the NRCS, are identified on Figure 8-1. Slopes exceeding 12 percent only occur along 0.19-mile of the 16.7-mile Preferred Route and 0.24-mile of the 16.7-mile Alternate Route. During construction, DP&L will implement a SWPPP and associated BMPs as necessary to control erosion and sedimentation in areas with slopes exceeding 12 percent. Once construction is complete, soils will be revegetated and stabilized. As a result, no erosional impacts resulting from slopes exceeding 12 percent are expected.

⁸ USDA National Resources Conservation Service (NRCS) Custom Soil Resource Report for Miami County, Ohio <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx> January 2019.

⁹ USGS, Geologic Units of Miami County, OH, Cincinnati Group as used by Wickstrom (1990) <https://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=OH0c%3B0>.

¹⁰ State of Ohio, Department of Natural Resources (DNR), Division of Geological Survey. Surficial Geology of the Piqua 30 x 60-Minute Quadrangle, http://geosurvey.ohiodnr.gov/portals/geosurvey/PDFs/SurficialPDF_Drafts/Piqua_Surficial_v1.pdf. Generated 05/2011. Accessed January 2019.

¹¹ USGS Digital Map 2005. Ohio Geologic Map <https://mrdata.usgs.gov/geology/state/state.php?state=OH> Accessed January 2019.

Based on the bedrock geologies and overlaying soils present along both routes, as described above, they are generally expected to be suitable for foundation construction. To obtain further site-specific details on the suitability of the soils for foundation construction, DP&L will conduct detailed engineering design and geotechnical soil borings. Engineering design and geotechnical test drilling will likely be completed soon after the Project is certificated by OPSB and engineering plans and boring logs will be provided to the OPSB staff shortly thereafter.

At a minimum, geotechnical soil borings will provide the following information to be utilized for structure placement and foundation design engineering as needed:

- (1) Subsurface Soil Properties
- (2) Static Water Level
- (3) Rock Quality Description
- (4) Percent Recovery

DP&L anticipates that foundations will only be required at some angle structures that will be ultimately determined during the engineering design. When required, foundations will be engineered based on the results of geotechnical soil boring and laboratory test results to ensure they are sited in locations considered suitable based on soil and rock properties and surface slope.

(E) ENVIRONMENTAL AND AVIATION REGULATION COMPLIANCE

(1) Licenses, Permits, and Authorizations Required for the Facility

DP&L anticipates submitting a Notice of Intent for coverage under OEPA General National Pollutant Discharge Elimination System (“NPDES”) Permit for construction stormwater. At most, non-reporting coverage under U.S. Army Corps of Engineers Nationwide Permit 12 (Utility Lines) for wetland and stream impacts associated with construction only would apply to this Project. Portions of both the Preferred and Alternate Routes are located in 401 Water Quality Certification (“WQC”) Ineligible and Possibly Eligible watersheds, therefore an individual 401 WQC under Nationwide Permit 12 or alternate Director’s Authorization from the OEPA may or may not be required and will be dependent on the final selected route and a final evaluation of waterbodies impacted by the Project. No permanent fill in streams or wetlands is expected to be necessary. Other agency coordination required as part of the Nationwide Permit coverage will be conducted as necessary (e.g., authorizations from the USFWS, ODNR, and/or the OHPO). Appropriate Ohio Department of Highway and/or Miami County Driveway permits will be obtained as necessary for temporary access road entrances. Should building or other permits be required from Miami County or local municipalities those too would be obtained by DP&L prior to construction.

(2) Construction Debris

As construction work proceeds, the ROW will be kept clean of all trash and debris resulting from the work. Debris associated with construction of the proposed transmission line is expected to consist of conductor scrap, construction material packaging including cartons, insulator crates, conductor reels and wrapping, and used storm water erosion control materials. Clearance poles, conductor reels and other materials with salvage value will be removed from the construction area for reuse or salvage. It is estimated that approximately 300 cubic yards of construction debris could be generated from the Project. Construction debris will be disposed of in accordance with state and federal requirements for such disposal. Where trees must be cleared from the ROW, which is expected to be minimal, the resulting brush will be either mechanically chipped and hauled off-site, wind-rowed along the edge of the ROW, prepared for fire wood use by the landowner, or handled as the landowner prefers. Grubbing of stumps and roots is not currently planned in these areas.

(3) Stormwater and Erosion Control

A SWPPP document will be prepared and incorporated into the Construction Plans and Specifications and shall be made available on-site during construction of the Project. The SWPPP will include the following general conditions at a minimum.

Erosion and Sedimentation Controls

Implementation of erosion and sedimentation control practices shall conform to the Ohio Department of Natural Resources Rainwater and Land Development Manual (2006¹²); the OEPA NPDES Permit Program for the discharge of stormwater from construction sites, and any erosion and sediment control practices and standards required by the Miami County Soil and Water Conservation District Office.

Wetlands, streams and other environmentally sensitive areas shall be clearly flagged before commencement of clearing or construction. No construction or access will be permitted in these areas unless clearly specified in the Construction Plans and Specifications and authorized by permit. When streams are temporarily impacted the area will be stabilized immediately upon completion of the construction task. Grubbing activities are not expected to be required. Where applicable (e.g., steep slopes), perimeter sediment controls shall be implemented for grubbing activities and shall continue to function until disturbed areas are permanently stabilized.

Specific Silt Fence or Filter Sock Inspection Requirements

Silt fencing and/or other appropriate best management practices for erosion and sediment control shall be constructed before upslope land disturbance begins. All silt fences, filter socks, etc. shall be placed as close to the contour as possible so that water will not concentrate at low points in the fence and so that small swales or depressions which may carry concentrated flows to the silt fence are

¹² http://oilandgas.ohiodnr.gov/portals/oilgas/pdf/stormwater/rld_11-6-14all.pdf

dissipated along its length. Where possible, vegetation shall be preserved for five feet upslope from the silt fence.

Silt fence shall be placed so that eight inches of cloth are below the ground surface. Excess material shall lay at the bottom of the six-inch deep trench and the trench shall be backfilled and compacted. Silt fence shall allow runoff to pass only as diffuse flow through the geotextile fabric. If runoff overtops the silt fence, flows under or around the ends, one of the following shall be performed, as appropriate: 1) the layout of the silt fence shall be changed, 2) accumulated sediment shall be removed, or 3) other practices shall be installed.

Soil Stabilization

As specified in the SWPPP document, disturbed areas that remain un-worked for more than 14 days the area will be stabilized with mulch or other acceptable means no later than seven days after the last construction in that area. For disturbed areas within 50 feet of a surface water of the state, and not at final grade, DP&L will stabilize the area within two days. Permanent soil stabilization methods and timeframes are similar and will include seeding and mulching of disturbed areas.

Maintenance / Inspection

All erosion and sediment control practices shall be inspected at least once every seven days and within 24 hours after any storm event greater than 0.5-inch of rain per 24-hour period.

All erosion and sedimentation control structures will be maintained in good working order. Straw wattles, straw bales, and silt fence will be inspected for excess sediment accumulation, tears in fabric and to ensure proper staking. Inspections will continue until the site is at least 70% stabilized with newly sown grasses or gravel as appropriate. If a repair is necessary, it will be initiated within 48 hours of the report. Records of the maintenance and inspection must be maintained throughout the construction period. Records shall include, at a minimum, the name of the inspector, major observations, date of inspection, certification of compliance, and corrective measures taken.

Materials Management

All materials stored on-site shall be kept in an orderly manner in their appropriate containers and, if possible, under a roof or other enclosure. Products shall be kept in their original containers with the original manufacturer's label. Manufacturer's recommendations for proper use and disposal will be followed. Material Safety Data Sheets will be retained and available on-site at all times during construction.

(4) Disposition of Contaminated Soil and Hazardous Materials

Contaminated soils are not anticipated to be encountered during construction of the Project.

The following general conditions will also be included in the SWPPP to address disposition of contaminated soil and hazardous materials generated or encountered during construction:

Spill Prevention

All on-site vehicles will be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers, which are clearly labeled. Secondary containment shall be provided for all on-site fuel storage tanks.

All sanitary waste will be collected in portable units and emptied regularly by a licensed sanitary waste management contractor, as required by local regulations.

All spills will be cleaned up immediately after discovery. Manufacturer's recommended methods for spill cleanup will be followed. Materials and equipment necessary for spill cleanup will be kept in a designated storage area on-site.

Spills will be reported to the appropriate government agency as required. Any suspected hazardous materials encountered during construction shall be reported to the DP&L Environmental Department.

(5) Maximum Height of Aboveground Structures

The tallest structures associated with the Project will be the transmission line poles, which would be designed with an anticipated maximum height of approximately 90 feet. The typical height of transmission structures will be approximately 70 feet in height. There are 10 airstrips/heliports within five miles of the Project according to ESRI's Online Airport Layer, only two of which are public; Dayton-Phillipsburg [Federal Aviation Association ("FAA") Identifier 317] and Waco Field (FAA Identifier 1WF). Both of the identified public airstrips are located at least three miles from the Project and therefore the Project is not anticipated to affect operations at those facilities.

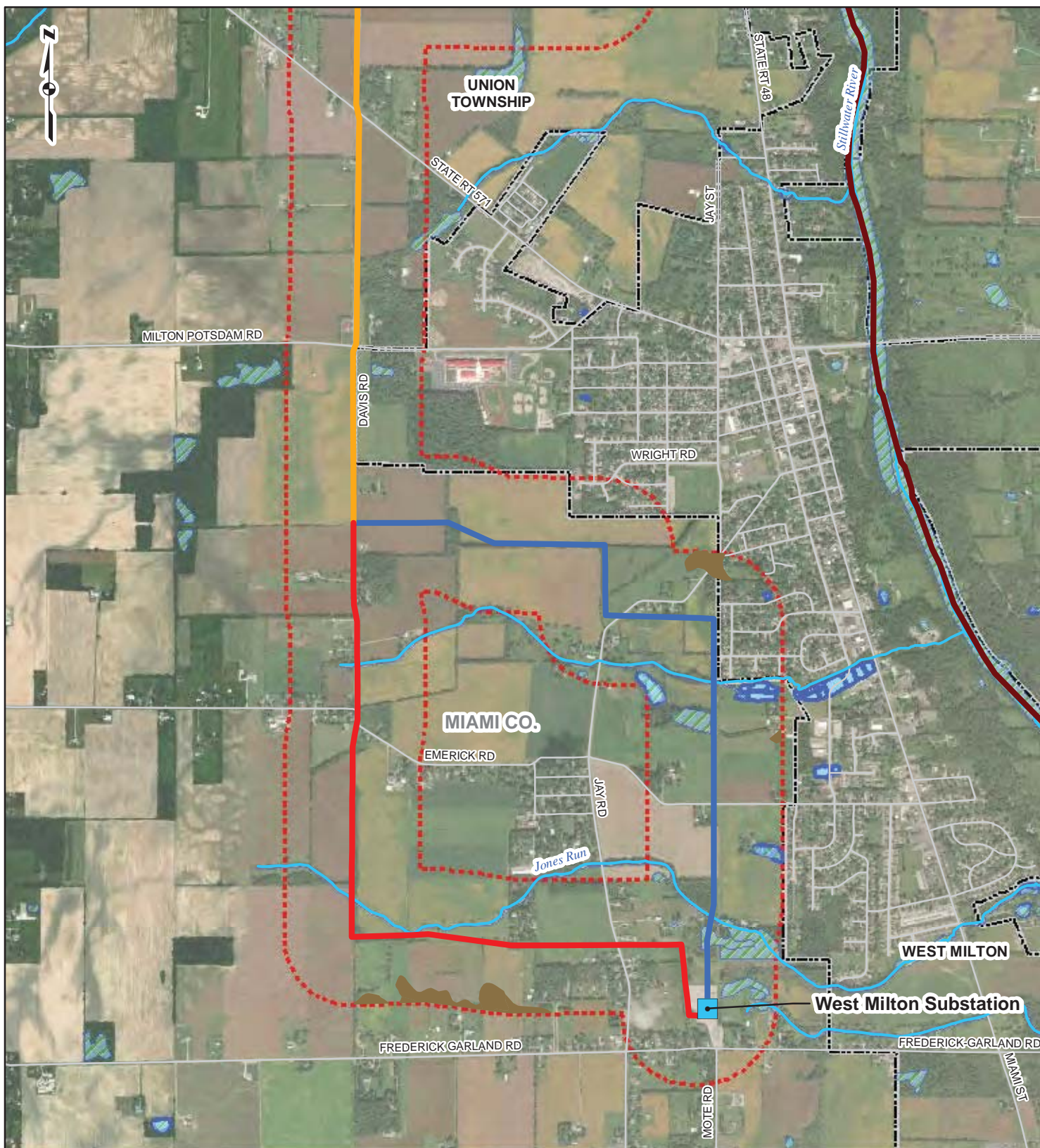
The height of construction equipment associated with the Project is expected to be less than that of the transmission line poles except for the use of a crane where steel poles are required. The exact structure locations have not been determined, only preliminary locations have been determined, however all transmission structure locations will be input to the FAA's Notice Criteria Tool website.

(6) Dusty or Muddy Conditions Plan**Dust Control**

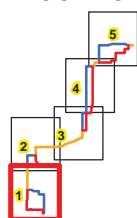
The site and surrounding areas will be kept free from dust nuisance resulting from site activities. During excessively dry periods of active construction, dust suppression will be implemented where necessary through irrigation, mulching, or application of tackifier resins.

Excessive Muddy Soil Conditions

Construction entrances will be established and maintained to a condition that will prevent tracking or flowing of sediment onto public roads and ROWs. Sediment tracked onto public roads and/or ROWs will be removed as soon as practical and daily at minimum.



PROJECT LOCATION



MIAMI COUNTY, OHIO

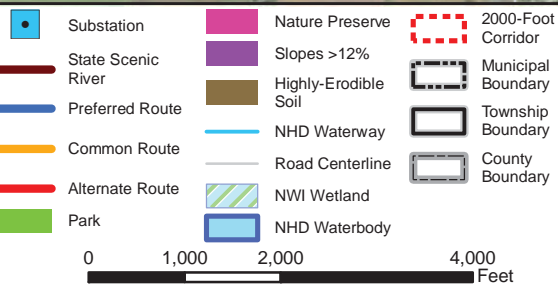


FIGURE 8-1 ECOLOGICAL RESOURCES SHEET 1 OF 5



WEST MILTON - ELDEAN 138 kV

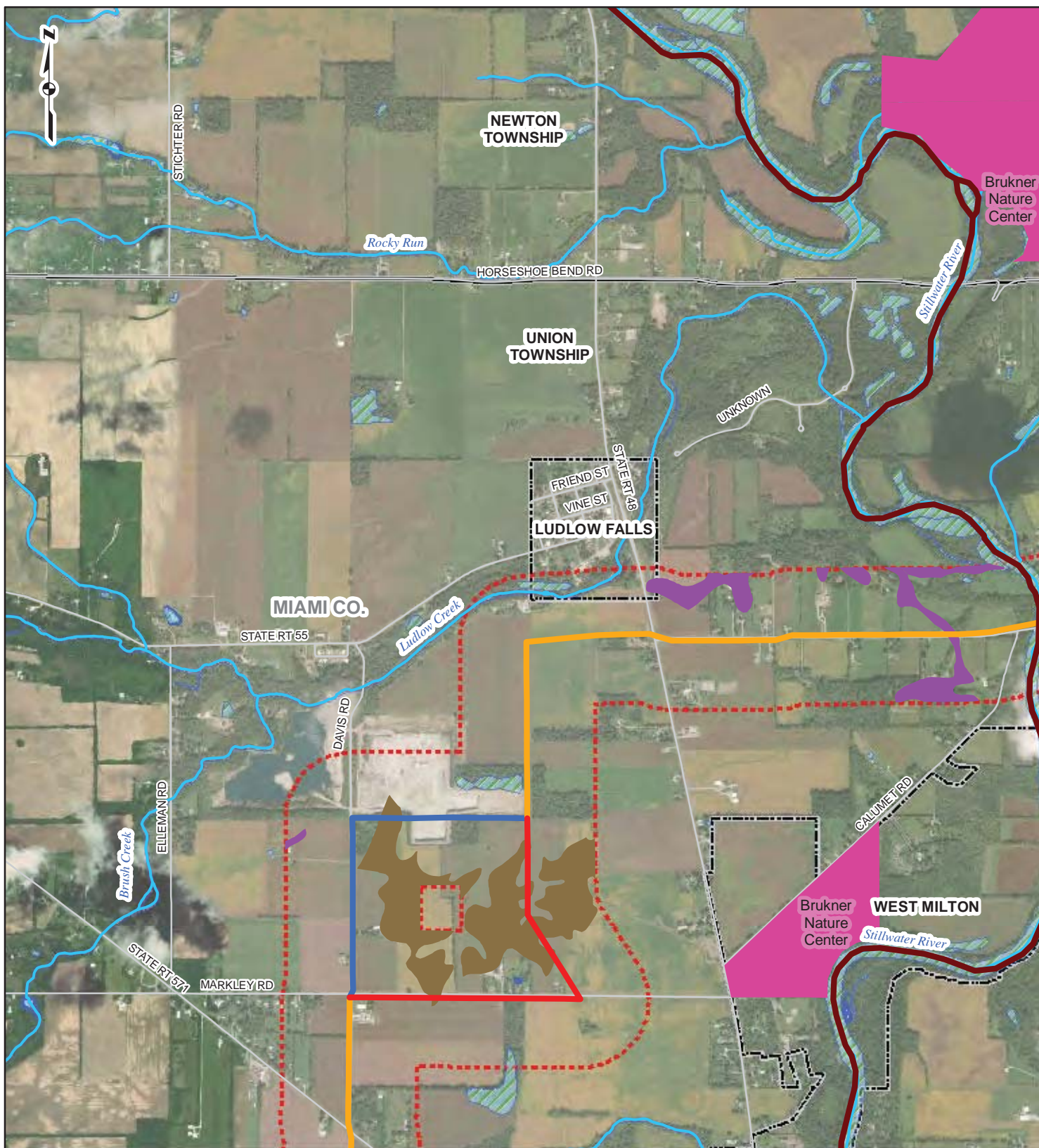
DAYTON POWER & LIGHT



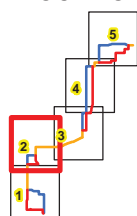
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APPROVED: MRW

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PROJECT LOCATION



MIAMI COUNTY, OHIO

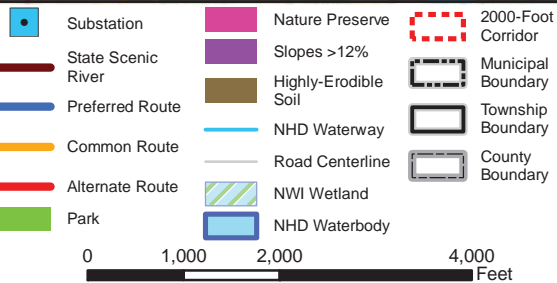


FIGURE 8-1 ECOLOGICAL RESOURCES SHEET 2 OF 5



WEST MILTON - ELDEAN 138 kV

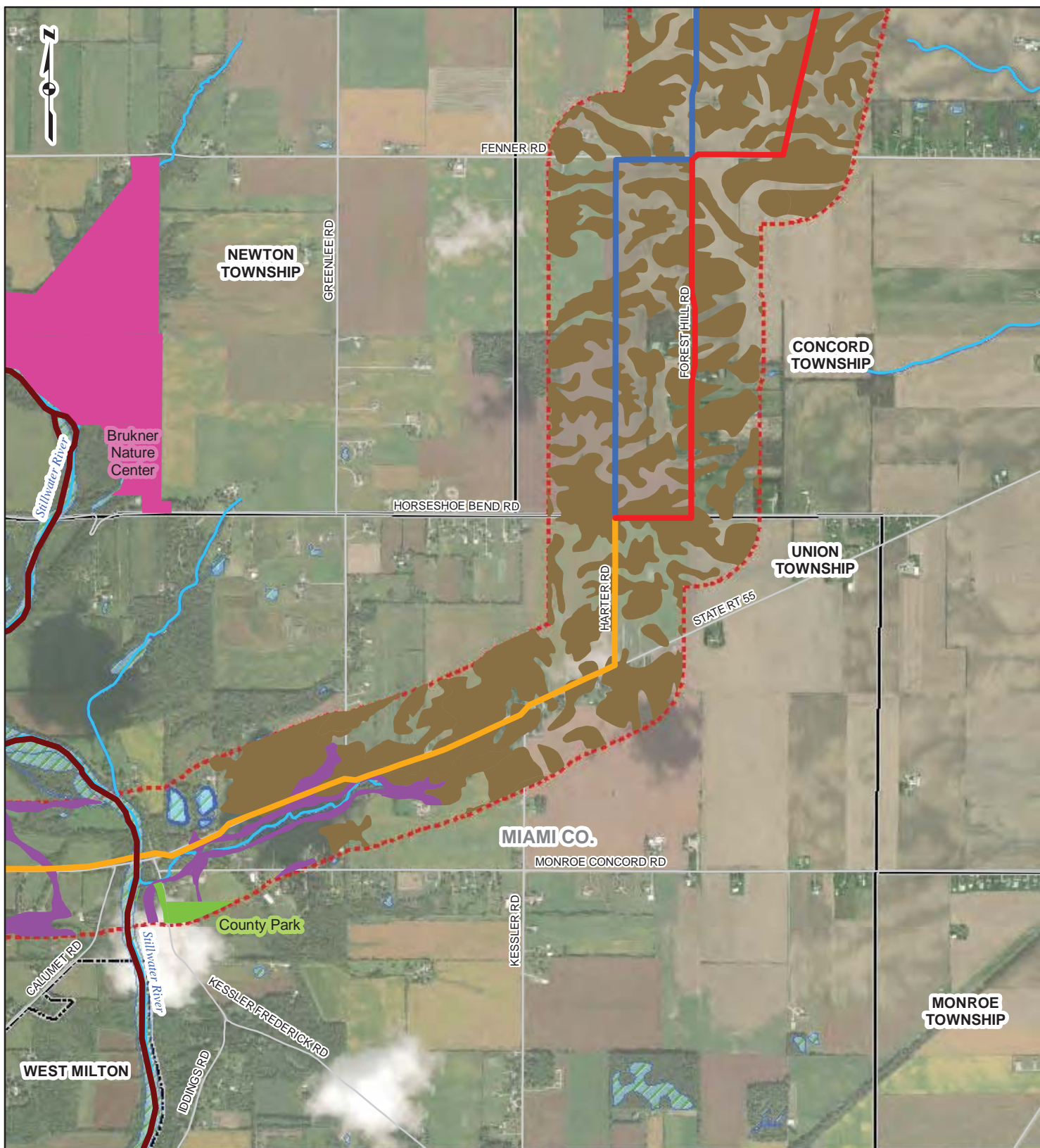
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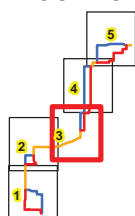
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PROJECT LOCATION



MIAMI COUNTY, OHIO

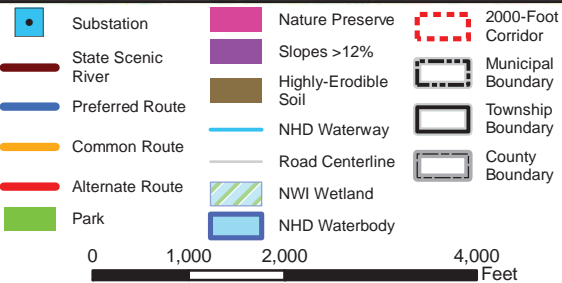
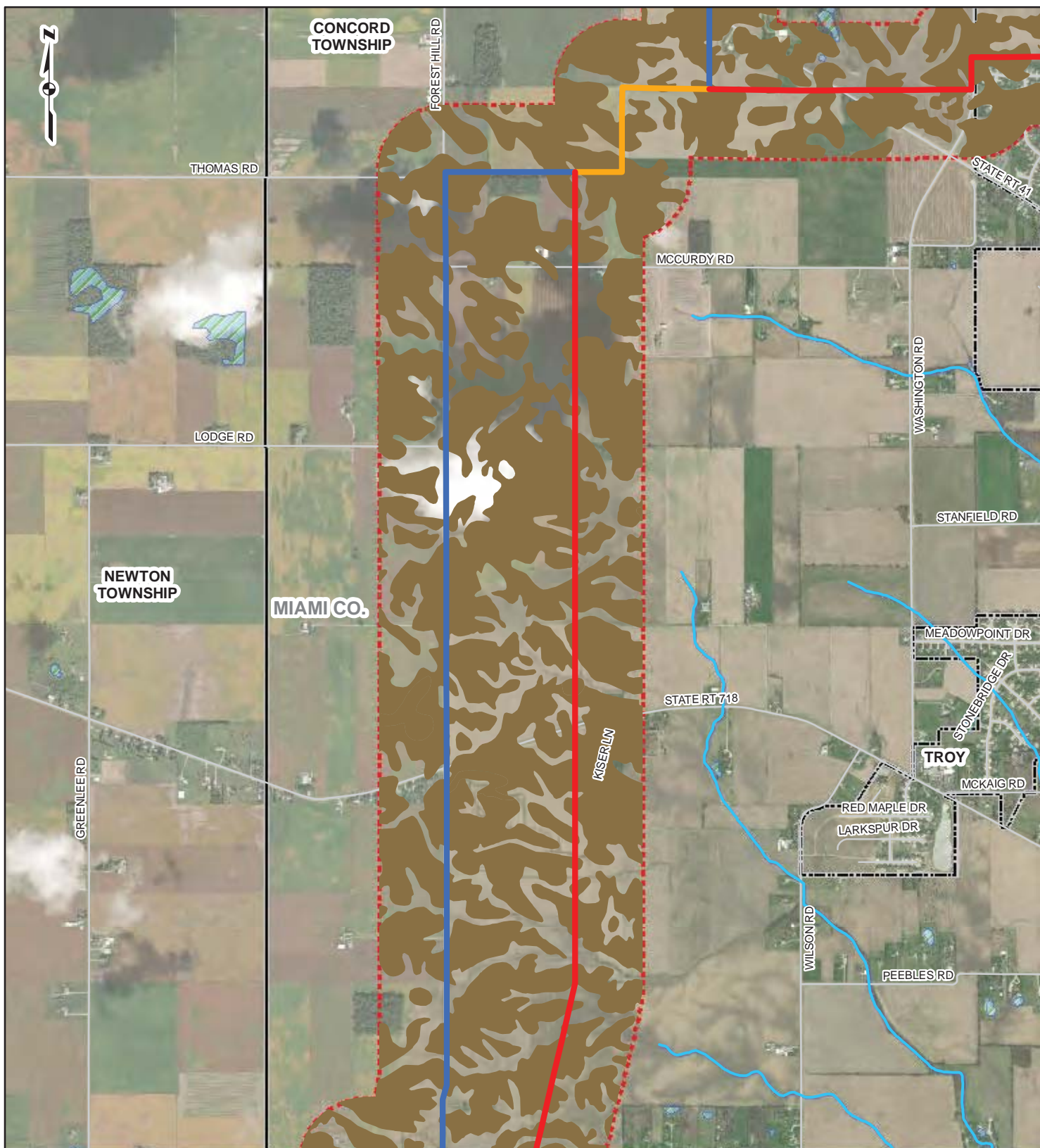


FIGURE 8-1 ECOLOGICAL RESOURCES SHEET 3 OF 5

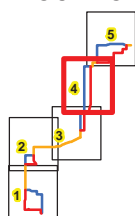
WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

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PROJECT LOCATION



MIAMI COUNTY, OHIO

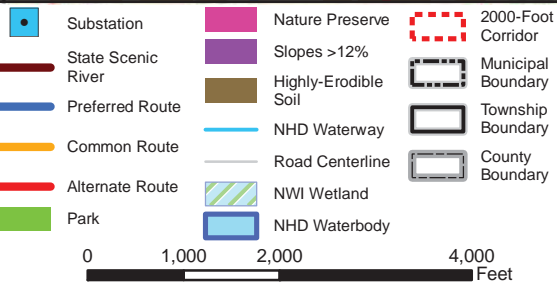


FIGURE 8-1 ECOLOGICAL RESOURCES SHEET 4 OF 5



WEST MILTON - ELDEAN 138 kV

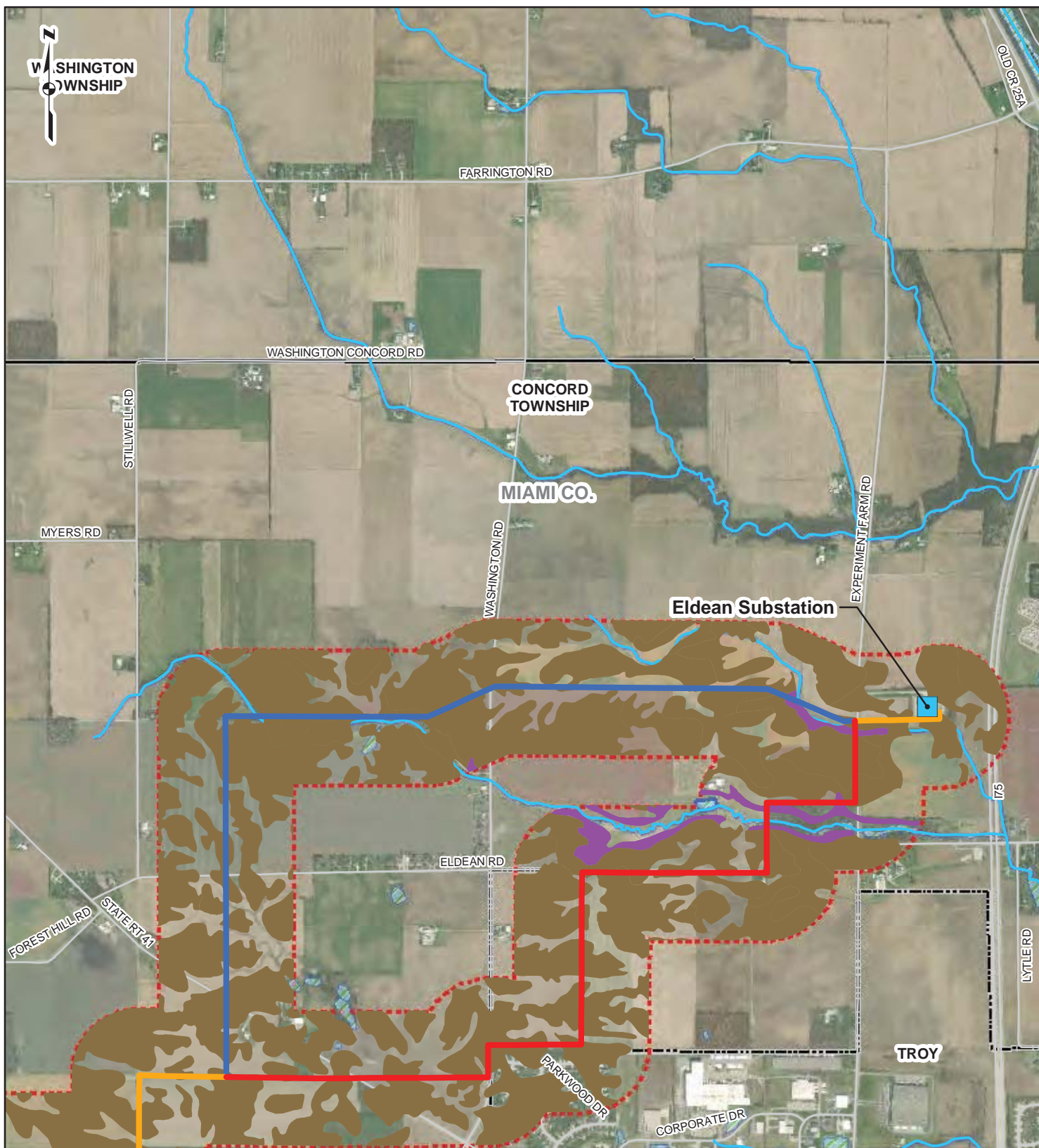
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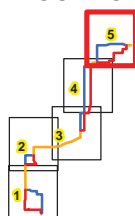
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PROJECT LOCATION



MIAMI COUNTY, OHIO

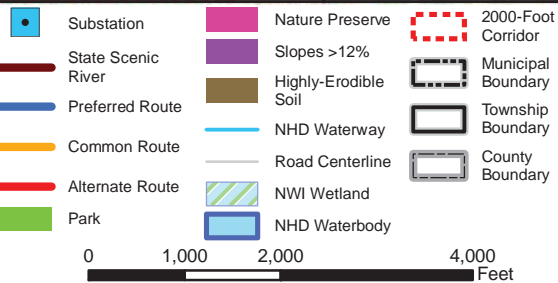


FIGURE 8-1 ECOLOGICAL RESOURCES SHEET 5 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT

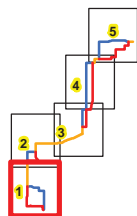


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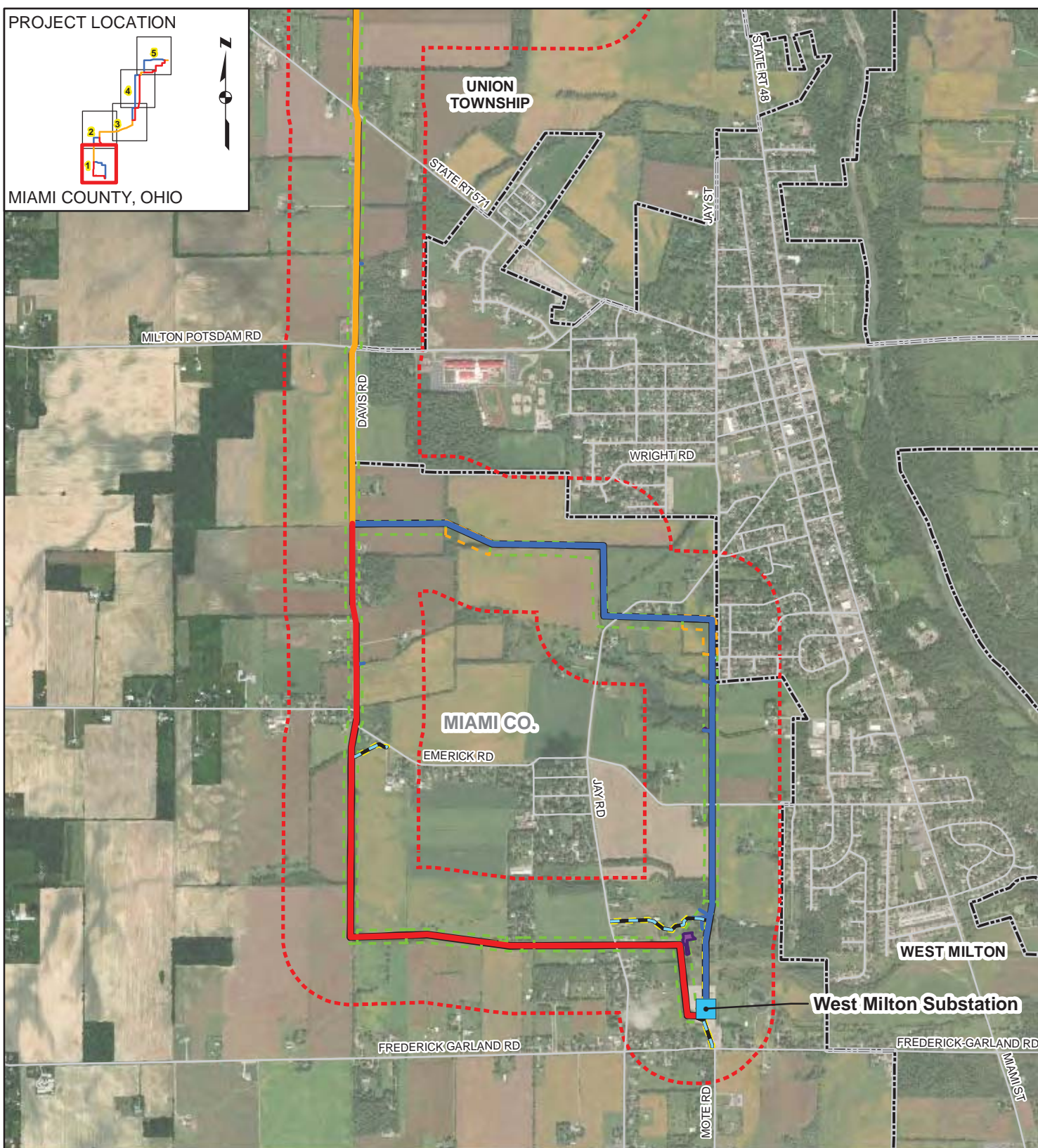
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PROJECT LOCATION



MIAMI COUNTY, OHIO



Substation

Preferred Route

Common Route

Alternate Route

Proposed Access Route

Delineated Stream

Delineated Wetland

Delineated Pond

200- Ft. Study Corridor

200- Ft. Study Corridor (No Access)

Access Road Not Studied

Road Centerline

2000-Foot Corridor

Right-of-Way

Municipal Boundary

Township Boundary

County Boundary

0 1,000 2,000 4,000 Feet

FIGURE 8-2
DELINEATED AQUATIC RESOURCES
SHEET 1 OF 5



WEST MILTON - ELDEAN 138 kV

DAYTON POWER & LIGHT



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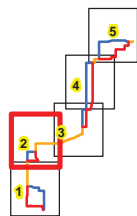
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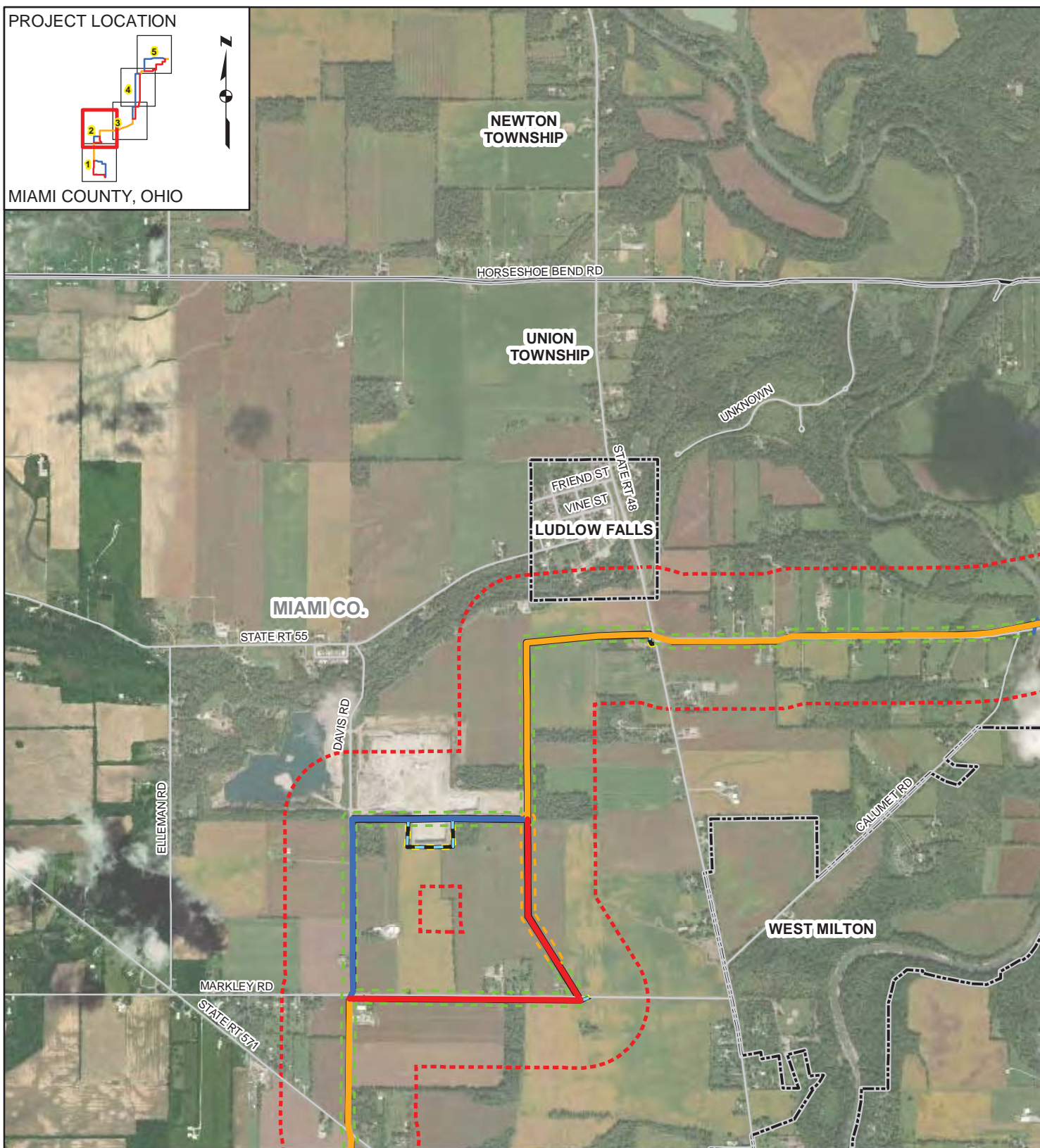
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PROJECT LOCATION



MIAMI COUNTY, OHIO



Substation

Preferred Route

Common Route

Alternate Route

Proposed Access Route

Delineated Stream



Delineated Wetland



Delineated Pond



200- Ft. Study Corridor



200- Ft. Study Corridor (No Access)



Access Road Not Studied

Road Centerline

2000-Foot Corridor

Right-of-Way

Municipal Boundary

Township Boundary

County Boundary

0 1,000 2,000 4,000 Feet

FIGURE 8-2
DELINEATED AQUATIC RESOURCES
SHEET 2 OF 5

WEST MILTON - ELDEAN 138 kV



DAYTON POWER & LIGHT



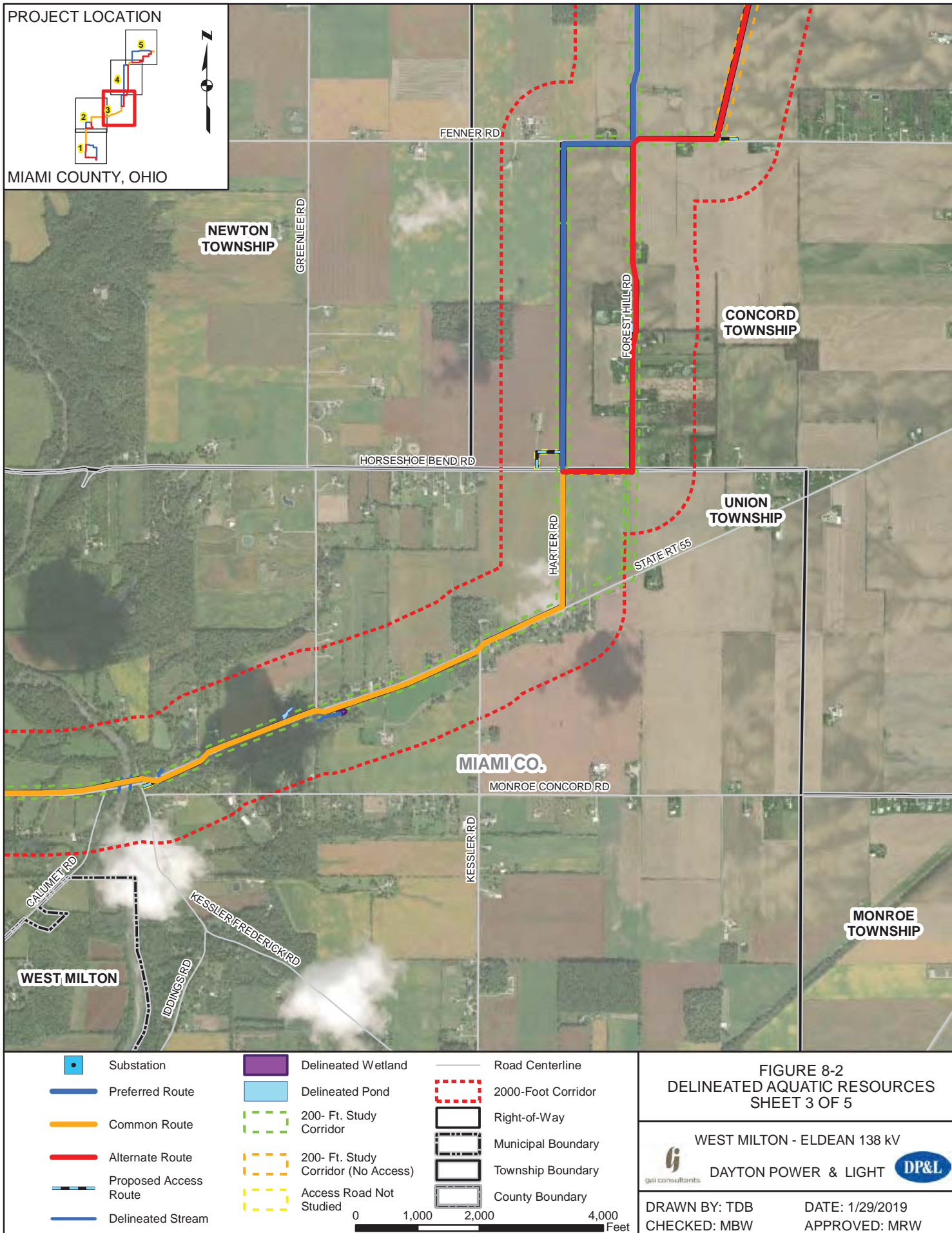
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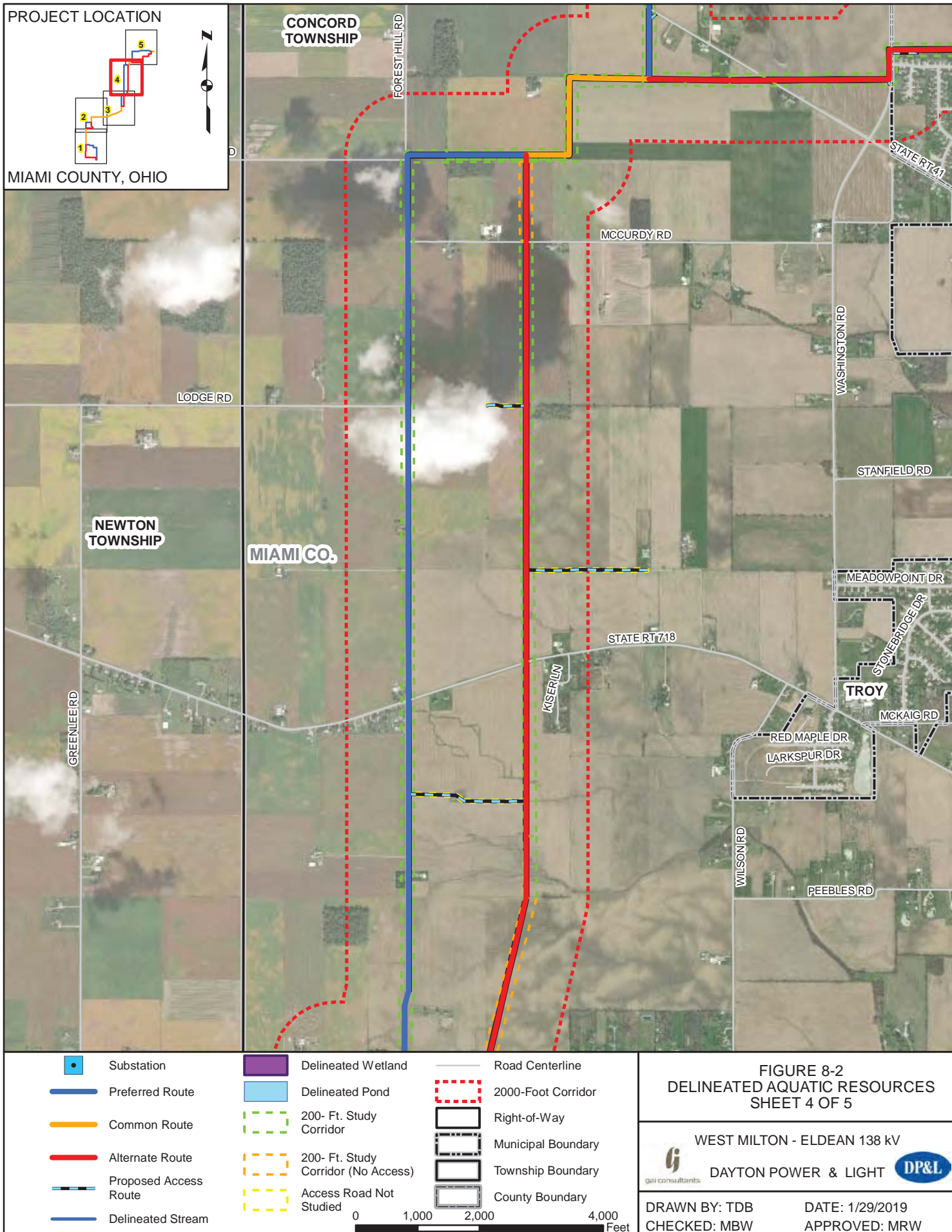
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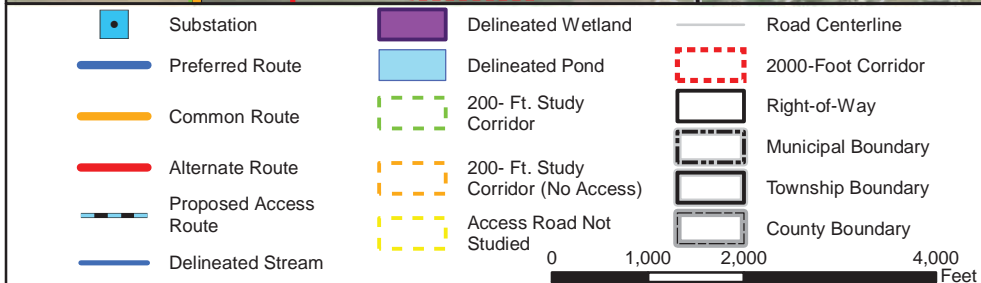
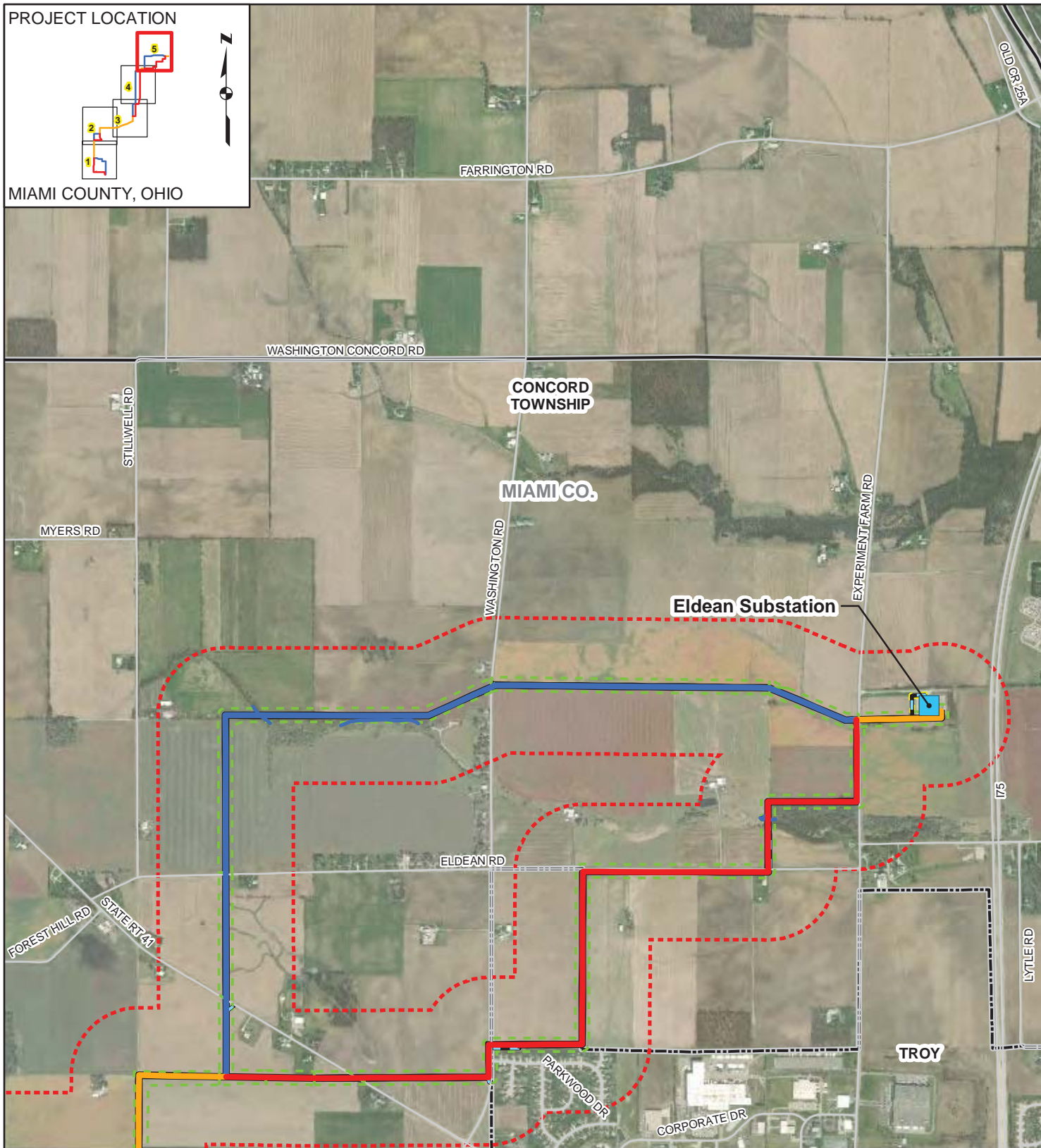
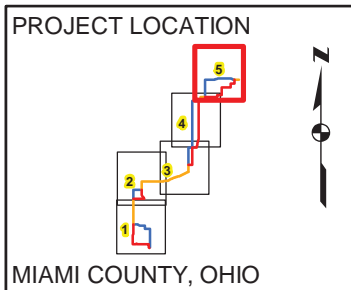
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REFERENCE:ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; MIAMI COUNTY, 2018; ODOT, 2018.



**FIGURE 8-2
DELINEATED AQUATIC RESOURCES
SHEET 5 OF 5**

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/29/2019
CHECKED: MBW APPROVED: MRW

REFERENCE:ESRI WORLD IMAGERY, 2011, OBTAINED THROUGH ESRI WORLD IMAGERY, MICROSOFT CORPORATION, ACCESSED 1/2019; MIAMI COUNTY, 2018; ODOT, 2018.

APPENDIX 3-1

Long-Term Forecast Report of the Dayton Power and Light Company – 2018

THE DAYTON POWER AND LIGHT COMPANY

**Long-Term Forecast Report
to the
Public Utilities Commission
of Ohio**

ELECTRIC

2018

FORM FE-T9:
SPECIFICATIONS OF PLANNED ELECTRIC TRANSMISSION LINES

- | | | |
|-----|--|---|
| 1. | Name and Number | West Milton – Eldean 138 kV New Line |
| 2. | Points of Origin
Terminus | West Milton Substation (existing)
Eldean Substation (existing) |
| 3. | Right of Way Length
Width
of circuits | 16 miles
50'
1 |
| 4. | Voltage Design
Operate | 138 kV
138 kV |
| 5. | Application for Certificate | 2017 |
| 6. | Construction Commence
Commercial Operation | October 1, 2021
June 1, 2022 |
| 7. | Capital Investment | Total: \$12,000,000 |
| 8. | Substations | West Milton (existing)
Substation voltage of 138 kV
Unknown area required.

Eldean (existing)
Substation voltage of 138 kV
Unknown area required. |
| 9. | Supporting Structures | Single wood pole or steel structures with post insulators. |
| 10. | Participation with other
Utilities | N/A |
| 11. | Purpose of the Planned
Transmission Line | To meet NERC reliability criteria. |
| 12. | Consequences of Line
Construction Deferment or
Termination | Violation of NERC reliability criteria and reduced 138 kV capacity. |
| 13. | Miscellaneous | |

APPENDIX 4-1

Route Selection Study

Route Selection Study

The Dayton Power and Light Company
West Milton to Eldean
138 kV Transmission Line Project
Miami County, Ohio

GAI Project Number: G121196.00

October 2015

Prepared for: The Dayton Power and Light Company
1900 Dryden Road
Dayton, Ohio 45439

Prepared By: GAI Consultants, Inc.
Cincinnati Office
1830 Airport Exchange Boulevard, Suite 220
Erlanger, Kentucky 41018



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1.0	Introduction and Purpose.....	1
2.0	Route Selection Methodology	2
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Figure 3.3 Route Alternatives

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1.0 Introduction and Purpose

The Dayton Power and Light Company (DP&L) is planning to construct a new 138 kV transmission line to improve the reliability of electric power in the northwest area of the DP&L transmission system. The West Milton to Eldean 138 kV Transmission Line Project (Project) area is located in the vicinity of West Milton, Ohio, west of the city of Troy in Miami County (Townships of Union and Concord), as illustrated in Figure 1 below. The new transmission line will be constructed to connect the West Milton Substation and the Eldean Substation which are 11 miles apart based on a straight linear path.



Figure 1
Project Overview Map and Study Area

The proposed new 138 kV circuit will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system under various outage conditions, as required to comply with the mandatory North American Electric Reliability Corporation (NERC) reliability standards. A recent contingency analysis conducted by Regional Transmission Expansion Planning indicated that, under a multiple contingency condition for two DP&L circuits in the area, voltages would be below the minimum acceptable level at eight transmission buses according to Pennsylvania, New Jersey, Maryland Interconnection (PJM) reliability criteria. This multiple contingency would effectively leave the northwest area of the DP&L transmission system without a 138 kV source. The proposed new 138 kV circuit will mitigate this situation and ensure compliance with the mandatory NERC reliability standards.

This purpose and overall objective of this Route Selection Study is to assist in determining the best transmission line route alternatives that avoid or minimize adverse environmental and social impacts to the extent practical, considering technical and economic feasibility. The Route Selection Study involved the acquisition and evaluation of environmental, land use, cultural and engineering data to develop several route segments that could be combined to create various route alternatives for comparative analysis and ultimate ranking to meet the above objective. The study will result in the selection of preferred and alternate routes to advance into application development. The siting criteria employed for establishing route segments and complete route alternatives were as follows:

- avoidance or minimization with existing and proposed future land uses (e.g., by utilizing existing transmission line or road corridors where possible);
- avoidance or minimization of effects on human, natural, visual, and cultural resources;
- avoid or minimize visibility from densely populated areas;
- minimize impacts to construction and maintenance costs by selecting shorter, more direct routes;
- locate routes through terrain where economical construction and mitigation techniques can be employed; and
- consistency with DP&L's transmission needs, schedule, regulatory agency directives, and environmental regulations.

Construction of a 138 kV transmission line of this length requires that DP&L prepare and submit and Application for a Certificate of Environmental Compatibility and Public Need to the Ohio Power Siting Board (OPSB). To that end, this route selection study serves as the first component to fulfill the application development process, and ultimately gaining regulatory approval to construct the line.

2.0 Route Selection Methodology

GAI Consultants, Inc. (GAI) and DP&L assembled a team of environmental scientists, design engineers, geographic information specialists, and a cultural resource specialist to conduct this route selection study. The methodology of the study is designed to identify transmission line route alternatives that minimize the overall effects on ecology, sensitive land uses, and cultural resources to the greatest extent practical while maintaining economic and engineering or technical feasibility. GAI utilized techniques adapted from the methods reported by Electric Power Research Institute (EPRI) and Georgia Transmission Corporation (GTC) (2009). The study process relies on detailed land use, ecological and cultural resource data from many public sources and other providers which is confirmed to the extent possible and supplemented through field observations. This process results in a comprehensive assessment of the study area and the candidate route alternatives that is presented in this report. The data and analysis process presented herein also allows comparison of additional route alternatives or modifications in response to public input or regulatory agency reviews.

2.1 Defining the Study Area

The first step in the siting process involved the identification of a study area encompassing the Milton and Eldean Substations and intervening areas. The 53-square mile study area, measuring 10.7 miles (north-south) by 7.3 miles (east-west) based on the longest sides of the study area, generally encompasses the town of West Milton, a portion of the Stillwater River watershed area, sparsely populated communities to the south, and largely rural land to the north. The study area is situated west of the city of Troy, Ohio, outside of the city boundaries and is shown in Figure 3.1, Project Location Map and Figure 3.2, Project Study Area, both of which follow the text of this report.

The boundaries of the study area were determined based on a review of United States Geological Survey (USGS) maps and aerial photography. Significant siting features such as urban or densely populated areas, water bodies, large forested and riparian areas, utility corridors, and transportation routes, and the fixed terminus points of the proposed transmission line were principally used to define the boundaries for the study. The eastern study boundary was generally positioned to avoid the western developed suburban areas of Troy, Ohio while capturing the rural lands for possible route corridors. The western study area limit was established just west of the DP&L's 69 kV transmission line (oriented north-south) in order to evaluate co-location or paralleling of this transmission corridor.

The selected study area offers the flexibility to consider a wide range of route corridors and route segments while maintaining reasonable distances of route alternatives to connect the Milton and Eldean Substations. Furthermore, the east to west breadth of the study area allows for route options that would cross the Stillwater River at a variety points north to south.

2.2 Siting Attributes and Constraints

The key objective of the Route Selection Study is to systematically determine the most viable routes for construction of the transmission line while avoiding or minimizing effects on ecological features, sensitive lands, densely populated areas, and cultural sites while maximizing the economical feasibility and the construction practicability. GAI and DP&L defined a variety of siting attributes and siting constraints. Attributes are generally features or factors that are favorable or desirable (e.g., shorter route lengths, paralleling utility corridors, minimizing turn angles, etc.) for construction and operation of a transmission line. Siting constraints are generally those features or factors that are undesirable, to be minimized or avoided to the extent practical, in proximity to a transmission line. The attributes and constraints utilized for the study area are summarized in Table 3-1.

**Table 3-1
Quantitative Route Scoring Criteria**

Siting Attributes and Constraints ¹	Score Weighting
Ecology	
Number of Perennial Streams Crossed	30%
Wetlands Crossed, acres in ROW (National Wetland Inventory data)	
Forests Lands Crossed, acres to be cleared	
Threatened and Endangered Species Sitings/Listings, within 1,000 feet	
Land Use	
Residences, # within 100 feet of centerline (accounts for 70% within subcategory "Residences")	30%
Residences, # within 100 to 1000 feet (accounts for 30% within subcategory "Residences")	
Number of Properties Crossed	
Institutional Uses, number within 1,000 feet (schools, hospitals, churches)	
State Scenic River Area, feet crossed in undeveloped zones ("area" includes 1000 feet adjacent to river) ²	
Other Sensitive Areas Crossed (parks, preserves, trails, agency-managed areas, golf courses, public-use airports or airstrips), linear feet (70% within "sensitive areas" category)	
Number of Other Sensitive Areas within 1,000 feet (parks, preserves, trails, agency-managed areas, golf courses, public-use airports or airstrips) (30% within "sensitive areas" category)	
Cultural	
National Register of Historic Places listed sites or structures, within 1,000 feet	10%
Ohio Historic Structure/Sites Inventory, # within 1,000 feet	
Known Archaeological Sites, # within 100 feet	
Cemeteries, # within 100 feet	
Engineering	
Route Length, feet	30%
Paralleling Existing ROW (utility or road), linear feet	
Number of Highway, Road, or Railroad Crossings	
Length of Route with Slope >20%, feet	
Number of Turn Angles >10 degrees	

Notes:

- Where applicable, right-of-way (ROW) required to be cleared or disturbed is assumed to be 75 feet, or 37.5 feet if parallel to road ROW or existing transmission line ROW.
- "Undeveloped zones" are defined as areas without residences or other structures, or where agricultural land is in use.

Following establishment of the study area, GAI utilized aerial photography from the Ohio State Imagery Program (Miami County, 2011), USGS topographic mapping, and published data to compile an attributes and constraints map based on geographic information system (GIS) software programs. This mapping was primarily utilized to identify major siting features, avoidance areas, and socioeconomic attributes and constraints.

2.3 Selection of Candidate Route Alternatives

After defining the limits of the study area, various geographical data and aerial imagery (2012) were assembled and organized using a GIS program to produce maps consisting of readily available data sources (locations of rivers and streams, National Wetland Inventory data, floodplains, forests, scenic or public preservation areas, regulatory-protected species, residences, airports, churches, cemeteries, cultural resource and historic sites, public-use areas such as golf courses, etc.). The geographical area between the two substations can generally be described as three subareas, 1) the vicinity of West Milton, its suburbs, and the Stillwater River corridor, 2) middle area consisting of hamlets of Kessler and Nashville south of State Route 55 and sparse groupings of residences and agricultural fields, and 3) the northern subarea that is largely used for agricultural crops with sparse farm residences, small groupings of residences, and the western residential developments of Troy.

DP&L's guidelines in commissioning this study included evaluating both road or existing transmission line ROW corridors and "cross-country" corridors (largely agricultural fields), where land use may be suitable, for potential siting of a transmission line in terms of construction, operation and maintenance. For possible "cross-country" routes, following property lines was preferred over diagonal crossing when practical. GAI and DP&L selected some avoidance areas based on land use, relatively dense residential areas, and preserved natural areas (mainly the Stillwater River vicinity) to be considered for avoidance or minimization while identifying possible route corridors. Route alternative corridors crossing the Stillwater River, a State Scenic River, were chosen to coincide with bridges or existing aerial electric line (distribution or transmission lines) crossing points. A windshield survey was conducted on several occasions from February 2012 to May 2014 to view the general study area for potential corridors as well as constraints or avoidance areas as defined above that may not be apparent based solely on GIS data and mapping sources. GAI also consulted with the Ohio Department of Natural Resources to obtain location data for protected species for consideration in siting the route corridors.

All of the route segments utilized to form the various route alternatives that were devised for analysis and scoring are depicted in Figure 3.3 which is located at the end of the report text. There were four potential route corridors selected in the immediate vicinity of the West Milton Substation, which begin with connection to the substation itself. Three of the four corridors follow existing DP&L-owned transmission lines including various voltages (69 kV, 138 kV, and 345 kV). The fourth corridor follows a road ROW (Frederick Garland Road) toward the east. In general, four largely unique route corridors were identified which span from the southern study area limit to the north section of the study area. These corridors were selected to provide a full range of options for analysis, including paralleling of road ROW, and crossing through agricultural lands aligning with property boundaries to the extent practical. In addition, one corridor was established from south to north on the west side of West Milton, due to the presence of schools and existing area development. This corridor diverges toward the north (north of Ludlow Falls community) to offer two additional route candidate corridors to cross the Stillwater River.

In the north and northwest portion of the study area approaching Eldean Substation, several route candidates (approximately five general corridors with additional segments for optional routing between the five primary corridors) were developed and analyzed. These route alternatives offered a combination of agricultural land and road ROW for comparative analysis. All route segments were assigned a node for each end of the segment (letter A through JJ during the first study phase) as a system to track and identify route segments.

2.4 Route Scoring Process

After all potential route segments were created, segment combinations were then assembled to create individual route alternatives to span between the two substations. All possible segment combinations were assigned a route identification number. Segment combinations that would require backtracking, thus increasing distance and potential effects, were not considered. During the initial scoring process, a total of 105 route alternatives were analyzed and scored through a comparative analysis process. As described below the number of route alternatives evaluated and scored was increased to 110 for the supplemental (second) scoring process following several route adjustments and newly identified route segments.

Relative Scaling of Attribute Data: In order to compare attribute measurements on a relative scale and to obtain a score that could be compared across the different alternatives, each summed data result for each attribute for a particular route alternative was normalized, or mathematically proportioned, to a scale of one to 100. The normalized values for each attribute/constraint, the total normalized score for each route alternative, and the overall rank of the route alternatives after applying weighting factors was then calculated. In this procedure the alternative with the highest value (less favorable result) for individual attributes receives a relative score of 100; that with the lowest value (more favorable result) receives a relative score of 0. (Note: If all alternatives have an impact value of zero for a specific attribute criterion, then the weighted value is set to zero). Note that the value system for the attribute of paralleling existing ROW (distance) is converse of that described above. Thus, the attribute values are transformed to a relative scale from one to 100 to obtain relative scores for each attribute criterion that was considered in the analysis and scoring. Using the relative score position, or rank, of the alternative in comparison to the values for all alternatives provided an indication of how a particular alternative compares overall. The normalized attribute scores within each category (ecological, land use, engineering, cultural resources) were then averaged for each route alternative, then all category scores were summed to determine the overall route score. The formula used for normalizing the data to achieve a relative scale is as follows, as based on a methodology suggested by EPRI/GTC (2009) and Gaige, et al. (1991):

$$\text{Normalized score value} = (x - \text{minimum value}) / \text{range}] * 100, \text{ where } x = \text{actual attribute value}$$

Weighting of Attributes and Constraints: The weighting factors applied to individual attributes for route selection study were based on the Project planning team's (DP&L and GAI staff) professional judgment based on Project objectives and previous route study experience on similar projects. Certain attributes and constraints have more impact on the ecological features, humans and their activities, socioeconomic features, the engineering design specifications and construction implementation processes relative to other attributes. Based on these premises, the Project planning team developed the following weighting values for each attribute category: Ecological (30%), Land Use (30%), Cultural Resources (10%), and Engineering/Construction (30%).

3.0 Route Evaluation and Ranking Results

3.1 Initial Route Scoring Results and Rankings

Table 3-2 summarizes the criteria category scores, with weighting values applied, and the overall relative ranking of all route alternatives for the initial route scoring process for 105 route alternatives. The total route scores ranged from 1,838 to 4,425 out of a possible range from zero to 10,000. The weighting values were applied by multiplying the normalized score by the actual percent weighting value (rather than dividing the percent value by 100) in order to arrive at overall route scores expressed in the "thousands" for ease of comparison (versus decimal values). Based on the route scoring system and process, a lower overall score indicates a more favorable route alternative and conversely a higher score indicates a more inferior route alternative given the variety of attributes that were measured.

The results of the initial scoring process indicated that the 12 highest ranked routes (Routes 103, 132, 131, 104, 133, 113, 107, 115, 106, 105, 114, and 119) all utilize the same western route segments from the West Milton Substation (with the exception of the H'-LL-J' segment), and follow the same route to roughly reach halfway toward the Eldean Substation in the vicinity of nodes M, N, and O on State Route 55. This western route (segments A-H-H') consists of both cross-country and road ROW route portions and crosses the Stillwater River along the State Route 55 bridge and ROW where an overhead distribution line exists. The A-H-H'-J'-J-M combination is favored, based on the overall scores and the fact that it is common to 12 of the top 15 route scores, in comparison to other route alternatives exiting the West Milton Substation to the north and east.

From the vicinity of nodes M, N, and O, the top 15 route alternatives diverge on five different route paths to reach the northern section of the study area. Four of the top nine route alternatives utilize the N-O-P-BB route segment combination, including the top three scoring routes, for traversing the central portion of the study area which mostly consists of agricultural land. Five of the top 15 scoring routes include paralleling portions of Forest Hill Road (segments N-O-R and N-O-R-W). Four of the top 15 routes parallel Greenlee Road (segments M-S-V-X) to reach the north section of the study area.

For the northern portion of the study area, 11 of the top 15 ranked route alternatives utilize the GG-HH-II-JJ segments to reach the Eldean Substation terminus. However, other route segment combinations in the Eldean Road vicinity (e.g., segment DD-EE-EE') scored high as well. These various segments consist of both road ROW and cross-country (agricultural land) routes.

New route segments were added on Markley Road starting at node H' and extending to new node LL, then turning north alongside DP&L's existing 69 kV circuit and ROW. The additional route offers a second alternative for reaching node J', and attempts to achieve a route alternative having less in common with the other route to node J'.

Initially, the segments A-B-C-G-N and A-D-G-N (refer to Figure 3.5) were devised as a route corridor option existing the West Milton Substation toward the east across the Stillwater River then heading north for a more direct access to the center of the study area to the north. Although this route corridor would pass by the privately owned Wagner air/landing strip (a single grass turf runway), the corridor was evaluated early in the Route Selection Study (RSS) to determine if the routes in this corridor would score relatively high. The routes were evaluated due to the air strip's unknown status (active or no longer operational) and potential availability for purchase. While some routes in this corridor scored moderately high, DP&L decided to remove this corridor from further consideration due to the logistical issues of the route proximity to the private Wagner air strip. For the same reasons (although all routes would run parallel with the air strip), the route segment (P-BB) near the Leavelle air strip (private, turf single runway) was abandoned due to the potential logistics and unknown status as to its current operational status.

Based on the initial scoring results, DP&L staff reviewed several of the top ranked routes for qualitative aspects that were not necessarily fully considered in the route analysis and scoring process. The section of State Route 55 used for the majority of the top ranked routes (segments J-M-N-O) is heavily traveled and presents challenges for transmission line construction due to the heavier traffic, shared ROW with highway maintenance operations, and other overhead utilities adjacent to the highway. Most notably, the existing communication cables near State Route 55 presents a potential set back issue (further from road edge) as transfer of such cables to DP&L's proposed future pole structures is not guaranteed. Additionally, it was DP&L's preference to minimize the number of residential parcels crossed by or adjacent to the proposed route. DP&L concluded that Route 120 and 128 as the most viable and feasible two routes to be presented to the public for soliciting input.

Route 120 (A-H-H'-J'-J-M-S-V-X-W-Z-CC-BB-DD-GG-HH-II-JJ) was ranked 14 overall. Route 128 was selected as one of the highest ranked route alternatives having the lowest percentage of route in common with Route 120 at 28%. The commonality of this route with the Preferred Route exceeds the

OPSB rule, Administrative Rule 4906-05-04(A), that states: "Two routes shall be considered as alternatives if not more than 20% of the routes are in common". However, it is within the acceptable range for a variance request from the OPSB given the study area (which was ultimately granted). Route 128 consists of the following segments: A-H-H'-LL-J'-J-M-N-O-R-P'-BB-AA-EE-EE'-KK-II-JJ. Although this route presents the logistical challenges noted above for segments J-M-N-O, it was considered a viable route that is constructible and capable of meeting transmission operational needs. The two routes are depicted below in Figure 2.

3.2 Public Input and Supplemental Route Development

DP&L held the first public meeting on March 25, 2014 to present Route 120 (displayed as the blue/orange route in Figure 2) and Route 128 (red/orange route) to residents and stakeholders interested in the Project. The public meetings, which are required by OPSB rules, are intended to inform the public of DP&L's route alternatives being considered for an application to the OPSB and to allow the public to make inquiries about the route selection process and to make comments and suggestions on the two route alternatives. Public input was received during the meeting, including both verbal and written comments, as well as residents' comments received subsequent to the meeting through direct communication to DP&L staff and filing letters with the OPSB.

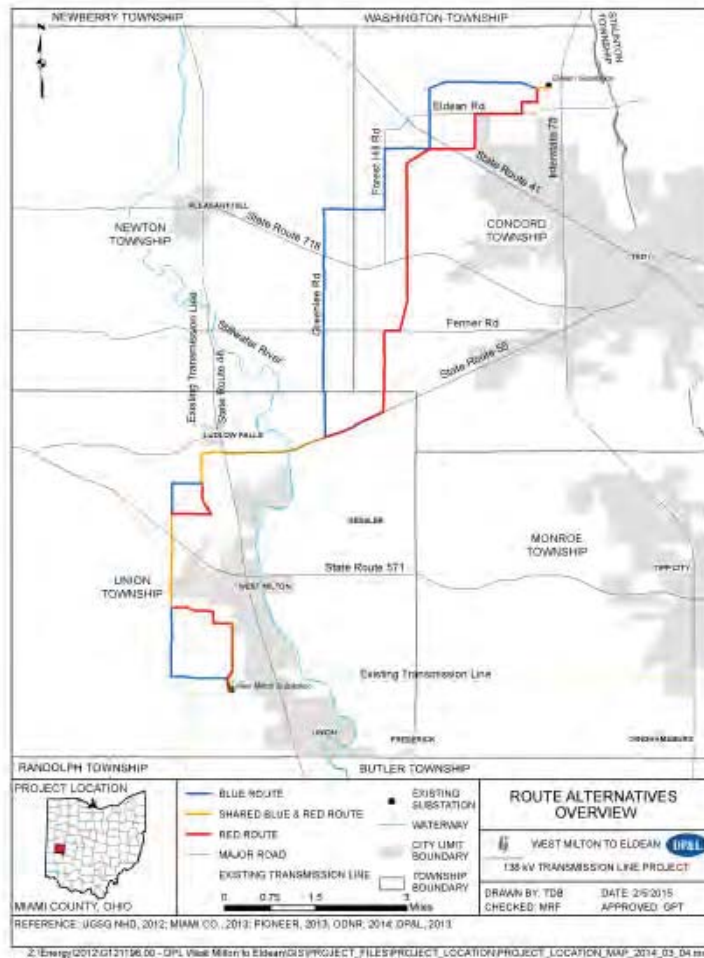


Figure 2
Route Alternatives for Public Input – March 2014 Meeting

The vast majority of comments (87%) generated from the public meeting were offered by residents of Greenlee Road which is the primary north-south road corridor that comprises 3.8 miles of Route 120 (blue/orange route). Additionally, Greenlee Road residents submitted several comment letters to the OPSB including a signed petition in opposition to the Greenlee Road portion of Route 120. The comments primarily concerned 1) the effect on landscape aesthetics, in particular where no overhead utility lines currently exist, and the viewshed toward and from land owned by the Brukner Nature Center, 2) the potential and/or perceived adverse effect on a farm on Greenlee Road considered to be of historical significance (a "Bicentennial Farm" as designated by the Ohio Department of Agriculture), and 3) lower property values as a result of a transmission line along road frontage, among other documented concerns. A few comments were also received from residents or landowners crossed by Route 128 (red/orange route) expressing concerns and opposition to this route due to various effects on their property including its impacts to crop cultivation.

Following DP&L's consideration and review of all public comments received during and after the March 25, 2014 public meeting, several new route segment alternatives were developed for evaluation in the vicinity of the southern Forest Hill Road vicinity, in lieu of the Greenlee Road option.

To avoid new route segments that would parallel Forest Hill Road along a number of residential lots, routes were devised to cross agricultural fields and align with property boundaries where feasible. Refer to Figure 3, Revised Route Alternatives Based on Public Input (March 2014). Starting at a new node NN on State Route 55, one new route segment heads north along Harter Road then continues for one mile through agricultural fields until Fenner Road is reached, then turns to the east to re-join the existing route segment on Forest Hill Road where residential lots are relatively sparse.

Additionally, new route segments were added at node OO to provide options for more length through agricultural fields, further to the north, following the Concord and Newton Township boundary (north-south). Several complete route alternatives (from substation to substation) were assembled using the supplemental route segments in the southern Forest Hill Road vicinity. The new routes were then analyzed, scored, and ranked against all previous route alternatives as describe in the next section.

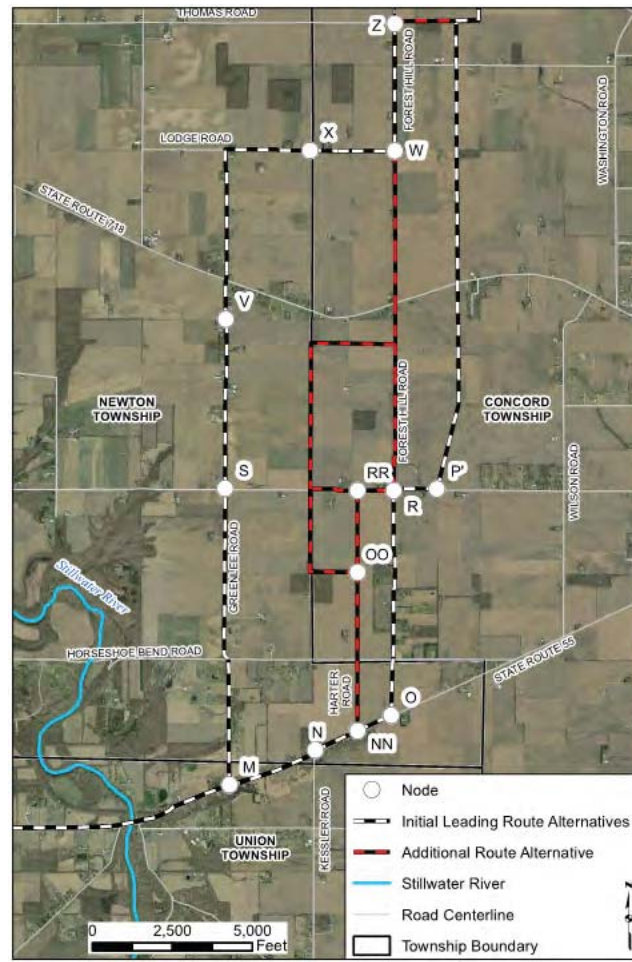


Figure 3
Revised Route Alternatives Based on Public Input (March 2014)

3.3 Supplemental Route Alternatives Analysis and Ranking

As a result of developing the above-mentioned supplemental route segments, after considering input received from the March 25th public meeting, the analysis and route scoring process described in Section 2.4 was performed. The purpose was to produce a relative comparison of all of the route alternatives including the new supplemental route segments used to form several new route alternatives. A total of 110 route alternatives were analyzed and processed with resulting scores ranging from 2,114 (best scoring alternative) to 4,587.

Table 3-3 summarizes the scoring results of the 110 route alternatives including the attribute category rankings for each route. The top 10 route alternatives consisted of three unique route segments in the central portion of the RSS study area, which indicates that the three different route segments are comparatively close in scoring. The central part of the study area is generally the south end of the Forest Hill Road, State Route 55, and vicinity, which is where supplemental route options were added. Three of the top 10 routes consisted of the agricultural field option from State Route 55 to Fenner Road (NN-OO-RR), three routes consisted of the Forest Hill Road alignment (O-R), and four routes included the Greenlee Road alignment (M-S-V or M-S-R).

The top ranked route segments in the northern section of the Project entering the Eldean Substation were DD-GG'-HH-II'-JJ (all of which crosses agricultural fields) and DD-EE-EE'-KK-II' (utilizing Eldean

Road, a short segment of agricultural land, and Experiment Farm Road). The DD-GG'-HH-II'-JJ segment combination ranks slightly better for ecological, land use and cultural resources criteria categories than the alternate leading segment entering the substation.

The alternative route segments exiting the West Milton Substation include the A-B'-H segment which heads north and the A-H segment that heads westward from the substation then north. The A-H segment is ranked higher for the ecological category (due to likely fewer wetland crossings), but A-H is ranked lower for the land use (primarily due to a summer camp located adjacent to the alignment), cultural resources, and engineering (due to less co-location with existing transmission corridor) categories.

The scoring process resulted in the highest ranked route being Route 138 which utilizes the new supplemental segment NN-OO-RR crossing agricultural fields, then crossing over Forest Hill Road toward the east, then turning north through agricultural fields (P'-BB) then entering the Eldean Substation utilizing the northern-most segment combination (DD-GG-HH-II). Route 138, considered a "cross-country" route, would span and bisect several agricultural field parcels in the P'-BB segment, which is less desired than routes that follow agricultural field property boundaries or road ROW to the extent practical. The second highest ranked route, Route 139, utilizes Greenlee Road (from State Route 55) and then the northernmost route segments to enter the Eldean Substation. For the reasons discussed above concerning Greenlee Road, this is not a viable route based on public input.

The #3 ranked route, Route 135, was ultimately selected by DP&L as one of two routes to advance for presentation at a second public informational meeting. Refer to Figure 4 below for a map of this route (shown as the blue/orange route). Besides the route being one of the highest scoring, Route 135 offers the advantage of a combination of routing along rural roads (e.g., Forest Hill Road) and crossing agricultural fields aligning with property boundaries where practical.

The second selected route alternative for presentation to the public should ideally have <20% in common with the other route alternative being considered for possible selection as the Preferred Route. Early in the RSS, DP&L and GAI recognized that the <20% in common requirement would be difficult to achieve for the Project and requested a waiver of the rule, and suggested approximately 30% or less in common, from the OPSB. The OPSB granted this waiver of the rule to DP&L. The next highest favorably ranked route that approaches 30% or less in common was Route 128. Route 128, having 34% in common with the alternative selected Route 135, was ranked 31st overall out of 110 route alternatives. It utilizes segments that diverge from Route 135 in several locations including exiting the West Milton Substation from the north and utilizing the Markley Road option to utilize more existing DP&L transmission ROW. Route 125 runs roughly parallel with Route 135 north of State Route 55 but spans much more agricultural fields and a shorter and different section of Forest Hill Road to the south. The route is depicted on the Figure 4 map below as the red/orange route.

3.4 Second Public Meeting Input on Revised Route Alternatives

Following the development of supplemental route segments resulting from the first public meeting, and the identification, evaluation and scoring of supplemental route alternatives, a second public informational meeting was held on July 9, 2014. Similar to the first meeting, the purpose of the meeting was to seek public input and comments on the two revised route alternatives (blue/orange Route 135 and red/orange Route 128 as shown in Figure 4) being considered for an application to the OPSB.

Public comments were received during the meeting as well as two comments submitted to the OPSB several weeks subsequent to the meeting. The majority of comments were supportive of the blue/orange route, which consisted of the longest section paralleling Forest Hill Road (Route 135). Few public comments supported the red/orange route alternative (Route 128) which consists of a larger percentage of agricultural fields in the central portion of the study area.

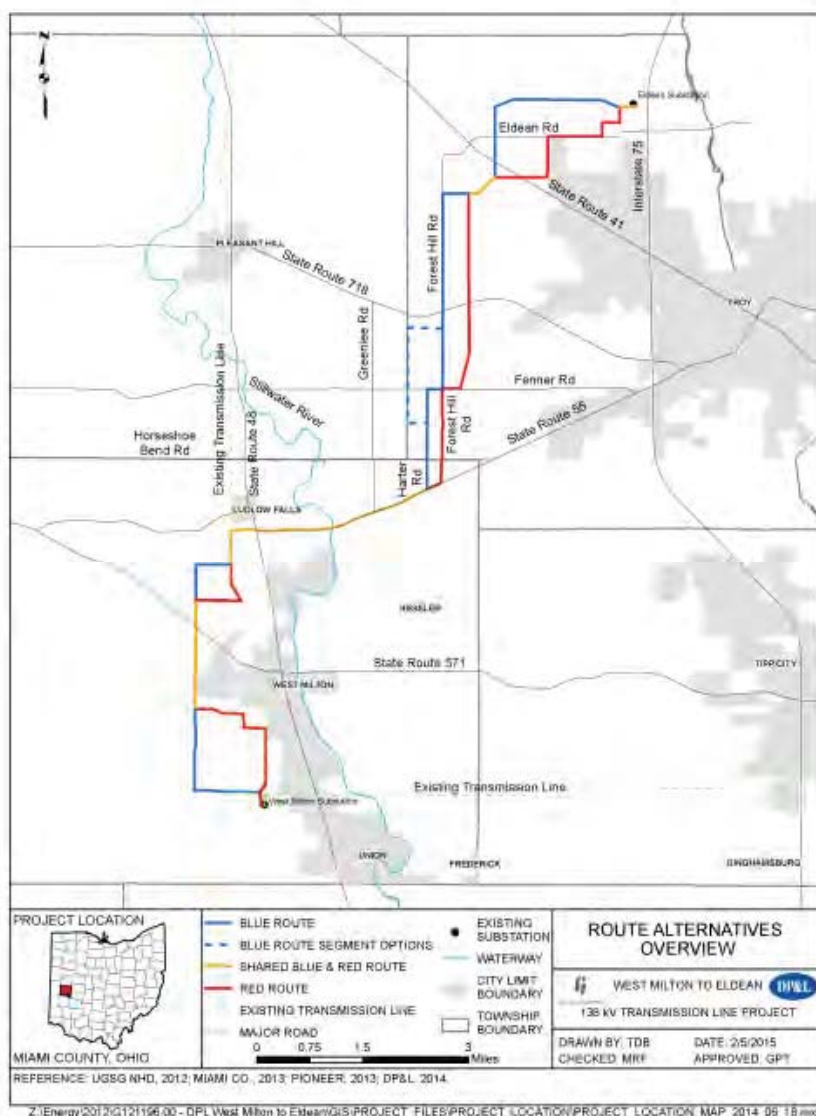


Figure 4
Revised Route Alternatives for Public Review – July 2014 Meeting

3.5 Selection of Preferred and Alternate Routes

Based on the results of the public meeting and a qualitative review of the route alternatives (depicted in Figure 4), the Preferred and Alternate Routes were selected by the DP&L siting team. The primary qualitative factors considered in the final selection were the minimization of route lengths that bisect land parcels (mainly agricultural fields) to the extent practical, minimization of routes proximal to residences along road ROW, and the feasibility of construction and maintenance of the transmission line.

3.5.1 Preferred Route

The Preferred Route was determined to be Route 135 (blue/orange route in Figure 5). The route is the 3rd highest scoring route overall and received comments of support based on the

3.5.2 Alternate Route

This map illustrates the proposed high-speed rail alignment through the western half of Ohio. The route is color-coded: blue for the main corridor, red for branches or specific segments, and yellow for connecting paths. Key locations and features include:

- Substations:** West Milton Substation (southwest) and Eldean Substation (northeast).
- Towns and Municipalities:** Newton Township, Ludlow Falls, Concord Township, Union Township, West Milton, and Troy.
- Airports:** Bayshore Airport (Private), Leavelle Airstrip (Private), Wagner Airport (Private), and Troy Airfield.
- Waterways:** Muskegon River, Sandusky River, Raisin River, and various creeks like Sugar Creek and Williams Lake.
- Infrastructure:** Major roads like State Route 571 and US-20, and existing rail lines.
- Geographic Features:** The map shows the transition from the Lake Erie shoreline in the north to the Ohio River valley in the south.

The route starts at the West Milton Substation, travels north through Union and Newton Townships, then east through Ludlow Falls and Concord Township, ending at the Eldean Substation. A branch line is shown connecting to the Troy area.

Figure 5
Preferred (Blue/Orange) and Alternate (Red/Orange) Routes

3.6 Route Adjustments for Optimizing Alignments

Following the selection of the Preferred and Alternate Routes, DP&L responded to a few landowners' request for meetings to discuss the proposed transmission alignment on their properties. These requests for changing the alignment, exclusively within an individual landowner's property, were evaluated on a case-by-case basis to determine the impact on ecological features, land use, socioeconomics, and engineering design and constructability. One area on the Preferred Route, one area on the Alternate Route, and one area on the common route were determined to be reasonable requests to optimize the alignment of these route segments, which are described below.

3.6.1 Common Route – South of State Route 41

A route adjustment relocated the proposed centerline from a diagonal orientation (1,750 feet length) over an agricultural field to the landowner's nearby property line requiring the addition of a right angle turn in the transmission line (the common route south of node BB). The optimized route segment is now 2,470 feet in length and will have less impact on agricultural crop operations. One residence is located 540 feet from this optimized route segment.

3.6.2 Preferred Route – West of Washington Road North

A request was made of DP&L to adjust the Preferred Route from the previous alignment through the middle of an agricultural crop land parcel (a 0.77-mile segment of the route) to a parallel alignment that would be situated along the landowner's property boundary in the same crop land parcel. The landowner requesting this optimization of the route has the property registered as an Ohio Agricultural District land parcel and the shift in alignment will result in a lesser impact to agricultural crop operations. The adjusted route is shown in Figure 6 below. The new alignment will also shift the line from the middle of the agricultural field of the adjacent landowner's parcel (to the west) to the property boundary (near node GG'). The overall length of the optimized route is 0.79 miles compared to 0.77 miles for the former route segment. The route will be positioned closer to an un-named ephemeral or intermittent tributary, which drains crop land and is partially parallel with the property boundary; however, the stream would be outside of the ROW with the exception of one crossing of the route. One residence is located 180 feet, and nine residences are located from 230 feet to 1,000 feet, from the optimized route. This is reasonably comparable to the previous Preferred Route where eight residences were located within 1,000 feet of the route segment.



Figure 6
Preferred Route – West of Washington Road Route Adjustment

3.6.3 Alternate Route – Area of Eldean Road / Washington Road Intersection

Similar to the previously described route adjustments for the Preferred Route, a request was received from the owner of the agricultural land, including their residence (<100 feet from the Alternate Route), located southeast of the intersection of Eldean Road and Washington Road on the Alternate Route. The adjusted route is shown in Figure 7 below between nodes AA-EE^{OPT}-EE'. The landowner, having crop land registered as Ohio Agricultural District land, requested that the route be shifted from the 0.74-mile road frontage route to the opposite side of their land and property boundary line. The optimized route segment is 0.74 miles in length through crop land, essentially the same as the previous Alternate Route (also 0.74 miles along road ROW and the edge of the crop land). Approximately a 1,300-foot portion the route

adjustment (segment AA-EE^{OPT}) is situated parallel with the rear property boundary of 15 residences (located on Parkwood Drive) but the route's centerline is more than 100 feet distance to any of these residences. The previous Alternate Route alignment was within 1,000 feet of 59 residences compared to 65 residences within 1,000 feet of the new route adjustment. There is no difference in ecological impacts – no streams, wetlands, or forested areas exist within the planned ROW of the optimized route.



Figure 7
Alternate Route – Eldean Road / Washington Road Intersection Route Adjustment

3.6.4 Preferred and Alternate Route Substitution – State Route 55 and Forest Hill Road

Subsequent to the submission of the Application for Certificate of Environmental Compatibility and Public Need in February 2015, and the OPSB's initial review of the Application, DP&L decided to substitute or switch a 1.6-mile section of the Preferred Route with a parallel segment of the Alternate Route. This section of the Preferred Route begins at State Route 55 on Harter Road and extends to the intersection of Fenner Road and Forest Hill Road. The area and route change is shown in Figure 8 below. In effect, the originally designated Alternate Route segment, which begins on State Route 55 then heads north mostly along Forest Hill Road (small section of field), was changed to or became the revised Preferred Route. This substitution of route segments was made by DP&L to alleviate a major landowner's objection to placing transmission facilities over a 1.0-mile length of crop land. No ecological impacts are anticipated from this route change as compared to the original Preferred Route through the agricultural field. The new Preferred Route along Forest Hill Road will be in closer proximity to more residences in comparison to the former Preferred Route alignment, but will most likely be co-located with DP&L's existing distribution lines (underbuilt onto new transmission facilities).



Figure 8
Preferred and Alternate Route Switch – Between Node NN and R / Forest Hill Road and State Route 55

TABLES



TABLE 3-2
INITIAL ROUTE ALTERNATIVES SCORING RESULTS

Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Total Route Score	Route ID	Overall Rank
			Normalized Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank			
103	A-B-HH'I-J'-J-M-N-O-R-P'-BB-DD-GG-HH-II-J	16.4	198	9	442	20	63	1	1,136	72	1,838	103	1
132	A-H-H'I-L'-J'-J-M-N-O-R-P'-BB-DD-EE-EE-KK-II-J	16.5	69	3	675	73	63	1	1,063	50	1,869	132	2
131	A-H-H'I-L'-J'-J-M-N-O-R-P'-BB-DD-GG-HH-II-J	16.6	55	2	665	71	63	1	1,119	67	1,902	131	3
104	A-H-H'I-J'-J-M-S-V-X-Y-F-F-GG-HH-II-J	16.8	143	4	634	63	63	1	1,096	62	1,935	104	4
133	A-H-H'I-L'-J'-J-M-S-V-X-Y-F-F-GG-HH-II-J	17.0	0	1	857	92	63	1	1,030	39	1,950	133	6
113	A-H-H'I-J'-J-M-N-O-P'-BB-DD-EE-EE-MM-KK-II-J	16.3	213	13	457	28	94	16	1,181	86	1,945	113	5
107	A-H-H'I-J'-J-M-N-O-P'-BB-AA-EE-EE-MM-KK-II-J	16.3	213	13	445	23	94	16	1,209	94	1,961	107	7
115	A-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-DD-GG-HH-II-J	16.7	246	21	507	38	63	1	1,163	81	1,978	115	8
106	A-H-H'I-J'-J-M-N-O-R-W-Z-CC-FF-GG-HH-II-J	16.5	193	8	470	32	63	1	1,255	102	1,980	106	9
105	A-H-H'I-J'-J-M-S-R-W-Z-CC-FF-GG-HH-II-J	16.9	147	5	500	37	63	1	1,292	103	2,002	105	10
114	A-H-H'I-J'-J-M-S-V-X-W-Z-CC-FF-GG-HH-II-J	16.8	147	5	641	65	63	1	1,156	79	2,006	114	11
119	A-H-H'I-J'-J-M-S-R-W-Z-CC-BB-DD-GG-HH-II-J	17.1	200	10	537	44	63	1	1,217	97	2,016	119	12
68	A-B'-H-H'I-J'-J-M-N-O-P'-BB-DD-GG-HH-II-J	16.4	382	30	208	1	344	34	1,088	59	2,023	68	13
120	A-H-H'I-J'-J-M-S-V-X-W-Z-CC-BB-DD-GG-HH-II-J	17.1	200	10	679	74	63	1	1,096	61	2,038	120	14
130	A-B'-H-H'I-J'-J-M-N-O-R-P'-BB-DD-EE-EE-KK-II-J	16.3	396	42	218	3	344	34	1,081	57	2,038	130	15
116	A-H-H'I-J'-J-M-S-V-X-Y-Z-CC-FF-GG-HH-II-J	16.8	147	5	649	68	63	1	1,210	95	2,069	116	16
117	A-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-J	16.6	261	23	523	42	94	16	1,191	91	2,069	117	17
129	A-B'-H-H'I-L'-J'-J-M-N-O-R-P'-BB-DD-GG-HH-II-J	16.6	239	20	432	19	344	34	1,072	54	2,087	129	18
45	A-B'-H-H'I-J'-J-M-S-V-X-Y-F-F-GG-HH-II-J	16.9	327	25	344	15	344	34	1,016	35	2,087	45	19
58	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-FF-GG-HH-II-J	16.5	377	29	237	5	344	34	1,158	80	2,115	58	22
121	A-H-H'I-J'-J-M-S-V-X-Y-Z-CC-BB-DD-GG-HH-II-J	17.1	200	10	687	76	63	1	1,167	83	2,116	121	23
122	A-H-H'I-J'-J-M-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-J	17.0	216	15	553	48	94	16	1,245	100	2,108	122	20
66	A-B'-H-H'I-J'-J-M-N-O-P'-BB-DD-EE-EE-MM-KK-II-J	16.4	398	43	224	4	375	62	1,117	66	2,114	66	21
118	A-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	16.6	261	23	511	40	94	16	1,252	101	2,118	118	24
123	A-H-H'I-J'-J-M-S-V-X-W-Z-CC-BB-DD-EE-EE-MM-KK-II-J	17.0	216	15	694	77	94	16	1,125	69	2,129	123	25
63	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-DD-GG-HH-II-J	16.7	430	51	274	7	344	34	1,099	63	2,146	63	26
39	A-B'-H-H'I-J'-J-M-S-R-W-Z-CC-FF-GG-HH-II-J	16.9	332	26	344	6	266	34	1,212	96	2,153	39	27
124	A-H-H'I-J'-J-M-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	17.0	216	15	541	47	94	16	1,306	104	2,157	124	28
128	A-B'-H-H'I-L'-J'-J-M-N-O-R-P'-BB-AA-EE-EE-KK-II-J	16.6	253	22	428	18	344	34	1,142	74	2,167	128	29
52	A-B'-H-H'I-J'-J-M-S-V-X-W-Z-CC-FF-GG-HH-II-J	16.9	332	26	408	16	344	34	1,092	60	2,175	52	30
44	A-B'-H-H'I-J'-J-M-S-R-W-Z-CC-BB-DD-GG-HH-II-J	17.1	384	33	304	10	344	34	1,152	78	2,185	44	33
125	A-H-H'I-J'-J-M-S-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	17.0	216	15	683	75	94	16	1,186	89	2,178	125	31
64	A-B'-H-H'I-J'-J-M-N-O-P'-BB-AA-EE-EE-MM-KK-II-J	16.4	398	43	212	2	375	62	1,194	92	2,179	64	32
57	A-B'-H-H'I-J'-J-M-S-V-X-W-Z-CC-BB-DD-GG-HH-II-J	17.1	384	33	445	22	344	34	1,032	40	2,206	57	34
46	A-B'-H-H'I-J'-J-M-S-V-X-Y-Z-CC-FF-GG-HH-II-J	16.9	332	26	416	17	344	34	1,145	75	2,237	46	35
61	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-J	16.6	446	54	290	9	375	62	1,127	70	2,238	61	36
67	A-B'-H-H'I-J'-J-M-N-O-P'-BB-DD-EE-HH-II-J	16.5	382	30	390	14	344	34	1,138	73	2,254	67	37
51	A-B'-H-H'I-J'-J-M-S-V-X-Y-Z-CC-BB-DD-GG-HH-II-J	17.1	384	33	454	25	344	34	1,103	64	2,285	51	39
42	A-B'-H-H'I-J'-J-M-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-J	17.0	400	45	320	12	375	62	1,181	87	2,276	42	38
65	A-B'-H-H'I-J'-J-M-N-O-P'-BB-AA-EE-HH-II-J	16.5	382	30	378	13	344	34	1,182	88	2,286	65	40
59	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	16.7	446	54	278	8	375	62	1,188	90	2,287	59	41
55	A-B'-H-H'I-J'-J-M-S-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-J	17.0	400	45	461	30	375	62	1,061	49	2,297	55	42
40	A-B'-H-H'I-J'-J-M-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	17.0	400	45	308	11	375	62	1,242	99	2,325	40	43
53	A-B'-H-H'I-J'-J-M-S-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-J	17.0	400	45	449	24	375	62	1,122	68	2,346	53	44
62	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-DD-EE-HH-II-J	16.8	430	51	456	27	344	34	1,148	76	2,378	62	46
49	A-B'-H-H'I-J'-J-M-S-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-J	17.0	400	45	469	31	375	62	1,131	71	2,376	49	45
60	A-B'-H-H'I-J'-J-M-N-O-R-W-Z-CC-BB-AA-EE-HH-II-J	16.8	430	51	444	21	344	34	1,176	85	2,394	60	47
43	A-B'-H-H'I-J'-J-M-S-R-W-Z-CC-BB-DD-EE-HH-II-J	17.1	384	33	486	34	344	34	1,202	93	2,416	43	49
47	A-B'-H-H'I-J'-J-M-S-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-J	17.0	400	45	458	29	375	62	1,176	84	2,408	47	48

TABLE 3-2
INITIAL ROUTE ALTERNATIVES SCORING RESULTS

Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Total Route Score	Route ID	Overall Rank
			Normalized Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank			
41	A-B-H-H-I-J-J-M-S-R-W-Z-CC-BB-AA-EE-HH-II-JJ	17.1	384	33	474	33	344	34	1,230	98	2,432	41	50
56	A-B-H-H-I-J-J-M-S-V-X-W-Z-CC-BB-DD-EE-HH-II-JJ	17.2	384	33	627	62	344	34	1,082	58	2,437	56	51
54	A-B-H-H-I-J-J-M-S-V-X-W-Z-CC-BB-AA-EE-HH-II-JJ	17.2	384	33	615	60	344	34	1,109	65	2,453	54	52
48	A-B-H-H-I-J-J-M-S-V-X-Y-Z-CC-BB-AA-EE-HH-II-JJ	17.2	384	33	624	61	344	34	1,163	82	2,515	48	53
50	A-B-H-H-I-J-J-M-S-V-X-Y-Z-CC-BB-DD-EE-HH-II-JJ	17.1	384	33	636	64	344	34	1,152	77	2,516	50	54
134	A-H-H-I-L-J-J-M-N-O-R-P-BB-AA-EE-EE-KK-II-JJ	18.0	234	19	739	79	94	16	1,556	105	2,623	134	55
126	A-H-J-U-T-V-X-W-Z-CC-FF-GG-HH-II-JJ	17.0	713	56	764	86	250	28	1,042	45	2,768	126	56
69	A-B-H-H-I-J-J-M-N-O-P-Q-AA-EE-EE-MM-KK-II-JJ	16.1	763	58	832	91	375	62	808	19	2,778	69	57
70	A-B-H-H-I-J-J-M-N-O-P-Q-AA-EE-HH-II-JJ	16.2	747	57	998	99	344	34	796	16	2,885	70	58
84	A-B-H-J-U-T-V-X-W-Z-CC-FF-GG-HH-II-JJ	17.0	898	59	530	43	531	74	978	29	2,937	84	59
89	A-B-H-J-U-T-V-X-W-Z-CC-BB-DD-GG-HH-II-JJ	17.2	951	61	568	49	531	74	918	25	2,968	89	60
77	A-B-H-J-U-T-S-V-X-Y-FF-GG-HH-II-JJ	17.0	1,001	72	589	56	531	74	887	24	3,008	77	61
90	A-B-H-J-U-T-V-X-Y-Z-CC-FF-GG-HH-II-JJ	17.0	898	59	539	46	531	74	1,048	46	3,016	90	62
71	A-B-H-J-U-T-S-R-W-Z-CC-FF-GG-HH-II-JJ	17.1	1,005	73	455	26	531	74	1,050	47	3,042	71	63
95	A-B-H-J-U-T-V-X-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.2	951	61	576	52	531	74	989	30	3,047	95	64
87	A-B-H-J-U-T-V-X-W-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	966	67	583	55	563	96	947	26	3,059	87	65
76	A-B-H-J-U-T-S-R-W-Z-CC-BB-DD-GG-HH-II-JJ	17.3	1,058	75	492	35	531	74	991	31	3,073	76	66
109	A-D-E-F-K-L-Q-AA-EE-EE-MM-KK-II-JJ	15.9	1,183	85	986	97	219	27	691	9	3,078	109	67
85	A-B-H-J-U-T-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	966	67	572	50	563	96	1,008	34	3,108	85	68
93	A-B-H-J-U-T-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	966	67	592	58	563	96	1,017	36	3,138	93	69
74	A-B-H-J-U-T-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	1,074	81	508	39	563	96	1,020	37	3,164	74	70
78	A-B-H-J-U-T-S-V-X-Y-Z-CC-FF-GG-HH-II-JJ	17.1	1,005	73	605	59	531	74	1,033	41	3,175	78	71
91	A-B-H-J-U-T-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	966	67	580	54	563	96	1,078	55	3,187	91	72
88	A-B-H-J-U-T-V-X-W-Z-CC-BB-DD-EE-HH-II-JJ	17.3	951	61	750	82	531	74	968	27	3,199	88	73
83	A-B-H-J-U-T-S-V-X-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.3	1,058	75	642	66	974	74	974	28	3,206	83	74
86	A-B-H-J-U-T-V-X-W-Z-CC-BB-AA-EE-HH-II-JJ	17.3	951	61	738	78	531	74	996	32	3,215	86	76
72	A-B-H-J-U-T-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	1,074	81	496	36	563	96	1,080	56	3,213	72	75
3	A-B-C-D-E-F-K-L-Q-AA-EE-EE-MM-KK-II-JJ	15.7	1,870	103	803	87	94	16	453	4	3,220	3	77
127	A-H-J-U-Y-FF-GG-HH-II-JJ	17.2	1,510	86	755	83	250	28	747	13	3,262	127	78
94	A-B-H-J-U-T-V-X-Y-Z-CC-BB-DD-EE-HH-II-JJ	17.3	951	61	758	85	531	74	1,038	43	3,278	94	79
92	A-B-H-J-U-T-V-X-Y-Z-CC-BB-AA-EE-HH-II-JJ	17.3	951	61	746	81	531	74	1,066	52	3,294	92	80
75	A-B-H-J-U-T-S-R-W-Z-CC-BB-DD-EE-HH-II-JJ	17.3	1,058	75	674	72	531	74	1,040	44	3,304	75	82
81	A-B-H-J-U-T-S-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	1,074	81	658	69	563	96	1,003	33	3,297	81	81
73	A-B-H-J-U-T-S-R-W-Z-CC-BB-AA-EE-HH-II-JJ	17.3	1,058	75	662	70	531	74	1,068	53	3,320	73	83
4	A-B-C-D-E-F-K-L-Q-AA-EE-HH-II-JJ	15.8	1,855	102	969	96	63	1	441	3	3,327	4	84
110	A-D-E-I-P-O-R-P-BB-DD-GG-HH-II-JJ	16.7	975	71	832	90	500	73	1,037	42	3,344	110	85
79	A-B-H-J-U-T-S-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	1,074	81	646	67	563	96	1,063	51	3,346	79	86
96	A-B-H-J-U-Y-FF-GG-HH-II-JJ	17.2	1,694	92	522	41	531	74	683	8	3,430	96	87
82	A-B-H-J-U-T-S-V-X-Y-Z-CC-BB-DD-EE-HH-II-JJ	17.3	1,058	75	824	89	531	74	1,023	38	3,437	82	88
80	A-B-H-J-U-T-S-V-X-Y-Z-CC-BB-AA-EE-HH-II-JJ	17.3	1,058	75	812	88	531	74	1,051	48	3,453	80	89
2	A-B-C-D-E-F-L-Q-AA-EE-HH-II-JJ	16.2	1,716	94	1,313	101	63	1	368	1	3,460	2	90
97	A-B-H-J-U-Y-Z-CC-FF-GG-HH-II-JJ	17.3	1,699	93	538	45	531	74	796	17	3,564	97	91
1	A-B-C-D-E-F-L-Q-AA-EE-EE-MM-KK-II-JJ	16.0	1,732	95	1,361	102	94	16	381	2	3,568	1	92
102	A-B-H-J-U-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.5	1,752	96	576	51	531	74	737	11	3,595	102	93
12	A-B-C-D-E-I-P-O-R-P-BB-DD-GG-HH-II-JJ	16.5	1,662	87	863	93	313	30	800	18	3,638	12	94
9	A-B-C-D-E-I-P-O-R-P-BB-AA-EE-HH-II-JJ	15.8	1,662	87	987	98	313	30	730	10	3,692	9	96
100	A-B-H-J-U-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.4	1,767	99	991	57	563	96	765	14	3,686	100	95
8	A-B-C-D-E-I-P-O-R-P-BB-AA-EE-EE-MM-KK-II-JJ	15.7	1,678	90	934	95	344	34	742	12	3,697	8	97
10	A-B-C-D-E-I-P-O-R-P-BB-DD-EE-EE-MM-KK-II-JJ	16.4	1,678	90	879	94	344	34	829	22	3,729	10	98

TABLE 3-2
INITIAL ROUTE ALTERNATIVES SCORING RESULTS

Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Total Route Score	Route ID	Overall Rank
			Normalized Ecological Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank			
98	A-B-H-J-U-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.4	1,767	99	579	53	563	96	826	21	3,735	98	99
101	A-B-H-J-U-Y-Z-CC-BB-DD-EE-HH-II-JJ	17.5	1,752	96	757	84	531	74	786	15	3,826	101	100
99	A-B-H-J-U-Y-Z-CC-BB-AA-EE-HH-II-JJ	17.5	1,752	96	746	80	531	74	814	20	3,842	99	101
11	A-B-C-D-E-I-P-O-R-P-BB-DD-EE-HH-II-JJ	16.5	1,662	87	1,045	100	313	30	850	23	3,869	11	102
5	A-B-C-D-E-I-K-L-Q-AA-EE-EE-MM-KK-II-JJ	15.5	1,793	101	1,430	103	344	34	613	7	4,180	5	103
6	A-B-C-D-E-I-P-Q-AA-EE-EE-MM-KK-II-JJ	15.5	2,044	105	1,456	104	344	34	475	6	4,318	6	104
7	A-B-C-D-E-I-P-Q-AA-EE-HH-II-JJ	15.6	2,028	104	1,622	105	313	30	463	5	4,425	7	105

TABLE 3-3
SUPPLEMENTAL AND UPDATED ROUTE ALTERNATIVES SCORING RESULTS

Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Total Route Score	Route ID	Overall Rank
			Normalized Ecological Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank			
138	A-H-H'-L-L'-J'-J'-M-N-NN-O-R-R-P'-BB-DD-GG-HH-II'-JJ	16.7	55	3	265	12	281	5	1,513	49	2,114	138	1
139	A-H-H'-L-L'-J'-J'-M-S-V-X-W-Z-BB-DD-GG-HH-II'-JJ	17.1	0	1	514	65	313	17	1,387	27	2,213	139	2
135	A-H-H'-J'-J'-M-N-NN-O-R-R-W-Z-BB-DD-GG-HH-II'-JJ	16.6	188	12	306	17	281	5	1,461	39	2,237	135	3
133	A-H-H'-L-L'-J'-J'-M-S-V-X-Y-FF-GG-HH-II'-JJ	17.0	0	1	492	59	313	17	1,440	34	2,244	133	4
129	A-B'-H-H'-L-L'-J'-J'-M-N-NN-O-R-P'-BB-DD-GG-HH-II'-JJ	16.7	239	25	152	2	313	17	1,584	69	2,287	129	5
131	A-H-H'-L-L'-J'-J'-M-N-NN-O-R-P'-BB-DD-GG-HH-II'-JJ	16.6	55	3	300	16	281	5	1,659	86	2,295	131	6
132	A-H-H'-L-L'-J'-J'-M-N-NN-O-R-P'-BB-DD-EE-EE-KK-II'-JJ	16.5	69	5	309	20	344	44	1,576	65	2,297	132	7
137	A-H-H'-J'-J'-M-N-NN-O-R-R-P'-BB-DD-GG-HH-II'-JJ	16.5	198	15	256	10	281	5	1,599	72	2,334	137	8
44	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-BB-DD-GG-HH-II'-JJ	17.1	384	38	247	9	344	44	1,422	31	2,396	44	9
39	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-FF-GG-HH-II'-JJ	16.9	331	31	209	6	344	44	1,523	54	2,407	39	10
119	A-H-H'-J'-J'-M-S-R-W-Z-CC-BB-DD-GG-HH-II'-JJ	17.1	200	17	394	38	313	17	1,520	53	2,427	119	11
45	A-B'-H-H'-J'-J'-M-S-V-X-Y-FF-GG-HH-II'-JJ	16.9	326	30	336	24	344	44	1,451	37	2,451	45	12
105	A-H-H'-J'-J'-M-S-R-W-Z-CC-FF-GG-HH-II'-JJ	16.9	147	9	357	27	313	17	1,644	82	2,461	105	13
136	A-H-H'-J'-J'-M-N-NN-O-W-Z-BB-DD-GG-HH-II'-JJ	17.2	188	12	307	19	281	5	1,691	97	2,467	136	14
63	A-B'-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-DD-GG-HH-II'-JJ	16.7	429	56	216	7	313	17	1,515	50	2,473	63	15
120	A-H-H'-J'-J'-M-S-V-X-W-Z-CC-BB-DD-GG-HH-II'-JJ	16.9	143	7	506	61	313	17	1,519	52	2,480	120	16
58	A-B'-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-FF-GG-HH-II'-JJ	16.5	376	34	179	5	313	17	1,616	75	2,484	58	17
68	A-B'-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-GG-HH-II'-JJ	16.5	381	35	144	1	313	17	1,647	83	2,485	68	18
103	A-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-GG-HH-II'-JJ	16.4	198	15	291	14	281	5	1,722	102	2,492	103	19
115	A-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-DD-GG-HH-II'-JJ	16.7	246	26	364	30	281	5	1,613	74	2,504	115	20
104	A-H-H'-J'-J'-M-S-V-X-Y-FF-GG-HH-II'-JJ	16.8	143	7	484	57	313	17	1,572	63	2,511	104	21
42	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	17.0	399	50	262	11	375	90	1,479	43	2,516	42	22
57	A-B'-H-H'-J'-J'-M-S-V-X-W-Z-CC-BB-DD-GG-HH-II'-JJ	17.1	384	38	381	33	344	44	1,427	32	2,535	57	23
52	A-B'-H-H'-J'-J'-M-S-V-X-W-Z-CC-FF-GG-HH-II'-JJ	16.9	331	31	343	25	344	44	1,528	55	2,546	52	24
122	A-H-H'-J'-J'-M-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	17.0	216	21	410	44	344	44	1,577	66	2,547	122	25
130	A-B'-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-EE-EE-KK-II'-JJ	16.4	395	47	153	3	375	90	1,633	79	2,556	130	26
134	A-H-H'-L-L'-J'-J'-M-N-NN-O-R-P'-BB-AA-EE-EE-KK-II'-JJ	16.6	69	5	440	49	344	44	1,708	100	2,560	134	27
106	A-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-FF-GG-HH-II'-JJ	16.5	193	14	327	23	281	5	1,760	105	2,561	106	28
114	A-H-H'-J'-J'-M-S-V-X-W-Z-CC-FF-GG-HH-II'-JJ	16.8	193	14	491	58	313	17	1,626	78	2,577	114	29
61	A-B'-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	16.6	445	59	232	8	344	44	1,572	64	2,593	61	30
128	A-B'-H-H'-L-L'-J'-J'-M-N-NN-O-R-P'-BB-AA-EE-EE-KK-II'-JJ	16.6	252	27	292	15	375	90	1,679	93	2,598	128	31
66	A-B'-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-EE-EE-MM-KK-II'-JJ	16.4	397	48	159	4	344	44	1,705	98	2,604	66	32
117	A-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	16.6	261	28	380	32	313	17	1,670	92	2,624	117	33
113	A-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-EE-EE-MM-KK-II'-JJ	16.4	213	19	307	18	313	17	1,803	108	2,635	113	34
55	A-B'-H-H'-J'-J'-M-S-V-X-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	17.0	399	50	397	39	375	90	1,484	47	2,655	55	35
43	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-BB-DD-EE-HH-II'-JJ	17.1	384	38	428	45	344	44	1,504	44	2,660	43	36
123	A-H-H'-J'-J'-M-S-V-X-W-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	17.0	216	21	544	74	344	44	1,582	68	2,686	123	37
46	A-B'-H-H'-J'-J'-M-S-V-X-Y-Z-CC-FF-GG-HH-II'-JJ	16.9	331	31	352	26	344	44	1,664	88	2,690	46	38
51	A-B'-H-H'-J'-J'-M-S-V-X-Y-Z-CC-BB-DD-GG-HH-II'-JJ	17.1	384	38	389	35	344	44	1,585	70	2,702	51	39
116	A-H-H'-J'-J'-M-S-V-X-Y-Z-CC-FF-GG-HH-II'-JJ	16.8	147	9	500	60	313	17	1,762	106	2,721	116	40
40	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II'-JJ	17.0	399	50	393	36	375	90	1,565	60	2,732	40	41
121	A-H-H'-J'-J'-M-S-V-X-Y-Z-CC-BB-DD-GG-HH-II'-JJ	17.1	200	17	537	71	313	17	1,684	94	2,733	121	42
62	A-B'-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-DD-EE-HH-II'-JJ	16.8	429	56	398	40	313	17	1,597	71	2,737	62	43
67	A-B'-H-H'-J'-J'-M-N-NN-O-R-P'-BB-DD-EE-HH-II'-JJ	16.5	381	35	325	21	313	17	1,730	103	2,749	67	44
124	A-H-H'-J'-J'-M-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II'-JJ	17.0	216	21	541	72	344	44	1,663	87	2,763	124	45
56	A-B'-H-H'-J'-J'-M-S-V-X-W-Z-CC-BB-DD-EE-HH-II'-JJ	17.1	384	38	563	77	344	44	1,509	48	2,799	56	46
107	A-H-H'-J'-J'-M-N-NN-O-R-P'-BB-AA-EE-EE-MM-KK-II'-JJ	16.4	213	19	438	47	313	17	1,842	110	2,806	107	47
59	A-B'-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II'-JJ	16.7	445	59	363	28	344	44	1,658	85	2,809	59	48
49	A-B'-H-H'-J'-J'-M-S-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II'-JJ	17.0	399	50	405	43	375	90	1,643	81	2,820	49	49
41	A-B'-H-H'-J'-J'-M-S-R-W-Z-CC-BB-AA-EE-HH-II'-JJ	17.2	384	38	559	76	344	44	1,544	57	2,830	41	50
118	A-H-H'-J'-J'-M-N-NN-O-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II'-JJ	16.6	261	28	511	64	313	17	1,756	104	2,840	118	51

TABLE 3-3
SUPPLEMENTAL AND UPDATED ROUTE ALTERNATIVES SCORING RESULTS

Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Route ID	Overall Rank
			Normalized Ecological Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank		
64	A-B'-HH'-J'-J-M-N-NN-O-R-P'-BB-AA-EE-EE-MM-KK-II-JJ	16.4	397	48	290	13	344	44	1,813	109	64	52
53	A-B'-HH'-J'-J-M-S-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.0	399	50	527	67	375	90	1,570	62	53	53
125	A-H-H'-J'-J-M-S-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.0	216	21	675	86	344	44	1,668	90	125	54
60	A-B'-HH'-J'-J-M-N-NN-O-R-W-Z-CC-BB-AA-EE-EE-HH-II-JJ	16.8	429	56	529	68	313	17	1,636	80	60	55
65	A-B'-HH'-J'-J-M-N-NN-O-R-P'-BB-AA-EE-EE-HH-II-JJ	16.5	381	35	456	55	313	17	1,792	107	65	56
50	A-B'-HH'-J'-J-M-S-V-X-Y-Z-CC-BB-DD-EE-HH-II-JJ	17.1	384	38	571	78	344	44	1,668	89	50	57
54	A-B'-HH'-J'-J-M-S-V-X-W-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.2	384	38	694	89	344	44	1,549	58	54	58
47	A-B'-HH'-J'-J-M-S-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.0	399	50	536	70	375	90	1,705	99	47	59
89	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-BB-DD-GG-HH-II-JJ	17.2	950	66	432	46	344	44	1,319	22	89	60
84	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-FF-GG-HH-II-JJ	17.0	897	64	394	37	344	44	1,421	30	84	61
126	A-H-H'-J'-J-U-T-V-X-W-Z-CC-FF-GG-HH-II-JJ	17.0	714	61	542	73	313	17	1,519	51	126	62
48	A-B'-HH'-J'-J-M-S-V-X-Y-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.2	384	38	702	90	344	44	1,684	95	48	63
76	A-B'-HH'-J'-J-U-T-S-R-W-Z-CC-BB-DD-GG-HH-II-JJ	17.3	1,058	80	363	29	344	44	1,357	25	76	64
71	A-B'-HH'-J'-J-U-T-S-R-W-Z-CC-FF-GG-HH-II-JJ	17.1	1,005	78	325	22	344	44	1,459	38	71	65
87	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	966	72	447	51	375	90	1,377	26	87	66
95	A-B'-HH'-J'-J-U-T-V-X-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.2	966	66	440	50	344	44	1,478	41	95	67
69	A-B'-HH'-J'-J-M-N-NN-O-P-Q-AA-EE-EE-MM-KK-II-JJ	16.1	762	63	838	98	344	44	1,274	19	69	68
90	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-FF-GG-HH-II-JJ	17.0	897	64	402	42	344	44	1,579	67	90	69
77	A-B'-HH'-J'-J-U-T-S-V-X-Y-FF-GG-HH-II-JJ	17.0	1,000	77	453	52	344	44	1,433	33	77	70
74	A-B'-HH'-J'-J-U-T-S-R-W-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	1,073	86	379	31	375	90	1,415	29	74	71
88	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-BB-DD-EE-EE-HH-II-JJ	17.3	950	66	613	82	344	44	1,402	28	88	72
70	A-B'-HH'-J'-J-M-N-NN-O-P-Q-AA-EE-EE-HH-II-JJ	16.2	747	62	1,005	101	313	17	1,253	17	70	73
93	A-B'-HH'-J'-J-U-T-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	966	72	456	54	375	90	1,535	56	93	74
85	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	966	72	578	79	375	90	1,462	40	85	75
75	A-B'-HH'-J'-J-U-T-S-R-W-Z-CC-BB-DD-EE-EE-HH-II-JJ	17.3	1,058	80	545	75	344	44	1,440	35	75	76
72	A-B'-HH'-J'-J-U-T-S-R-W-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	1,073	86	510	63	375	90	1,501	45	72	77
83	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.3	1,058	80	506	62	344	44	1,567	61	83	78
94	A-B'-HH'-J'-J-U-T-V-X-Y-Z-CC-BB-DD-EE-EE-HH-II-JJ	17.3	950	66	622	84	344	44	1,560	59	94	79
86	A-B'-HH'-J'-J-U-T-V-X-W-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.3	950	66	744	91	344	44	1,441	36	86	80
78	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-FF-GG-HH-II-JJ	17.1	1,005	78	468	56	344	44	1,669	91	78	81
96	A-B'-HH'-J'-J-U-Y-FF-GG-HH-II-JJ	17.2	1,694	97	386	34	344	44	1,112	11	96	82
91	A-B'-HH'-J'-J-U-T-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	966	72	586	81	375	90	1,621	76	91	83
127	A-H-H'-J'-J-U-T-S-R-W-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.3	1,058	80	676	87	344	44	1,479	42	127	84
81	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.2	1,511	91	534	69	313	17	1,210	15	81	85
109	A-D-E-F-K-L-Q-AA-EE-EE-MM-KK-II-JJ	15.9	1,073	86	522	66	375	90	1,625	77	109	86
3	A-B-C-D-E-F-K-L-Q-AA-EE-EE-MM-KK-II-JJ	15.7	1,183	90	1,057	103	375	90	1,012	9	3	87
92	A-B'-HH'-J'-J-U-T-V-X-Y-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.3	950	66	945	99	156	4	655	4	92	88
4	A-B-C-D-E-F-K-L-Q-AA-EE-EE-HH-II-JJ	15.8	1,855	107	1,111	105	125	3	633	3	4	90
102	A-B'-HH'-J'-J-U-Y-Z-CC-BB-DD-GG-HH-II-JJ	17.5	1,752	101	439	48	344	44	1,200	13	102	91
82	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-BB-DD-EE-EE-HH-II-JJ	17.3	1,699	80	1,058	88	344	44	1,649	84	82	92
97	A-B'-HH'-J'-J-U-Y-Z-CC-FF-GG-HH-II-JJ	17.3	1,699	98	402	41	344	44	1,302	21	97	93
110	A-D-E-I-P-O-R-P'-BB-DD-GG-HH-II-JJ	16.8	975	76	760	94	531	110	1,503	46	110	94
2	A-B-C-D-E-F-L-Q-AA-EE-EE-HH-II-JJ	16.2	1,717	99	1,455	109	63	1	551	1	2	95
79	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.2	1,073	86	653	85	375	90	1,710	101	79	96
1	A-B-C-D-E-F-L-Q-AA-EE-EE-MM-KK-II-JJ	16.0	1,733	100	1,432	107	94	2	572	2	1	97
100	A-B'-HH'-J'-J-U-Y-Z-CC-BB-DD-EE-EE-MM-KK-II-JJ	17.4	1,767	104	455	53	375	90	1,258	18	100	98
12	A-B-C-D-E-I-P-O-R-P'-BB-DD-GG-HH-II-JJ	16.5	1,663	92	791	95	281	5	1,147	12	12	99
80	A-B'-HH'-J'-J-U-T-S-V-X-Y-Z-CC-BB-AA-EE-EE-HH-II-JJ	17.3	1,058	80	819	97	344	44	1,689	96	80	100
101	A-B'-HH'-J'-J-U-Y-Z-CC-BB-DD-EE-EE-HH-II-JJ	17.5	1,752	101	621	83	344	44	1,283	20	101	101

TABLE 3-3
SUPPLEMENTAL AND UPDATED ROUTE ALTERNATIVES SCORING RESULTS

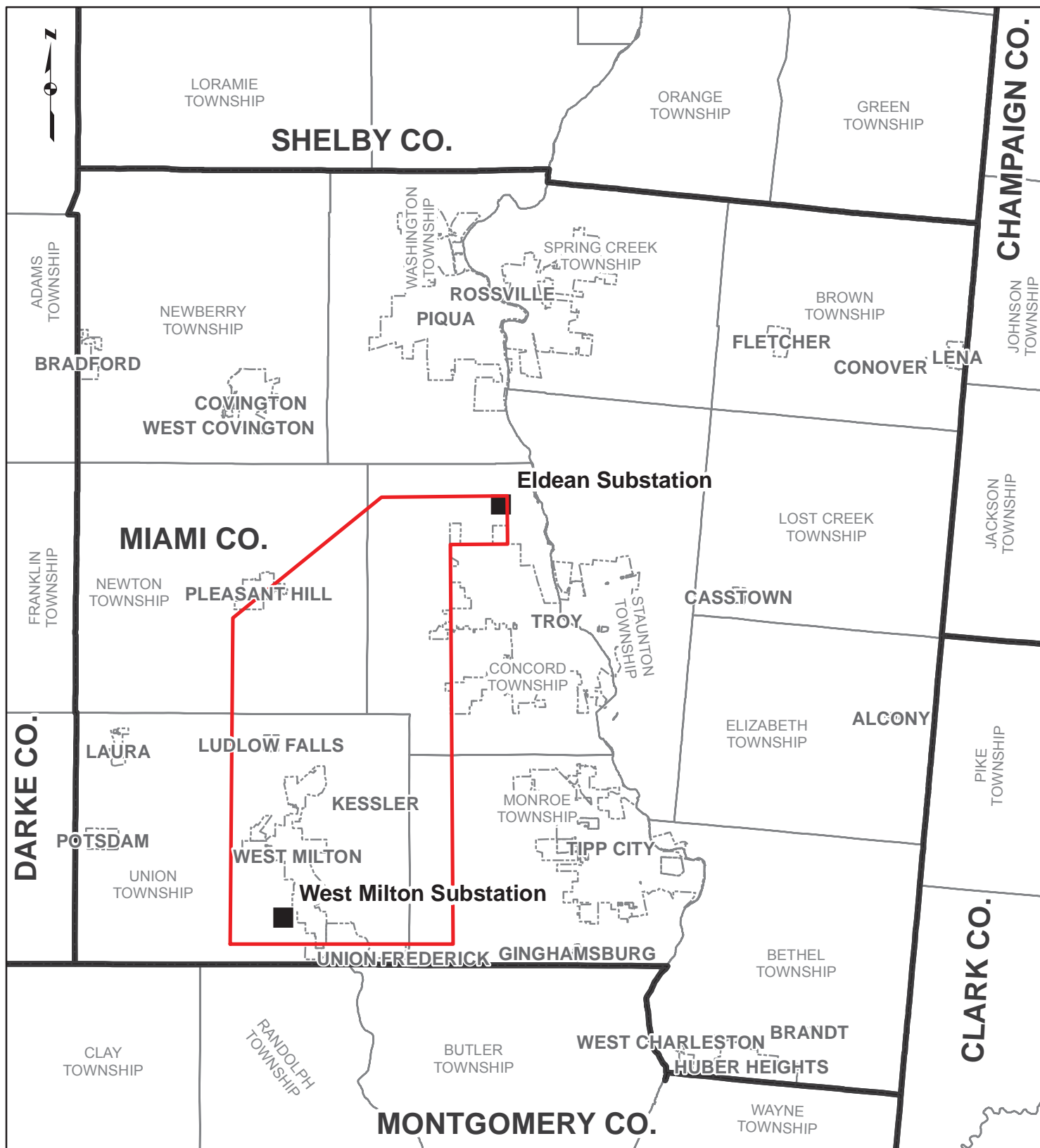
Route ID	Route Segment Description	Route Length	ECOLOGICAL		LAND USE		CULTURAL RESOURCES		ENGINEERING		Total Route Score	Route ID	Overall Rank
			Normalized Ecological Score (30% weighting)	Ecological Rank	Normalized Land Use Score (30% weighting)	Land Use Rank	Normalized Cultural Resource Score (10% weighting)	Cultural Resource Rank	Normalized Engineering Score (30% weighting)	Engineering Rank			
10	A-B-C-D-E-I-P-O-R-P-BB-DD-EE-EE-MM-KK-II-JJ	16.5	1,679	95	806	96	313	17	1,204	14	4,002	10	102
9	A-B-C-D-E-I-P-O-R-P-BB-AA-EE-HH-II-JJ	15.9	1,663	92	1,058	104	281	5	1,011	8	4,014	9	103
8	A-B-C-D-E-I-P-O-R-P-BB-AA-EE-EE-MM-KK-II-JJ	15.7	1,679	95	1,005	102	313	17	1,032	10	4,029	8	104
98	A-B'-HH'-JJ'-UU'-YY'-ZZ'-CC-BB-AA-EE-EE-MM-KK-II-JJ	17.4	1,767	104	586	80	375	90	1,343	24	4,072	98	105
11	A-B-C-D-E-I-P-O-R-P-BB-DD-EE-HH-II-JJ	16.6	1,663	92	973	100	281	5	1,229	16	4,146	11	106
99	A-B'-HH'-JJ'-UU'-YY'-ZZ'-CC-BB-AA-EE-HH-II-JJ	17.5	1,752	101	752	92	344	44	1,322	23	4,170	99	107
6	A-B-C-D-E-I-P-Q-AA-EE-EE-MM-KK-II-JJ	15.5	2,044	110	1,455	108	313	17	677	6	4,489	6	108
5	A-B-C-D-E-I-K-I-Q-AA-EE-EE-MM-KK-II-JJ	15.5	1,794	106	1,429	106	375	90	892	7	4,490	5	109
7	A-B-C-D-E-I-P-Q-AA-EE-HH-II-JJ	15.6	2,029	109	1,621	110	281	5	656	5	4,587	7	110

Preferred Route (March 2015)

Alternate Route

Optimized Preferred Route (October 2015)

FIGURES



PROJECT LOCATION



MIAMI COUNTY, OHIO

LEGEND

- STUDY AREA
- EXISTING SUBSTATION
- CITY LIMIT BOUNDARY
- TOWNSHIP BOUNDARY
- COUNTY BOUNDARY

0 1.5 3 6 Miles

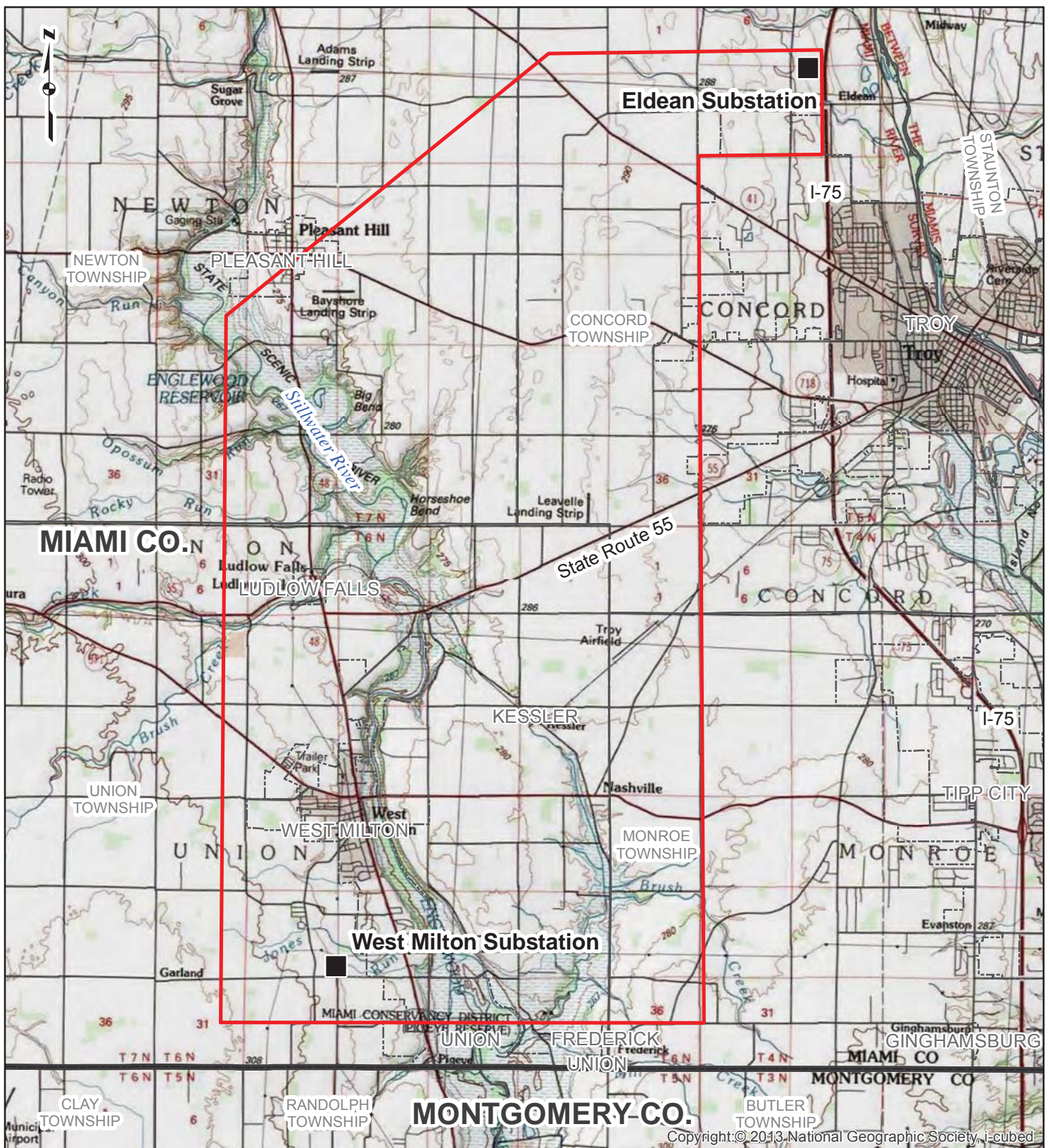
FIGURE 3.1 PROJECT LOCATION MAP

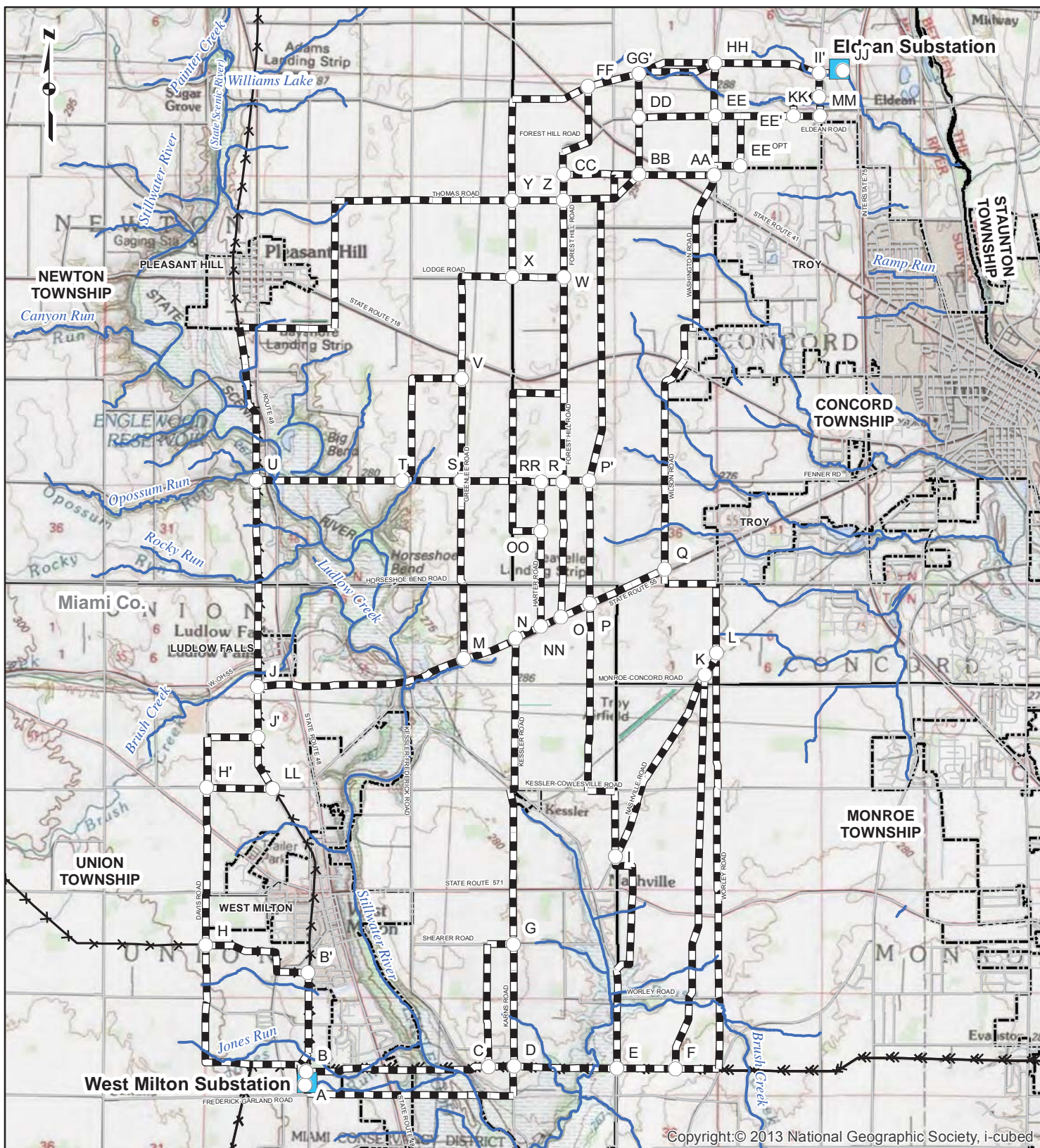
WEST MILTON TO ELDEAN 138kV
 DAYTON POWER & LIGHT

DRAWN BY: TDB
CHECKED: DRB

DATE: 2/5/2015
APPROVED: MAF

REFERENCE: MIAMI CO. GIS, 2013; ODNR, 2014; GAI, 2015.





PROJECT LOCATION



MIAMI COUNTY, OHIO

- Node
- Substation
- NHD Waterway
- Proposed Route Alternative
- Existing Transmission Line- Approximate
- Road Centerline
- Waterbody
- Airport
- City Limit
- Township Boundary
- County Boundary

0 3,500 7,000 14,000 Feet

FIGURE 3.3 ROUTE ALTERNATIVES

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



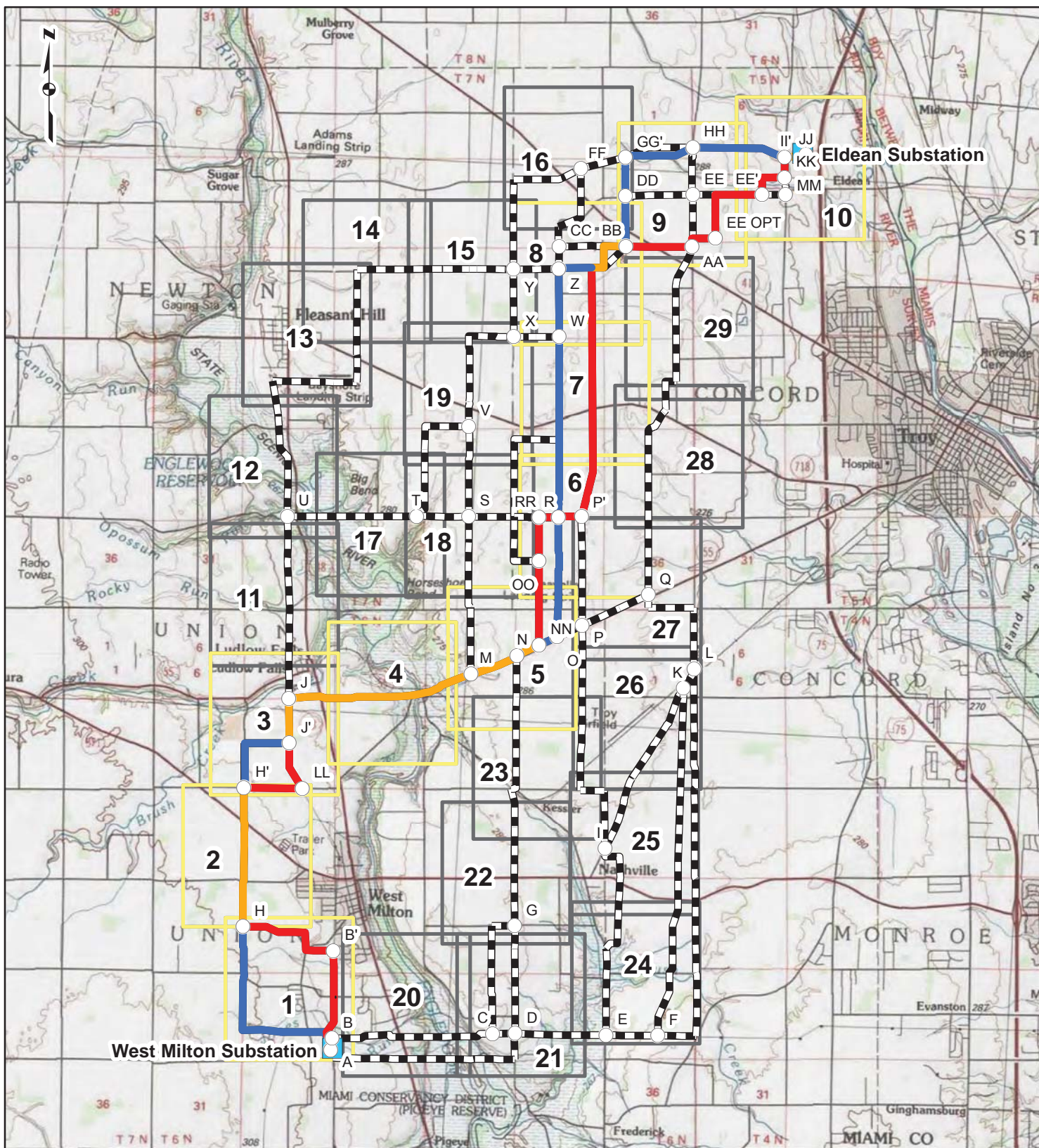
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DATE: 1/21/2015

CHECKED: MAF

APPROVED: MAF

REFERENCE: USGS 30' x 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986,) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 01/2015.



PROJECT LOCATION




MIAMI COUNTY, OHIO

- Node
- Existing Substation
- Preferred Route
- Common Route
- Alternate Route
- Proposed Route Alternative
- Sheet Boundary-Preferred and Alternate Route
- Sheet Boundary

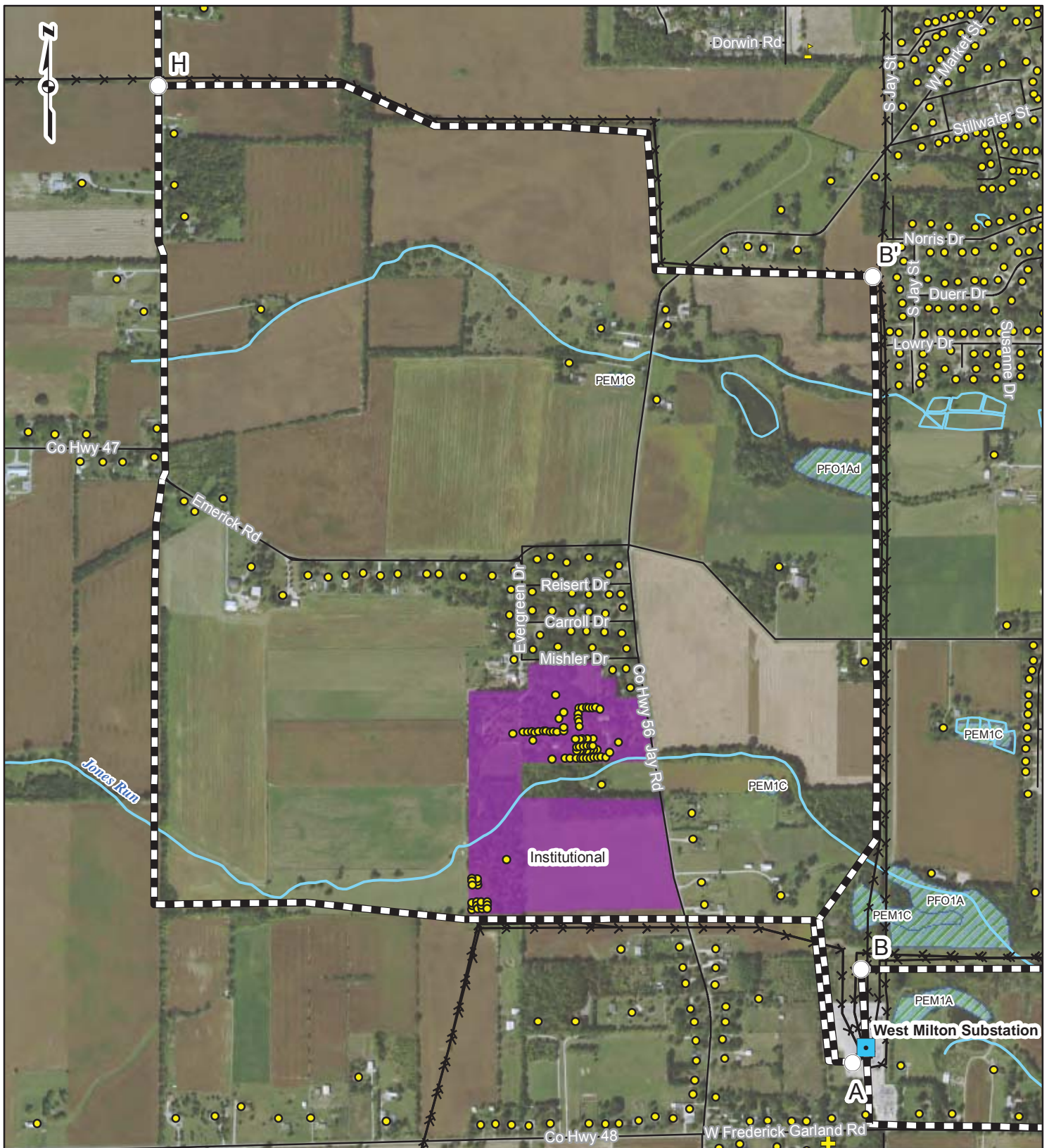
0 0.75 1.5 3 Miles

FIGURE 3.5 ROUTE ALTERNATIVES INDEX

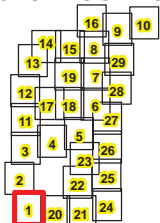
WEST MILTON TO ELDEAN 138kV
DAYTON POWER & LIGHT 

DRAWN BY: TDB DATE: 11/16/2015
CHECKED: MAF APPROVED: MAF

REFERENCE: USGS 30' x 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986,) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 11/2015.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✚ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▢ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 1 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

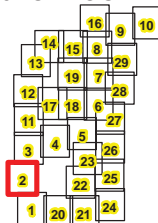
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 2 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



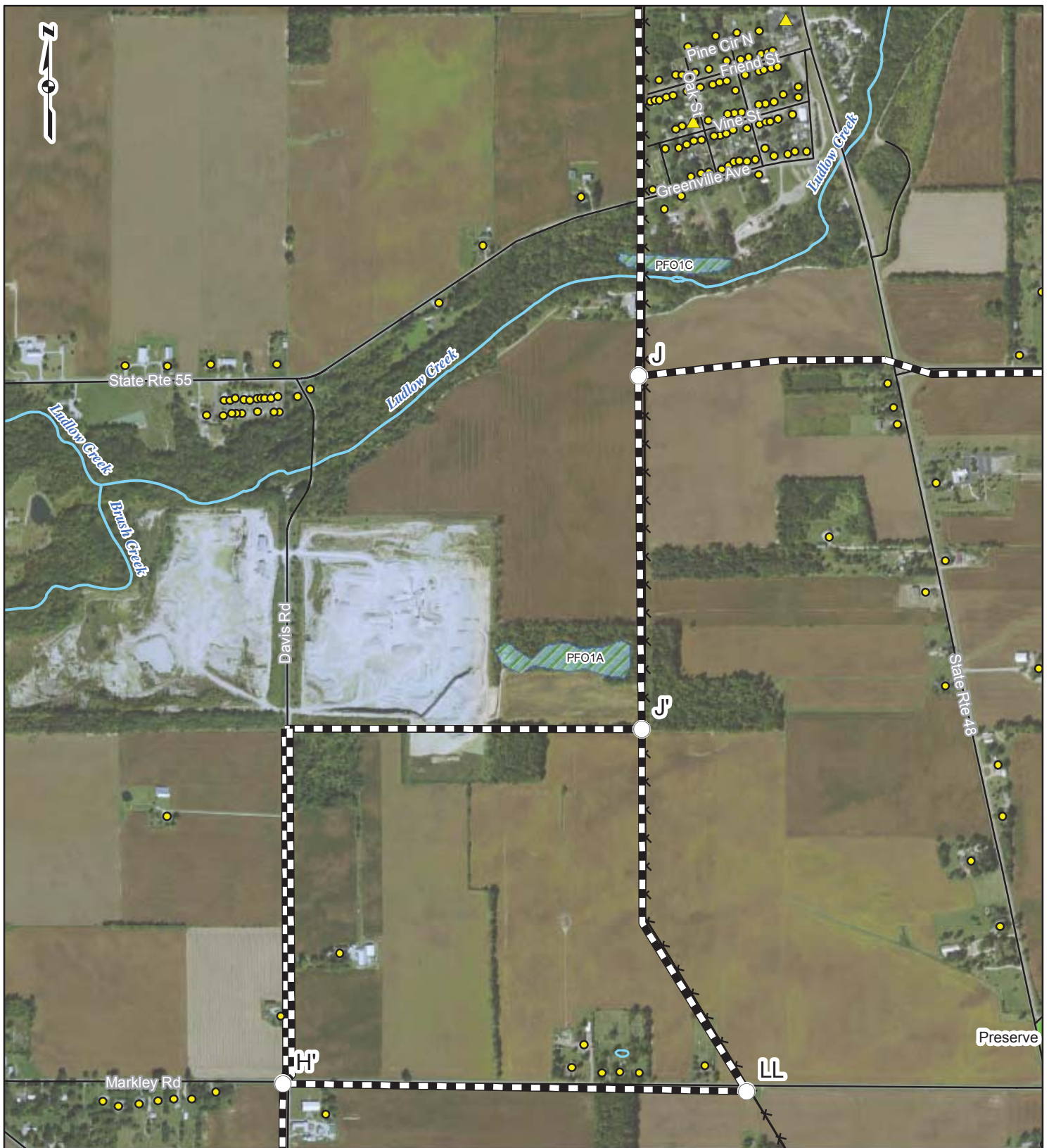
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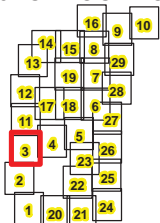
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ✚ School | ●●● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 3 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



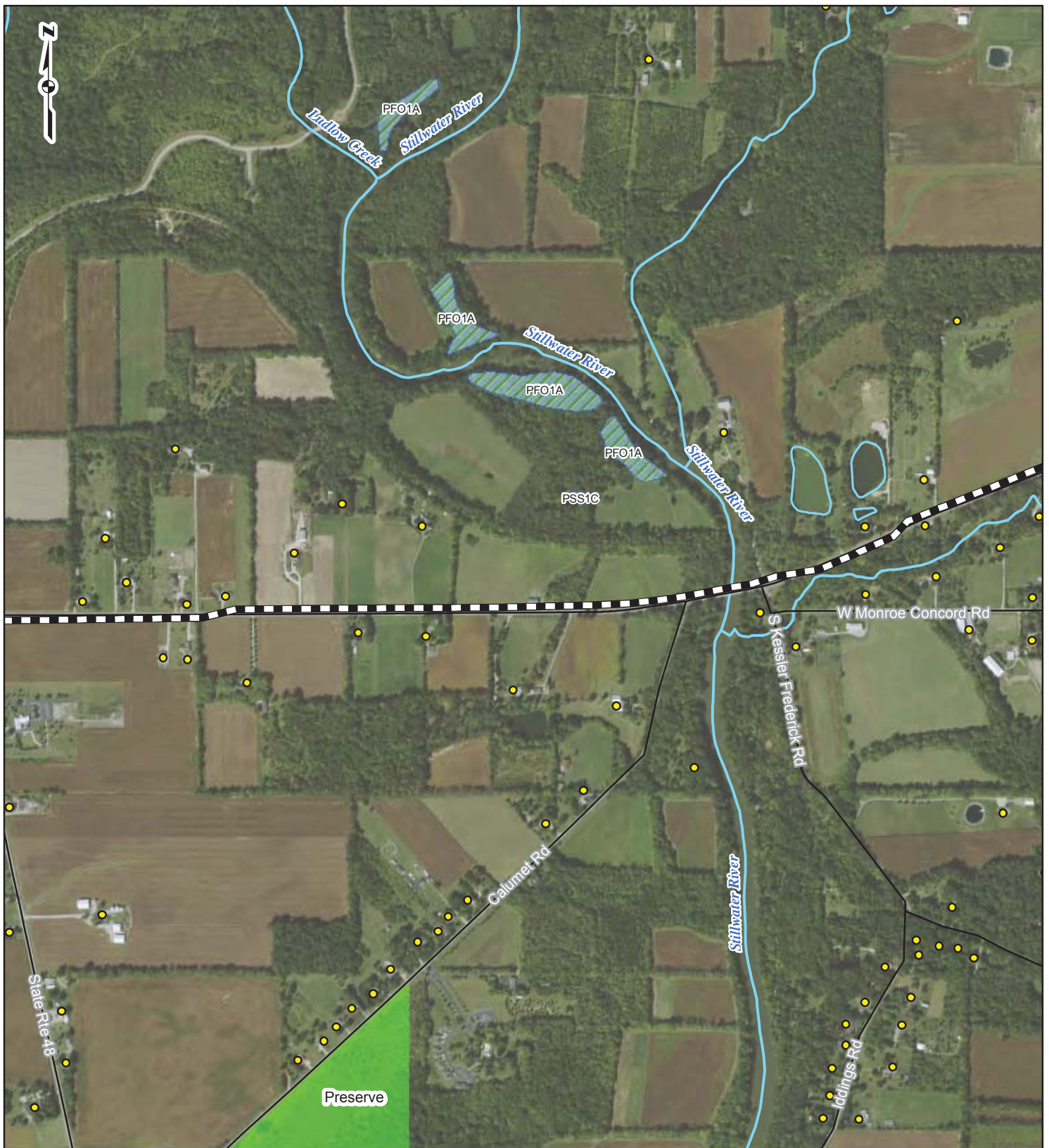
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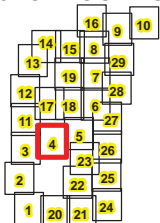
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| 🏫 School | ●●● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 4 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



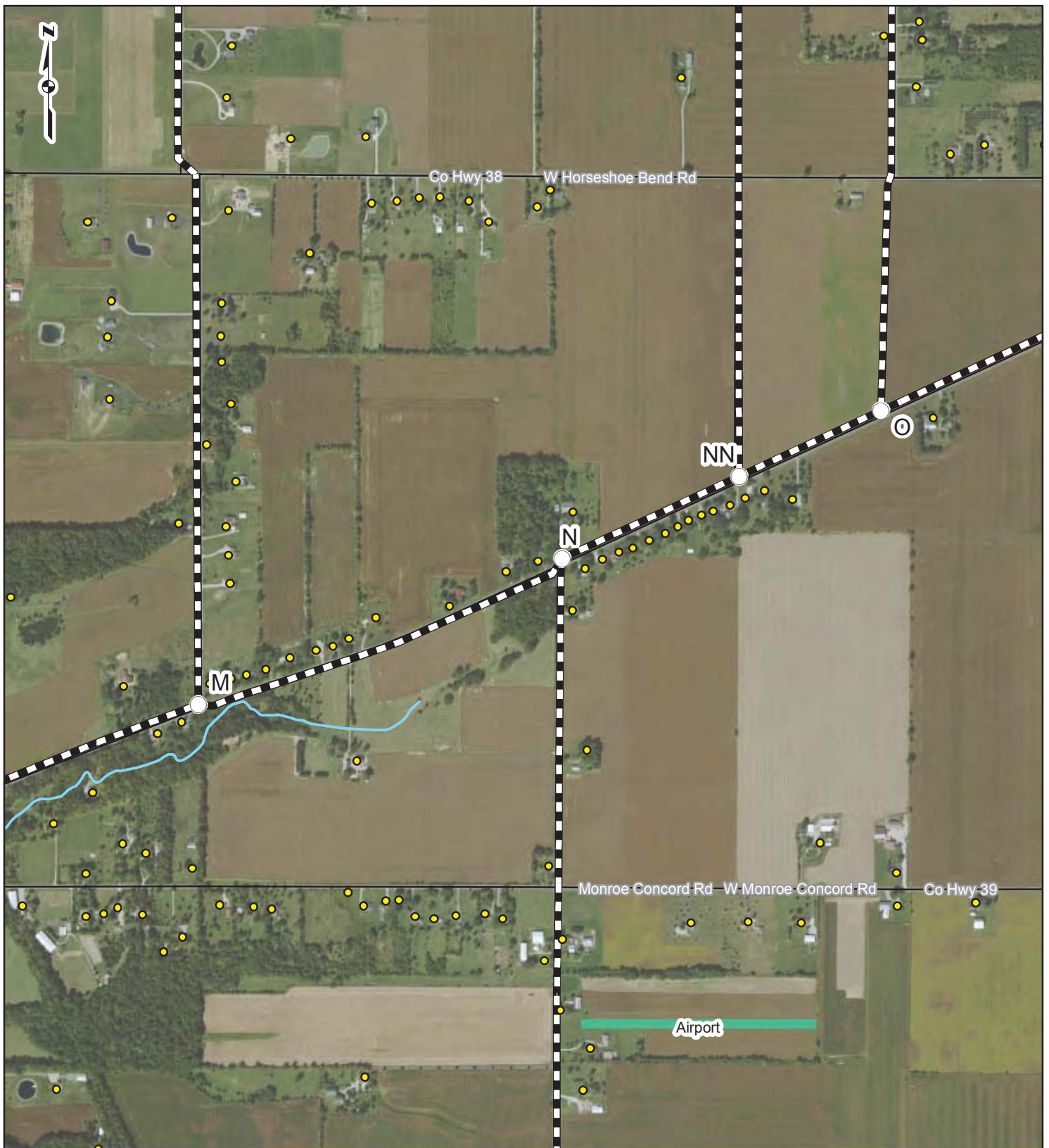
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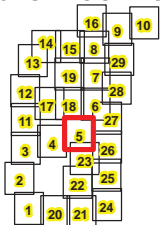
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 5 OF 29

WEST MILTON TO ELDEAN 138KV



DAYTON POWER & LIGHT



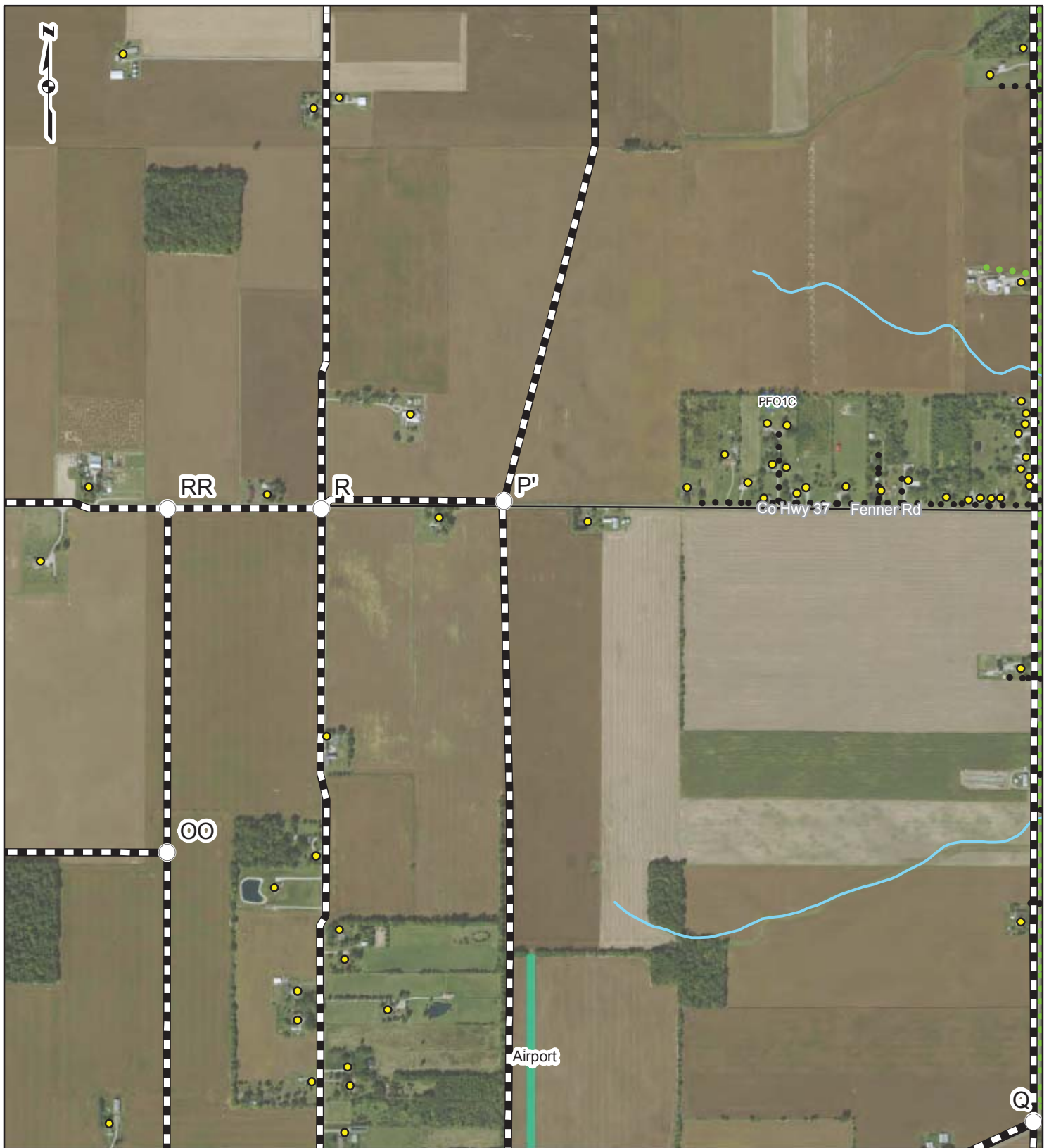
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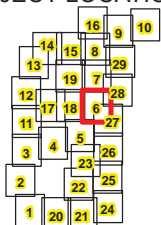
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | ▬ Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | ▬ NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 6 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

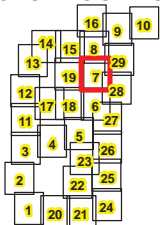
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | ▬ Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | ▬ NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▢ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 7 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



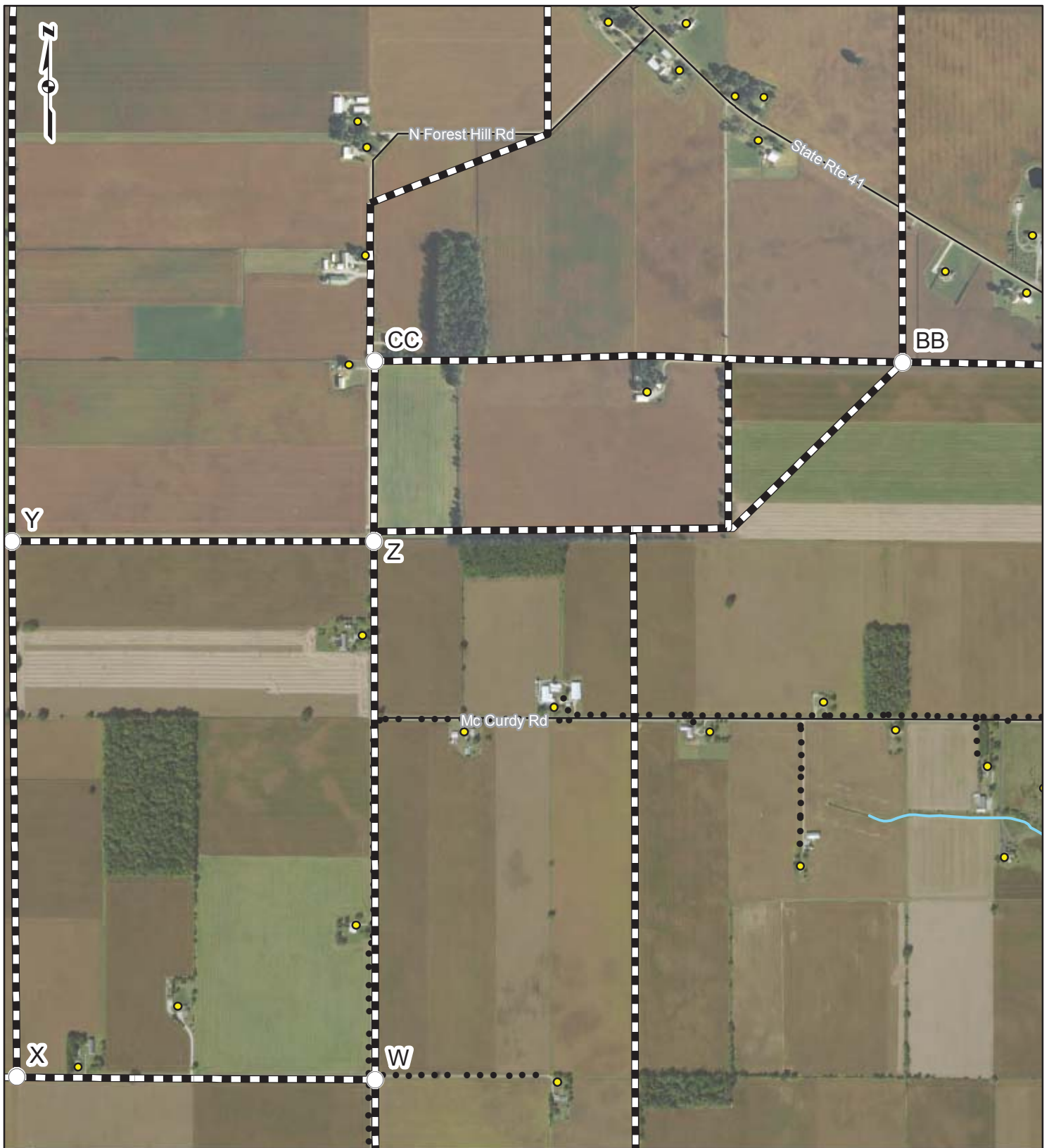
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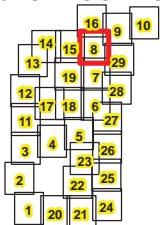
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 8 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



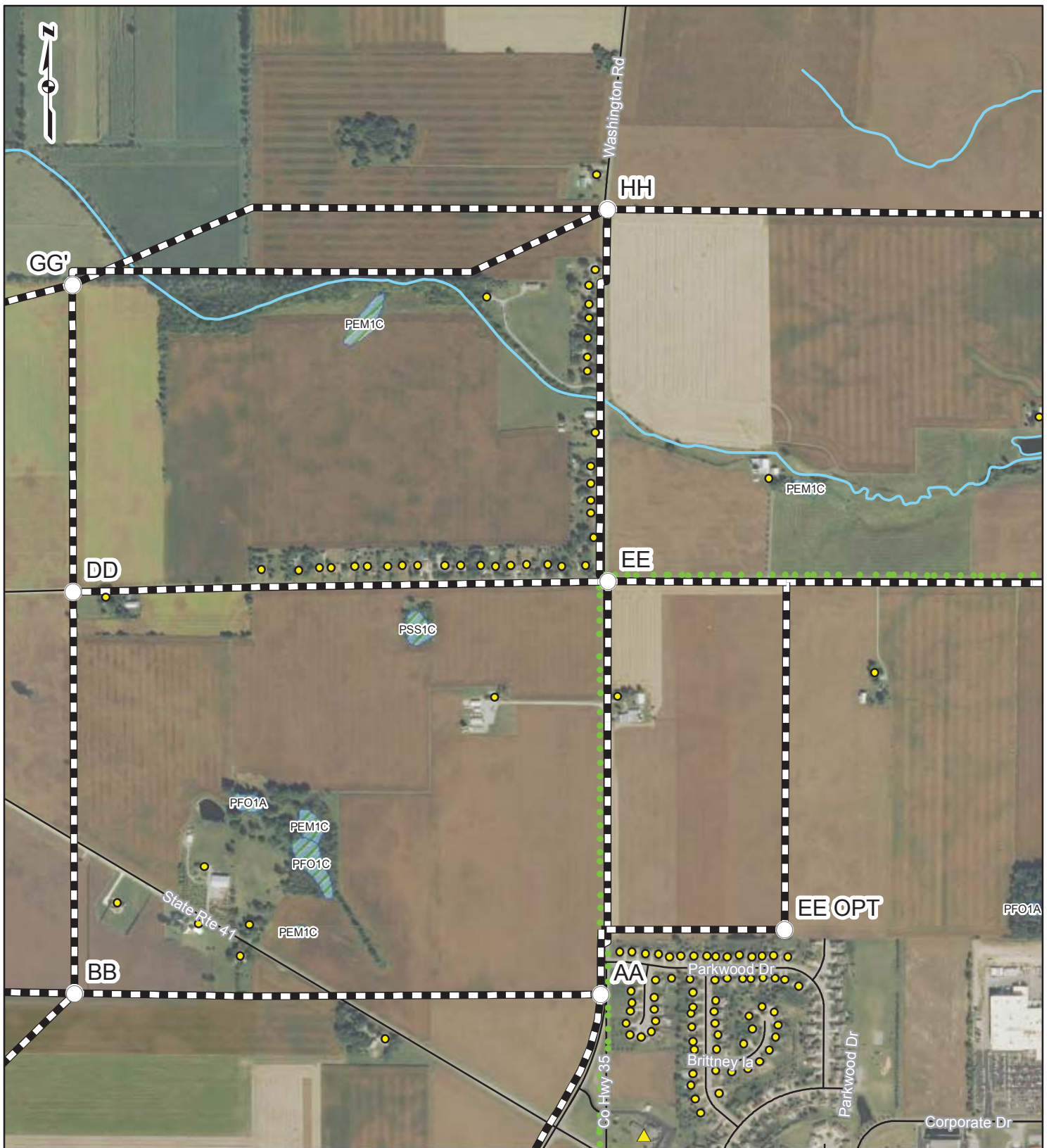
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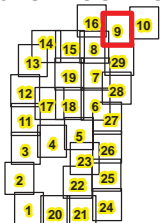
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✚ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 9 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

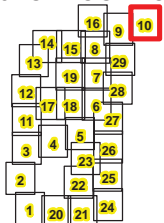
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 10 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



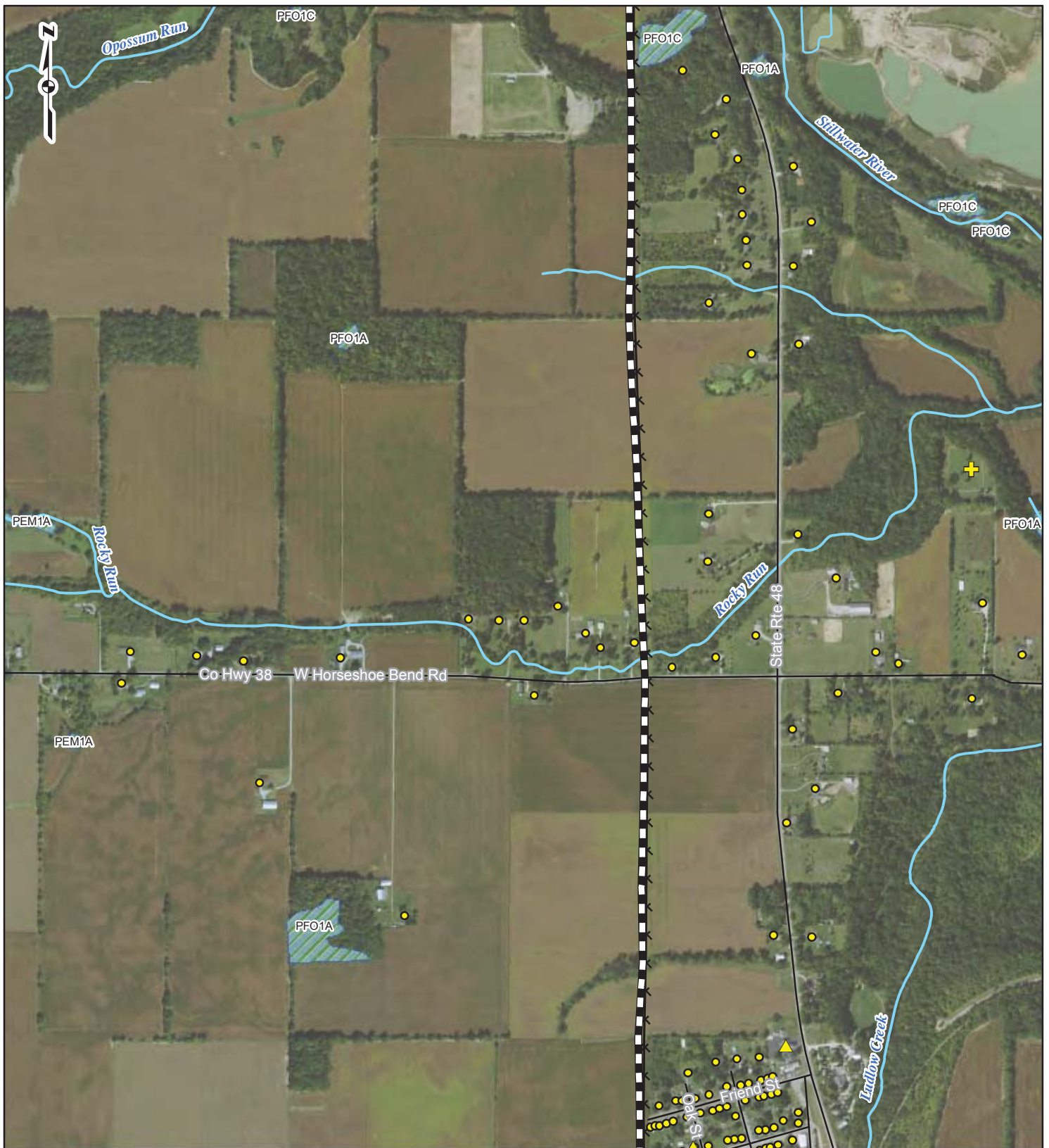
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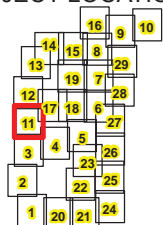
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PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✚ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ● Existing 3-Phase (Pioneer Only) | ▨ Airport (Private) |
| | | ▨ Institutional |
| | | ▨ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 11 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



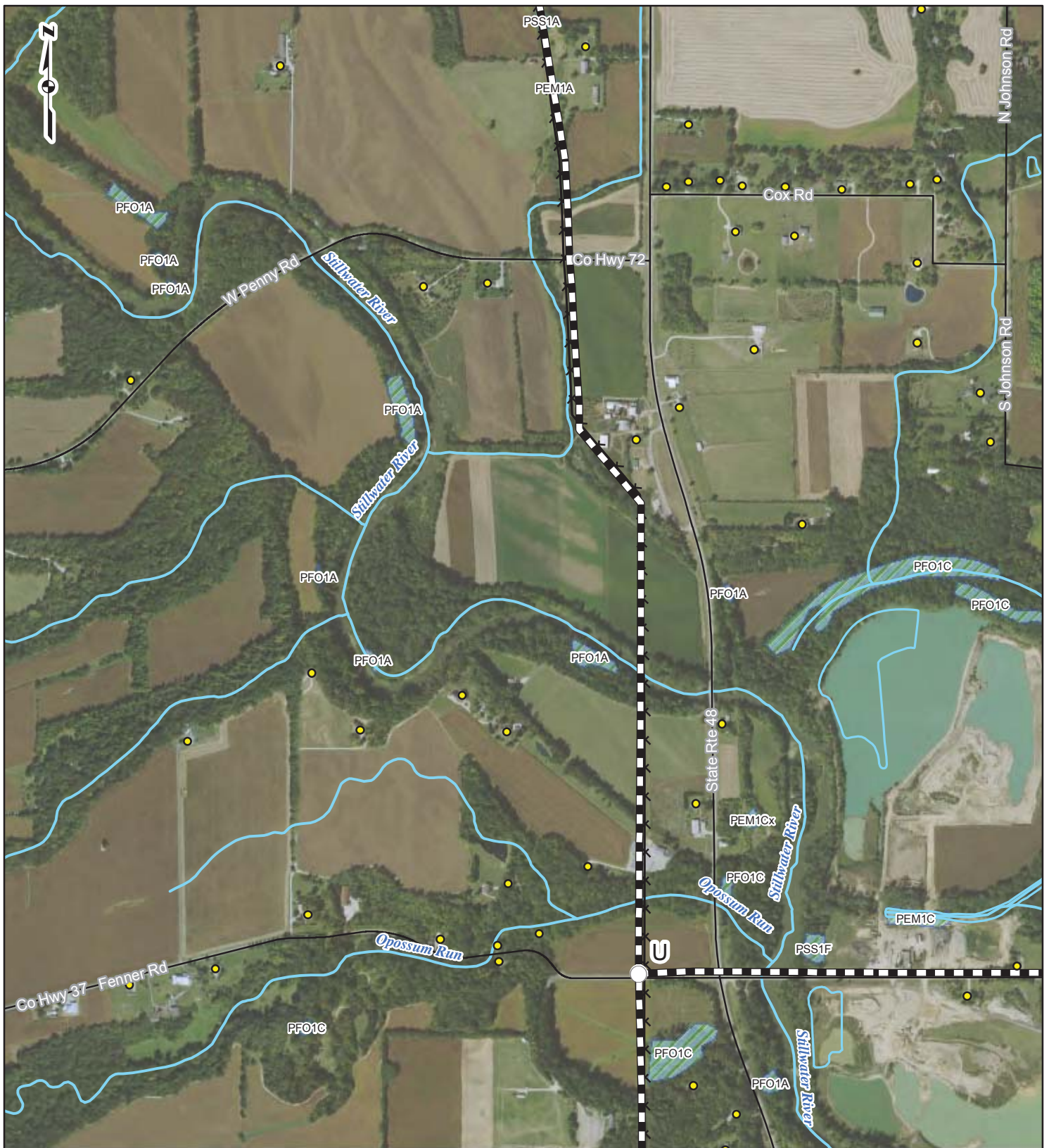
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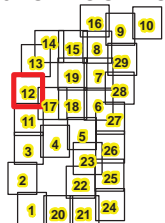
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 12 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



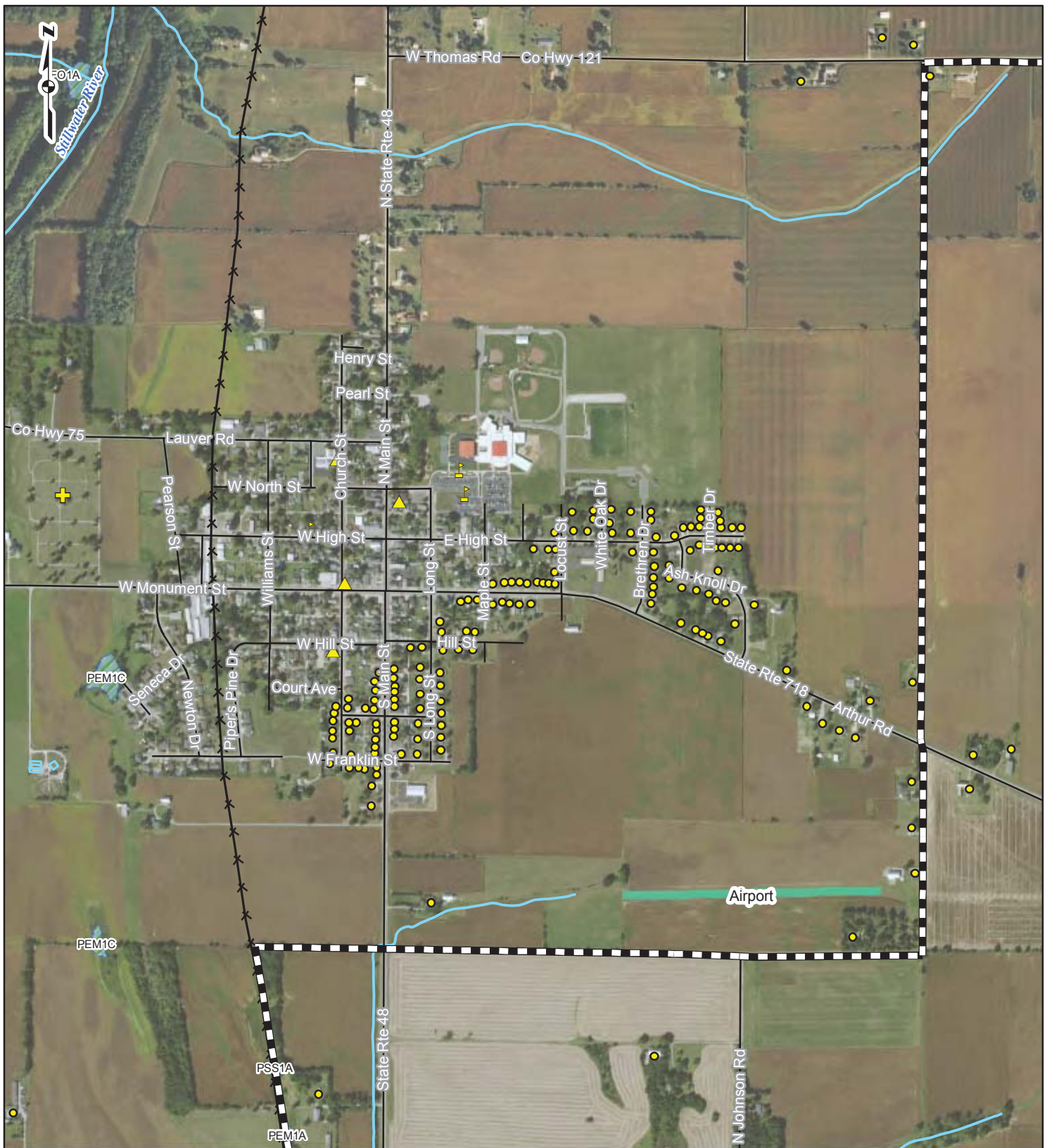
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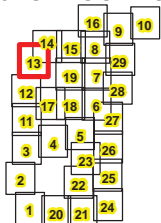
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|--|-------------------------------------|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Existing Transmission Line-Approximate | ● Existing 1-2 Phase (Pioneer Only) | — NHD Waterbody |
| ✕ Existing 3-Phase (Pioneer Only) | ● Existing 3-Phase (Pioneer Only) | — NWI Wetland |
| ✕ Cemetery | ● Church | — Airport (Private) |
| ✕ School | ● Institutional | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 13 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



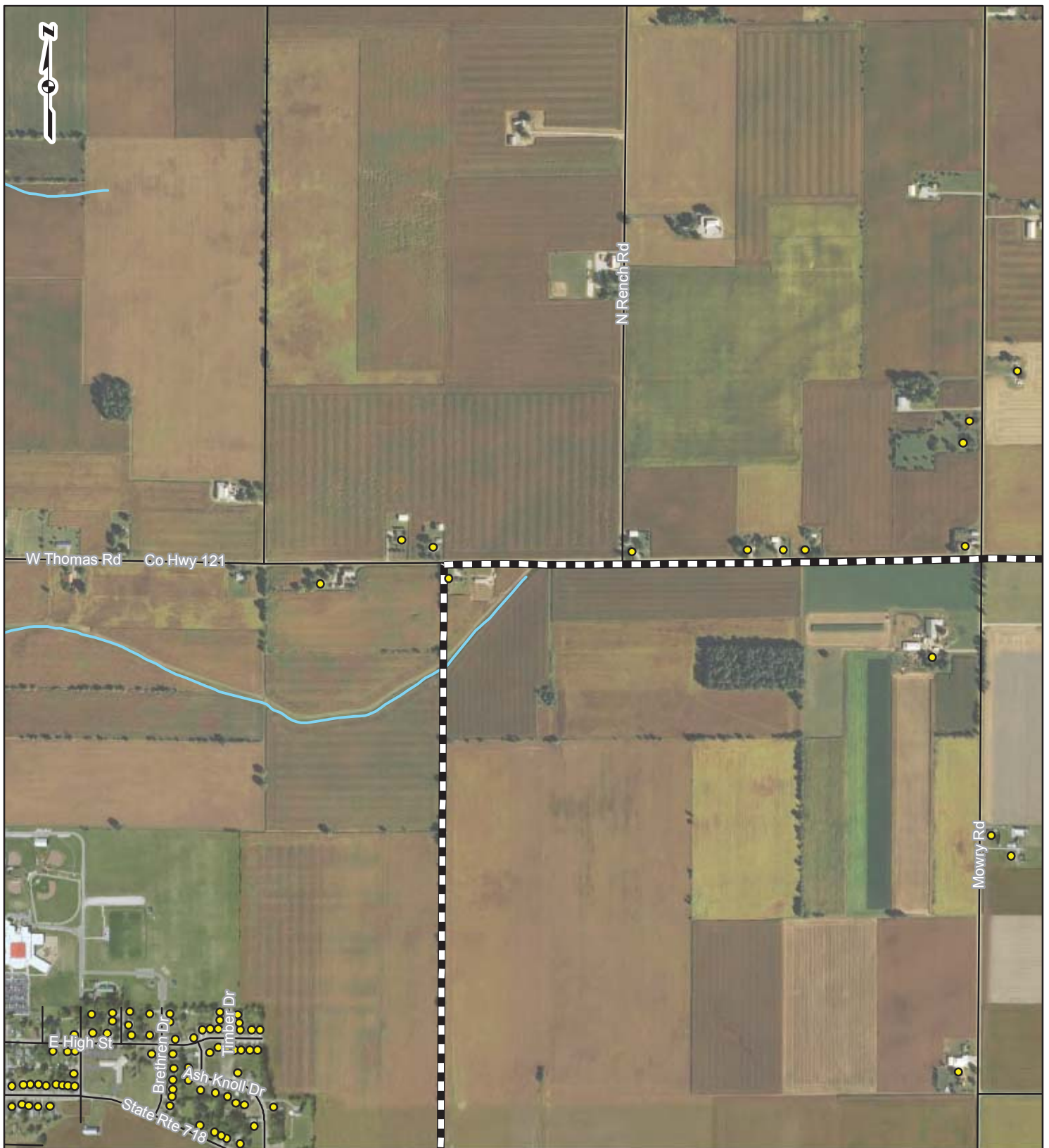
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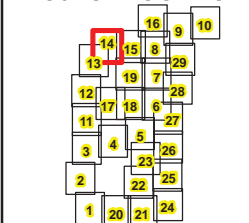
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▢ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 14 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



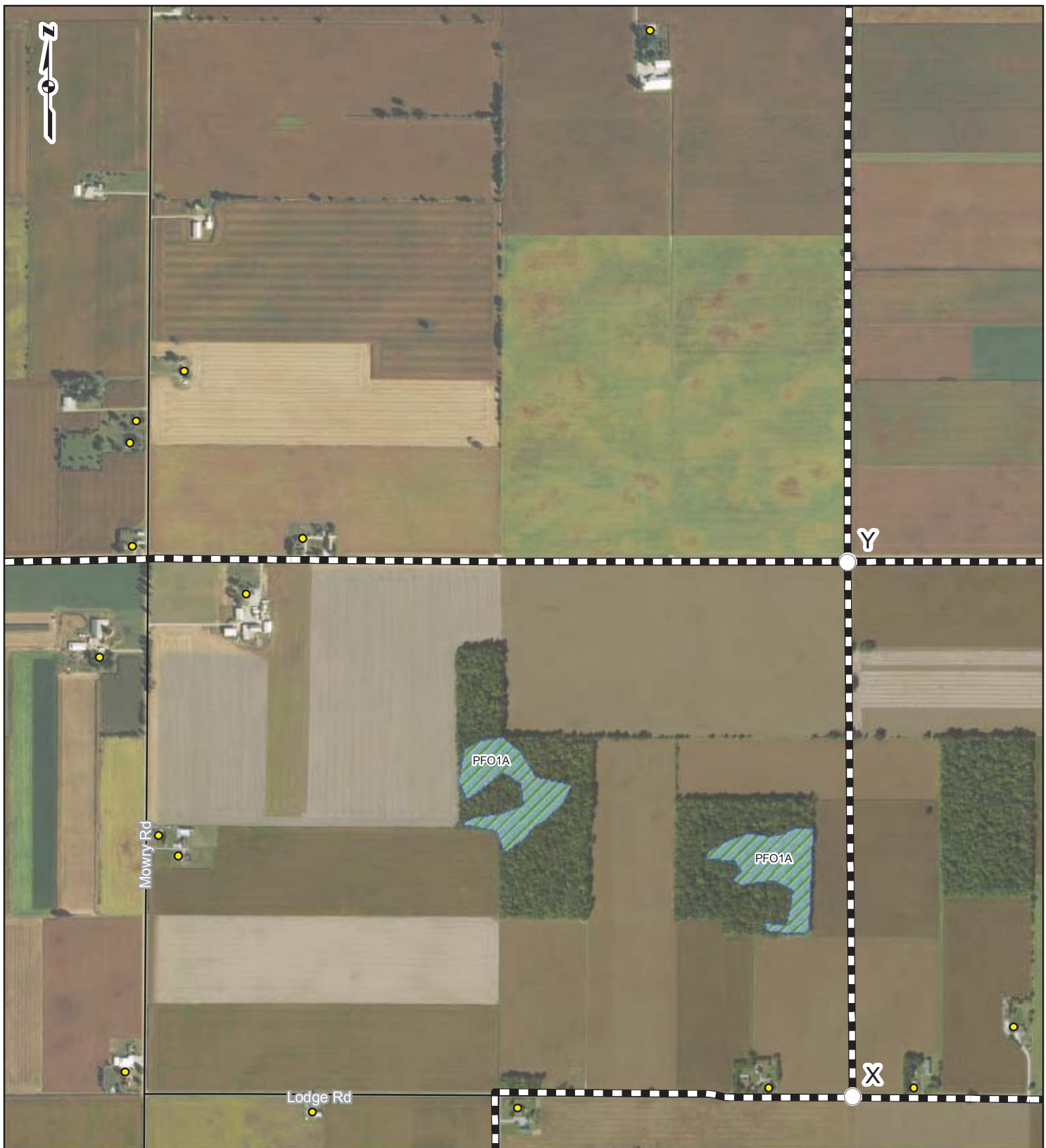
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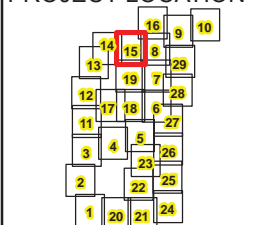
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- | | | |
|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 15 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



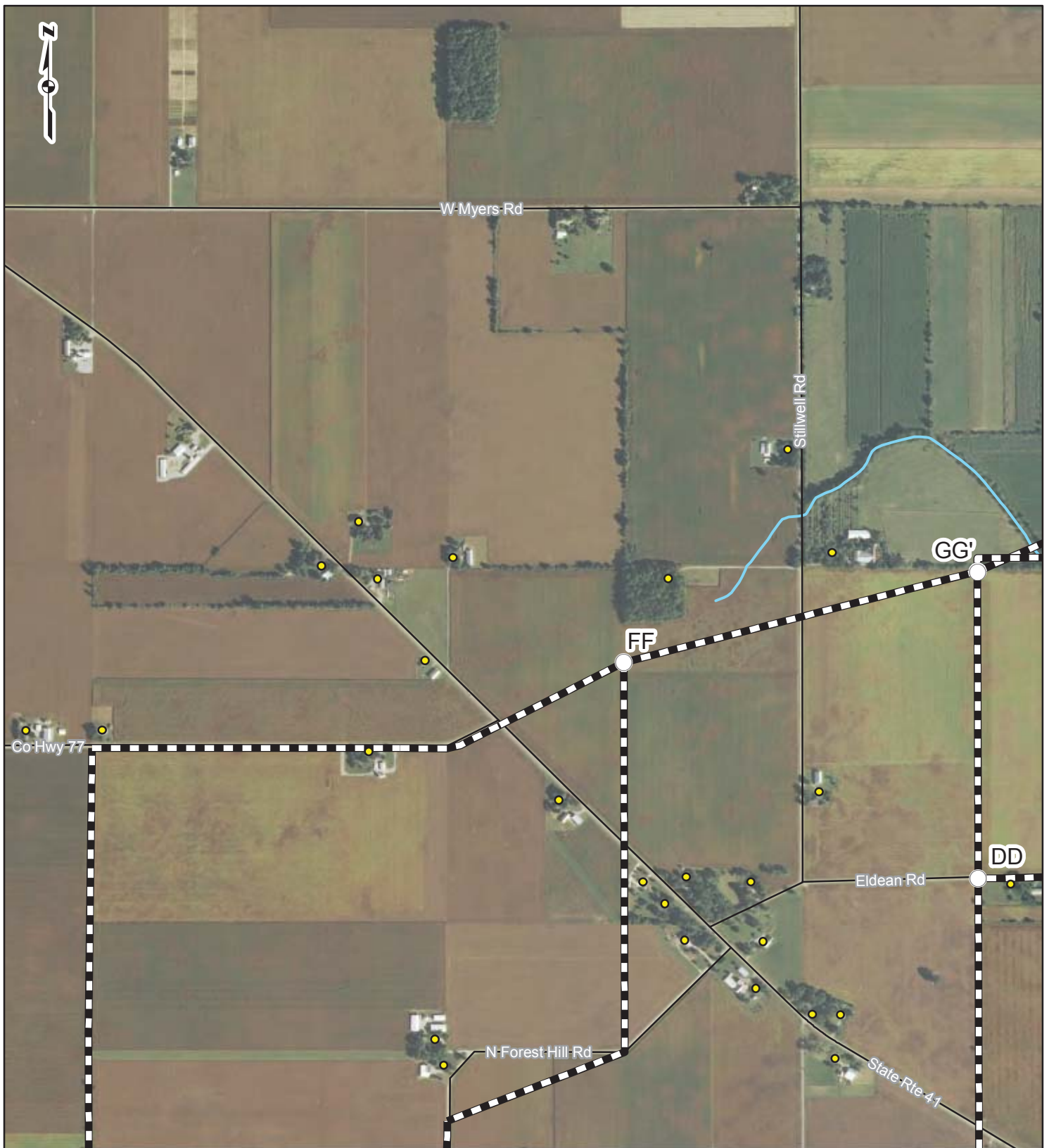
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DATE: 11/16/2015

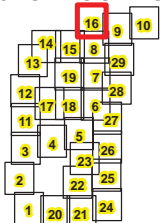
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 16 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



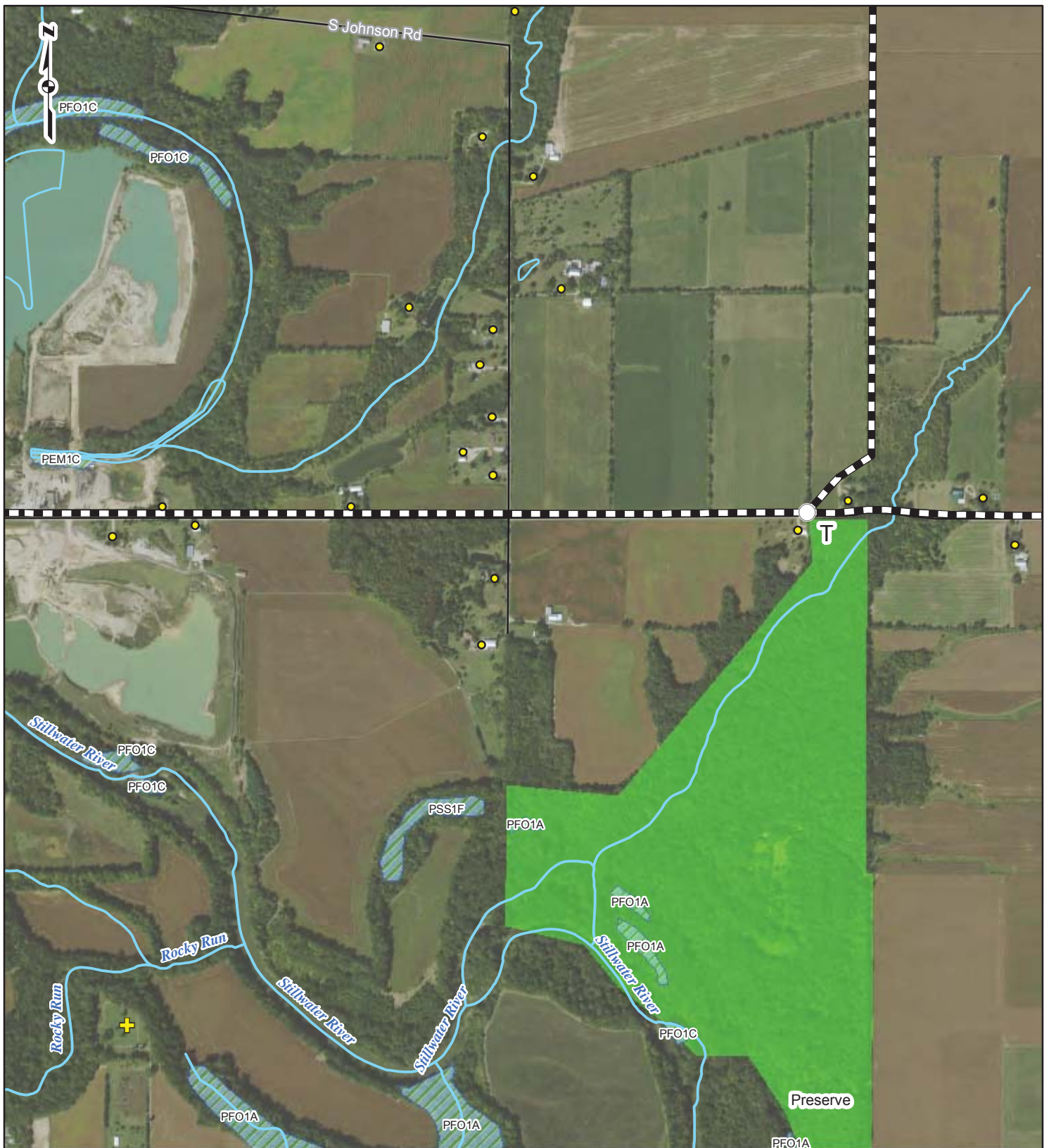
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DATE: 11/16/2015

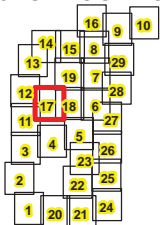
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Existing Transmission Line-Approximate | — Existing 1-2 Phase (Pioneer Only) | — NHD Waterbody |
| ✕ Existing 3-Phase (Pioneer Only) | — Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ✕ Existing 3-Phase (Pioneer Only) | ✕ Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| ✕ Existing 3-Phase (Pioneer Only) | ✕ Existing 3-Phase (Pioneer Only) | — Institutional |
| ✕ Existing 3-Phase (Pioneer Only) | ✕ Existing 3-Phase (Pioneer Only) | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 17 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

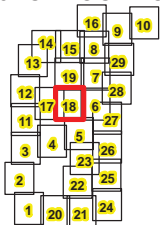
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ✚ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 18 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

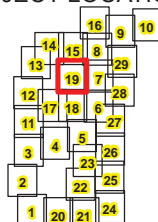
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▢ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 19 OF 29

WEST MILTON TO ELDEAN 138kV
DAYTON POWER & LIGHT

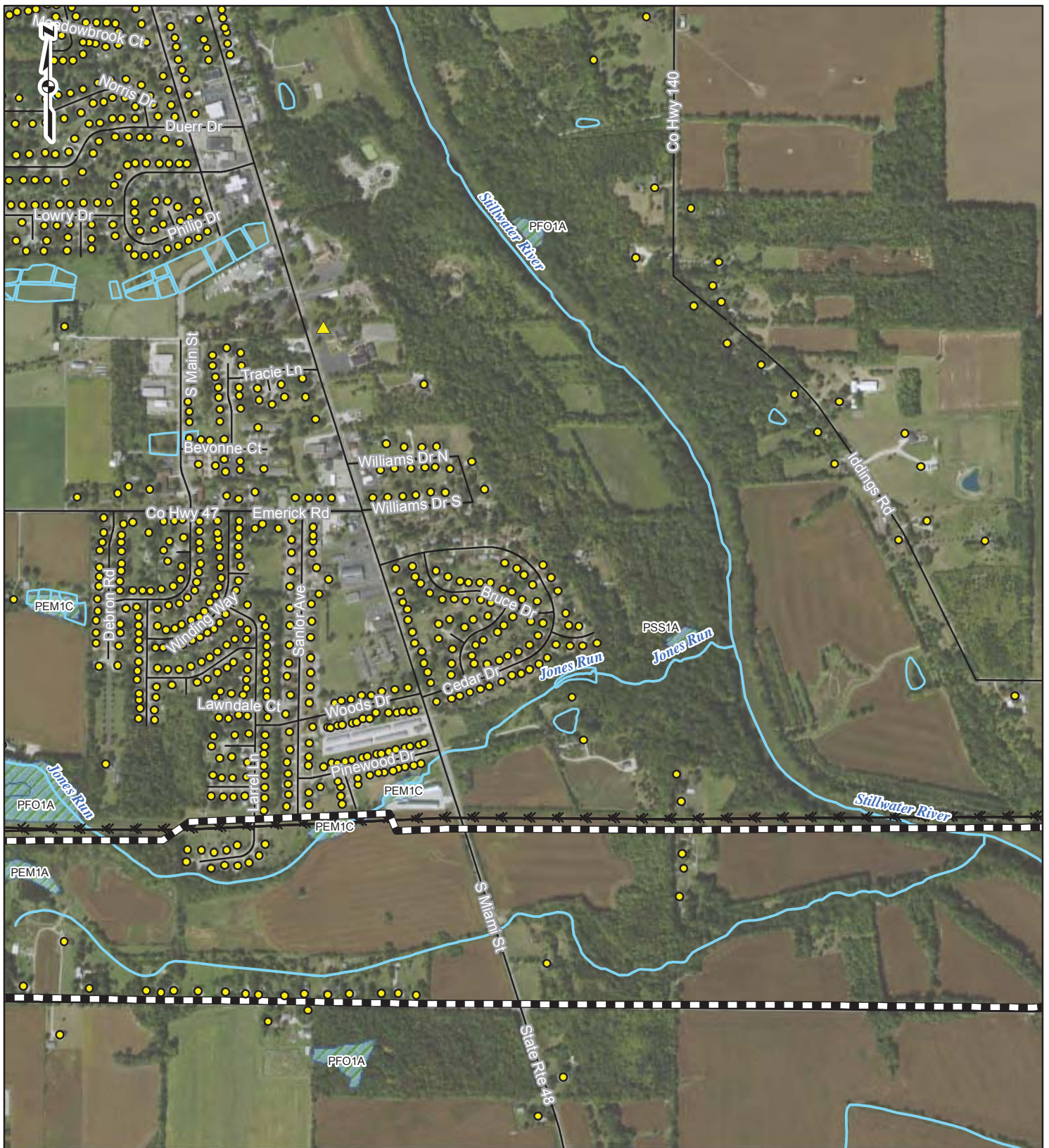
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DATE: 11/16/2015

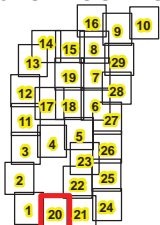
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 20 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

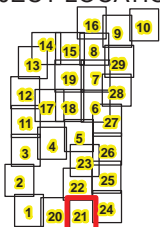
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ● Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✚ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ✚ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 21 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



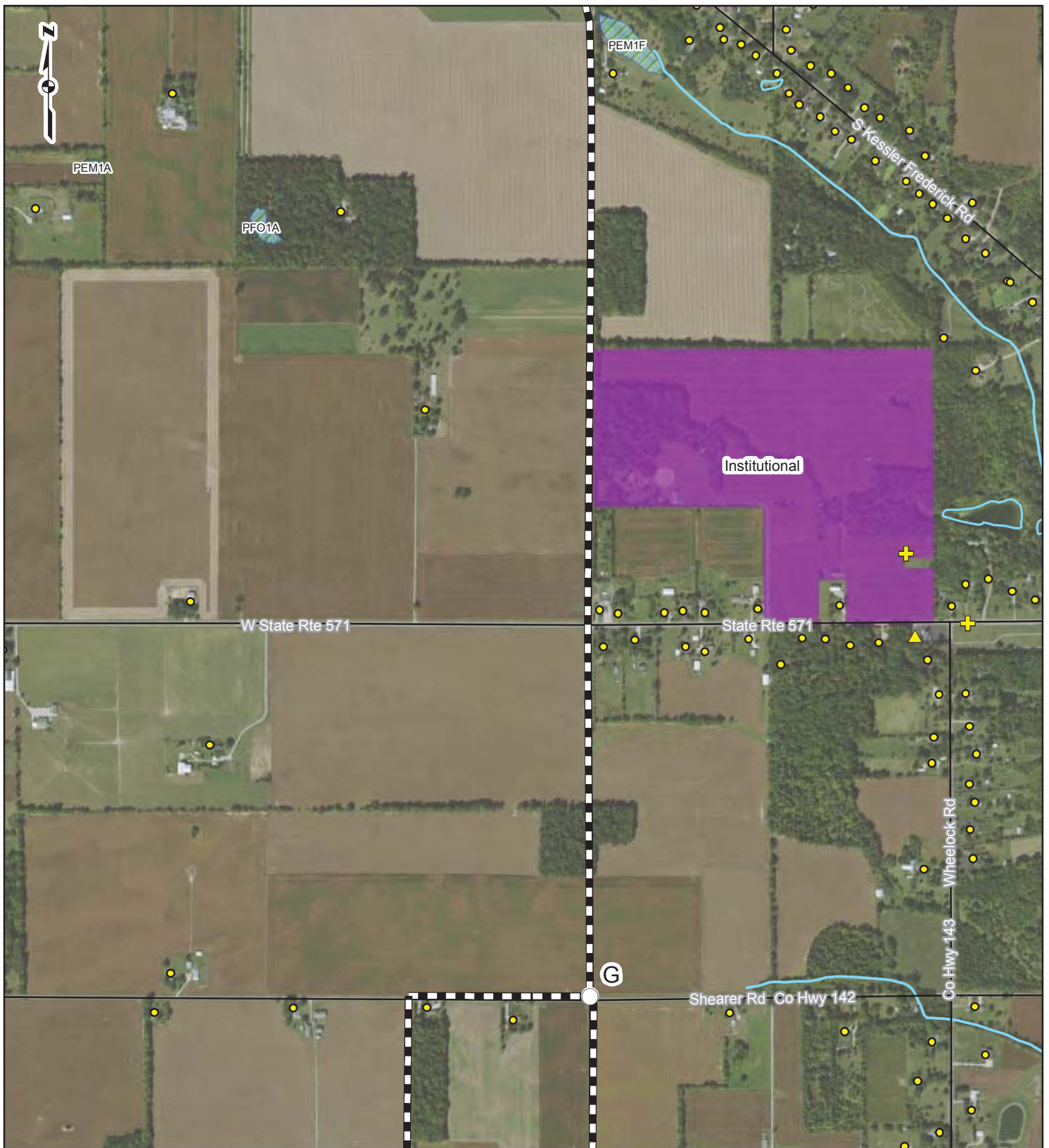
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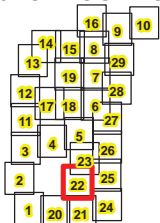
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Existing Transmission Line-Approximate | — Existing 1-2 Phase (Pioneer Only) | — NHD Waterbody |
| ✕ Existing 3-Phase (Pioneer Only) | — Existing 3-Phase (Pioneer Only) | — NWI Wetland |
| ✕ Cemetery | ✕ Church | ✕ Airport (Private) |
| ✕ School | ✕ Institutional | ✕ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 22 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

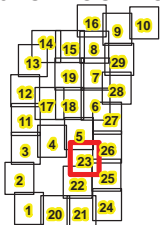
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▢ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 23 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



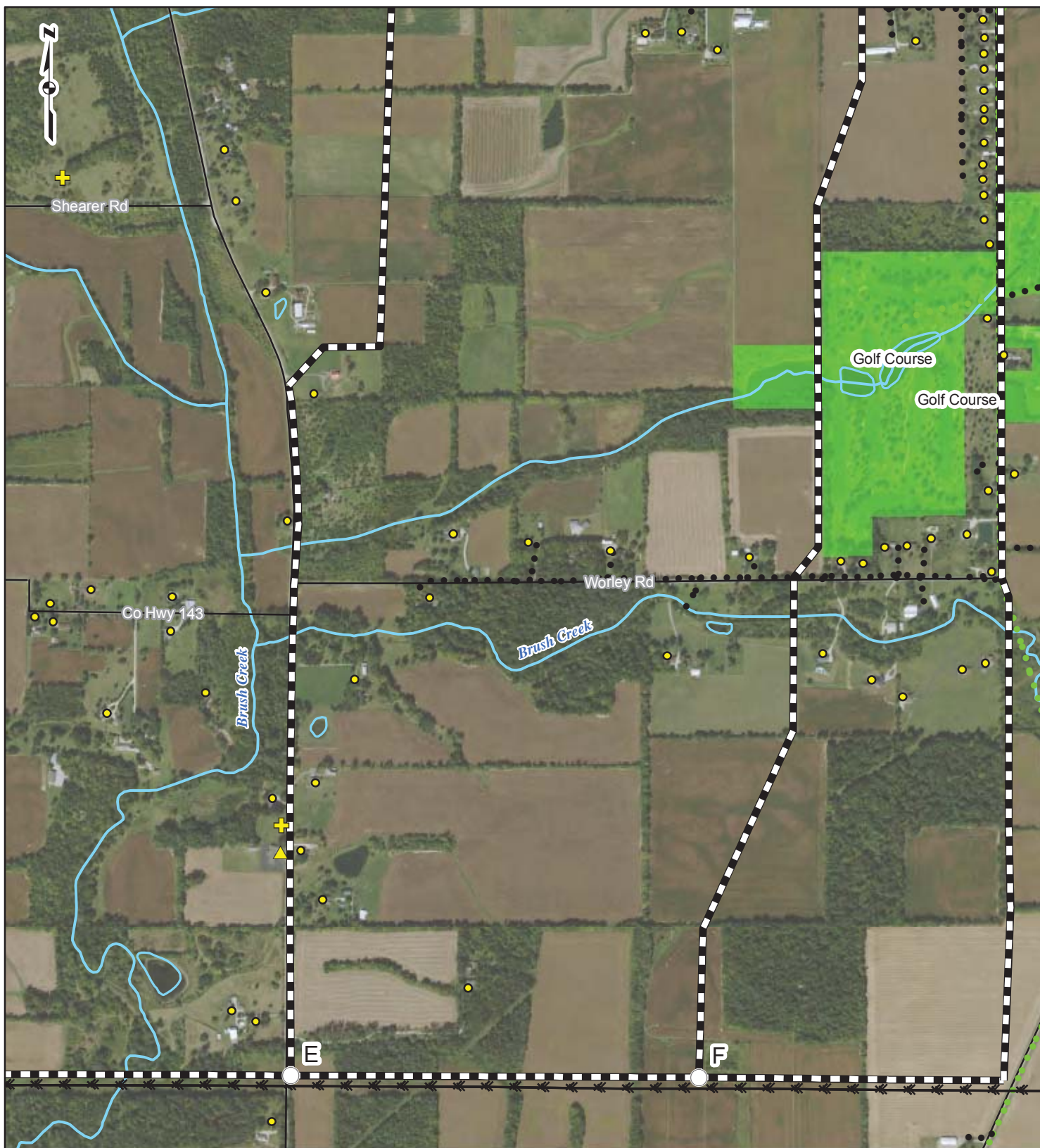
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DATE: 11/16/2015

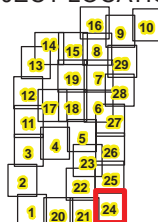
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION




MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▢ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

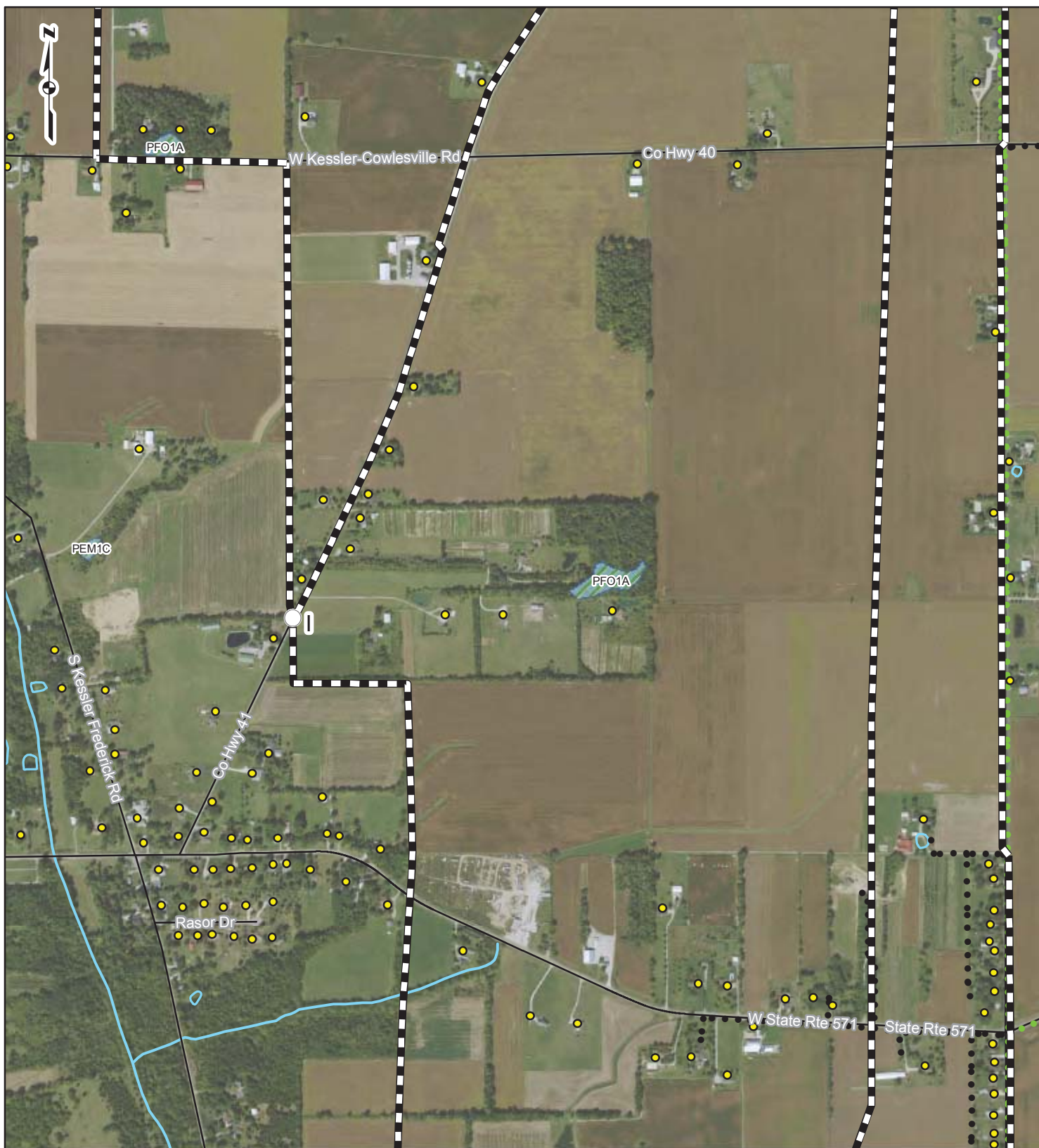
FIGURE 3.5 ROUTE ALTERNATIVES SHEET 24 OF 29

WEST MILTON TO ELDEAN 138kV
DAYTON POWER & LIGHT 

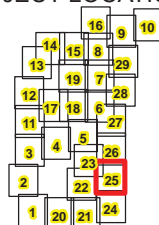
DRAWN BY: TDB
CHECKED: MAF

DATE: 11/16/2015
APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 25 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



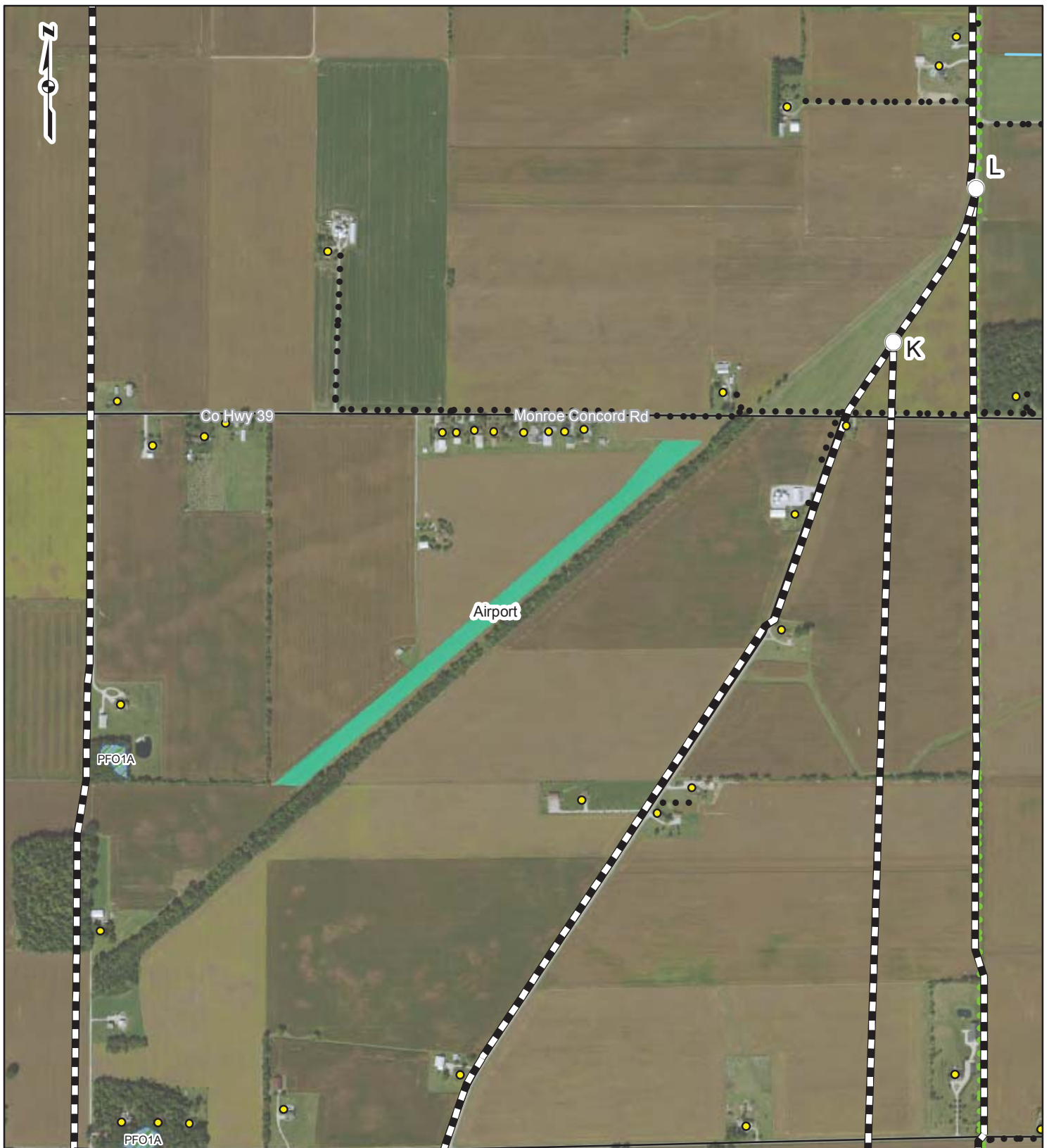
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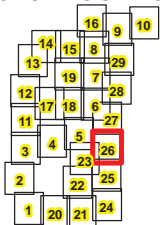
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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|-----------------------|--|---------------------|
| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✚ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ✚ School | ●● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 26 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



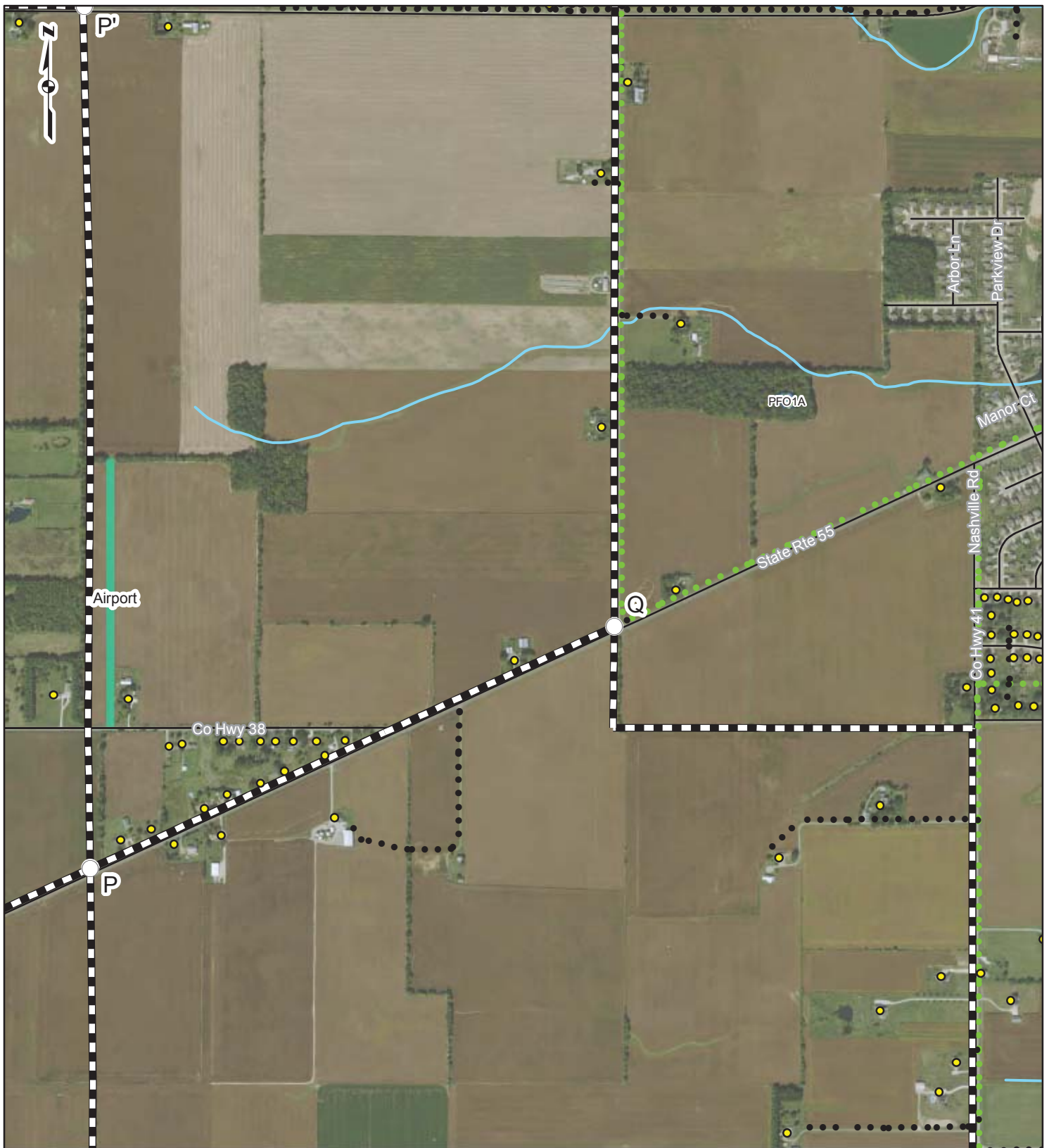
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DATE: 11/16/2015

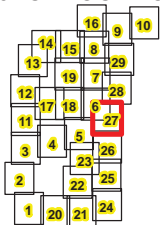
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APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✕ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | — NWI Wetland |
| ▲ School | ●● Existing 3-Phase (Pioneer Only) | — Airport (Private) |
| | | — Institutional |
| | | — Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 27 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

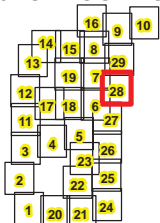
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| ▩ School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 28 OF 29

WEST MILTON TO ELDEAN 138kV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

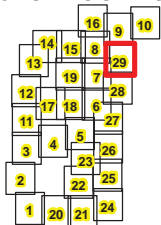
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REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.



PROJECT LOCATION



MIAMI COUNTY, OHIO

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| ○ Node | ● Residence | — Road Centerline |
| ■ Existing Substation | — Proposed Route Alternative | — NHD Waterway |
| ✚ Cemetery | ✕ Existing Transmission Line-Approximate | — NHD Waterbody |
| ▲ Church | ●● Existing 1-2 Phase (Pioneer Only) | ▨ NWI Wetland |
| 🏫 School | ●●● Existing 3-Phase (Pioneer Only) | ■ Airport (Private) |
| | | ■ Institutional |
| | | ■ Recreational |

0 500 1,000 2,000 Feet

FIGURE 3.5 ROUTE ALTERNATIVES SHEET 29 OF 29

WEST MILTON TO ELDEAN 138KV



DAYTON POWER & LIGHT



DRAWN BY: TDB

DATE: 11/16/2015

CHECKED: MAF

APPROVED: MAF

REFERENCE: ESRI WORLD IMAGERY, 2012, ACCESSED 11/2015; UGSG NHD, 2012; MIAMI CO., 2013; USFWS, 2010; PIONEER, 2013; DP&L, 2013.

APPENDIX 4-2

Route Selection Study Addendum

Route Selection Study Addendum

The Dayton Power and Light Company
West Milton – Eldean
138 kV Transmission Line Project
Miami County, Ohio

GAI Project Number: G121196.01

January 2019



Prepared by: GAI Consultants, Inc.
Indianapolis Office
201 N. Illinois Street, Suit 1700
Indianapolis, Indiana 46204

Prepared for: The Dayton Power and Light Company
1900 Dryden Road
Dayton, Ohio 45439

Route Selection Study Addendum

The Dayton Power and Light Company
West Milton-Eldean
138 kV Transmission Line Project
Miami County, Ohio

GAI Project Number: G121196.01

January 2019

Prepared for:
The Dayton Power and Light Company
1900 Dryden Road
Dayton, Ohio 45439

Prepared by:
GAI Consultants, Inc.
Indianapolis Office
201 N. Illinois Street, Suite 1700
Indianapolis, Indiana 46204

Table of Contents

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2.0 Route Adjustment for Optimizing Alignments 1

3.0 Third Public Meeting Input on Revised Route Alternatives 1

4.0 Selection of Preferred and Alternative Routes..... 2

5.0 Closure 2

Figure 1 Project Overview

Figure 2 Harter Road Optimization

Figure 3 Preferred and Alternate Routes, November 7, 2018 Open House

Figure 4 138 kV Double Circuit Utilization

Figure 5 Forest Hill Road Route Preference Switch

1.0 Introduction and Purpose

The Dayton Power and Light Company (DP&L) is planning to construct a new 138 kV transmission line to improve the reliability of electric power in the northwest area of the DP&L transmission system. The West Milton – Eldean 138 kV Transmission Line Project (Project) area is in the vicinity of West Milton, Ohio (OH), west of the City of Troy, OH (Figure 1). The new transmission line will be constructed to connect the existing West Milton Substation and the existing Eldean Substation, which are 11 miles apart based on a straight linear path.

Additional information on the Project purpose, objectives, initial route selection study efforts, and previous public open house comments and resulting optimizations have been previously documented. This Route Selection Study (RSS) Addendum documents the third public open house and the resulting route optimizations and/or route adjustments implemented to generate the final Preferred and Alternate Routes presented to OPSB in the application. This RSS Addendum captures route adjustments and public involvement since the Project's last OPSB application submittal in May 2018 under Case No. 14-0469-EL-BTX.

The objective of this RSS Addendum is to document route adjustments during the pre-application phase of the Project following the publication of the initial RSS and continued public input and constraints and opportunity analysis. This RSS Addendum does not include quantitative ranking of the routes.

2.0 Route Adjustment for Optimizing Alignments

Following the selection of the Preferred and Alternate Routes, DP&L responded to certain landowners' requests for meetings to discuss the proposed transmission line alignment on their properties. These requests for changing the alignment, exclusively within an individual landowner's property, were evaluated on a case-by-case basis to determine the impact on ecological features, land use, socioeconomics, and engineering design and constructability. One area on the Preferred Route was determined to be a reasonable request to optimize the alignment of the route, which is described below.

Harter Road Optimization

A request was made of DP&L to adjust the Preferred Route from the previous alignment to remove the line from passing through an agricultural field, albeit along a property line, and to parallel Harter Road and Horseshoe Bend Road. The Alternate Route already parallels the east side of Harter Road, so the route adjustment of the Preferred Route will make the proposed route along Harter Road a common route between State Route 55 and Horseshoe Bend Road. Once the common route heading north along Harter Road reaches Horseshoe Bend Road, the Preferred Route makes a right turn to parallel the south side of Horseshoe Bend Road before heading north and rejoining the Preferred Route along Forest Hill Road. The Harter Road optimization is shown on Figure 2.

3.0 Third Public Meeting Input on Revised Route Alternatives

Following the first two public open house meetings, route adjustments and/or route optimizations were made, and a third public open house was held on November 7, 2018 to solicit written and verbal feedback from landowners on the current Preferred and Alternate Routes at that time. The Preferred and Alternate Routes presented to the public at this open house are shown in Figure 3.

Public comments were received during the meeting as guests verbally provided feedback to GAI Consultants, Inc. (GAI) and DP&L staff. Comment cards were distributed throughout the open house to solicit written comments. Completed comment cards were received at and after the open house, as

well as comments submitted to the OPSB. The majority of the comments focused on four areas of the Project: 1) the area around the existing West Milton Substation, 2) from McCurdy Road north to the existing Eldean Substation, 3) State Route 55, and 4) the routes along and west of Forest Hill Road.

Comments received for the area around the West Milton Substation included concerns regarding additional structures (poles) on their property and the associated easement, preference for the Preferred or Alternate Route over the other, and electromagnetic field (EMF) concerns. Comments received for the area north of McCurdy Road to the existing Eldean Substation included preference for the Preferred or Alternate Route over the other, following property lines rather than going through farmland, request to bury the line, concerns of potential future development in the area whereby the new lines would impede development, preference to place lines along roads, general disagreement with the purpose and need for the Project, being 'boxed-in' by overhead utility lines, stay within existing DP&L easement and/or road easement and not obtaining new easement, and removing hard angles. Comments received for State Route 55 included health and EMF effects, burying lines, having the route go down Calumet Road (majority of comments), preference for placement of line on the south side of State Route 55, and concerns with pole heights and property values as well as easement size. Comments received for routes along and west of Forest Hill Road included preference for Alternate Route and property values and health effects.

4.0 Selection of Preferred and Alternative Routes

Based on the comments received from the third public open house, two route adjustments were made to the Preferred and Alternate Routes to be presented to the OPSB in the application: 1) 138 kV Double Circuit Utilization and, 2) Forest Hill Road Route Preference Switch.

138 kV Double Circuit Utilization

Based on feedback from the third public open house, DP&L explored the ability to double circuit an existing 138 kV line from the West Milton Substation to Davis Road, which parallels the Alternate Route presented at the third open house. Based on that review, DP&L has determined that conversion of the existing single circuit 138 kV line between the West Milton Substation to Davis Road could be double circuited for the Project. The existing structures of the 138 kV line are proposed to be replaced to hold the conductor wires for both circuits. This change will also change DP&L's route preferences. The double circuit 138 kV line will now become the Preferred Route and the prior Preferred Route will now become the Alternate Route. See Figure 4 for a view of the changes that occurred.

Forest Hill Road Route Preference Switch

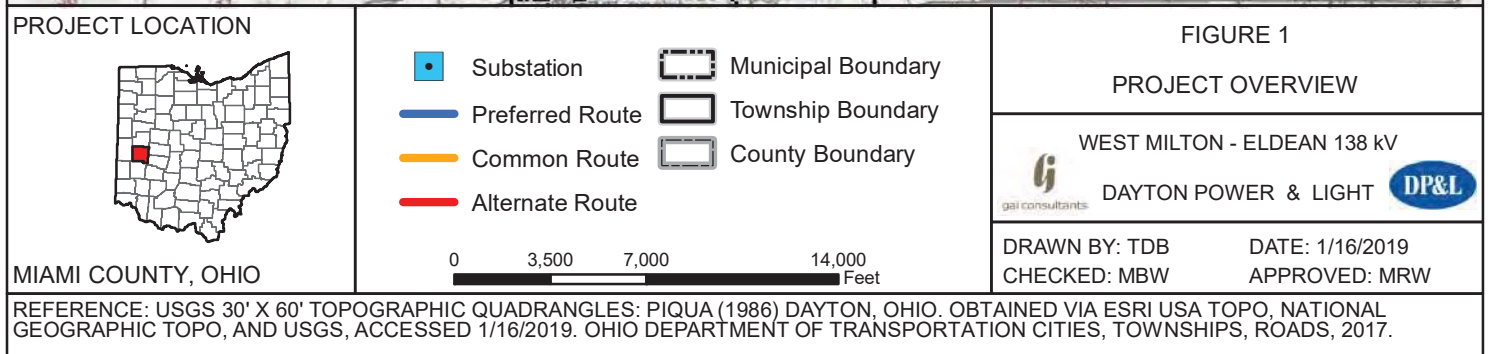
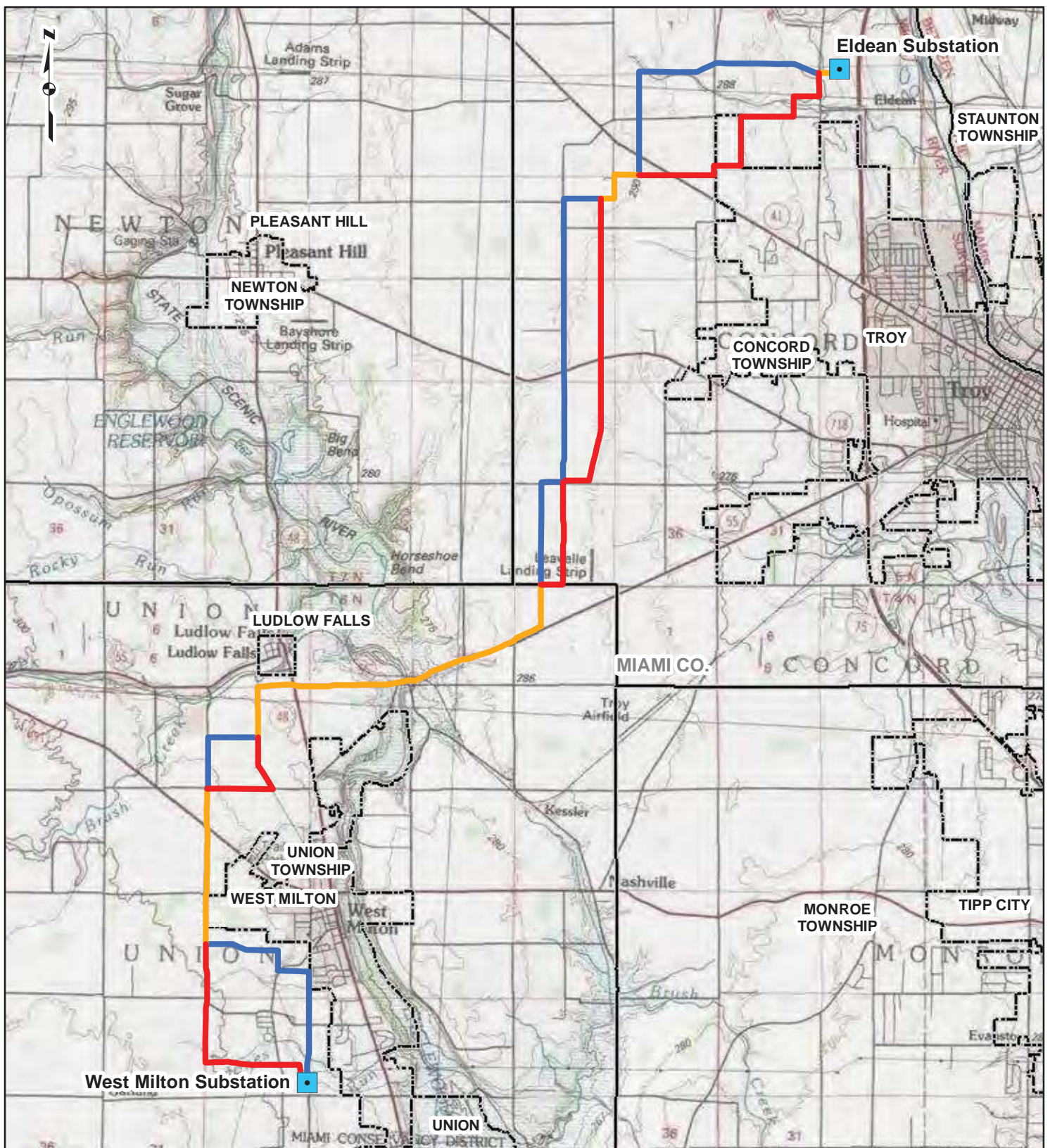
Based on feedback from the third public open house, DP&L determined that it was appropriate to switch the Preferred and Alternate Routes along and west of Forest Hill Road between Horseshoe Bend Road and Fenner Road. See Figure 5 for a view of the changes that occurred.

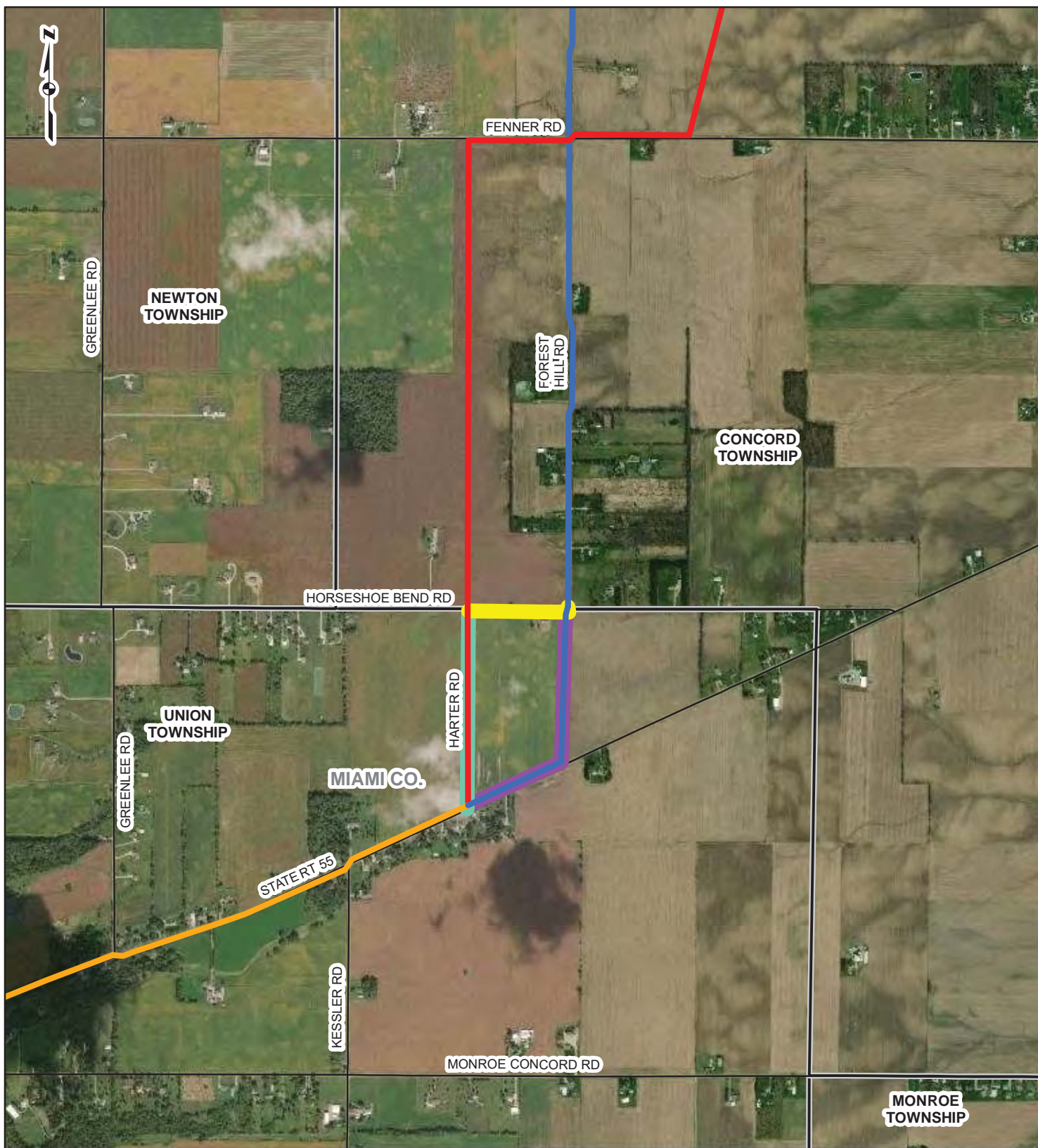
5.0 Closure

DP&L has held three public houses for this Project, two in 2014 and one in 2018, with solicited comments received during each open house. DP&L has reviewed the comments received from the third open house and reviewed them for applicability to the Project's objectives, as well as known constraints gathered as part of the RSS process. Following each open house, DP&L has made route adjustments to alleviate landowner concerns, two of which were made as a result of comments received from the latest open house. These two changes occurred in two of the four primary areas of concern based on a review and summary of received comments. DP&L believes that where received comments were not addressed in the Preferred and Alternate Routes to be presented to the OPSB in the application, those comments either do not align with the Project's objectives, constraints do not

allow for a change, or specific landowner requests will be discussed during the easement acquisition process following the OPSB's approval of a final route as these optimizations are not expected to affect additional landowners or occur outside of the overall Project study area.

FIGURES





PROJECT LOCATION



MIAMI COUNTY, OHIO

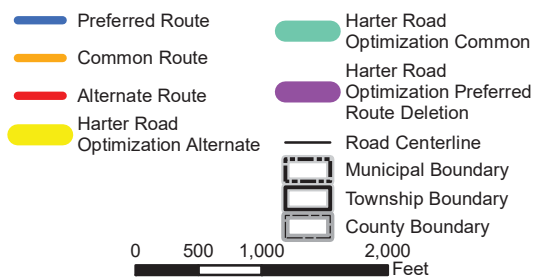
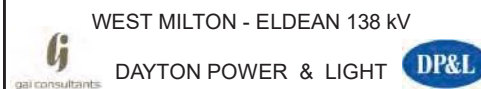


FIGURE 2

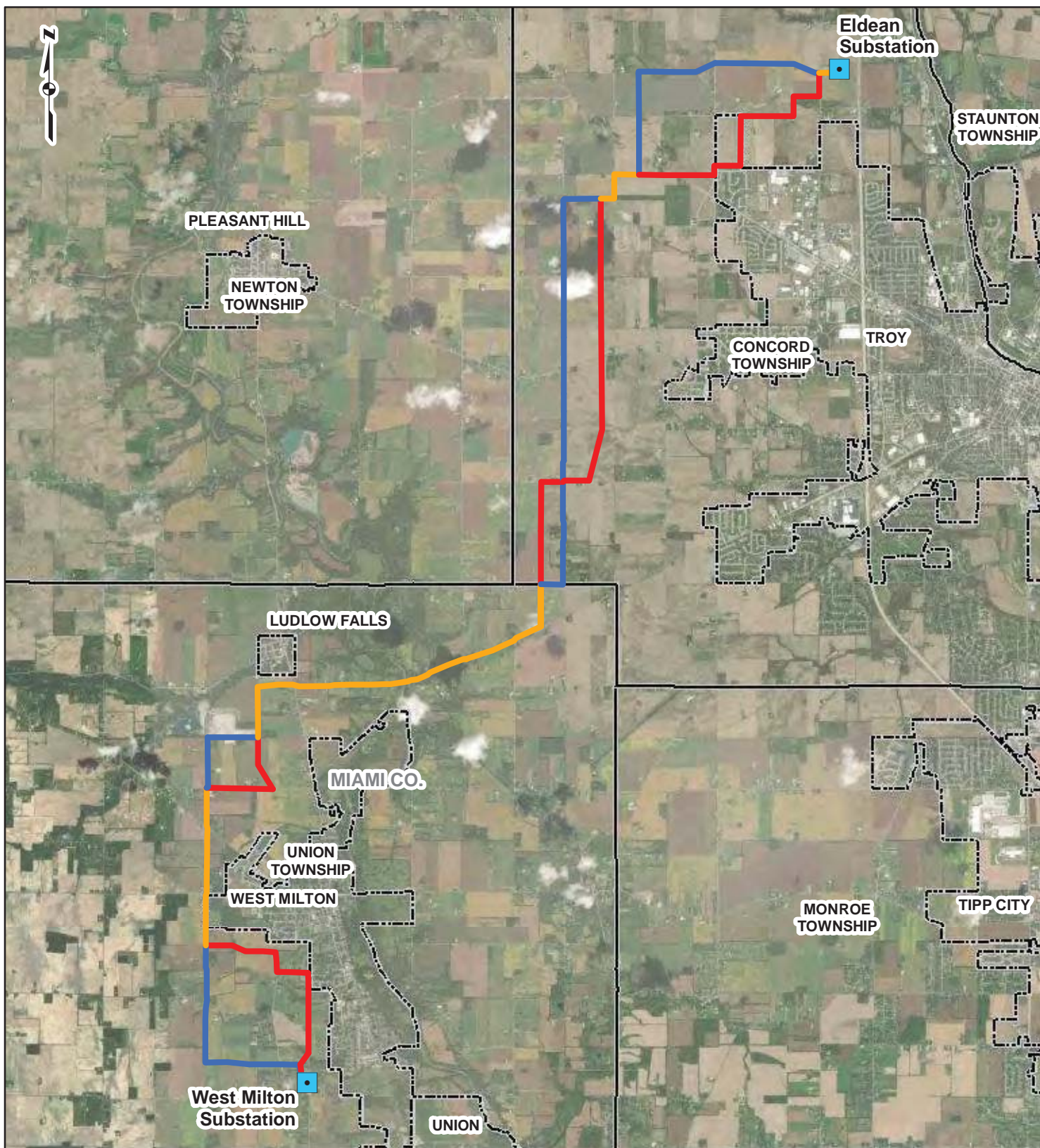
HARTER ROAD OPTIMIZATION



DRAWN BY: TDB
CHECKED: MBW

DATE: 1/16/2019
APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2017, ACCESSED: 1/16/2019.; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, 2017; MIAMI COUNTY ROAD CENTERLINES, 2018.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- Substation
- Preferred Route
- Common Route
- Alternate Route
- Municipal Boundary
- Township Boundary
- County Boundary

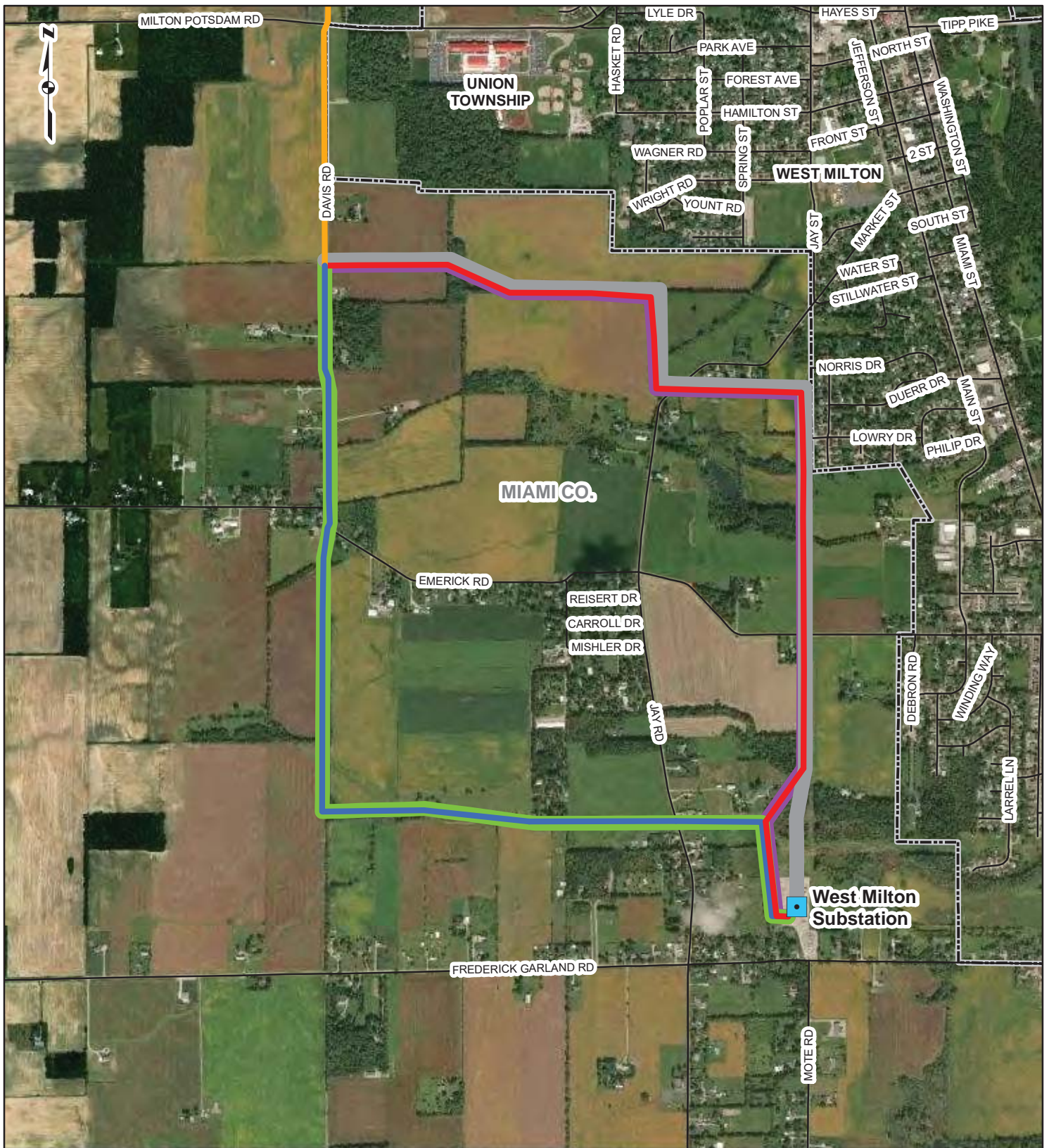
0 3,500 7,000 14,000 Feet

FIGURE 3
PREFERRED and ALTERNATE ROUTES
November 7, 2018 Open House

WEST MILTON - ELDEAN 138 kV
DAYTON POWER & LIGHT

DRAWN BY: TDB DATE: 1/16/2019
CHECKED: MBW APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, ACCESSED: 1/16/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017.



PROJECT LOCATION



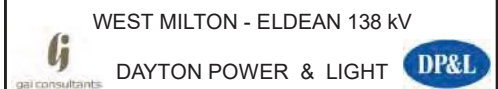
MIAMI COUNTY, OHIO

- Substation
- Preferred Route
- Common Route
- Alternate Route
- Double Circuit Preferred Route
- Switched to Alternate Route
- Alternate Route Deletion
- Road Centerline
- Municipal Boundary
- Township Boundary
- County Boundary

0 500 1,000 2,000 Feet

FIGURE 4

138 kV Double Circuit Utilization



DRAWN BY: TDB
CHECKED: MBW

DATE: 1/16/2019
APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2017, ACCESSED: 1/16/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, 2017; MIAMI COUNTY ROAD CENTERLINES, 2018.



PROJECT LOCATION



MIAMI COUNTY, OHIO

- Preferred Route
- Common Route
- Alternate Route
- Switched to Alternate Route
- Switched to Preferred Route
- Road Centerline
- Municipal Boundary
- Township Boundary
- County Boundary

0 500 1,000 2,000 Feet

FIGURE 5

Forest Hill Road Route Preference Switch

WEST MILTON - ELDEAN 138 kV
 DAYTON POWER & LIGHT
 DP&L

DRAWN BY: TDB
 CHECKED: MBW
 DATE: 1/16/2019
 APPROVED: MRW

REFERENCE: ESRI WORLD IMAGERY, 2017, ACCESSED: 1/16/2019; OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, 2017; MIAMI COUNTY ROAD CENTERLINES, 2018.

APPENDIX 6-1

Public Officials Contacted and Officials to be Served a Copy of the Certified Application

APPENDIX 6-1

Public Officials Contacted and Officials to be Served Copy of Certificate Application

City of Troy

Mike Beamish
Mayor
100 S. Market Street
Troy, OH 45373
937-335-1725

Martha Baker
President, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

Thomas Kendall
First Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

John Terwilliger
Second Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

John Schweser
Third Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

Bobby Phillips
Fourth Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

William Twiss
Fifth Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

APPENDIX 6-1 (continued)

Brock Heath
Sixth Ward, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

Todd Severt
At-large, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

William Lutz
At-large, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

Robin Oda
At-large, City Council
100 S. Market Street
Troy, OH 45373
937-335-1725

Village of West Milton

Anthony Miller
Mayor
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Matthew Kline
Municipal Manager
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Scott Fogle
Councilman
701 S. Miami Street
West Milton, OH 45383
937-698-1500

APPENDIX 6-1 (continued)

Sarah Copp
Chairwoman, Council
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Don Dohrman
Councilman
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Karen Grudich
Councilwoman
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Jason Land
Councilman
701 S. Miami Street
West Milton, OH 45383
937-698-1500

Miami County Board of Commissioners

Gregory Simmons
Vice President
201 West Main St.
Troy, OH 45373
937-440-5910

John Evans
Commissioner
201 West Main St.
Troy, OH 45373
937-440-5910

John O'Brien
Commissioner
201 West Main St.
Troy, OH 45373
937-440-5910

APPENDIX 6-1 (continued)

Concord Township

Thomas N. Mercer
Trustee
2625 Seneca Drive
Troy, OH 45373
937-308-2591

Don Pence
Trustee
2751 Meadowpoint Drive
Troy, Ohio 45373
937-216-4211

William B. Whidden
Trustee
2365 Black Oak Dr.
Troy, Ohio 45373
937-335-0431

Pat Quillen
Fiscal Officer
2306 Black Oak Dr.
Troy, Ohio 45373
937-335-4555

Union Township

Jim L. Albaugh
Trustee
9497 Markley Road
Laura, Ohio 45337
937-698-4480

William G. O'Brien
Trustee
9497 Markley Road
Laura, Ohio 45337
937-698-4480

Philip S. Mote
Trustee
9497 Markley Road
Laura, Ohio 45337
937-698-4480

APPENDIX 6-1 (continued)

Marjorie D. Coate
Trustee
9497 Markley Road
Laura, Ohio 45337
937-698-4480

APPENDIX 6-2

2014 Public Information Programs



Dayton Power & Light's West Milton to Eldean 138kV Transmission Line Project

The Dayton Power and Light Company (DP&L) has plans to strengthen the transmission system within Miami County by proposing the construction of a new 17-mile, 138,000-volt (138 kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio.

The proposed new 138 kV line will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system under various outage conditions, as required to comply with the mandatory Federal Energy Regulatory Commission (FERC)/North American Electric Reliability Corporation (NERC) reliability standards. The new line will improve service reliability to the customers in the area.

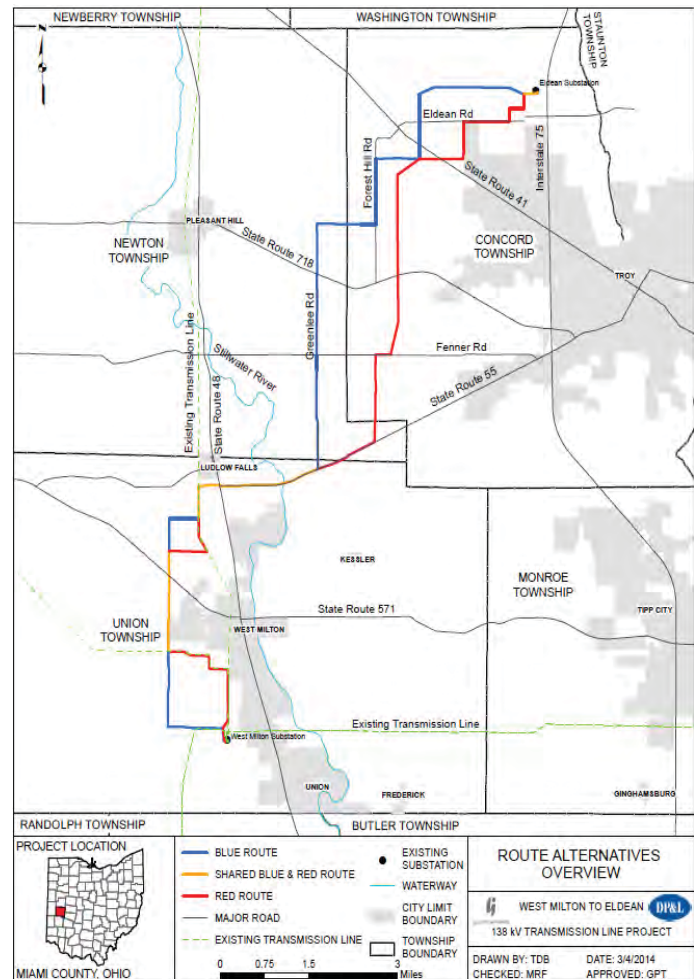
DP&L has extensively studied the general area between the two substations to identify multiple route options for the transmission line in an effort to minimize any impacts to sensitive areas and land uses. Based on the study's preliminary results, DP&L has identified the transmission line routes that are shown on the map.

These routes under consideration largely follow road right-of-way (often where electric distribution lines already exist) and DP&L's existing transmission line right-of-way (north and west of West Milton). The proposed routes were also designed to align with property lines. It is anticipated that the new line will be installed on single wood poles, with steel poles at select locations, averaging 65-90 feet in height.

The Ohio Power Siting Board (OPSB) is responsible for reviewing information for the project, including public comments and input, and determining whether to issue a Certificate of Environmental Compatibility and Public Need approving the project. DP&L plans to file an application with the OPSB in mid 2014 for the board's review and approval of the transmission line siting. The application will include a preferred and alternate route for most sections of the project area. If the application is approved by the OPSB, construction of the transmission line could begin in 2017.

Public comments will be accepted and considered by DP&L staff as part of the process of further evaluating the proposed routes. Interested parties may also send written comments or questions to: The Dayton Power and Light

Company, ATTN: W. Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439, or request information or comment by leaving a message at 937-331-4314.



Estimated Project Schedule

2014	March - Open House Meeting April - Field Inspections June - OPSB Application TBD - OPSB Public Hearings TBD - OPSB Approval
2015	Easement Procurement
2016	Engineering & Material Procurement
2017	Construction
2018	Project In-Service

Dayton Power & Light's West Milton to Eldean 138kV Transmission Line Project

Points of Interest

Estimated Project Schedule

2014	July - Open House Meeting August – Field Inspections September – OPSB Application TBD – OPSB Public Hearings TBD – OPSB Approval
2015	Easement Procurement Start
2016	Engineering & Material Procurement
2017	Construction
2018	Project In-Service

Ohio Power Siting Board (OPSB) Process

The OPSB is a separate entity within the Public Utilities Commission of Ohio, which is authorized to review and approve applications to build major utility facilities. Before filing an application to build a facility, the company is required to hold a public informational meeting, during which company representatives inform stakeholders about the company's plans and gather public input for consideration in developing the application.

Once the company submits its application for the new facility, the OPSB staff reviews it for completeness. After OPSB staff has determined the application to be complete, legal notices will be published in newspapers in those areas impacted by the proposed facility. The legal notices will include a listing of area libraries where a copy of the application may be viewed. The application can also be viewed online by going to the OPSB Web site. Interested persons are encouraged to submit written comments to the Docketing Division, 180 E. Broad Street, 11th floor, Columbus, OH 43215. DP&L's case number for the project is 14-0469-EL-BTX

OPSB staff will make a formal request for comments from other agencies and parties, and then make a recommendation to the full Board. After the OPSB staff makes its recommendation, formal public hearings are held. These hearings enable citizens, interest groups and governmental entities to present testimony.

The OPSB can be reached at:

- Phone: 1-866-270-6772
- Mailing Address: The Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215
- Website: <http://www.opsb.ohio.gov/opsb>

Field Inspections

Following the informational meeting, field inspections of the corridors will begin. The OPSB application process requires these inspections as part of the research of socioeconomic and ecological land use impacts. Property owners will be contacted before inspections occur to coordinate access where needed. Inspections are performed on foot and are non-invasive; however some minor random soil sampling will be taken.

Easement Procurement

Easement procurement is scheduled to start in 2015, once a route has been approved. A representative will contact each affected property owner and explain specifically where the line will go and request an easement. Compensation is based on market value of the interest being purchased. In most cases, the landowner will be able to continue to use the property beneath the line in any manner not inconsistent with the operation of the transmission line. The Company will seek the right to trim trees and other vegetation from the area beneath and surrounding the line.

Construction

Interruption of electric service is not anticipated during the construction of the transmission line. In the event an outage is required, it would typically be on an individual basis to transfer facilities from old to new poles and of very short duration. We would notify affected customers beforehand.

Property/Crop Damage

While trees will need to be removed from the easement area, DP&L will work with property owners to restore land and landscaping back to their original condition following construction activities. Compensation will be made for lost crops resulting from related project activities.

Notice of Public Information Meeting for Proposed Major Utility Facility

The Dayton Power and Light Company (DP&L) invites residents of Miami County and other interested members of the public to attend an informational open house to discuss its proposed West Milton-Eldean Transmission Line Project---a new 17-mile, 138,000-volt (138 kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio.

The public informational open house will be held from 6 to 8 PM, Wednesday, July 9, in the Gymnasium at Concord Elementary School, 3145 State Route 718, Troy, Ohio 45373.

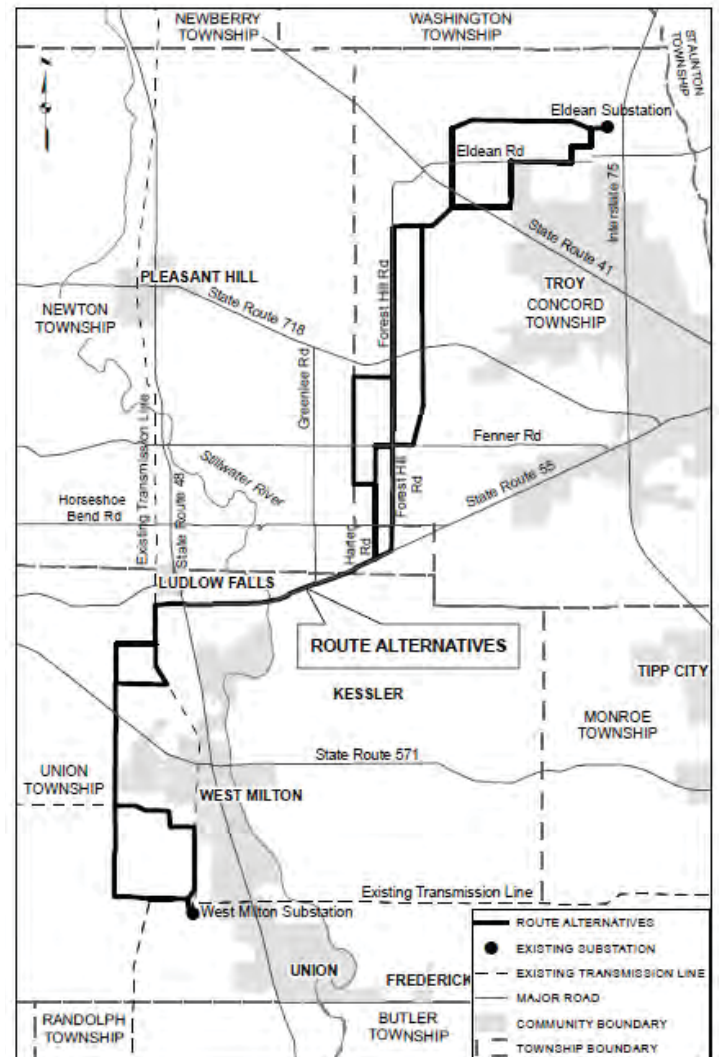
The proposed new 138 kV line will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system under various outage conditions, as required to comply with the mandatory Federal Energy Regulatory Commission (FERC)/North American Electric Reliability Corporation (NERC) reliability standards. The new line will improve service reliability to the customers in the area.

DP&L has extensively studied the general area between the two substations to identify multiple route options for the transmission line in an effort to minimize any impacts to sensitive areas and land uses. Based on the study's preliminary results, DP&L has identified the transmission line routes that are shown on the map.

These routes under consideration largely follow road right-of-way (often where electric distribution lines already exist) and DP&L's existing transmission line right-of-way (south and west of West Milton). The proposed routes were also designed to align with property lines where feasible. It is anticipated that the new line will be installed on single wood poles, with steel poles at select locations, averaging 65-90 feet in height.

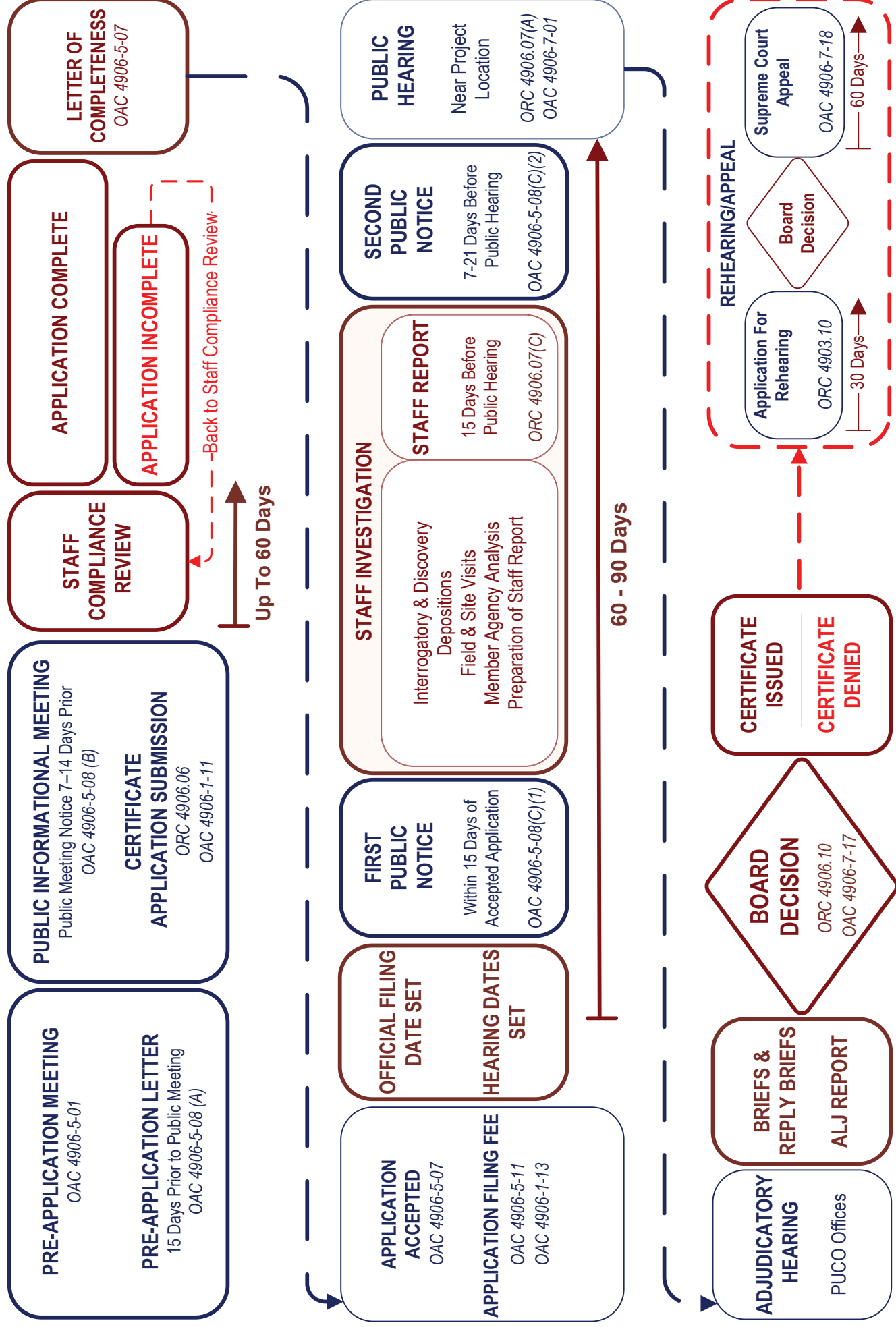
The Ohio Power Siting Board (OPSB) is responsible for reviewing information for the project, including public comments and input, and determining whether to issue a Certificate of Environmental Compatibility and Public Need approving the project. DP&L plans to file an application with the OPSB in 2014 for the board's review and approval of the transmission line siting. The application will include a preferred and alternate route for most sections of the project area. If the application is approved by the OPSB, construction of the transmission line could begin in 2017.

Public comments will be accepted and considered by DP&L staff as part of the process of further evaluating the proposed routes. Interested parties may also send written comments or questions to: The Dayton Power and Light Company, ATTN: W. Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439, or request information or comment by leaving a message at 937-331-4314.



OHIO POWER SITING PROCESS FLOWCHART

(Statute/Rule References and Select Blocks are Clickable Internet Links)



Construction and Operation are Monitored by the Board

Conditions of Certificate Apply for the Life of the Facility

APPENDIX 6-3

2018 Public Information Programs

Notice of Public Information Meeting for Proposed Major Utility Facility

The Dayton Power and Light Company (DP&L) plans to construct a new 17-mile, 138,000-volt (138 kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio.

The proposed new 138 kV line will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system as required to comply with the mandatory Federal Energy Regulatory Commission (FERC)/North American Electric Reliability Corporation (NERC) reliability standards. The new line will improve service reliability to the customers in the area.

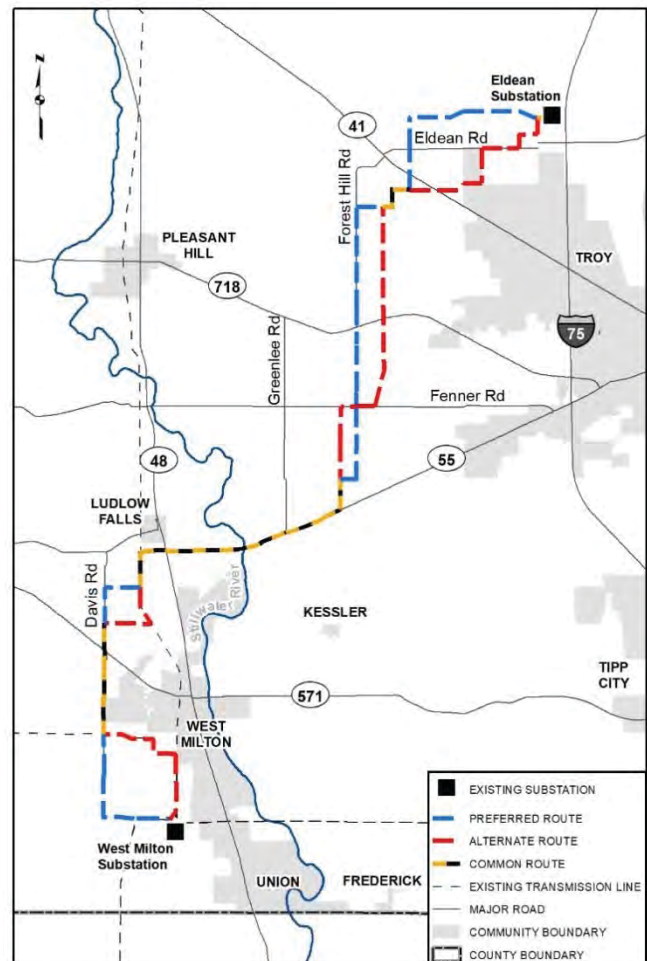
DP&L has extensively studied the general area between the two substations to identify multiple route options for the transmission line in an effort to minimize any impacts to sensitive areas and land uses. Based on the study's preliminary results, DP&L has identified the transmission line routes that are shown on the map.

These routes under consideration largely follow road right-of-way (often where electric distribution lines already exist) and DP&L's existing transmission line right-of-way (north and west of West Milton). The proposed routes were generally designed to align with property lines. It is anticipated that the new line will be installed on single wood poles, with steel poles at select locations, averaging 65-90 feet in height.

The Ohio Power Siting Board (OPSB) is responsible for reviewing information for the project, including public comments and input, and determining whether to issue a Certificate of Environmental Compatibility and Public Need approving the project. DP&L plans to file an application with the OPSB in 2019 for the board's review and approval of the transmission line siting. The application will include a preferred and alternate route for most sections of the project area. If the application is approved by the OPSB, construction of the transmission line could begin in 2021 and be completed in 2022.

Public comments will be accepted and considered by DP&L staff as part of the process of further evaluating the proposed routes. Interested parties may also send written comments or

questions to: The Dayton Power and Light Company, ATTN: W. Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439, or request information or comment by leaving a message at 937-331-4314 or e-mail westmiltoneldeanteam@aes.com.



Points of Interest

Estimated Project Schedule

2014	Open House Meetings Field Inspections
2018	Public Informational Meeting
2019	Submit Application to OPSB TBD – OPSB Public Hearings TBD – OPSB Approval Engineering & Easement Procurement Field Inspection Study
2020	Engineering, Easement & Material Procurement
2021	Construction Start
2022	Project In-Service

Ohio Power Siting Board (OPSB) Process

The OPSB is a separate entity within the Public Utilities Commission of Ohio, which is authorized to review and approve applications to build major utility facilities. Before filing an application to build a facility, the company is required to hold a public informational meeting, during which company representatives inform stakeholders about the company's plans and gather public input for consideration in developing the application.

Once the company submits its application for the new facility, the OPSB staff scrutinizes the plan, makes a formal request from other agencies and parties, and then makes a recommendation to the full Board. After the OPSB staff makes its recommendation, formal public hearings are held. These hearings enable citizens, interest groups and governmental entities to present testimony. Notice of the public hearing will be posted in Newspapers and mailed to affected property owners.

The application, staff reports, and other filings can be viewed online by going to the OPSB Web site. Interested persons are encouraged to submit written comments to the Docketing Division, 180 E. Broad Street, 11th floor, Columbus, OH 43215. DP&L's case number for the project is 18-1259-EL-BTX

The OPSB can be reached at:

- Phone: 1-866-270-6772
- Mailing Address: The Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215
- Website: <http://www.opsb.ohio.gov/opsb>

Field Inspections

Following the public informational meeting, field inspections for the Cultural Resource Survey will occur. The OPSB application process requires these inspections for route evaluation.

The goal of the cultural resources survey is to identify archeological sites and historic structures within a project area. These may include, but not limited to, Native American sites, farmstead sites, and cemeteries. The field survey is accomplished by a pedestrian reconnaissance of the proposed transmission route corridor and performing shovel test pits (STP) at locations with potential to be disturbed by the project, such as structure locations and access roads. The STP is hand excavated and would measure approximately 20" wide and 20" deep. Excavated soils would be screened for any artifact recovery. STPs would then be backfilled upon completion. Resulting data is shared with the Ohio Power Siting Board and the Ohio Historic Preservation Office for impact assessment.

DP&L has contracted with Judge Engineering to coordinate access permission to impacted properties.

Easement Procurement

Easement procurement will start after OPSB approves a route. A DP&L representative will contact each affected property owner and explain specifically where the line will go and request an easement. Compensation for easement is based on market value of the interest being purchased. In most cases, the landowner will be able to continue to use the property beneath the line in any manner not inconsistent with the operation of the transmission line. The Company will seek the right to trim trees and other vegetation from the area beneath and surrounding the line.

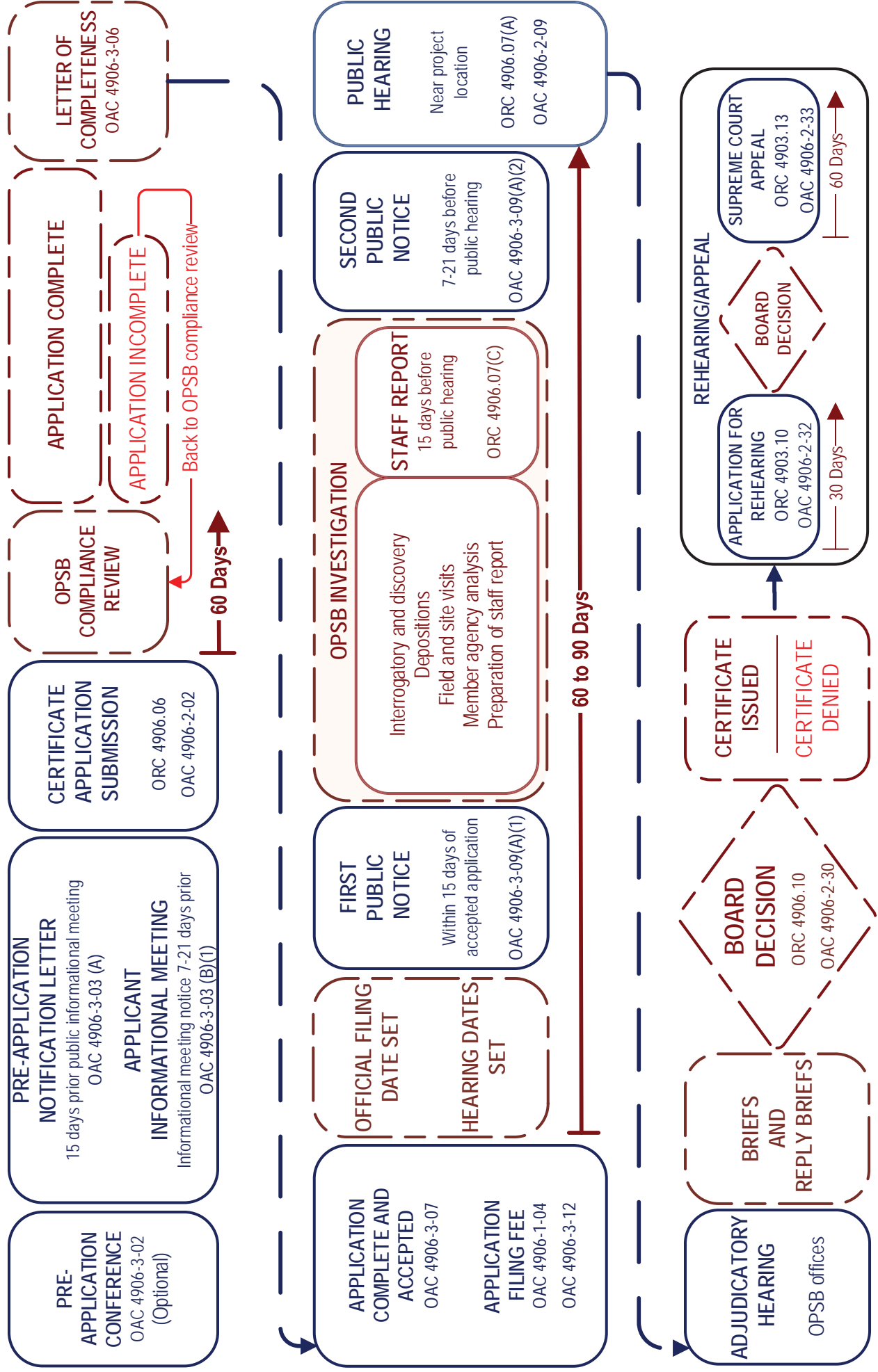
Construction

Interruption of electric service is not anticipated during the construction of the transmission line. In the event an outage is required, it would typically be on an individual basis to transfer facilities from old to new poles and of very short duration. We would notify affected customers beforehand.

Property/Crop Damage

While trees will need to be removed from the easement area, DP&L will work with property owners to restore land and landscaping back to their original condition following construction activities. Compensation will be made for lost crops resulting from related project activities.

STANDARD APPLICATION PROCESS FLOWCHART



LEGEND



Construction and operation are monitored by the OPSB



Dayton Daily News

SPRINGFIELD NEWS-SUN

JOURNAL-NEWS Today's Pulse

PROOF OF PUBLICATION STATE OF OHIO

PUBLIC NOTICE

Before the undersigned authority personally appeared Andrea Feltner, who on oath says that he/she is a Legal Advertising Representative of the Dayton Daily News, a daily newspaper of general circulation in Montgomery, Clark, Warren, Butler, Clinton, Greene, Preble, Miami, Darke, Mercer, Shelby, Fayette, Logan, Hamilton, Clermont, Auglaize, and Champaign Counties, and State of Ohio, and he/she further says that the Legal Advertisement, a copy of which is hereunto attached, has been published in the said Dayton Daily News, 1 Lines, 1 Time(s), last day of publication being 10/21/2018, and he/she further says that the bona fide daily paid circulation of the said Dayton Daily News was over 25,000 at the time the said advertisement was published, and that the price charged for same does not exceed the rates charged on annual contract for the like amount of space to other advertisers in the general display advertising columns.

GAI CONSULTANTS
201 N. ILLINOIS ST, SUITE 1700
INDIANAPOLIS, IN 46204

Invoice/Order Number: 0000480908

Ad Cost: \$2,847.60

Paid: \$2,847.60

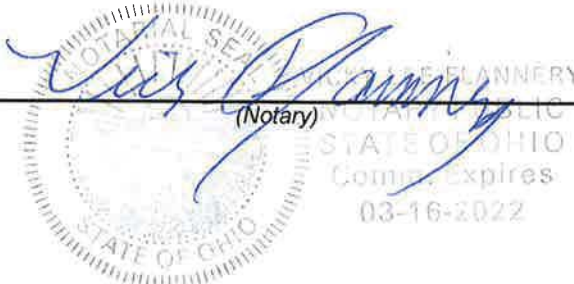
Balance Due: \$0.00

Signed


(Legal Advertising Agent)

Sworn or affirmed to, and subscribed before me, this 24th day of October, 2018 in Testimony whereof, I have hereunto set my hand and affixed my official seal, the day and year aforesaid.

Signed


(Notary)
NOTARY PUBLIC
STATE OF OHIO
Commission Expires
03-16-2022

Please see Ad on following page(s).

Invoice/Order Number: 0000480908
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Paid: \$2,847.60
Balance Due: \$0.00

Notice of Public Information Meeting for Proposed Major Utility Facility

The Dayton Power and Light Company (DP&L) invites residents of Miami County and other interested members of the public to attend an informational open house to discuss its proposed West Milton-Eldean Transmission Line Project – a new 17-mile, single circuit, 138,000-volt (138 kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio.

The public informational open house will be held from 5:30 to 7:30 PM, Wednesday, November 7, 2018 at The Crystal Room, 845 West Market Street, Troy, Ohio 45373. The informational open house provides the public an opportunity to meet and talk with project representatives and view detailed maps. There is no formal presentation. Visitors may come and go at any time.

The proposed new 138 kV line will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system to comply with the mandatory Federal Energy Regulatory Commission (FERC)/North American Electric Reliability Corporation (NERC) reliability standards. The new line will improve service reliability to the customers in the area.

DP&L has extensively studied the general area between the two substations to identify multiple route options for the transmission line in an effort to minimize any impacts to sensitive areas and land uses. Based on the study's preliminary results, DP&L has identified the transmission line routes that are shown on the map.

These routes under consideration largely follow road right-of-way (often where electric distribution lines already exist) and DP&L's existing transmission line right-of-way (south and west of West Milton). The proposed routes were also designed to align with property lines where feasible. It is anticipated that the new line will be installed on single wood poles, with steel poles at select locations, averaging 70-90 feet in height.

The Ohio Power Siting Board (OPSB) is responsible for reviewing information for the project, including public comments and input, and determining whether to issue a Certificate of Environmental Compatibility and Public Need approving the project. DP&L plans to file an application with the OPSB in early 2019 for the board's review and approval of the transmission line siting. The application will include a preferred and alternate route for most sections of the project area. If the application is approved by the OPSB, construction of the transmission line could begin in 2021 and be completed by June 2022. Estimates show this is an approximate \$12 million investment. The docket number for the project is 18-1259-EL-BIX and shall be included with any correspondence.

Public comments will be accepted and considered by DP&L staff as part of the process of further evaluating the proposed routes. Interested parties may also send written comments or questions to: The Dayton Power and Light Company, ATTN: West Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439, or westmiltoneldeanteam@aes.com, or request information or comment by leaving a message at 937-331-4314.

Information is also available at the project's website at <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west>



AFFP

Affidavit of Publication

STATE OF OHIO } SS
COUNTY OF MIAMI }

Connie Rosenbeck, being duly sworn, says:

That she is Retail Sales Representative of the MIAMI VALLEY SUNDAY NEWS, a weekly newspaper of general circulation, printed and published in TROY, MIAMI County, OHIO; that the publication, a copy of which is attached hereto, was published in the said newspaper on the following dates:

Oct 21, 2018

That said newspaper was regularly issued and circulated on those dates.

SIGNED:



Subscribed to and sworn to me this 21st day of Oct 2018



SHARON K. IKE
Notary Public, State of Ohio
My Commission Expires July 5, 2020



Sharon K. Ike, MIAMI County, OHIO

My commission expires: July 5, 2020

\$ 388.00

50007951 70083108 317-570-6800

GAI Consultants
Kim Mendez
201 North Illinois Street
Suite 1700
INDIANAPOLIS, IN 46204

Notice of Public Information Meeting for Proposed Major Utility Facility

The Dayton Power and Light Company (DP&L) invites residents of Miami County and other interested members of the public to attend an informational open house to discuss a proposed West Milton-Eldean Transmission Line Project - a new 7-mile, single circuit 138,000-volt (138kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio.

The public informational open house will be held from 5:30 to 7:30 PM, Wednesday, November 7, 2018 at The Crystal Room, 845 West Market Street, Troy, Ohio 45373. The informational open house provides the public an opportunity to meet and talk with project representatives and view detailed maps. There is no formal presentation. Visitors may come and go at any time.

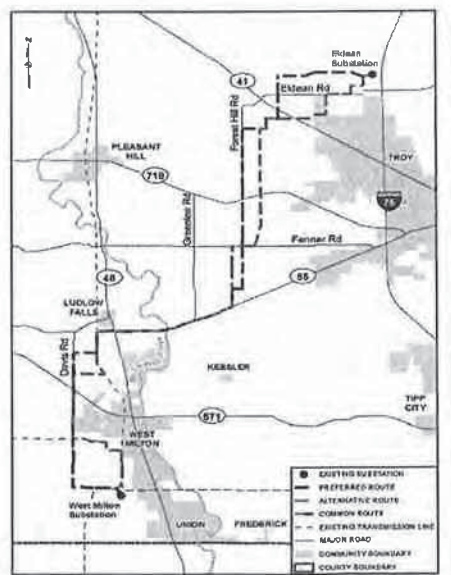
The proposed new 138 kV line will ensure that adequate transmission system voltages are maintained in the northwest area of the DP&L transmission system to comply with the mandatory Federal Energy Regulatory Commission (FERC)/North American Electric Reliability Corporation (NERC) reliability standards. The new line will improve service reliability to the customers in the area.

DP&L has extensively studied the general area between the two substations to identify multiple route options for the transmission line in an effort to minimize any impacts to sensitive areas and land uses. Based on the study's preliminary results, DP&L has identified the transmission routes that are shown on the map. These routes under consideration largely follow road right-of-way (often where electric distribution lines already exist) and DP&L's existing transmission right-of-way (south and west of West Milton). The proposed routes were also designed to align with property lines where feasible. It is anticipated that the new line will be installed on single wood poles, with steel poles at select locations, averaging 70-90 feet in height.

The Ohio Power Siting Board (OPSB) is responsible for reviewing information for the project, including public comments and input, and determining whether to issue a Certificate of Environmental Compatibility and Public Need approving the project. DP&L plans to file an application with the OPSB in early 2019 for the board's review and approval of the transmission line siting. The application will include a preferred and alternate route for most sections of the project area. If the application is approved by the OPSB, construction of the transmission line could begin in 2021 and be completed by June 2022. Estimates show this is an approximate \$12 million investment. The docket number for the project is 18-1259-EL-BTX and shall be included with any correspondence.

Public comments will be accepted and considered by DP&L staff as part of the process of further evaluating the proposed routes. Interested parties may also send written comments or questions to: The Dayton Power and Light Company, ATTN: West Milton-Eldean Project Team, 1900 Dryden Road, Area 420, Dayton, Ohio 45439, or westmiltoneldeanteam@aes.com, or request information or comment by leaving a message at 937-331-4314.

Information is also available at the project's website at <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west-milton/>.





October 16, 2018

«MAILING_NAME»

«MAILING_STREET»

«TaxpCity», «TaxpState» «TaxpZipcod»

Re: Notice of Public Information Meeting for a Proposed Major Utility Facility
The Dayton Power and Light Company
West Milton-Eldean Transmission Line Project Open House Invitation
Ohio Power Siting Board Case Number 18-1259-EL-BTX

Dear Property Owner or Resident:

The Dayton Power and Light Company (DP&L) is proposing a new 138 kilovolt (kV) transmission line from the existing West Milton Substation to the existing Eldean Substation located northwest of Troy, Ohio, and you have been identified as a landowner along or adjacent to the preliminary transmission line routes.

Based on the preliminary routes and a 75-foot-wide maximum proposed right-of-way, your property(ies) has been identified as being crossed by the proposed right-of-way or abutting* a property crossed by the proposed right-of-way. Your properties include the following: «CrossAbutting»

* Abutting properties are those where the proposed right-of-way is not located, but is abutting a property that is crossed by the proposed right-of-way for the route.

Please join us for an informational open house from 5:30 pm to 7:30 pm on Wednesday, November 7, 2018 at The Crystal Room located at 845 West Market Street, Troy, Ohio 45373. The informational open house provides the opportunity to meet and talk with project representatives and view detailed maps. There is no formal presentation. You may come and go at any time.

If you are the landowner and have tenants living on your property please notify them of this information.

The proposed West Milton-Eldean Transmission Line Project includes construction of approximately 17 miles of single circuit 138 kV transmission line in the Village of West Milton and City of Troy in Union and Concord Townships, Miami County, Ohio. The purpose of the project is to allow for adequate transmission system voltages to be maintained in the northwest area of the DP&L transmission system to comply with the mandatory North American Electric Reliability Corporation reliability standards. The typical height of transmission structures will be approximately 70 feet with an anticipated maximum of 90 feet and will be predominantly wood pole construction. The project will require a 30- to 75-foot-wide permanent right-of-way for which easements will be obtained from landowners. DP&L anticipates completion of this project at the beginning of 2022. Estimates show this is an approximate \$12 million investment.

The rules established by the Ohio Power Siting Board (OPSB) require DP&L to study multiple routes and to submit two routes for the board's evaluation. Either route will allow DP&L to satisfy its objectives for reliability standards. Each route has advantages and drawbacks. The public information meeting will help determine which route to recommend as preferred and which to recommend as the alternate route.

The OPSB is responsible for reviewing all the information related to the project, including input from the public, and determining whether the facility will meet the suitability and necessity requirements of the siting process.

Ohio's siting process requires that the proposed facilities:

- Satisfy the public need criteria for the facility;
- Satisfy all engineering requirements for the project;
- Address the compatibility of the facility with existing land use in the area; and
- Address the socioeconomic, land use, ecological, cultural and environmental effects of the facility on the area.



The OPSB will make the final decision regarding which route is selected. Members of the public are encouraged to comment about this project. You can comment by calling 937-331-3314 or sending an email inquiry to westmiltoneldeanteam@aes.com.

You can also send your comments directly to the OPSB at its contact information listed below. Persons can request notice of the board meeting by signing up on the board's website or contacting them at their phone number listed below. Persons who desire to intervene in a board proceeding shall prepare and file with the OPSB a petition setting forth the grounds for the proposed intervention and the interest of the petitioner in the proceedings within 30 days after the date of publication of the notice required in accordance with paragraph (A)(1) of rule 4906-3-09 of the Administrative Code. The 30 days will commence following notification after an accepted application is filed with OPSB. Upon an accepted, complete application being deemed filed, the board or administrative law judge shall promptly fix the date(s) for the public hearing(s) and notify the parties. After filing an accepted, complete application with the board, the applicant shall give two notices of the proposed utility facility, one of which shall be a written notice to each owner of a property crossed and/or adjacent to the preferred and alternative routes for the transmission line and will include the time and place of the public and adjudicatory hearings. You may also contact OPSB at any time regarding the project and/or to request information pertaining to the public hearing at the contact information below.

Contact information for the OPSB:

Ohio Power Siting Board
180 East Broad Street
Columbus, Ohio 43215-3793
1-866-270-6772
contact.opsb@puc.state.oh.us
<http://www.opsb.ohio.gov>

Additional information about this project can be found online at <https://www.dpandl.com/about-dpl/who-we-are/system-improvements/west-milton/>. You may also request information or comment on the project by using our website.

On behalf of DP&L, I look forward to seeing you at the public informational open house.

Sincerely,

A handwritten signature in black ink, reading "Barry J. Bentley". The signature is written in a cursive style with a large, stylized "B" and "B".

Barry J. Bentley
Senior Vice President, U.S. Utilities

Attachment – Project Location Map

APPENDIX 7-1

Ohio Historic Preservation Office Correspondence



In reply refer to
2015-MIA-31792-1

RECEIVED

AUG 03 2015

GAI CONSULTANTS INC.
PROJ. NO 9150587.00

July 27, 2015

Jonathan Glenn
GAI Consultants
385 East Waterfront Drive
Homestead, PA 15120-5005

Dear Mr. Glenn:

Re: DP&L West Milton-Eldean 138kV Transmission Line, Union Township, Miami County, Ohio

This is in response to your transmittal of June 8, 2015 concerning the proposed project. The comments of the Ohio Historic Preservation Office are submitted in accordance with the provisions of Section 106 of the National Historic Preservation Act of 1966, as amended.

The project involves construction of a new 138 kV transmission line in Union Township, Miami County, Ohio. A check of our records shows that the project area has not been surveyed and that a large number of sites have been identified near the project area. Given the presence of sites nearby on similar topography, we recommend that a preliminary archaeological survey be conducted to identify sites in this area.

A survey will include a review of records and documents and a field investigation, generally excavation of small subsurface test units or if the ground surface is visible, surface collection. Frequently, enough information is obtained from the survey that the archaeologists can make recommendations on the National Register eligibility of historic properties or recommend further investigation.

Additionally, any buildings that appear to be over 50 years old should be documented and evaluated for National Register eligibility.

If you need a list of consultants, please call me at (614) 298-2000 or check our website at www.ohiohistory.org/hpconsultants. Thank you for your cooperation.

Sincerely,

A handwritten signature in black ink that reads "Nathan J. Young".

Nathan J. Young, Project Reviews Manager
Resource Protection and Review

June 5, 2015

Project G150587.00

Mr. Mark J. Epstein, Department Head
Ohio Historic Preservation Office
800 East 17th Avenue
Columbus, Ohio 43211-2474

**Re: Section 106 Review - Project Summary Form
The Dayton Power and Light Company
West Milton – Eldean 138 kV Transmission Line Project
Union and Concord Townships, Miami County**

Dear Mr. Epstein:

On behalf of The Dayton Power and Light Company (DP&L), GAI Consultants, Inc. (GAI) is submitting the enclosed *Section 106 Review - Project Summary Form* to initiate consultation for the West Milton – Eldean 138 kV Transmission Line Project, Union and Concord Townships, Miami County, Ohio. Based on DP&L's early planning information, the Project involves the construction of approximately 17 miles of new overhead transmission line right-of-way (ROW) primarily traversing open agricultural settings and frequently paralleling existing road and utility line ROWs. Specific pole locations have not yet been selected and access roads have not yet been designed; however, pole locations will be situated to avoid previously recorded archaeological sites. GAI assumes the project will require installation of approximately 320 tangent structures (single wood poles) and approximately 32 angle structures (single steel poles with concrete foundations).

A review of previously recorded historic properties (including archaeological sites and historic architectural resources) indicates that there are two recorded historic architectural resources and two recorded archaeological sites within the possible ROW; however, they will not be directly impacted by the Area of Potential Effect (APE). Several resources are previously recorded within 0.50 miles of the APE.

DP&L and GAI request your review and comment on the definition of the APE as defined in the enclosed *Section 106 Review - Project Summary Form*, as well as a response as to the need for cultural resources studies. We look forward to successfully completing consultation with your office. We appreciate your assistance in the development of the Project. If you have any questions or concerns, please feel free to contact me at 412-476-2000, extension 1204 or j.glenn@gaiconsultants.com.

Respectfully submitted,
GAI Consultants, Inc.



Jonathan Glenn, M.A., RPA
Cultural Resources Manager

cc: Gregory P. Tokar; Michael A. Frank

Enclosure: *Section 106 Review - Project Summary Form*

APPENDIX 7-2

Section 106 Review and Cultural Resources Management Literature Review

(CONFIDENTIAL)

**Section 106 Review and Cultural Resources Management Literature Review (Confidential)
will be provided to the Ohio Power Siting Board Under Separate Cover**

APPENDIX 8-1

Wetland, Upland and ORAM Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Greentown/Howard County Sampling Date: 10/6/14
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland A - Wet In
 Investigator(s): Tyler Rankin/Geoffrey Palmer Section, Township, Range: S29/T6N/R5E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): concave
 Slope (%): 0 Lat: 39.939671 Long: -84.333119 Datum: NAD 83
 Soil Map Unit Name MoA - Millsdale silty clay loam, 0 to 2 percent slopes NWI Classification: PEM

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland A</u>
Hydric soil present? <u>Y</u>	
Indicators of wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>4</u> (A) Total Number of Dominant Species Across all Strata: <u>4</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1 <u>Salix nigra</u>		<u>5</u>	<u>Y</u>	<u>OBL</u>	
2 <u>Ulmus Americana</u>		<u>5</u>	<u>Y</u>	<u>FACW</u>	
3					
4					
5					
		<u>10</u>	= Total Cover		Prevalence Index Worksheet Total % Cover of: OBL species <u>20</u> x 1 = <u>20</u> FACW species <u>100</u> x 2 = <u>200</u> FAC species <u>5</u> x 3 = <u>15</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>125</u> (A) <u>235</u> (B) Prevalence Index = B/A = <u>1.88</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1 <u>Cornus alba</u>		<u>10</u>	<u>Y</u>	<u>FACW</u>	
2					
3					
4					
5					
		<u>10</u>	= Total Cover		
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u>X</u> Dominance test is >50% <u>X</u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1 <u>Phalaris arundinacea</u>		<u>80</u>	<u>Y</u>	<u>FACW</u>	
2 <u>Typha angustifolia</u>		<u>15</u>	<u>N</u>	<u>OBL</u>	
3 <u>Impatiens capensis</u>		<u>5</u>	<u>N</u>	<u>FACW</u>	
4 <u>Apocynum cannabinum</u>		<u>5</u>	<u>N</u>	<u>FAC</u>	
5					
6					
7					
8					
9					
10					
		<u>105</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>Y</u>
1					
2					
		<u>0</u>	= Total Cover		

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

SOIL

Sampling Point: Vetland A - Wet I

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-4	10 YR 3/2	100	None				Silt Loam	
4-18	Gley 2.5/10Y	80	10 YR 3/6	20	C	M	Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):

 Type: _____
 Depth (inches): _____
Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | |
|---|
| <input checked="" type="checkbox"/> Surface Water (A1) |
| <input type="checkbox"/> High Water Table (A2) |
| <input checked="" type="checkbox"/> Saturation (A3) |
| <input type="checkbox"/> Water Marks (B1) |
| <input type="checkbox"/> Sediment Deposits (B2) |
| <input type="checkbox"/> Drift Deposits (B3) |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) |
| <input checked="" type="checkbox"/> Iron Deposits (B5) |
| <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input checked="" type="checkbox"/> Water-Stained Leaves (B9) |

- | |
|---|
| <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input checked="" type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <u>X</u>	No <u> </u>	Depth (inches): <u>3</u>
Water table present?	Yes <u> </u>	No <u>X</u>	Depth (inches): <u> </u>
Saturation present?	Yes <u>X</u>	No <u> </u>	Depth (inches): <u>6</u>

 (includes capillary fringe)
Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Greentown/Howard County Sampling Date: 10/6/14
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland A - Wet Out
 Investigator(s): Tyler Rankin/Geoffrey Palmer Section, Township, Range: S29/T6N/R5E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None
 Slope (%): 0 Lat: 39.939962 Long: -84.333436 Datum: NAD 83
 Soil Map Unit Name MoA - Millsdale silty clay loam, 0 to 2 percent slopes NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u> </u>
Hydric soil present? <u>N</u>	
Indicators of wetland hydrology present? <u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across all Strata: <u>4</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>0.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u> = Total Cover			Prevalence Index Worksheet Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>100</u> x 4 = <u>400</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>100</u> (A) <u>400</u> (B) Prevalence Index = B/A = <u>4.00</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1					
2					
3					
4					
5					
		<u>0</u> = Total Cover			
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u> </u> Dominance test is >50% <u> </u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Poa annua</u>	<u>40</u>	<u>Y</u>	<u>FACU</u>	
2	<u>Viola canadensis</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3	<u>Plantago lanceolata</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4	<u>Trifolium repens</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
5					
6					
7					
8					
9					
10					
		<u>100</u> = Total Cover			
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>N</u>
1					
2					
		<u>0</u> = Total Cover			

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

SOIL

Sampling Point: 'etland A - Wet O

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/3	90	10 YR 4/2	10	RM	M	Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____
Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:Primary Indicators (minimum of one is required; check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Water table present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Saturation present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____

 (includes capillary fringe)
Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Greentown/Howard County Sampling Date: 10/6/14
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland B - Wet In
 Investigator(s): Tyler Rankin/Geoffrey Palmer Section, Township, Range: S3/T6N/R5E
 Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave
 Slope (%): 0 Lat: 39.997935 Long: -84.303122 Datum: NAD 83
 Soil Map Unit Name Ee - Eel Silt Loam NWI Classification: PEM

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland A</u>
Hydric soil present? <u>Y</u>	
Indicators of wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		Prevalence Index Worksheet Total % Cover of: OBL species <u>80</u> x 1 = <u>80</u> FACW species <u>10</u> x 2 = <u>20</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>90</u> (A) <u>100</u> (B) Prevalence Index = B/A = <u>1.11</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u>X</u> Dominance test is >50% <u>X</u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Acorus calamus</u>	<u>40</u>	<u>Y</u>	<u>OBL</u>	
2	<u>Scirpus atrovirens</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3	<u>Eupatorium perfoliatum</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
4	<u>Impatiens capensis</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
5					
6					
7					
8					
9					
10					
		<u>90</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>Y</u>
1					
2					
		<u>0</u>	= Total Cover		

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

SOIL

Sampling Point: Vetland B - Wet I

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-5	10 YR 3/1	100	None				Silt Loam	
5-18	Gley 2.5/N	70	10 YR 3/6	20	C	M	Silt Loam	
			10 YR 2/1	10	RM	M	Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|--|--|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):

 Type: _____
 Depth (inches): _____
Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input checked="" type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input checked="" type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> (C6) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input checked="" type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Water table present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Saturation present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Depth (inches):	Surface

 (includes capillary fringe)
Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Greentown/Howard County Sampling Date: 10/6/14
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland b - Wet Out
 Investigator(s): Tyler Rankin/Geoffrey Palmer Section, Township, Range: S3/T6N/R5E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): None
 Slope (%): 0 Lat: 39.996765 Long: -84.303233 Datum: NAD 83
 Soil Map Unit Name Ee - Eel silt loam NWI Classification: None

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u> </u>
Hydric soil present? <u>N</u>	
Indicators of wetland hydrology present? <u>N</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across all Strata: <u>6</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>16.67%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		Prevalence Index Worksheet Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>0</u> x 2 = <u>0</u> FAC species <u>15</u> x 3 = <u>45</u> FACU species <u>110</u> x 4 = <u>440</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>125</u> (A) <u>485</u> (B) Prevalence Index = B/A = <u>3.88</u>
<u>Sapling/Shrub stratum</u> (Plot size: <u>15'</u>)					
1	<u>Acer rubrum</u>	<u>15</u>	<u>Y</u>	<u>FAC</u>	
2	<u>Robinia pseudoacacia</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3					
4					
5					
		<u>25</u>	= Total Cover		
<u>Herb stratum</u> (Plot size: <u>5'</u>)					Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u> </u> Dominance test is >50% <u> </u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Poa annua</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2	<u>Viola canadensis</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
3	<u>Plantago lanceolata</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
4	<u>Trifolium repens</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
5					
6					
7					
8					
9					
10					
		<u>100</u>	= Total Cover		
<u>Woody vine stratum</u> (Plot size: <u>15'</u>)					Hydrophytic vegetation present? <u>N</u>
1					
2					
		<u>0</u>	= Total Cover		

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

SOIL

Sampling Point: /etland b - Wet O

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-18	10 YR 4/4	100					Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils:	
<input type="checkbox"/> Histisol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R)	<div>*Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic</div>
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Dark Surface (S7) (LRR K, L)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Other (explain in remarks)	
<input type="checkbox"/> 2 cm Muck (A10)	<input type="checkbox"/> Depleted Matrix (F3)		
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)			

Restrictive Layer (if observed):	Hydric soil present? <u> N </u>
Type: _____	
Depth (inches): _____	

Remarks:

HYDROLOGY

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

Field Observations:				Indicators of wetland hydrology present? <u> N </u>
Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	
Water table present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	
Saturation present? (includes capillary fringe)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____	

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Miami County Sampling Date: 6/16/15
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland C - Wet In
 Investigator(s): Tyler Rankin/Nathan Ehlinger Section, Township, Range: S7/T5N/R6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): concave
 Slope (%): 2 Lat: 40.07827 Long: -84.245936 Datum: WGS 84
 Soil Map Unit Name _____ NWI Classification: PEM

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation _____, soil _____, or hydrology _____ significantly disturbed?

Are "normal circumstances" _____

Are vegetation _____, soil _____, or hydrology _____ naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland C</u>
Hydric soil present? <u>Y</u>	
Indicators of wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.)	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>3</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		Prevalence Index Worksheet Total % Cover of: OBL species <u>30</u> x 1 = <u>30</u> FACW species <u>70</u> x 2 = <u>140</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>100</u> (A) <u>170</u> (B) Prevalence Index = B/A = <u>1.70</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: _____ Rapid test for hydrophytic vegetation X Dominance test is >50% X Prevalence index is ≤3.0* _____ Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) _____ Problematic hydrophytic vegetation* (explain) _____ *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Phalaris arundinacea</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>	
2	<u>Carex vulpinoidea</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>	
3	<u>Carex shortiana</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
4	<u>Carex stipata</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	
5	<u>Scirpus atrovirens</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
6	<u>Iris virginica</u>	<u>5</u>	<u>N</u>	<u>OBL</u>	
7					
8					
9					
10					
		<u>100</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>Y</u>
1					
2					
		<u>0</u>	= Total Cover		

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

SOIL

Sampling Point: Vetland C - Wet I

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-16	10 YR 4/2	80	10 YR 5/6	20	C	M	Silt Loam	
							Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- ☐ Histisol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ 5 cm Mucky Peat or Peat (S3)
- ☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- ☐ Coast Prairie Redox (A16) (LRR K, L, R)
☐ Dark Surface (S7) (LRR K, L)
☐ Iron-Manganese Masses (F12) (LRR K, L, R)
☐ Very Shallow Dark Surface (TF12)
☐ Other (explain in remarks)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
☐ High Water Table (A2)
☒ Saturation (A3)
☐ Water Marks (B1)
☐ Sediment Deposits (B2)
☐ Drift Deposits (B3)
☐ Algal Mat or Crust (B4)
☐ Iron Deposits (B5)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Sparsely Vegetated Concave Surface (B8)
☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
☐ True Aquatic Plants (B14)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizospheres on Living Roots (C3)
☐ Presence of Reduced Iron (C4)
☐ Recent Iron Reduction in Tilled Soils (C6)
☐ Thin Muck Surface (C7)
☐ Gauge or Well Data (D9)
☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
☒ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Stunted or Stressed Plants (D1)
☒ Geomorphic Position (D2)
☒ FAC-Neutral Test (D5)

Field Observations:

Surface water present? Yes No X Depth (inches):
 Water table present? Yes No X Depth (inches):
 Saturation present? Yes X No Depth (inches): 6
 (includes capillary fringe)

Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton - Eldean Transmission Line Proje City/County: Miami County Sampling Date: 6/16/15
 Applicant/Owner: Dayton Power and Light State: Ohio Sampling Point: Wetland C - Wet out
 Investigator(s): Tyler Rankin/Nathan Ehlinger Section, Township, Range: S7/T5N/R6E
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none
 Slope (%): 2 Lat: 40.07835 Long: -84.246009 Datum: WGS 84
 Soil Map Unit Name MoA - Millsdale silty clay loam, 0 to 2 percent slopes NWI Classification: PEM

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	<u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u> </u>
Hydric soil present?	<u>N</u>	
Indicators of wetland hydrology present?	<u>N</u>	

Remarks: (Explain alternative procedures here or in a separate report.)

Corresponding Upland Data point for Wetland A along alternate route

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A) Total Number of Dominant Species Across all Strata: <u>3</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>0.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u> = Total Cover			Prevalence Index Worksheet Total % Cover of: OBL species <u>0</u> x 1 = <u>0</u> FACW species <u>15</u> x 2 = <u>30</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>85</u> x 4 = <u>340</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>100</u> (A) <u>370</u> (B) Prevalence Index = B/A = <u>3.70</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1					
2					
3					
4					
5					
		<u>0</u> = Total Cover			
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u> </u> Dominance test is >50% <u> </u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Schedonorus arundinaceus</u>	<u>35</u>	<u>Y</u>	<u>FACU</u>	
2	<u>Lolium perenne</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
3	<u>Dactylis glomerata</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
4	<u>Phalaris arundinacea</u>	<u>15</u>	<u>N</u>	<u>FACW</u>	
5					
6					
7					
8					
9					
10					
		<u>100</u> = Total Cover			
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>N</u>
1					
2					
		<u>0</u> = Total Cover			

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

SOIL

Sampling Point: /etland C - Wet o

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-16	10 YR 4/3	100					Silt Loam	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____
Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:Primary Indicators (minimum of one is required; check all that apply)

- | | |
|--|---|
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Water table present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____
Saturation present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches):	_____

 (includes capillary fringe)
Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site West Milton-Eldean City/County: Miami County Sampling Date: 06/17/2015
 Applicant/Owner: Dayton Power & Light State: Ohio Sampling Point: Wetland D - Wet In
 Investigator(s): Tyler Rankin/Nathan Ehlinger Section, Township, Range: S29 T6N R5E
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave
 Slope (%): 2 Lat: 39.948602 Long: -84.332415 Datum: WGS 84
 Soil Map Unit Name BgmA-Blount silt loam, ground moraine, 0 to 2 percent slopes NWI Classification: N/A

Are climatic/hydrologic conditions of the site typical for this time of the year? Y (If no, explain in remarks)

Are vegetation , soil , or hydrology significantly disturbed?

Are "normal circumstances"

Are vegetation , soil , or hydrology naturally problematic?

present? Yes

SUMMARY OF FINDINGS

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland D</u>
Hydric soil present? <u>Y</u>	
Indicators of wetland hydrology present? <u>Y</u>	
Remarks: (Explain alternative procedures here or in a separate report.) Intermittent stream flows through wetland	

VEGETATION -- Use scientific names of plants.

Tree Stratum	(Plot size: <u>30'</u>)	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across all Strata: <u>2</u> (B) Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		Prevalence Index Worksheet Total % Cover of: OBL species <u>35</u> x 1 = <u>35</u> FACW species <u>40</u> x 2 = <u>80</u> FAC species <u>0</u> x 3 = <u>0</u> FACU species <u>0</u> x 4 = <u>0</u> UPL species <u>0</u> x 5 = <u>0</u> Column totals <u>75</u> (A) <u>115</u> (B) Prevalence Index = B/A = <u>1.53</u>
Sapling/Shrub stratum	(Plot size: <u>15'</u>)				
1					
2					
3					
4					
5					
		<u>0</u>	= Total Cover		
Herb stratum	(Plot size: <u>5'</u>)				Hydrophytic Vegetation Indicators: <u> </u> Rapid test for hydrophytic vegetation <u>X</u> Dominance test is >50% <u>X</u> Prevalence index is ≤3.0* <u> </u> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic
1	<u>Impatiens capensis</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	
2	<u>Symplocarpus foetidus</u>	<u>15</u>	<u>Y</u>	<u>OBL</u>	
3	<u>Iris pseudacorus</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
4	<u>Phalaris arundinacea</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
5	<u>Peltandra virginica</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
6					
7					
8					
9					
10					
		<u>75</u>	= Total Cover		
Woody vine stratum	(Plot size: <u>15'</u>)				Hydrophytic vegetation present? <u>Y</u>
1					
2					
		<u>0</u>	= Total Cover		

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

SOIL

Sampling Point: Vetland D - Wet I

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-6	10YR2/1	100					Muck	
6-16	Gley 1 5/10Y	100					SiSaC	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|---|--|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):

 Type: _____
 Depth (inches): _____
Hydric soil present? Y

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | |
|--|
| <input checked="" type="checkbox"/> Surface Water (A1) |
| <input checked="" type="checkbox"/> High Water Table (A2) |
| <input checked="" type="checkbox"/> Saturation (A3) |
| <input type="checkbox"/> Water Marks (B1) |
| <input type="checkbox"/> Sediment Deposits (B2) |
| <input type="checkbox"/> Drift Deposits (B3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) |
| <input type="checkbox"/> Iron Deposits (B5) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input type="checkbox"/> Water-Stained Leaves (B9) |

- | |
|---|
| <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <u>X</u>	No <u> </u>	Depth (inches): <u>2</u>
Water table present?	Yes <u>X</u>	No <u> </u>	Depth (inches): <u>4</u>
Saturation present?	Yes <u>X</u>	No <u> </u>	Depth (inches): <u>0</u>

 (includes capillary fringe)
Indicators of wetland hydrology present? Y

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Project/Site	West Milton-Eldean Transmission Line Project		City/County:	Miami County		Sampling Date:	06/17/2015	
Applicant/Owner:	Dayton Power and Light			State:	Ohio		Sampling Point:	Wetland D - Wet Out
Investigator(s):	Tyler Rankin/Nathan Ehlinger			Section, Township, Range:	S29 T6N R5E			
Landform (hillslope, terrace, etc.):	hillslope			Local relief (concave, convex, none):	convex			
Slope (%):	3	Lat:	39.948691	Long:	-84.332295	Datum:	WGS 84	
Soil Map Unit Name MoA-				NWI Classification:	N/A			

Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation _____, soil _____, or hydrology _____ naturally problematic? Yes

(If needed, explain any answers in remarks.)

Hydrophytic vegetation present?	<u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>N/A</u>
Hydric soil present?	<u>N</u>	
Indicators of wetland hydrology present?	<u>N</u>	

Tree Stratum (Plot size: 30')		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Celtis occidentalis</i>	20	Y	FAC
2	<i>Carya ovata</i>	20	Y	FACU
3				
4				
5				
		40	= Total Cover	
Sapling/Shrub stratum (Plot size: 15')		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Lonicera morrowii</i>	30	Y	FACU
2	<i>Prunus serotina</i>	10	Y	FACU
3	<i>carya ovata</i>	10	Y	FACU
4				
5				
		50	= Total Cover	
Herb stratum (Plot size: 5')		Absolute % Cover	Dominant Species	Indicator Status
1	<i>Parthenocissus quinquefolia</i>	30	Y	FACU
2	<i>Ageratina altissima</i>	15	Y	FACU
3				
4				
5				
6				
7				
8				
9				
10				
		45	= Total Cover	
Woody vine stratum (Plot size: 15')		Absolute % Cover	Dominant Species	Indicator Status
1				
2				
		0	= Total Cover	

Dominance Test Worksheet			
Number of Dominant Species that are OBL, FACW, or FAC: 1 (A)			
Total Number of Dominant Species Across all Strata: 7 (B)			
Percent of Dominant Species that are OBL, FACW, or FAC: 14.29% (A/B)			
Prevalence Index Worksheet			
Total % Cover of:			
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column totals	135 (A)		520 (B)
Prevalence Index = B/A =			3.85
Hydrophytic Vegetation Indicators:			
<input type="checkbox"/> Rapid test for hydrophytic vegetation <input type="checkbox"/> Dominance test is >50% <input type="checkbox"/> Prevalence index is ≤3.0* <input type="checkbox"/> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic hydrophytic vegetation* (explain)			
*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic			
Hydrophytic vegetation present?			
			N

SOIL

Sampling Point: Vetland D - Out

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type*	Loc**		
0-16	10YR4/2	100					SiC	

*Type: C = Concentration, D = Depletion, RM = Reduced Matrix, MS = Masked Sand Grains. **Location: PL = Pore Lining, M = Matrix

Hydric Soil Indicators:

- | | |
|--|---|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Sandy Gleyed Matrix (S4) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Sandy Redox (S5) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Stripped Matrix (S6) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Mucky Mineral (F1) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) |
| <input type="checkbox"/> 2 cm Muck (A10) | <input type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) | |

Indicators for Problematic Hydric Soils:

- | |
|--|
| <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (explain in remarks) |

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

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric soil present? N

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- | |
|--|
| <input type="checkbox"/> Surface Water (A1) |
| <input type="checkbox"/> High Water Table (A2) |
| <input type="checkbox"/> Saturation (A3) |
| <input type="checkbox"/> Water Marks (B1) |
| <input type="checkbox"/> Sediment Deposits (B2) |
| <input type="checkbox"/> Drift Deposits (B3) |
| <input type="checkbox"/> Algal Mat or Crust (B4) |
| <input type="checkbox"/> Iron Deposits (B5) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) |
| <input type="checkbox"/> Water-Stained Leaves (B9) |

- | |
|---|
| <input type="checkbox"/> Aquatic Fauna (B13) |
| <input type="checkbox"/> True Aquatic Plants (B14) |
| <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Gauge or Well Data (D9) |
| <input type="checkbox"/> Other (Explain in Remarks) |

Secondary Indicators (minimum of two required)

- | |
|--|
| <input type="checkbox"/> Surface Soil Cracks (B6) |
| <input type="checkbox"/> Drainage Patterns (B10) |
| <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Crayfish Burrows (C8) |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1) |
| <input type="checkbox"/> Geomorphic Position (D2) |
| <input type="checkbox"/> FAC-Neutral Test (D5) |

Field Observations:

Surface water present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Water table present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Depth (inches): _____

(includes capillary fringe)

Indicators of wetland hydrology present? N

Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Site: <u>Wetland A</u>	Rater(s): <u>T. Rankin</u>	Date: <u>10/6/14</u>
------------------------	----------------------------	----------------------

2	2
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)

8	16
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)

17	27
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	
<input checked="" type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input type="checkbox"/> filling/grading <input type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

8.5	35.5
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	
<input checked="" type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input checked="" type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

35.5
subtotal this page

Site: Wetland A Rater(s): T. Rankin Date: 10/6/14

35.5
subtotal first page

0 0
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)

7 42.5
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

42.5

End of Quantitative Rating. Complete Categorization Worksheets.

Site: <u>Wetland B</u>	Rater(s): <u>T. Rankin</u>	Date: <u>10/6/14</u>
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1	1
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)

7	8
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)

10	18
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	
<input type="checkbox"/> ditch <input type="checkbox"/> tile <input type="checkbox"/> dike <input type="checkbox"/> weir <input type="checkbox"/> stormwater input	<input type="checkbox"/> point source (nonstormwater) <input checked="" type="checkbox"/> filling/grading <input checked="" type="checkbox"/> road bed/RR track <input type="checkbox"/> dredging <input type="checkbox"/> other _____

16	34
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	
<input type="checkbox"/> mowing <input type="checkbox"/> grazing <input type="checkbox"/> clearcutting <input type="checkbox"/> selective cutting <input type="checkbox"/> woody debris removal <input type="checkbox"/> toxic pollutants	<input type="checkbox"/> shrub/sapling removal <input type="checkbox"/> herbaceous/aquatic bed removal <input type="checkbox"/> sedimentation <input type="checkbox"/> dredging <input type="checkbox"/> farming <input type="checkbox"/> nutrient enrichment

34
subtotal this page

Site: <u>Wetlands</u>	Rater(s): <u>T. Rankin</u>	Date: <u>10/6/14</u>
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34

subtotal first page

0	34
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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)

4	38
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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) Interspersion.

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

38

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland C	Rater(s): Tyler Rankin	Date: 6/16/15
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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)

7	7
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)

13	20
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	
<input type="checkbox"/> ditch	<input type="checkbox"/> point source (nonstormwater)
<input checked="" type="checkbox"/> tile	<input type="checkbox"/> filling/grading
<input type="checkbox"/> dike	<input type="checkbox"/> road bed/RR track
<input type="checkbox"/> weir	<input type="checkbox"/> dredging
<input type="checkbox"/> stormwater input	<input type="checkbox"/> other _____

7	27
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	
<input checked="" type="checkbox"/> mowing	<input type="checkbox"/> shrub/sapling removal
<input checked="" type="checkbox"/> grazing	<input type="checkbox"/> herbaceous/aquatic bed removal
<input type="checkbox"/> clearcutting	<input type="checkbox"/> sedimentation
<input type="checkbox"/> selective cutting	<input type="checkbox"/> dredging
<input type="checkbox"/> woody debris removal	<input type="checkbox"/> farming
<input type="checkbox"/> toxic pollutants	<input type="checkbox"/> nutrient enrichment

27
subtotal this page

Site: WETLAND C	Rater(s): Tyler Rankin	Date: 6/16/15
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27

subtotal first page

0

27

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)

0

27

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) Interspersion.

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

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 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

27

End of Quantitative Rating. Complete Categorization Worksheets.

Site: Wetland D**Rater(s):** Nathan Ehlinger**Date:** 6/17/15**2****2**

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)

8**10**

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)

20**30**

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

13**43**

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

43

subtotal this page

Site: WETLAND D	Rater(s): Nathan Ehlinger	Date: 6/17/15
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43

subtotal first page

0 43

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)

2 45

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

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's 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

45

End of Quantitative Rating. Complete Categorization Worksheets.

APPENDIX 8-2

Stream QHEI and HHEI Data Forms



Primary Headwater Habitat Evaluation Form

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

36

SITE NAME/LOCATION **Stream 1**

SITE NUMBER **126** RIVER BASIN **Great Miami** DRAINAGE AREA (mi²) **0.25**

LENGTH OF STREAM REACH (ft) **126** LAT. **39.95103** LONG. **-84.35072** RIVER CODE **1** RIVER MILE **1**

DATE **10/06/14** SCORER **TER** COMMENTS **Channelized Drainage Ditch**

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

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

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text" value="0%"/>	<input checked="" type="checkbox"/> SILT [3 pt]	<input type="text" value="50%"/>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text" value="0%"/>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text" value="0%"/>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text" value="10%"/>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text" value="0%"/>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> MUCK [0 pts]	<input type="text" value="0%"/>
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text" value="20%"/>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text" value="0%"/>

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **10.00%**

(A)

Substrate Percentage Check

(B)

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

HHEI Metric Points

Substrate Max = 40

16

A + B

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

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

Pool Depth Max = 30

0

COMMENTS **Channelized drainage ditch within Aq fields** MAXIMUM POOL DEPTH (centimeters): **0**

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

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

Bankfull Width Max=30

20

COMMENTS **Channelized drainage ditch within Aq fields** AVERAGE BANKFULL WIDTH (meters): **2.10**

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 type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

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

COMMENTS **Channelized drainage ditch within Aq fields**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS **Channelized drainage ditch within Aq fields**SINUOSITY (Number of bends per 61 m (200 ft) of channel) (Check *ONLY* one box):

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

STREAM GRADIENT ESTIMATE

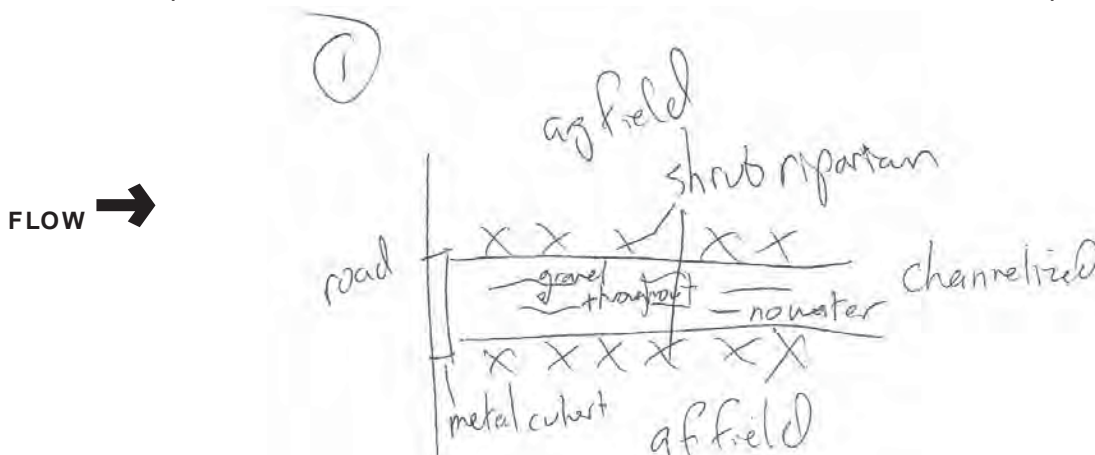
<input checked="" type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
--	---	---	---	--

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

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	Stillwater River	Distance from Evaluated Stream	1.79

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **West Milton** NRCS Soil Map Page: NRCS Soil Map Stream Order
County: **Miami** Township / City: **Union****MISCELLANEOUS**Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: **10/06/14** Quantity: **0.03**Photograph Information: **See Photograph Appendix**Elevated Turbidity? (Y/N): ☒ N Canopy (% open): **50%**Were samples collected for water chemistry? (Y/N): ☒ N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) ☒ Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): ☒ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Salamanders Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N
Frogs or Tadpoles Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ NComments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

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

50

SITE NAME/LOCATION **Stream 2**

SITE NUMBER **106** RIVER BASIN **Great Miami** DRAINAGE AREA (mi²) **0.25**

LENGTH OF STREAM REACH (ft) **106** LAT. **39.96731** LONG. **-84.35123** RIVER CODE **106** RIVER MILE **106**

DATE **10/06/14** SCORER **TER** COMMENTS **Channelized Drainage Ditch**

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

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

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

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **30.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **21**TOTAL NUMBER OF SUBSTRATE TYPES: **4**

HHEI Metric Points

Substrate Max = 40

25

A + B

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

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

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

0

Pool Depth Max = 30

0

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

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

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

3.50

Bankfull Width Max=30

25

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Moderate 5-10m
<input checked="" type="checkbox"/>	<input 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 type="checkbox"/>	<input checked="" type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

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

COMMENTS: **Channelized drainage ditch along side**FLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS:

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

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

STREAM GRADIENT ESTIMATE

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

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

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	Stillwater River	Distance from Evaluated Stream	1.61

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: West Milton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Miami Township / City: Union**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 10/06/14 Quantity: 0.03Photograph Information: See Photograph AppendixElevated Turbidity? (Y/N): N Canopy (% open): 20%Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) NComments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

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

45

SITE NAME/LOCATION **Stream 3**

SITE NUMBER RIVER BASIN **Great Miami** DRAINAGE AREA (mi²) **0.15**

LENGTH OF STREAM REACH (ft) **200** LAT. **39.99503** LONG. **-84.31362** RIVER CODE RIVER MILE

DATE **10/06/14** SCORER **TER** COMMENTS

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

STREAM CHANNEL MODIFICATIONS:

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

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

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

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **40.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

21

TOTAL NUMBER OF SUBSTRATE TYPES:

4

HHEI Metric Points

Substrate Max = 40

25

A + B

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

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

Pool Depth Max = 30

0

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

0

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

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

Bankfull Width Max=30

20

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

3.50

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input type="checkbox"/>	Wide >10m	<input type="checkbox"/>	<input type="checkbox"/>	Mature Forest, Wetland	<input type="checkbox"/>	<input type="checkbox"/>	Conservation Tillage
<input checked="" type="checkbox"/>	<input checked="" 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 culverted stream coming from drain tilesFLOW REGIME (At Time of Evaluation) (Check *ONLY* one box):

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

COMMENTS

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

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

STREAM GRADIENT ESTIMATE

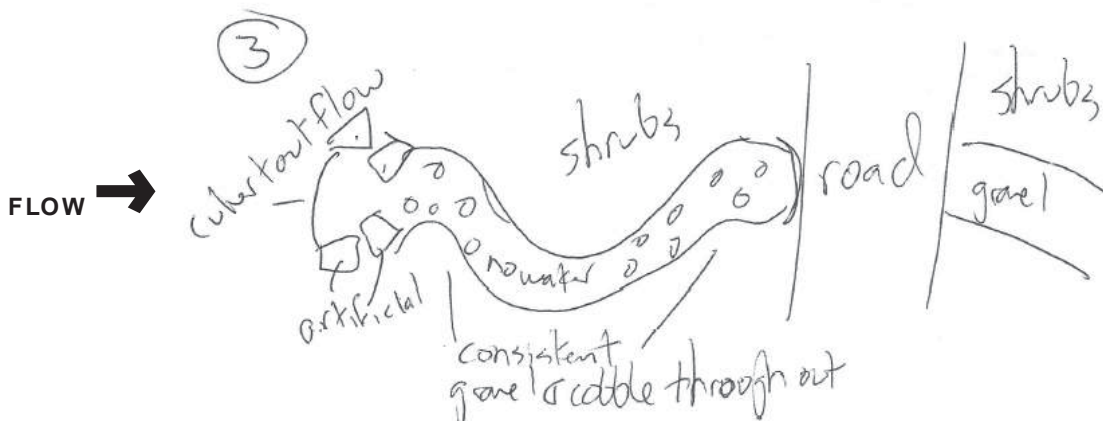
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

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

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	Stillwater River	Distance from Evaluated Stream	0.09

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: West Milton NRCS Soil Map Page: NRCS Soil Map Stream Order
County: Miami Township / City: Union**MISCELLANEOUS**Base Flow Conditions? (Y/N): Y Date of last precipitation: 10/06/14 Quantity: 0.03Photograph Information: See Photograph AppendixElevated Turbidity? (Y/N): N Canopy (% open): 20%Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) NComments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

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

70

SITE NAME/LOCATION **Stream 4**

SITE NUMBER RIVER BASIN **Great Miami** DRAINAGE AREA (mi²) **0.50**

LENGTH OF STREAM REACH (ft) **200** LAT. **39.99781** LONG. **-84.30382** RIVER CODE RIVER MILE

DATE **10/06/14** SCORER **TER** COMMENTS

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

STREAM CHANNEL MODIFICATIONS:

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

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<input type="text"/> 0%	<input type="checkbox"/> SILT [3 pt]	<input type="text"/> 10%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<input type="text"/> 0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<input type="text"/> 0%
<input type="checkbox"/> BEDROCK [16 pt]	<input type="text"/> 0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	<input type="text"/> 0%
<input checked="" type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<input type="text"/> 30%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<input type="text"/> 0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<input type="text"/> 50%	<input type="checkbox"/> MUCK [0 pts]	<input type="text"/> 0%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	<input type="text"/> 10%	<input type="checkbox"/> ARTIFICIAL [3 pts]	<input type="text"/> 0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **30.00%**

(A)

Substrate Percentage Check

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

21

TOTAL NUMBER OF SUBSTRATE TYPES:

4

HHEI Metric Points

Substrate Max = 40

25

A + B

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

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

Pool Depth Max = 30

25

COMMENTS

MAXIMUM POOL DEPTH (centimeters):

20

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

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

Bankfull Width Max=30

20

COMMENTS

AVERAGE BANKFULL WIDTH (meters):

2.80

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Wide >10m
<input type="checkbox"/>	<input type="checkbox"/>	Moderate 5-10m
<input 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 checked="" type="checkbox"/>	Mature Forest, Wetland
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Immature Forest, Shrub or Old Field
<input type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

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

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

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

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

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

STREAM GRADIENT ESTIMATE

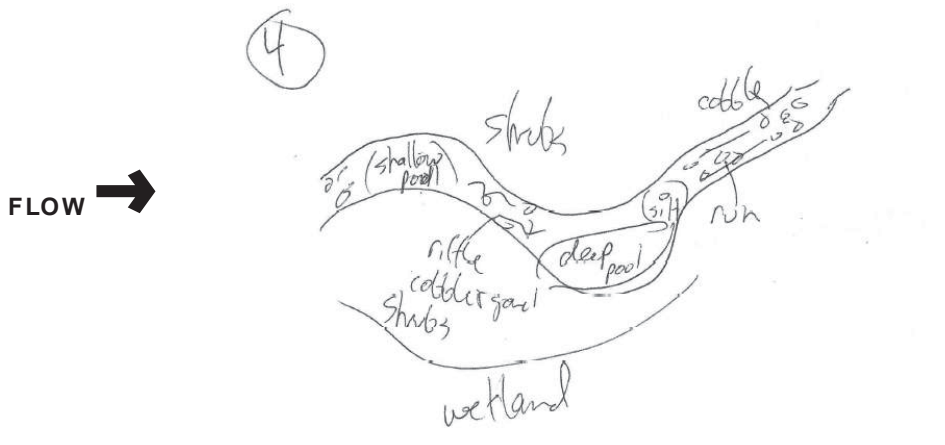
☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☒ Moderate (2 ft/100 ft) ☐ Moderate to Severe ☐ Severe (10 ft/100 ft)

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

<input type="checkbox"/> WWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> CWH Name:	<input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input checked="" type="checkbox"/> EWH Name:	Stillwater River	Distance from Evaluated Stream	0.61

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **West Milton** NRCS Soil Map Page: NRCS Soil Map Stream Order
County: **Miami** Township / City: **Union****MISCELLANEOUS**Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: **10/06/14** Quantity: **0.03**Photograph Information: **See Photograph Appendix**Elevated Turbidity? (Y/N): ☒ N Canopy (% open): **20%**Were samples collected for water chemistry? (Y/N): ☒ N (Note lab sample no. or id. and attach results) Lab Number: Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm) Is the sampling reach representative of the stream (Y/N) ☒ Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): ☒ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)Fish Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Salamanders Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N
Frogs or Tadpoles Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ N Aquatic Macroinvertebrates Observed? (Y/N) ☒ N Voucher? (Y/N) ☒ NComments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



Stream & Location: Stream 5

RM: _ _ _ _ Date: 10 / 6 / 14

Stillwater River

Scorers Full Name & Affiliation:

River Code: - - - -

STORET #: - - - -

Lat./ Long.: 39.99456/-84.31584

Office verified location ☒

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

Check ONE (Or 2 & average)

BEST TYPES		POOL RIFFLE		OTHER TYPES		POOL RIFFLE		ORIGIN		QUALITY		Substrate 13 Maximum 20
<input type="checkbox"/>	BLDR /SLABS [10]	5	5	<input type="checkbox"/>	HARDPAN [4]	<input type="checkbox"/>	POOL RIFFLE	<input type="checkbox"/>	LIMESTONE [1]	<input type="checkbox"/>	HEAVY [-2]	
<input type="checkbox"/>	BOULDER [9]	10	10	<input type="checkbox"/>	DETRITUS [3]	<input type="checkbox"/>		<input checked="" type="checkbox"/>	TILLS [1]	<input type="checkbox"/>	MODERATE [-1]	
<input checked="" type="checkbox"/>	COBBLE [8]	30	30	<input type="checkbox"/>	MUCK [2]	<input type="checkbox"/>		<input type="checkbox"/>	WETLANDS [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
<input type="checkbox"/>	GRAVEL [7]	5	5	<input checked="" type="checkbox"/>	SILT [2]	30	30	<input type="checkbox"/>	HARDPAN [0]	<input type="checkbox"/>	FREE [1]	
<input type="checkbox"/>	SAND [6]	20	20	<input type="checkbox"/>	ARTIFICIAL [0]			<input type="checkbox"/>	SANDSTONE [0]	<input type="checkbox"/>	EXTENSIVE [-2]	
<input type="checkbox"/>	BEDROCK [5]							<input type="checkbox"/>	RIP/RAP [0]	<input checked="" type="checkbox"/>	MODERATE [-1]	
(Score natural substrates; ignore sludge from point-sources)								<input type="checkbox"/>	LACUSTURINE [0]	<input checked="" type="checkbox"/>	NORMAL [0]	
NUMBER OF BEST TYPES: <input checked="" type="checkbox"/> 4 or more [2] <input type="checkbox"/> 3 or less [0]								<input type="checkbox"/>	SHALE [-1]	<input type="checkbox"/>	NONE [1]	
Comments								<input type="checkbox"/>	COAL FINES [-2]			

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

Check ONE (Or 2 & average)

3	UNDERCUT BANKS [1]	3	POOLS > 70cm [2]		OXBOWS, BACKWATERS [1]	<input type="checkbox"/>	EXTENSIVE >75% [11]
3	OVERHANGING VEGETATION [1]	1	ROOTWADS [1]	2	AQUATIC MACROPHYTES [1]	<input checked="" type="checkbox"/>	MODERATE 25-75% [7]
	SHALLOWS (IN SLOW WATER) [1]	1	BOULDERS [1]	2	LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/>	SPARSE 5-<25% [3]
2	ROOTMATS [1]					<input type="checkbox"/>	NEARLY ABSENT <5% [1]

Comments

Cover
Maximum
20
15

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 type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input checked="" type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input checked="" type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments

Channel
Maximum
20
9

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

River right looking downstream

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY			
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input checked="" type="checkbox"/>	FOREST, SWAMP [3]	<input type="checkbox"/>	CONSERVATION TILLAGE [1]		
<input checked="" type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/>	SHRUB OR OLD FIELD [2]	<input type="checkbox"/>	URBAN OR INDUSTRIAL [0]		
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/>	RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/>	MINING / CONSTRUCTION [0]		
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/>	FENCED PASTURE [1]				
	<input type="checkbox"/> NONE [0]	<input type="checkbox"/>	OPEN PASTURE, ROWCROP [0]				

Comments

residential and agricultural land uses beyond 100m

Indicate predominant land use(s) past 100m riparian.

Riparian
Maximum
10
8

5] POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

- ☒ > 1m [6]
☐ 0.7-<1m [4]
☐ 0.4-<0.7m [2]
☐ 0.2-<0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 & average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]
☒ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1] ☒ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☒ FAST [1] ☐ INTERMITTENT [-2]
☒ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

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

Comments

Pool /
Current
Maximum
12
10

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

Check ONE (Or 2 & average).

☐ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input checked="" type="checkbox"/> BEST AREAS > 10cm [2]	<input checked="" 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 type="checkbox"/> MAXIMUM < 50cm [1]	<input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> BEST AREAS < 5cm [metric=0]		<input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]	<input checked="" type="checkbox"/> MODERATE [0]
			<input type="checkbox"/> EXTENSIVE [-1]

Comments

Riffle /
Run
Maximum
8
5

6] GRADIENT (8 ft/mi)

DRAINAGE AREA

(601 mi²)

- ☐ VERY LOW - LOW [2-4]
☐ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]

%POOL: 20

%GLIDE:

%RUN: 60

%RIFFLE: 20

Gradient
Maximum
10
10

AJ 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

CLARITY

- 1st --sample pass-- 2nd
☐ < 20 cm
☒ 20-40 cm
☐ 40-70 cm
☐ > 70 cm/ CTB
☐ SECCHI DEPTH

meters

CANOPY

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

CJ RECREATION

POOL: ☐ >100R2 ☐ >3ft

BJ AESTHETICS

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

DJ 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

EJ ISSUES

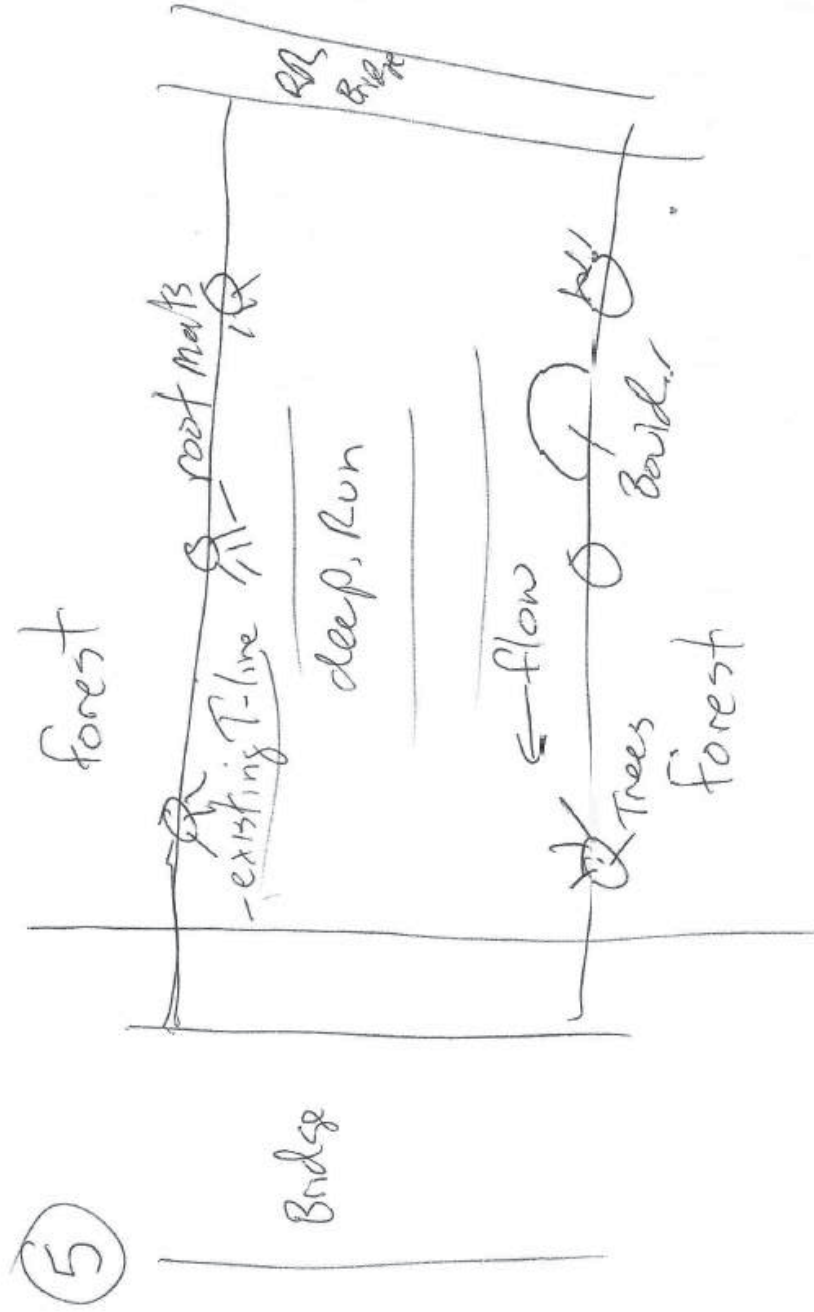
- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT&GRIME
CONTAMINATED / LANDFILL
BMPs-CONSTRUCTION-SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF / LAWN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

FJ MEASUREMENTS

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

Legacy Tree:

Stream Drawing:



Stream & Location: Stream 5-00 (Stream 6) RM: Date: 06/17/06 15DPL West Milton - Eldon Scorers Full Name & Affiliation: Nathan Ehlinger POWER Eng.River Code: STORET #: Lat./Long.: 39.9484/84.3322 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR /SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate 15 Maximum 20
<input type="checkbox"/> BOULDER [9]	<input type="checkbox"/> DETRITUS [3]	<input type="checkbox"/> MUCK [2]	<input type="checkbox"/> SILT [2]	<input checked="" type="checkbox"/> TILLS [1]	<input type="checkbox"/> WETLANDS [0]	<input type="checkbox"/> MODERATE [-1]	
<input checked="" type="checkbox"/> COBBLE [8]	<u>20</u>	<input type="checkbox"/> ARTIFICIAL [0]	<input type="checkbox"/> SANDSTONE [0]	<input type="checkbox"/> HARDPAN [0]	<input type="checkbox"/> RIP/RAP [0]	<input checked="" type="checkbox"/> NORMAL [0]	
<input checked="" type="checkbox"/> GRAVEL [7]	<u>70</u>		<input type="checkbox"/> LACUSTURINE [0]	<input type="checkbox"/> SHALE [-1]	<input type="checkbox"/> COAL FINES [-2]	<input type="checkbox"/> EXTENSIVE [-2]	
<input checked="" type="checkbox"/> SAND [6]	<u>75</u>					<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> BEDROCK [5]	<u>10</u>					<input type="checkbox"/> NONE [1]	

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.

Check ONE (Or 2 & average)

AMOUNT	
<input type="checkbox"/> UNDERCUT BANKS [1]	<input type="checkbox"/> POOLS > 70cm [2]
<input type="checkbox"/> OVERHANGING VEGETATION [1]	<input type="checkbox"/> ROOTWADS [1]
<input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]	<input type="checkbox"/> BOULDERS [1]
<input type="checkbox"/> ROOTMATS [1]	<input type="checkbox"/> OXBOWS, BACKWATERS [1]
	<input type="checkbox"/> AQUATIC MACROPHYTES [1]
	<input type="checkbox"/> LOGS OR WOODY DEBRIS [1]

Comments:

Cover
Maximum
20
5

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 checked="" type="checkbox"/> MODERATE [3]	<input type="checkbox"/> GOOD [5]	<input checked="" type="checkbox"/> RECOVERED [4]	<input checked="" type="checkbox"/> MODERATE [2]
<input type="checkbox"/> LOW [2]	<input checked="" type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input 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
12

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

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]
<input checked="" type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]
	<input type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]

Comments:

Indicate predominant land use(s) past 100m riparian.
Riparian
Maximum
10
6.5

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 type="checkbox"/> 0.7-<1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input checked="" type="checkbox"/> SLOW [1]
<input checked="" type="checkbox"/> 0.4-<0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]	<input type="checkbox"/> VERY FAST [1]
<input type="checkbox"/> 0.2-<0.4m [1]		<input checked="" type="checkbox"/> FAST [1]
<input type="checkbox"/> < 0.2m [0]		<input type="checkbox"/> INTERSTITIAL [-1]
		<input type="checkbox"/> INTERMITTENT [-2]
		<input checked="" type="checkbox"/> MODERATE [1]
		<input type="checkbox"/> EDDIES [1]

Comments:

Recreation Potential
Primary Contact
Secondary Contact
(circle one and comment on bank)Pool /
Current
Maximum
12
7

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

Check ONE (Or 2 & average)

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input type="checkbox"/> BEST AREAS > 10cm [2]	<input type="checkbox"/> MAXIMUM > 50cm [2]	<input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]	<input checked="" type="checkbox"/> NONE [2]
<input checked="" 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 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
56) GRADIENT (/ 0 ft/mi) ☐ VERY LOW - LOW [2-4]
DRAINAGE AREA (4.5 mi²) ☒ MODERATE [6-10]
☐ HIGH - VERY HIGH [10-6]%POOL: **15** %GLIDE: **35**
%RUN: **25** %RIFFLE: **25**Gradient
Maximum
10
7

A) SAMPLED REACH

Check ALL that apply

METHOD

- ☐ BOAT
☒ WADE
☐ L. LINE
☐ OTHER

STAGE

- 1st - sample past - 2nd
☐ HIGH
☒ UP
☐ NORMAL
☐ LOW
☐ DRY

DISTANCE

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

CLARITY

- 1st - sample past - 2nd
☐ < 20 cm
☐ 20 - < 40 cm
☐ 40 - 70 cm
☐ > 70 cm / CTB
☐ SECCHI DEPTH

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
☐ ARMORED / SLUMPS
☐ ISLANDS / SCOURED
☐ IMPOUNDED / DESICCATED
☐ FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

E) ISSUES

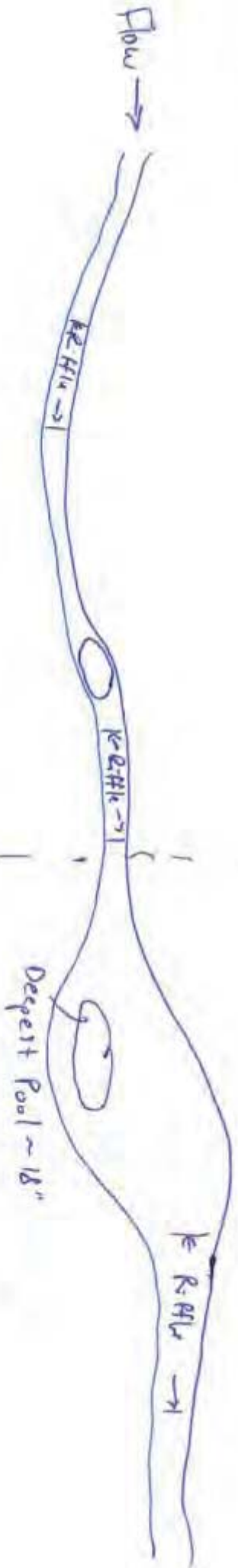
- WWTP / CSO / NPDES / INDUSTRY
HARDENED / URBAN / DIRT & GRIME
CONTAMINATED / LANDFILL
BMPs - CONSTRUCTION - SEDIMENT
LOGGING / IRRIGATION / COOLING
BANK / EROSION / SURFACE
FALSE BANK / MANURE / LAGOON
WASH H₂O / TILE / H₂O TABLE
ACID / MINE / QUARRY / FLOW
NATURAL / WETLAND / STAGNANT
PARK / GOLF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

F) MEASUREMENTS

- \bar{x} width
 \bar{x} depth
max. depth
 \bar{x} bankfull width
bankfull \bar{x} depth
W/D ratio
bankfull max. depth
floodprone \bar{x}^2 width
entrench. ratio
Legacy Tree:

Stream Drawing:

N ↑



Open Pasture

Forested

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

Stream reach observed is partially in open pasture with riparian forested area

Stream & Location: Stream 5-DG-A - Siegel Property RM: --- Date: 11/19/14
 Map: DPel - West Milton - Elean Scorers Full Name & Affiliation: Tyler Rankin, Powell Engineering
 River Code: --- STORET #: --- Lat/Long: 40.0631 184.2736 Office Address: ---

1) SUBSTRATE

Check ONLY Two substrate TYPE BOXES, estimate % or note every type present

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
	POOL RIFFLE		POOL RIFFLE				
<input type="checkbox"/> BLDR / SLABS [10]	<u>---</u>	<input type="checkbox"/> HARDPAN [4]	<u>---</u>	<input type="checkbox"/> LIMESTONE [1]	<u>---</u>	<input type="checkbox"/> HEAVY [-2]	<u>---</u>
<input type="checkbox"/> BOULDER [8]	<u>---</u>	<input type="checkbox"/> DETRITUS [3]	<u>---</u>	<input type="checkbox"/> TILLS [1]	<u>---</u>	<input type="checkbox"/> MODERATE [-1]	<u>---</u>
<input checked="" type="checkbox"/> COBBLE [8]	<u>15</u>	<input type="checkbox"/> MUCK [2]	<u>---</u>	<input type="checkbox"/> WETLANDS [2]	<u>---</u>	<input type="checkbox"/> NORMAL [2]	<u>---</u>
<input checked="" type="checkbox"/> GRAVEL [7]	<u>40</u>	<input checked="" type="checkbox"/> SILT [2]	<u>45</u>	<input type="checkbox"/> HARDPAN [2]	<u>---</u>	<input type="checkbox"/> FREE [1]	<u>---</u>
<input type="checkbox"/> SAND [8]	<u>---</u>	<input type="checkbox"/> ARTIFICIAL [5]	<u>---</u>	<input type="checkbox"/> SANDSTONE [2]	<u>---</u>	<input type="checkbox"/> EXTENSIVE [-2]	<u>---</u>
<input type="checkbox"/> BEDROCK [5]	<u>---</u>			<input type="checkbox"/> RIPRAP [2]	<u>---</u>	<input type="checkbox"/> MODERATE [-1]	<u>---</u>
(Score natural substrates; ignore sludge from point-sources)				<input type="checkbox"/> LACUSTURINE [2]	<u>---</u>	<input type="checkbox"/> NORMAL [2]	<u>---</u>
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [3]				<input type="checkbox"/> SHALE [-1]	<u>---</u>	<input type="checkbox"/> NONE [1]	<u>---</u>
Comments: <u>---</u>				<input type="checkbox"/> COAL FINES [-2]	<u>---</u>		

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	
		Check ONE (Or 2 & average)	
<u>---</u> UNDERCUT BANKS [1]	<u>---</u> POOLS > 75cm [2]	<input type="checkbox"/> EXTENSIVE >75% [11]	<u>---</u>
<u>2</u> OVERHANGING VEGETATION [1]	<u>---</u> ROOTWADS [1]	<input type="checkbox"/> MODERATE 25-75% [7]	<u>---</u>
<u>---</u> SHALLOWS (IN SLOW WATER) [1]	<u>---</u> BOULDERS [1]	<input checked="" type="checkbox"/> SPARSE 5-25% [3]	<u>---</u>
<u>1</u> ROOTMATS [1]	<u>---</u>	<input type="checkbox"/> NEARLY ABSENT <5% [1]	<u>---</u>
Comments: <u>---</u>			

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 [5]	<input type="checkbox"/> HIGH [3]
<input type="checkbox"/> MODERATE [2]	<input type="checkbox"/> GOOD [5]	<input type="checkbox"/> RECOVERED [4]	<input type="checkbox"/> MODERATE [2]
<input checked="" type="checkbox"/> LOW [2]	<input type="checkbox"/> FAIR [3]	<input type="checkbox"/> RECOVERING [3]	<input type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	
Comments: <u>---</u>			

4) BANK EROSION AND RIPARIAN ZONE

Check ONE in each category for EACH BANK (Or 2 per bank & average)

EROSION		RIPARIAN WIDTH		FLOOD PLAIN QUALITY	
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input type="checkbox"/> FOREST, SWAMP [3]	<input type="checkbox"/> CONSERVATION TILLAGE [1]		
<input checked="" type="checkbox"/> MODERATE [2]	<input type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]	<input type="checkbox"/> URBAN OR INDUSTRIAL [3]		
<input type="checkbox"/> HEAVY / SEVERE [1]	<input type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]	<input type="checkbox"/> MINING / CONSTRUCTION [3]		
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]			
	<input type="checkbox"/> NONE [3]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [3]			
Comments: <u>---</u>					

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH	CHANNEL WIDTH	CURRENT VELOCITY	Recreation Potential
Check ONE (ONLY)	Check ONE (Or 2 & average)	Check ALL that apply	Primary Contact
<input type="checkbox"/> > 1m [5]	<input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]	<input type="checkbox"/> TORRENTIAL [-1]	Secondary Contact
<input type="checkbox"/> 0.7-1m [4]	<input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]	<input type="checkbox"/> SLOW [1]	
<input type="checkbox"/> 0.4-0.7m [2]	<input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [3]	<input type="checkbox"/> INTERSTITIAL [-1]	
<input type="checkbox"/> 0.2-0.4m [1]		<input type="checkbox"/> INTERMITTENT [-2]	
<input type="checkbox"/> < 0.2m [0]		<input type="checkbox"/> EDGES [1]	
Indicate for reach - pools and riffles			
Comments: <u>no flow, isolated pools</u>			

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species: --- Check ONE (Or 2 & average): NO RIFFLE (metric=0)

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input 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 type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input 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 [3]
Comments: <u>currently no riffles flowing, riffles do exist in high water condition</u>			<input type="checkbox"/> EXTENSIVE [-1]

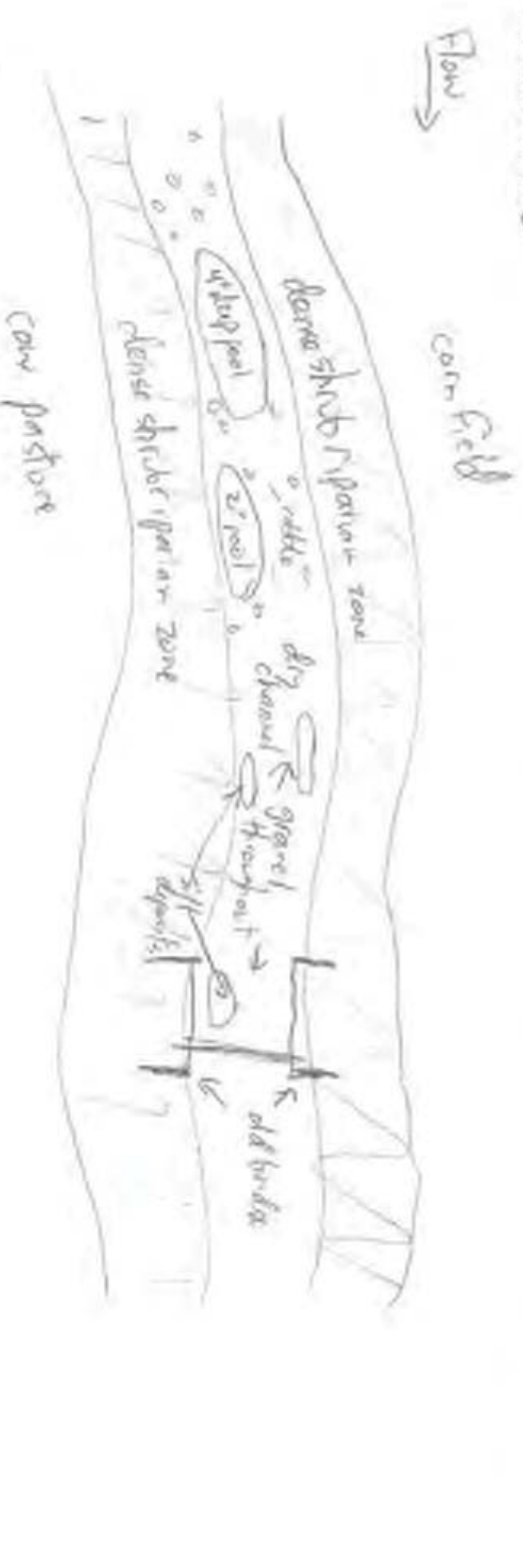
6) GRADIENT	DRAINAGE AREA	%POOL	%GLIDE	Gradient
<u>9.1</u> (ft/m)	<input type="checkbox"/> VERY LOW - LOW [2-4]	<u>30</u>	<u>---</u>	<u>8</u>
<u>11.75</u> (m²)	<input checked="" type="checkbox"/> MODERATE [5-10]	<u>40</u>	<u>30</u>	
	<input type="checkbox"/> HIGH - VERY HIGH [10-4]			

A) SAMPLED REACH

Check ALL that apply

METHOD	STAGE	CLARITY	BYAESTHETICS	DJ MAINTENANCE	EJ ISSUES	FJ MEASUREMENTS
<input type="checkbox"/> BOAT <input checked="" type="checkbox"/> WADGE <input type="checkbox"/> L. LINE <input type="checkbox"/> OTHER	<input type="checkbox"/> HIGH <input type="checkbox"/> UP <input type="checkbox"/> INCREASING <input type="checkbox"/> FLOW <input type="checkbox"/> DRY	<input type="checkbox"/> 0.5 Km <input type="checkbox"/> 0.2 Km <input checked="" type="checkbox"/> 0.1 Km <input type="checkbox"/> 0.12 Km <input type="checkbox"/> OTHER	<input type="checkbox"/> NUISANCE ALGAE <input type="checkbox"/> INVASIVE MACROPHYTES <input type="checkbox"/> EXCESS TURBIDITY <input type="checkbox"/> DISCOLORATION <input type="checkbox"/> FOAM / SCUM <input type="checkbox"/> OIL / SHEEN <input type="checkbox"/> TRASH / LITTER <input type="checkbox"/> NUISANCE COOR <input type="checkbox"/> SLUDGE DEPOSITS <input type="checkbox"/> CROWDING / OUTFALLS	<input type="checkbox"/> PUBLIC / PRIVATE / BOTH / NA <input type="checkbox"/> ACTIVE / HISTORIC / BOTH / NA <input type="checkbox"/> YOUNG-SUCCESSION-OLD <input type="checkbox"/> SHADY / SNAG / REMOVED <input type="checkbox"/> MODIFIED / DIPPED OUT / NA <input type="checkbox"/> LEVEED / ONE SIDED <input type="checkbox"/> RELOCATED / CUTOFFS <input type="checkbox"/> MOVING-BED / OLD-STABLE <input type="checkbox"/> ARMOURD / SLUMPS <input type="checkbox"/> ISLANDS / SCOURED <input type="checkbox"/> IMPOUNDED / DISLOCATED <input type="checkbox"/> FLOOD CONTROL / DRAINAGE	<input type="checkbox"/> WWTP / CSO / NPDES / INDUSTRY <input type="checkbox"/> HAZARDOUS / URBAN / DIRT/SHRINE <input type="checkbox"/> CONTAMINATED / LANDFILL <input type="checkbox"/> BARRIERS-CONSTRUCTION-SEGMENT <input type="checkbox"/> LOGGING / REGULATION / COOKING <input type="checkbox"/> BANK / EROSION / SURFACE <input type="checkbox"/> FALSE BANK / MARIJUANA / LAGOON <input type="checkbox"/> WASH H2O / TILE / H2O TABLE <input type="checkbox"/> ACID / MINE / QUARRY / FLOW <input type="checkbox"/> NATURAL / WETLAND / STAGNANT <input type="checkbox"/> PARK / GOLF / LAWN / HOME <input type="checkbox"/> ATMOSPHERE / DATA PAUCITY	<input type="checkbox"/> R width <input type="checkbox"/> R depth <input type="checkbox"/> max. depth <input type="checkbox"/> R bankfull width <input type="checkbox"/> bankfull R depth <input type="checkbox"/> W/D ratio <input type="checkbox"/> bankfull max. depth <input type="checkbox"/> floodplain x ² width <input type="checkbox"/> embank. ratio <input type="checkbox"/> Legacy Tree:

Stream Drawing:



Stream & Location: Stream S-06-BRM: _____ Date: 10/21/15D&L West Milton-Eldon Scorers Full Name & Affiliation: Nathan E. Linger POWERRiver Code: _____ STORET #: _____ Lat./Long.: 40.0529 184.2060 Office verified location ☐1] SUBSTRATE Check ONLY Two substrate TYPE BOXES;
estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES		OTHER TYPES		ORIGIN		QUALITY	
<input type="checkbox"/> BLDR / SLABS [10]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> HARDPAN [4]	<input type="checkbox"/> POOL RIFFLE	<input type="checkbox"/> LIMESTONE [1]	<input type="checkbox"/> SILT	<input type="checkbox"/> HEAVY [-2]	Substrate <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">14</div> Maximum 20
<input type="checkbox"/> BOULDER [9]	<u>10</u> <u>15</u>	<input type="checkbox"/> DETRITUS [3]		<input checked="" type="checkbox"/> TILLS [1]		<input type="checkbox"/> MODERATE [-1]	
<input type="checkbox"/> COBBLE [8]		<input type="checkbox"/> MUCK [2]		<input type="checkbox"/> WETLANDS [0]		<input checked="" type="checkbox"/> NORMAL [0]	
<input checked="" type="checkbox"/> GRAVEL [7]	<u>20</u> <u>45</u>	<input type="checkbox"/> SILT [2]	<u>35</u> <u>20</u>	<input type="checkbox"/> HARDPAN [0]		<input type="checkbox"/> FREE [1]	
<input checked="" type="checkbox"/> SAND [6]	<u>15</u> <u>20</u>	<input type="checkbox"/> ARTIFICIAL [0]		<input type="checkbox"/> SANDSTONE [0]		<input type="checkbox"/> EXTENSIVE [-2]	
<input type="checkbox"/> BEDROCK [5]		(Score natural substrates; ignore sludge from point-sources)		<input type="checkbox"/> RIP/RAP [0]		<input type="checkbox"/> MODERATE [-1]	
NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0]				<input type="checkbox"/> LACUSTURINE [0]		<input checked="" type="checkbox"/> NORMAL [0]	
Comments				<input type="checkbox"/> SHALE [-1]		<input type="checkbox"/> NONE [1]	
				<input type="checkbox"/> COAL FINES [-2]			

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

Check ONE (Or 2 & average)

<u>1</u> UNDERCUT BANKS [1]	<u>0</u> POOLS > 70cm [2]	<u>0</u> OXBOWS, BACKWATERS [1]	<input type="checkbox"/> EXTENSIVE >75% [11]
<u>1</u> OVERHANGING VEGETATION [1]	<u>1</u> ROOTWADS [1]	<u>0</u> AQUATIC MACROPHYTES [1]	<input checked="" type="checkbox"/> MODERATE 25-75% [7]
<u>0</u> SHALLOWS (IN SLOW WATER) [1]	<u>1</u> BOULDERS [1]	<u>1</u> LOGS OR WOODY DEBRIS [1]	<input type="checkbox"/> SPARSE 5-25% [3]
<u>0</u> ROOTMATS [1]			<input type="checkbox"/> NEARLY ABSENT <5% [1]

Comments

 Cover
 Maximum

11

 20

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 type="checkbox"/> LOW [1]
<input type="checkbox"/> NONE [1]	<input checked="" type="checkbox"/> POOR [1]	<input type="checkbox"/> RECENT OR NO RECOVERY [1]	

Comments

 Channel
 Maximum

9

 20

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

EROSION	RIPARIAN WIDTH	FLOOD PLAIN QUALITY
<input type="checkbox"/> NONE / LITTLE [3]	<input type="checkbox"/> WIDE > 50m [4]	<input checked="" type="checkbox"/> FOREST, SWAMP [3]
<input checked="" type="checkbox"/> MODERATE [2]	<input checked="" type="checkbox"/> MODERATE 10-50m [3]	<input type="checkbox"/> SHRUB OR OLD FIELD [2]
<input type="checkbox"/> HEAVY / SEVERE [1]	<input checked="" type="checkbox"/> NARROW 5-10m [2]	<input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]
	<input type="checkbox"/> VERY NARROW < 5m [1]	<input type="checkbox"/> FENCED PASTURE [1]
	<input type="checkbox"/> NONE [0]	<input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0]

Comments

 Indicate predominant land use(s)
 past 100m riparian.
 Riparian
 Maximum

55

 10

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

- ☐ > 1m [6]
☐ 0.7-1m [4]
☐ 0.4-0.7m [2]
☒ 0.2-0.4m [1]
☐ < 0.2m [0]

- ☒ POOL WIDTH > RIFFLE WIDTH [2]
☐ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

- ☐ TORRENTIAL [-1] ☐ SLOW [1]
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]
☐ FAST [1] ☒ INTERMITTENT [-2]
☐ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

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

 Pool /
 Current
 Maximum

1

 12

Comments

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

Check ONE (Or 2 & average).

☒ NO RIFFLE [metric=0]

RIFFLE DEPTH	RUN DEPTH	RIFFLE / RUN SUBSTRATE	RIFFLE / RUN EMBEDDEDNESS
<input 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 type="checkbox"/> MAXIMUM < 50cm [1]	<input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]	<input 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

No flow in riffle location
 Riffle /
 Run
 Maximum

0

 8
6] GRADIENT (9.1 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-5]

DRAINAGE AREA

(1.75 mi²)%POOL: 15 %GLIDE: 25%RUN: 40 %RIFFLE: 20
 Gradient
 Maximum

8

 10

A) SAMPLED REACH

Check ALL that apply

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

Channelized stream with few isolated pools in survey area.

Drainage tile outlets observed on downstream left bank.

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

CLARITY

- 1st - sample pass - 2nd
☐ < 20 cm
☐ 20-40 cm
☐ 40-70 cm
☒ > 70 cm / CTB
☐ SECCHI DEPTH

B) AESTHETICS

- ☐ NUISANCE ALGAE
☐ INVASIVE MACROPHYTES
☐ EXCESS TURBIDITY
☐ DISCOLORATION
☐ FOAM / SCUM
☐ OIL SHEEN
☐ TRASH / LITTER
☐ NUISANCE ODOR
☐ SLUDGE DEPOSITS
☐ CSOS/ISSOs/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

E) ISSUES

- ☐ WWT / 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
☐ W/D ratio
☐ bankfull max. depth
☐ floodprone \bar{x}^2 width
☐ entrench. ratio
☐ Legacy Tree:

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

C) RECREATION

- AREA DEPTH
POOL: ☐ > 100ft² ☐ > 3ft

Stream Drawing:



Row Crop

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

☐ WWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUSBase Flow Conditions? (Y/N): N Date of last precipitation: 6/17/15 Quantity: 0.47

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 40Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

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

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

Additional comments/description of pollution impacts: _____

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

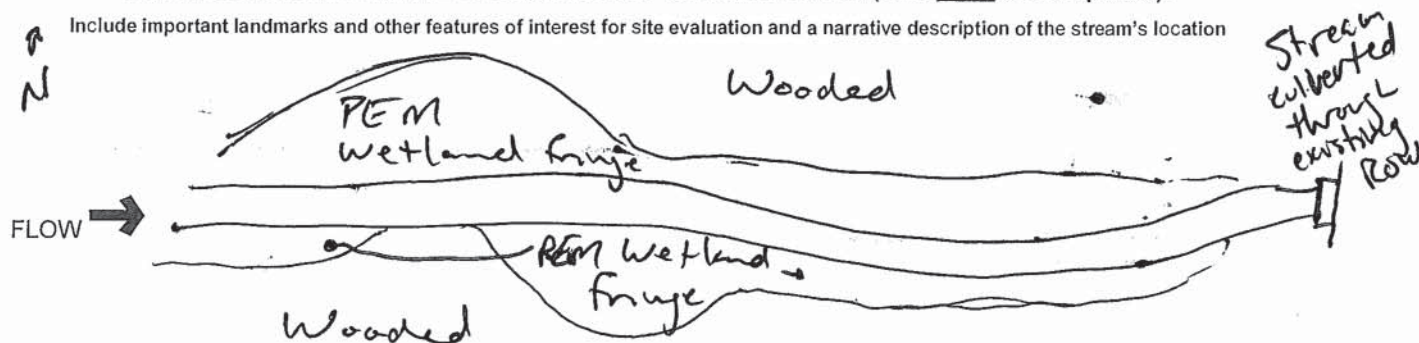
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) N Voucher? (Y/N) _____

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

Comments Regarding Biology: _____

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

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





Primary Headwater Habitat Evaluation Form

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

65

SITE NAME/LOCATION DPL West Mt. Iron - Eldon
S-003 (Stream 8) NUMBER _____ RIVER BASIN _____ DRAINAGE AREA (mi²) 1.1
LENGTH OF STREAM REACH (ft) 200 LAT. 39.950572 LONG. -84.832263 RIVER CODE _____ RIVER MILE _____
DATE 6/17/15 SCORER NLC 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 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	<u>0</u>	<input type="checkbox"/> SILT [3 pt]	<u>5</u>
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	<u>0</u>	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	<u>3</u>
<input type="checkbox"/> BEDROCK [16 pt]	<u>0</u>	<input type="checkbox"/> FINE DETRITUS [3 pts]	<u>0</u>
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	<u>21</u>	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	<u>0</u>
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	<u>47</u>	<input type="checkbox"/> MUCK [0 pts]	<u>0</u>
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	<u>24</u>	<input type="checkbox"/> ARTIFICIAL [3 pts]	<u>0</u>

Total of Percentages of
Bldr Slabs, Boulder, Cobble, Bedrock 21

(A) 15

(B) 5

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES:

TOTAL NUMBER OF SUBSTRATE TYPES:

HHEI
Metric
PointsSubstrate
Max = 4020

A + B

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

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

COMMENTS _____

MAXIMUM POOL DEPTH (centimeters):

5'Pool Depth
Max = 3025

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

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

COMMENTS _____

AVERAGE BANKFULL WIDTH (meters)

8'Bankfull
Width
Max=3020

This information must also be completed

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

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

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

<input 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 type="checkbox"/> 2.0
<input checked="" type="checkbox"/> 0.5	<input type="checkbox"/> 1.5	<input type="checkbox"/> 2.5
		<input type="checkbox"/> 3.0
		<input type="checkbox"/> >3

STREAM GRADIENT ESTIMATE

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

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

☐ VWH Name: _____ Distance from Evaluated Stream _____

☐ CWH Name: _____ Distance from Evaluated Stream _____

☐ EWH Name: _____ Distance from Evaluated Stream _____

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

USGS Quadrangle Name: _____ NRCS Soil Map Page: _____ NRCS Soil Map Stream Order _____

County: _____ Township / City: _____

MISCELLANEOUSBase Flow Conditions? (Y/N): N Date of last precipitation: 6/17/15 Quantity: 0.47

Photograph Information: _____

Elevated Turbidity? (Y/N): N Canopy (% open): 5Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: _____

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

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

Additional comments/description of pollution impacts: _____

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

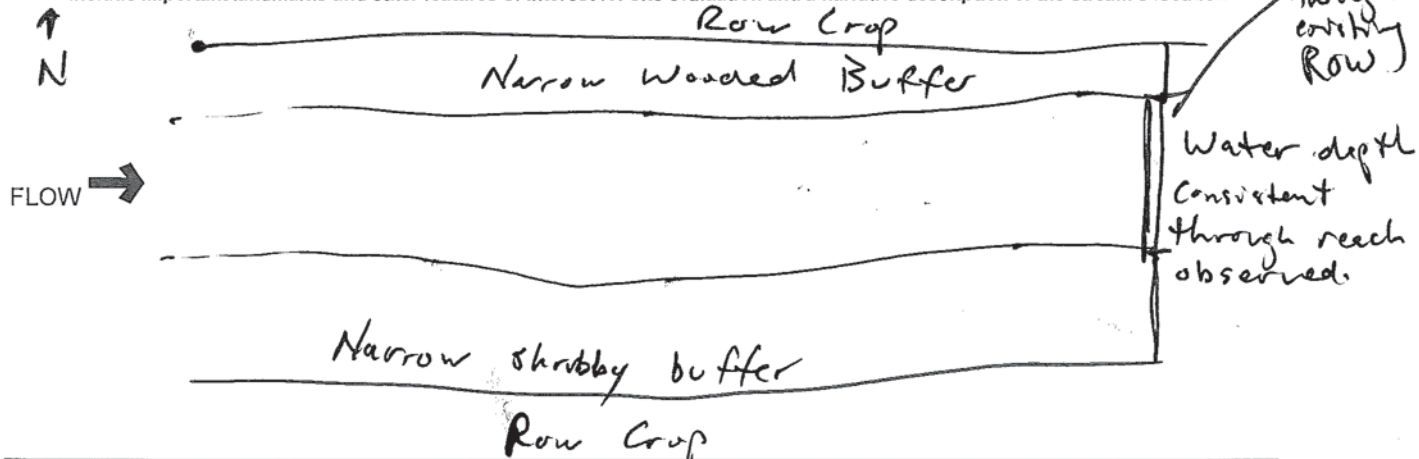
Fish Observed? (Y/N) N Voucher? (Y/N) _____ Salamanders Observed? (Y/N) N Voucher? (Y/N) _____

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

Comments Regarding Biology: _____

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

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



Stream & Location: **Stream 9 - Jones Run**RM: _____ Date: **10/1/15**

DPAL West Milton - Eldon

Scorer's Full Name & Affiliation: **Tyler Zentgraf**

River Code: _____

STORET #: _____

Lat./ Long.: **39.7912 184.2322**Office verified location ☒**1) SUBSTRATE** Check ONLY two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 & average)

BEST TYPES

- ☐ BLDR (BLATS) [10]
☐ BOULDER [8]
☒ COBBLE [8]
☒ GRAVEL [7]
☐ SAND [8]
☐ BEDROCK [5]

POOL RIFFLE

- _____
 3 10
 3.0 1.7
 1.5 2.8

OTHER TYPES

- ☐ HARDPAN [4]
☐ DETRITUS [3]
☐ MUCK [2]
☐ SILT [2]
☐ ARTIFICIAL [0]

POOL RIFFLE

- _____
 50 5

ORIGIN

- ☐ LIMESTONE [1]
☒ TILLS [1]
☐ WETLANDS [0]
☐ HARDPAN [0]
☐ SANDSTONE [2]
☐ RIPRAP [3]
☐ LACUSTURNE [2]
☐ SHALE [-1]
☐ COAL FINES [-2]

QUALITY

- ☐ HEAVY [-2]
☐ MODERATE [-1]
☐ NORMAL [0]
☐ FREE [1]
☐ EXTENSIVE [-2]
☐ MODERATE [-1]
☐ NORMAL [0]
☐ NONE [1]

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)

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)

UNDERCUT BANKS [1]

OVERHANGING VEGETATION [1]

SHALLOWS (IN SLOW WATER) [1]

ROOTMATS [1]

POOLS > 70cm [2]

ROOTWADS [1]

BOULDERS [1]

OXBOWS, BACKWATERS [1]

AQUATIC MACROPHYTES [1]

LOGS OR WOODY DEBRIS [1]

Comments _____

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

- ☐ HIGH [4]
☐ MODERATE [2]
☒ LOW [2]
☐ NONE [1]

DEVELOPMENT

- ☐ EXCELLENT [7]
☐ GOOD [5]
☒ FAIR [3]
☐ POOR [1]

CHANNELIZATION

- ☐ NONE [0]
☐ RECOVERED [4]
☐ RECOVERING [2]
☐ RECENT OR NO RECOVERY [1]

STABILITY

- ☒ HIGH [2]
☐ MODERATE [2]
☐ LOW [1]

Comments _____

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

River right looking downstream

EROSION

- ☒ NONE / LITTLE [3]
☐ MODERATE [2]
☐ HEAVY / SEVERE [1]

RIPARIAN WIDTH

- ☐ WIDE > 50m [4]
☐ MODERATE 10-50m [3]
☒ NARROW 5-10m [2]
☐ VERY NARROW < 5m [1]
☐ NONE [0]

FLOOD PLAIN QUALITY

- ☐ FOREST SWAMP [3]
☐ SHRUB OR OLD FIELD [2]
☒ RESIDENTIAL, PARK, NEW FIELD [1]
☐ FENCED PASTURE [1]
☐ OPEN PASTURE, ROWCROP [0]

- ☐ CONSERVATION TILLAGE [1]
☐ URBAN OR INDUSTRIAL [0]
☐ MINING / CONSTRUCTION [0]

Comments _____

5) POOL / GLIDE AND RIFFLE / RUN QUALITY**MAXIMUM DEPTH**

- Check ONE (ONLY)
☐ > 1m [5]
☐ 0.7-1m [4]
☐ 0.4-0.7m [3]
☒ 0.2-0.4m [1]
☐ < 0.2m [0]

CHANNEL WIDTH

- Check ONE (Or 2 & average)
☐ POOL WIDTH > RIFFLE WIDTH [2]
☒ POOL WIDTH = RIFFLE WIDTH [1]
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

- Check ALL that apply
☐ TORRENTIAL [-1]
☐ VERY FAST [1]
☐ FAST [1]
☒ MODERATE [1]
☐ SLOW [1]
☐ INTERSTITIAL [-1]
☐ INTERMITTENT [-2]
☐ EDDIES [1]

Comments _____

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

RIFFLE DEPTH

- ☐ BEST AREAS > 10cm [2]
☒ BEST AREAS 5-10cm [1]
☐ BEST AREAS < 5cm [0]

RUN DEPTH

- ☐ MAXIMUM > 50cm [2]
☒ MAXIMUM < 50cm [1]

RIFFLE / RUN SUBSTRATE

- ☐ STABLE (e.g., Cobble, Boulder) [2]
☒ MOD. STABLE (e.g., Large Gravel) [1]
☐ UNSTABLE (e.g., Fine Gravel, Sand) [0]

RIFFLE / RUN EMBEDDEDNESS

- ☐ NONE [2]
☒ LOW [1]
☐ MODERATE [0]
☐ EXTENSIVE [-1]

Comments _____

6) GRADIENT **1.36** ft/m

- ☐ VERY LOW - LOW [2-4]
☐ MODERATE [5-10]
☒ HIGH - VERY HIGH [10-4]

%POOL: **15**%GLIDE: **0**

Gradient

DRAINAGE AREA

1.85 sq ft%RUN: **40**%RIFFLE: **45**

Maximum

AJ SAMPLED REACH

Check ALL that apply

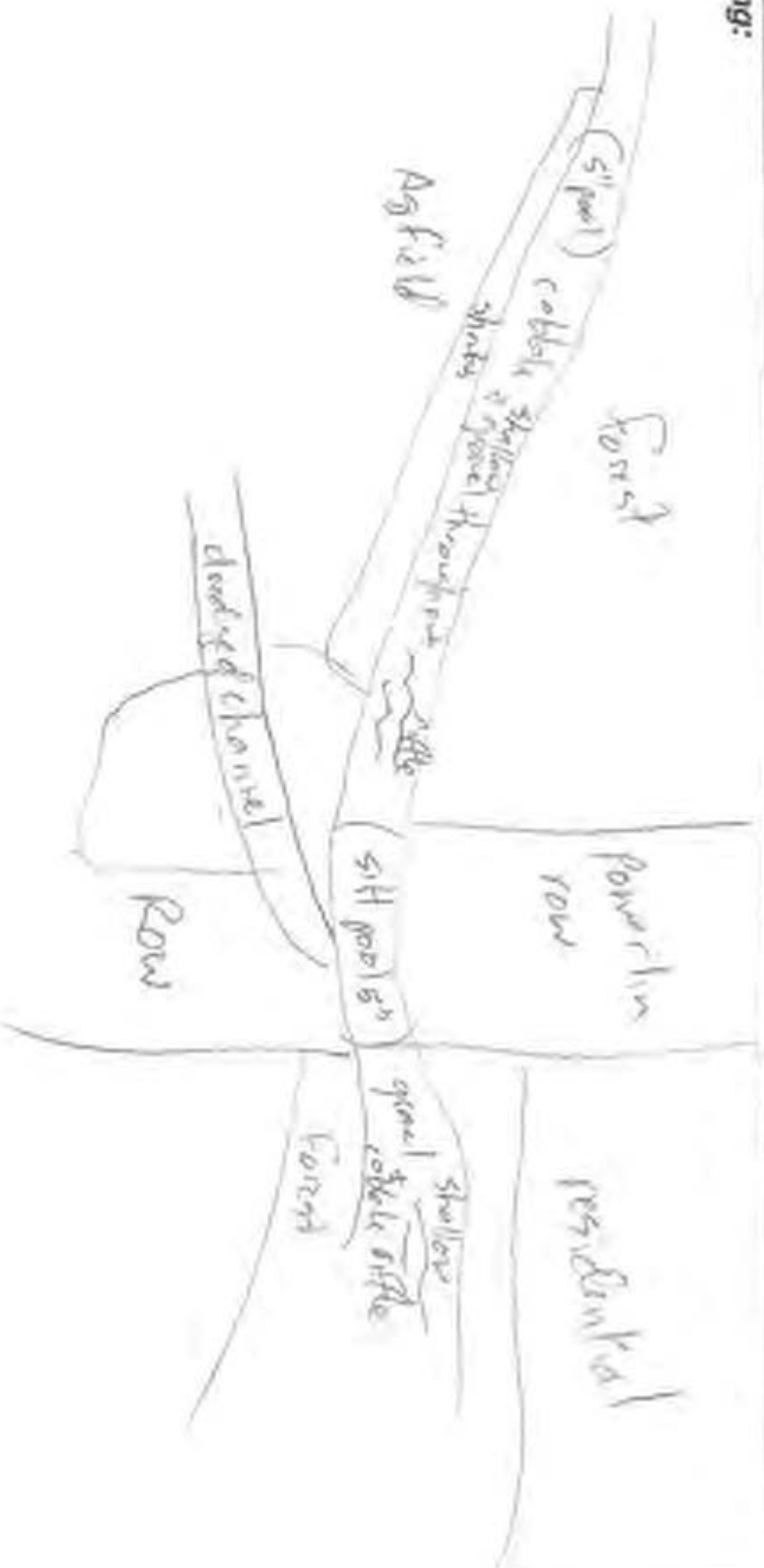
Comment (If: Reach consideration? Is reach typical of stream? Are there any concerns - inferred. Other Sampling observations, concerns, Access directions, etc.)

Reach considered in separate reach stream. Redesign & study constructed

drainage channels observed flowing into stream

METHOD	STAGE	CLARITY	BI/ESTHETICS	DJ/MAINTENANCE	Circle score & COMMENT	EJ/ISSUES	FJ/MEASUREMENTS
<input type="checkbox"/> BOAT <input type="checkbox"/> W/MADE <input type="checkbox"/> L LINE <input type="checkbox"/> OTHER	<input type="checkbox"/> HIGH <input checked="" type="checkbox"/> NORMAL <input type="checkbox"/> LOW <input type="checkbox"/> DRY	<input type="checkbox"/> 0.5 Km <input type="checkbox"/> 0.2 Km <input type="checkbox"/> 0.1 Km <input type="checkbox"/> 0.05 Km <input type="checkbox"/> OTHER	<input type="checkbox"/> NUISANCE ALGAE <input type="checkbox"/> INVASIVE MACROPHYTES <input type="checkbox"/> EXCESS TURBIDITY <input type="checkbox"/> DISCOLORATION <input type="checkbox"/> FOAM / SCUM <input type="checkbox"/> OIL SHEEN <input type="checkbox"/> TRASH / LITTER <input type="checkbox"/> NUISANCE ODOR <input type="checkbox"/> SLUDGE DEPOSITS <input type="checkbox"/> CSO/SLOW OUTFALLS	<input type="checkbox"/> FUGUE / PRIVATE / BOTH / NA <input type="checkbox"/> ACTIVE / HISTORIC / BOTH / NA <input type="checkbox"/> YOUNG-SUCCESSION-OLD <input type="checkbox"/> SPRAWL / SNAG / REMOVED <input type="checkbox"/> MODIFIED / DEPRESSED OUT / NA <input type="checkbox"/> LEVEED / ONE SIDED <input type="checkbox"/> RELOCATED / CUTOFFS <input type="checkbox"/> MC/VNO-BELOAD-STABLE <input type="checkbox"/> ARMORED / SLUMPS <input type="checkbox"/> ISLANDS / SECURED <input type="checkbox"/> IMPOUNDED / DESICCATED <input type="checkbox"/> FLOOD CONTROL / DRAINAGE		<input type="checkbox"/> WWTP / CSO / NPDES / INDUSTRY <input type="checkbox"/> HAZARDOUS / URBAN / DIRT/SURFACE <input type="checkbox"/> CONTAMINATED / LANDFILL <input type="checkbox"/> DAMS-CONSTRUCTION-SECEMENT <input type="checkbox"/> LOGGING / IRRIGATION / COOLING <input type="checkbox"/> BANK / EROSION / SURFACE <input type="checkbox"/> FALSE BANK / MAMMURE / LADDOON <input type="checkbox"/> WASH / H2O / TILE / H2O TABLE <input type="checkbox"/> ACID / MINE / QUARRY / FLOW <input type="checkbox"/> NATURAL / WETLAND / STAGNANT <input type="checkbox"/> PARK / GOLF / LAWN / HOME <input type="checkbox"/> ATMOSPHERE / DATA PAUCITY	<input type="checkbox"/> R width <input type="checkbox"/> R depth <input type="checkbox"/> max. depth <input type="checkbox"/> x bankfull width <input type="checkbox"/> bankfull x depth <input type="checkbox"/> WTD ratio <input type="checkbox"/> bankfull max. depth <input type="checkbox"/> bankfull x ² width <input type="checkbox"/> entrench. ratio Legacy Tree:

Stream Drawing:





Primary Headwater Habitat Evaluation Form

64

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

SITE NAME/LOCATION	Stream 10				
SITE NUMBER		RIVER BASIN	Great Miami		
LENGTH OF STREAM REACH (ft)	200	LAT.	39.94102	LONG.	-84.33214
DATE	07/17/15	RIVER CODE		RIVER MILE	
SCORER	TER	COMMENTS	Channelized Drainage Ditch		

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

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

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input type="checkbox"/> SILT [3 pt]	5%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	10%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	55%	<input type="checkbox"/> MUCK [0 pts]	0%
<input checked="" type="checkbox"/> SAND (<2 mm) [6 pts]	30%	<input type="checkbox"/> ARTIFICIAL [3 pts]	0%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 10.00%

(A)

Substrate Percentage Check 100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 15

TOTAL NUMBER OF SUBSTRATE TYPES: 4

HHEI Metric Points

Substrate Max = 40

19

A + B

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

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

COMMENTS 6" Max Pool Depth

MAXIMUM POOL DEPTH (centimeters): 17

Pool Depth Max = 30

25

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

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

COMMENTS 8', 7.5', 7'

AVERAGE BANKFULL WIDTH (meters): 2.30

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

L	R	(Per Bank)
<input 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 type="checkbox"/>	<input type="checkbox"/>	Residential, Park, New Field
<input type="checkbox"/>	<input type="checkbox"/>	Fenced Pasture

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

COMMENTS Dredged channel

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

STREAM GRADIENT ESTIMATE

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

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

<input checked="" type="checkbox"/> WWH Name: Jones Run	Distance from Evaluated Stream	0.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **West Milton** NRCS Soil Map Page: NRCS Soil Map Stream Order
County: **Miami** Township / City: **Union****MISCELLANEOUS**Base Flow Conditions? (Y/N): ☒ Y Date of last precipitation: **07/13/15** Quantity: **0.10**
Photograph Information: **See Photograph Appendix**
Elevated Turbidity? (Y/N): ☐ N Canopy (% open): **90%**
Were samples collected for water chemistry? (Y/N): ☐ N (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) ☒ Y If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): ☐ N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) ☐ N Voucher? (Y/N) ☐ N Salamanders Observed? (Y/N) ☐ N Voucher? (Y/N) ☐ N
Frogs or Tadpoles Observed? (Y/N) ☐ N Voucher? (Y/N) ☐ N Aquatic Macroinvertebrates Observed? (Y/N) ☐ N Voucher? (Y/N) ☐ N
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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





Primary Headwater Habitat Evaluation Form

53

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

SITE NAME/LOCATION	Stream 11								
SITE NUMBER		RIVER BASIN	Great Miami		DRAINAGE AREA (mi ²)	0.22			
LENGTH OF STREAM REACH (ft)	200	LAT.	39.94108	LONG.	-84.33250	RIVER CODE		RIVER MILE	
DATE	07/17/15	SCORER	TER	COMMENTS	Channelized Drainage Ditch				

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

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

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

TYPE	PERCENT	TYPE	PERCENT
<input type="checkbox"/> BLDR SLABS [16 pts]	0%	<input checked="" type="checkbox"/> SILT [3 pt]	40%
<input type="checkbox"/> BOULDER (>256 mm) [16 pts]	0%	<input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts]	0%
<input type="checkbox"/> BEDROCK [16 pt]	0%	<input type="checkbox"/> FINE DETRITUS [3 pts]	0%
<input type="checkbox"/> COBBLE (65-256 mm) [12 pts]	5%	<input type="checkbox"/> CLAY or HARDPAN [0 pt]	0%
<input checked="" type="checkbox"/> GRAVEL (2-64 mm) [9 pts]	30%	<input type="checkbox"/> MUCK [0 pts]	5%
<input type="checkbox"/> SAND (<2 mm) [6 pts]	15%	<input type="checkbox"/> ARTIFICIAL [3 pts]	5%

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock 5.00%

(A)

Substrate Percentage Check 100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: 12

TOTAL NUMBER OF SUBSTRATE TYPES: 6

HHEI Metric Points

Substrate Max = 40

18

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 3" Max Pool Depth

MAXIMUM POOL DEPTH (centimeters): 7

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

COMMENTS 8', 7.5', 7'

AVERAGE BANKFULL WIDTH (meters): 2.30

Bankfull Width Max=30

20

This information must also be completed

RIPARIAN ZONE AND FLOODPLAIN QUALITY

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

RIPARIAN WIDTH

FLOODPLAIN QUALITY

L	R	(Per Bank)	L	R	(Most Predominant per Bank)	L	R	
<input type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input checked="" 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 Dredged channel

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

STREAM GRADIENT ESTIMATE

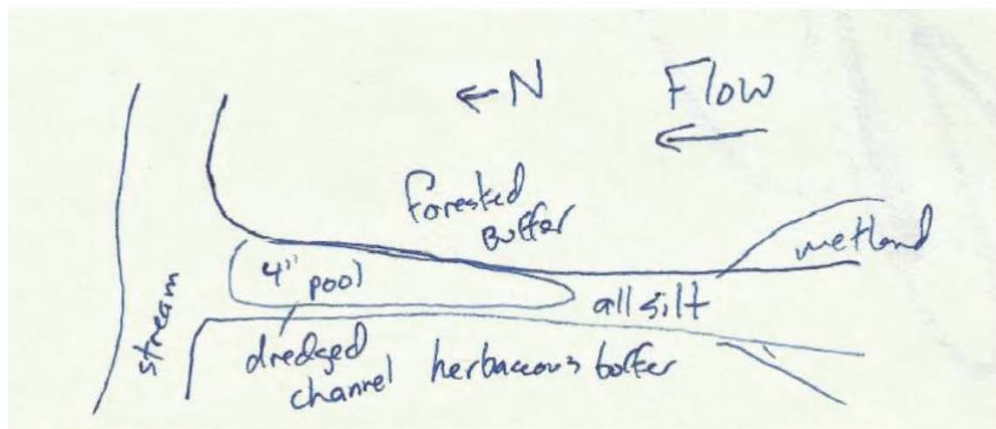
<input type="checkbox"/> Flat (0.5 ft/100 ft)	<input type="checkbox"/> Flat to Moderate	<input checked="" type="checkbox"/> Moderate (2 ft/100 ft)	<input type="checkbox"/> Moderate to Severe	<input type="checkbox"/> Severe (10 ft/100 ft)
---	---	--	---	--

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

<input checked="" type="checkbox"/> WWH Name: Jones Run	Distance from Evaluated Stream	0.00
<input type="checkbox"/> CWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>
<input type="checkbox"/> EWH Name: <input type="text"/>	Distance from Evaluated Stream	<input type="text"/>

MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATIONUSGS Quadrangle Name: **West Milton** NRCS Soil Map Page: NRCS Soil Map Stream Order
County: **Miami** Township / City: **Union****MISCELLANEOUS**Base Flow Conditions? (Y/N): **Y** Date of last precipitation: **07/13/15** Quantity: **0.10**
Photograph Information: **See Photograph Appendix**
Elevated Turbidity? (Y/N): **N** Canopy (% open): **90%**
Were samples collected for water chemistry? (Y/N): **N** (Note lab sample no. or id. and attach results) Lab Number:
Field Measures: Temp (°C) Dissolved Oxygen (mg/l) pH (S.U.) Conductivity (µmhos/cm)
Is the sampling reach representative of the stream (Y/N) **Y** If not, please explain: Additional comments/description of pollution impacts: **BIOTIC EVALUATION**Performed? (Y/N): **N** (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)
Fish Observed? (Y/N) **N** Voucher? (Y/N) **N** Salamanders Observed? (Y/N) **N** Voucher? (Y/N) **N**
Frogs or Tadpoles Observed? (Y/N) **N** Voucher? (Y/N) **N** Aquatic Macroinvertebrates Observed? (Y/N) **N** Voucher? (Y/N) **N**
Comments Regarding Biology: **DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

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



APPENDIX 8-3

Aquatic Resource Photographs



Stream 1: Downstream, Looking East



Stream 1: Upstream, Looking West



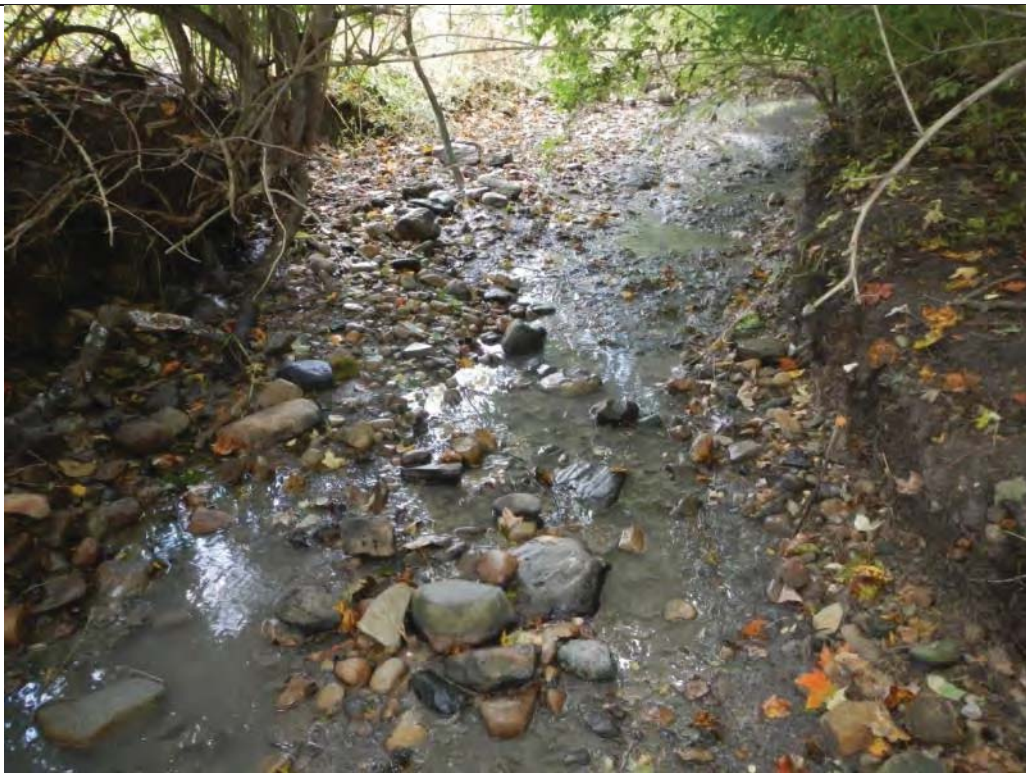
Stream 2: Downstream, Looking East



Stream 3: Upstream, Looking North



Stream 3: Downstream, Looking South



Stream 4: Upstream, Looking East



Stream 4: Downstream, Looking West



Stream 5: Upstream, Looking North



Stream 5: Downstream, Looking South



Stream 6: Downstream, Looking East



Stream 6:Upstream, Looking West



Stream 7: Downstream, Looking East



Stream 7:Upstream, Looking West



Stream 8: Upstream, Looking West



Stream 8: Downstream, Looking East



Wetland A: Looking North



Wetland A: Looking South



Wetland B: Looking East



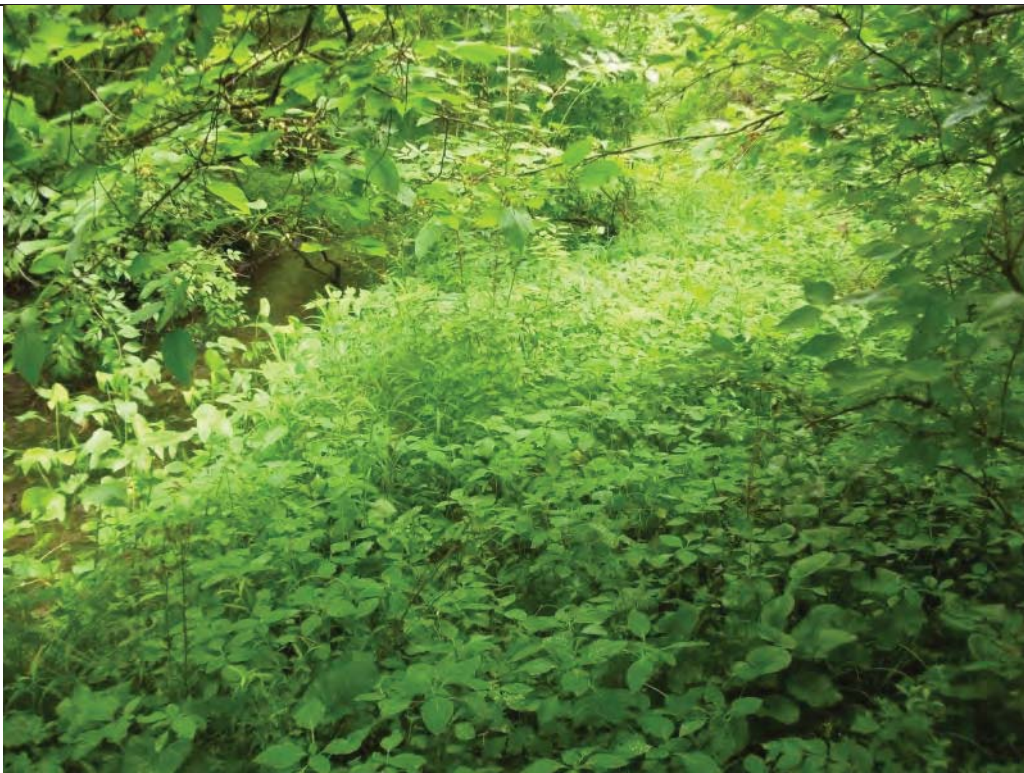
Wetland B: Looking North



Wetland C: Looking Southwest



Wetland C: Looking West



Wetland D: Looking West



Wetland D: Looking East



Pond 1: Looking North

APPENDIX 8-4

USFWS and ODNR Correspondence Letters

Matt White

From: susan_zimmermann@fws.gov on behalf of Ohio, FW3 <ohio@fws.gov>
Sent: Tuesday, August 21, 2018 9:49 AM
To: Matt White
Cc: nathan.reardon@dnr.state.oh.us; kate.parsons@dnr.state.oh.us
Subject: 2018 Re-Coordination of West Milton - Eldean 138kV Transmission Line, Miami Co. OH



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 #03E15000-2013-TA-0631

Dear Mr. White,

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

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

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

The proposed project is in the vicinity of one or more confirmed records of Indiana bats. Therefore, we recommend that trees ≥ 3 inches dbh be saved wherever possible. Because the project will result in a small amount of forest clearing relative to the available habitat in the immediately surrounding area, habitat removal is unlikely to result in significant impacts to these species. Since Indiana bat presence in the vicinity of the project has been confirmed, clearing of trees ≥ 3 inches dbh during the summer roosting season may result in direct take of individuals. If any caves or abandoned mines may be disturbed, further coordination with this office is requested to determine if fall or spring portal surveys are warranted. If no caves or abandoned mines are present and tree removal is unavoidable, we recommend that removal of any trees ≥ 3 inches dbh only occur between October 1 and March 31. Following this seasonal tree clearing recommendation should ensure that any effects to Indiana bats and northern long-eared bats are insignificant or discountable. **Please note that, because Indiana bat presence has already been confirmed in the project vicinity, any additional summer surveys would not constitute presence/absence surveys for this species.**

The proposed project lies within the range of the **rayed bean** (*Villosa fabalis*), a federally listed endangered species. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). Should the proposed project directly or indirectly impact any of the habitat types described above, we recommend that a survey be conducted to determine the presence or probable absence of rayed bean mussels in the vicinity of the proposed site. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office. Surveyors must have valid Federal and State permits to survey for federally listed mussels in Ohio.

The proposed project lies within the range of the **snuffbox** (*Epioblasma triquetra*), a federally listed endangered species. The snuffbox occurs in swift currents of riffles and shoals over gravel and sand with occasional cobble and boulders. Should the proposed project directly or indirectly impact any of the habitat types described above, we recommend that a survey be conducted to determine the presence or probable absence of the snuffbox in the vicinity of the proposed site. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office. Surveyors must have valid Federal and State permits to survey for federally listed mussels in Ohio.

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

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

These comments have been prepared under the authority of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the ESA, and are consistent with the intent of the National Environmental Policy Act of 1969 and the Service's Mitigation Policy. This letter provides technical assistance only and does not serve as a completed section 7 consultation document. We recommend that the project be coordinated with the Ohio Department of Natural Resources due to the potential for the project to affect state listed species and/or state lands. Contact John Kessler, Environmental Services Administrator, at (614) 265-6621 or at john.kessler@dnr.state.oh.us.

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,

A handwritten signature in blue ink, appearing to read "Scott Pruitt", is positioned above the printed name.

Scott Pruitt
Acting Field Office Supervisor

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

Matt White

From: Matt White
Sent: Monday, August 06, 2018 1:20 PM
To: ohio@fws.gov
Cc: Marc Walters; Matt White
Subject: TAILS# 03E15000-2013-TA-0631; West Milton - Eldean 138 kV Transmission Line Comment Renewal Request
Attachments: G121196_01_DPL_West_Milton_Elden_Overview_2018_08_06.pdf; WME Routes 2015_10_22.kmz

Mr. Everson,

The Dayton Power and Light Company (DP&L) is proposing to build a new 138 kilovolt (kV) transmission line to connect its existing West Milton and Eldean Substations which are located in Union and Concord Townships in Miami County, Ohio. The substations are approximately 11.5 miles apart geographically, but the proposed transmission line would be approximately 16.6 miles in length with a proposed 75-foot wide right-of-way (ROW) (much of it along existing road ROW and agricultural fields). A topographic project location map illustrating the project vicinity and routes is attached for your reference. Also attached is a kmz of the routes.

GAI Consultants, on behalf of DP&L, has previously corresponded with your office (TAILS# 03E15000-2013-TA-0631), with the most recent comment response letter (email) from the USFWS dated March 1, 2017. Based on project delays and regulatory requirements, an additional/updated project review is being requested concerning the potential for the project to impact rare, threatened, or endangered species or sensitive resources.

Thank you for your assistance in this request.

Matthew B. White, M.S.

Assistant Environmental Manager

GAI Consultants, 201 N. Illinois Street, Suite 1700, Indianapolis, IN 46204

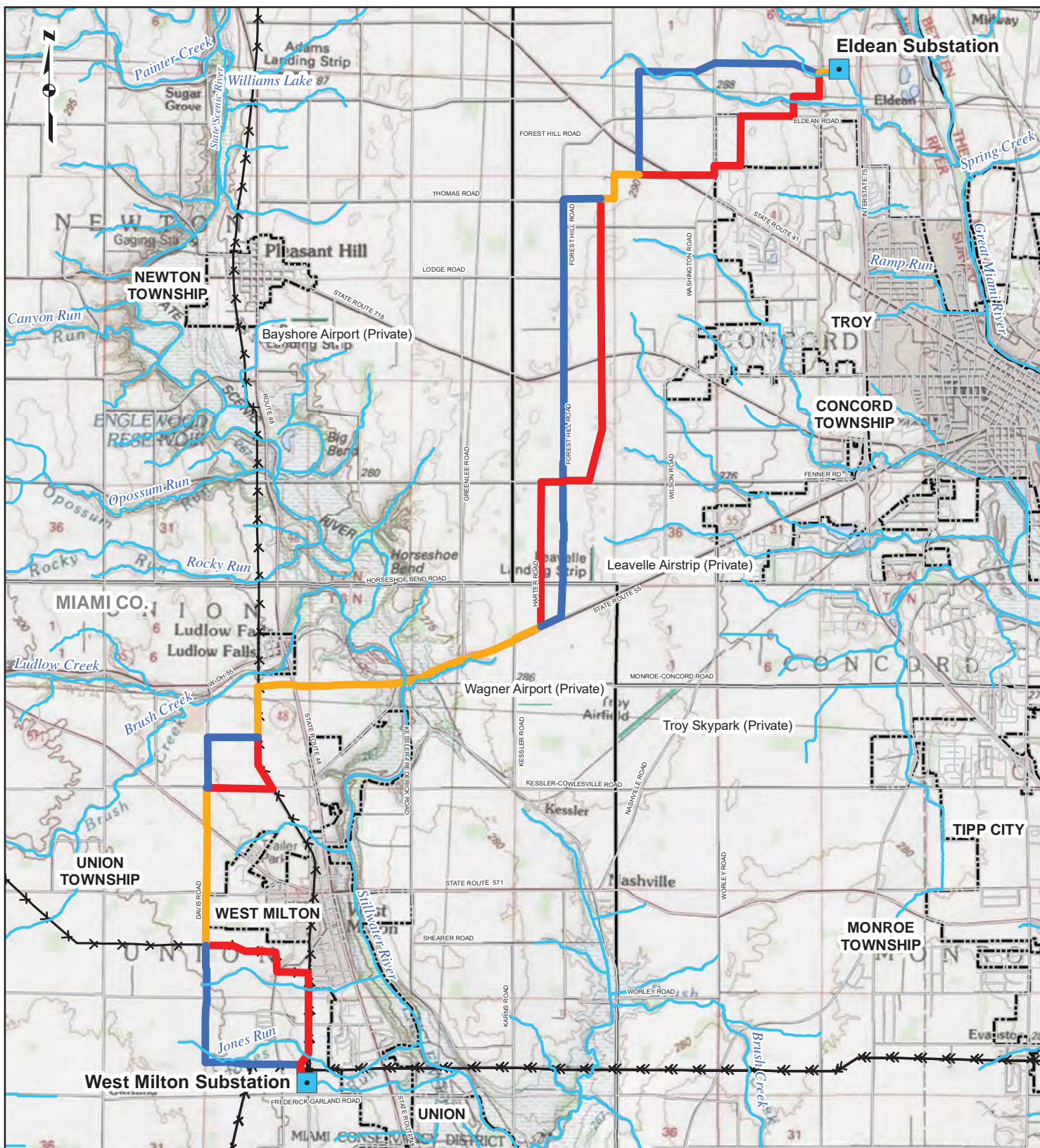
T 317.570.6800 **D** 317.436.4832 **M** 412.848.7283

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**ENGINEERING,
PLANNING, AND
ENVIRONMENTAL
CONSULTING SINCE 1958**

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PROJECT LOCATION



MIAMI COUNTY, OHIO

- Substation
- NHD Waterway
- Preferred Route
- Common Route
- Alternate Route
- Existing Transmission Line- Approximate
- Road Centerline
- Waterbody
- Airport
- City Limit
- Township Boundary
- County Boundary

0 3,500 7,000 14,000 Feet

PREFERRED AND ALTERNATE ROUTES

WEST MILTON TO ELDEAN 138kV
DAYTON POWER & LIGHT

DRAWN BY: PPD DATE: 8/6/2018
CHECKED: TDB APPROVED: MBW

REFERENCE: USGS 30' X 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 8/6/2018. OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017. U.S. GEOLOGICAL SURVEY'S NATIONAL HYDROGRAPHY DATASET LOCAL RESOLUTION, 2018.



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

October 12, 2018

Matt White
GAI Consultants
3720 Dressler Road NW
Canton, Ohio 44718

Re: 18-916; West Milton - Eldean 138 kV Transmission Line 15-258 Comment Renewal Request

Project: The proposed project involves building a new 138 kilovolt (kV) transmission line to connect its existing West Milton and Eldean Substations.

Location: The proposed project is in Union and Concord Townships, Miami 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:

Wood's-hellebore (*Melanthium woodii*), T
Creek heelsplitter (*Lasmigona compressa*), SC
Indiana bat (*Myotis sodalis*), E, FE
Waterfall (geologic feature)
Stillwater State Scenic River
Francis Scenic River Easement – ODNR Scenic Rivers Program
Twin Arch Reserve – Miami Co. Park District
Brukner Nature Center – Brukner Nature Center

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. Additional comments on some of the features may be found in pertinent sections below.

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

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

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

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

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

The project is within the vicinity of records for the Indiana bat (*Myotis sodalis*), a state endangered and federally endangered species. Presence of the Indiana bat has been established in the area, and therefore additional summer surveys would not constitute presence/absence in the area. 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 no tree removal is proposed, this project is not likely to impact this species.

The project is within the range of the club shell (*Pleurobema clava*), a state endangered and federally endangered mussel, the rayed bean (*Villosa fabalis*), a state endangered and federally endangered mussel, and the snuffbox (*Epioblasma triquetra*), a state endangered and federally endangered 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 Iowa darter (*Etheostoma exile*), a state endangered fish. The DOW recommends no in-water work in perennial streams from April 15 to June 30 to reduce impacts to indigenous aquatic species and their habitat. If no in-water work is proposed in a perennial stream, this project is not likely to impact 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.

Scenic Rivers: The Ohio Scenic Rivers Program has the following comment.

The ODNR Scenic Rivers Program would prefer that the existing crossing of the Route 55 bridge southeast of the Village of Ludlow Falls over the Stillwater State Scenic River be utilized. Every attempt should be made to “overbuild” the wires vertically on an existing tower at the actual river

crossing location, thus spanning the river valley. This will reduce the amount of riparian vegetation that needs to be cleared to install and maintain the transmission lines long term. Once the lines are beyond the stream channel and any existing riparian forest buffer on either side of the stream, the lines could then be installed on poles or structures running parallel to existing structures. For long term maintenance in riparian areas, the Scenic Rivers Program requests that DP&L plant low growing native shrubs and trees (underneath transmission lines) to provide some form of a riparian forest buffer at the river crossing location. Scenic Rivers Program staff can assist DP&L regarding determining which species may be most appropriate for crossing of the Stillwater State Scenic River. Melissa Clark, Southwest Regional Manager, can assist with a native plant list and any questions that DP&L may have about the Stillwater State Scenic River. Ms. Clark may be contacted at Melissa.clark@dnr.state.oh.us or (937) 408-8554.

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

Matt White

From: Matt White
Sent: Monday, August 06, 2018 1:18 PM
To: environmentalreviewrequest@dnr.state.oh.us
Cc: Marc Walters; Matt White
Subject: 17-146; West Milton - Eldean 138 kV Transmission Line 15-258 Comment Renewal Request
Attachments: G121196_01_DPL_West_Milton_Elden_Overview_2018_08_06.pdf; WME Routes 2015_10_22.kmz

ODNR Office of Real Estate – Environmental Review Services Section,

The Dayton Power and Light Company (DP&L) is proposing to build a new 138 kilovolt (kV) transmission line to connect its existing West Milton and Eldean Substations which are located in Union and Concord Townships in Miami County, Ohio. The substations are approximately 11.5 miles apart geographically, but the proposed transmission line would be approximately 16.6 miles in length with a proposed 75-foot wide right-of-way (ROW) (much of it along existing road ROW and agricultural fields). A topographic project location map illustrating the project vicinity and routes is attached for your reference. Also attached is a kmz of the routes.

GAI Consultants, on behalf of DP&L, has previously corresponded with your office (17-146; 15-258), with the most recent comment response letter from the ODNR Office of Real Estate dated March 15, 2017. Based on project delays and regulatory requirements, an additional/update project review is being requested concerning the potential for the project to impact rare, threatened, or endangered species or sensitive resources.

In the March 15, 2017 comment response letter, several listed species, a geologic feature, an ODNR Scenic Rivers Program easement, etc. were identified as having records at or within a one-mile radius of the project area according to the Natural Heritage Database. Shall these still be present and/or applicable to the project review we are requesting that for the static resources location information and for the mobile resources, guidance from ODNR as to whether habitat assessments and/or species surveys within the project area are required.

The proposed electric transmission line will cross the Stillwater River (a state scenic river), however is not proposed to be impacted by construction as the transmission line will span the river, no work below the ordinary high water mark is proposed and vegetation where required to be cleared for safety and reliability will be done by hand when within 25 feet of the ordinary high water mark. At the proposed crossing location of Stillwater River an overhead distribution line exists along the same alignment and would be consolidated with the new transmission line structures. The existing structures will be replaced with new structures.

Thank you for your assistance in this request.

Matthew B. White, M.S.
Assistant Environmental Manager

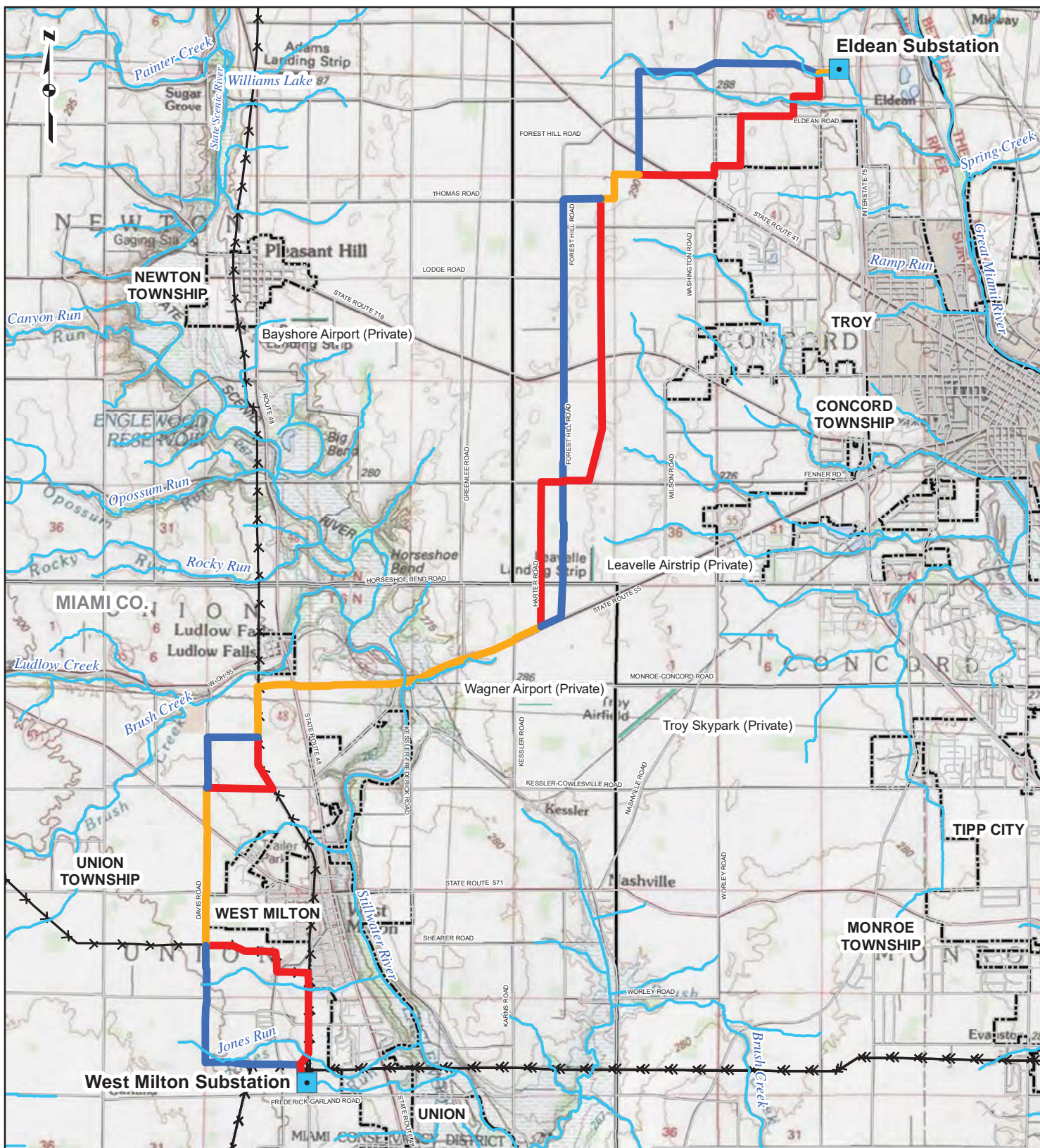
GAI Consultants, 201 N. Illinois Street, Suite 1700, Indianapolis, IN 46204
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PROJECT LOCATION



MIAMI COUNTY, OHIO

- Substation
- NHD Waterway
- Preferred Route
- Common Route
- Alternate Route
- Existing Transmission Line- Approximate
- Road Centerline
- Waterbody
- Airport
- City Limit
- Township Boundary
- County Boundary

0 3,500 7,000 14,000 Feet

PREFERRED AND ALTERNATE ROUTES

WEST MILTON TO ELDEAN 138kV
 DAYTON POWER & LIGHT

DRAWN BY: PPD DATE: 8/6/2018
 CHECKED: TDB APPROVED: MBW

REFERENCE: USGS 30' X 60' TOPOGRAPHIC QUADRANGLES: PIQUA (1986) DAYTON, OHIO. OBTAINED VIA ESRI USA TOPO, NATIONAL GEOGRAPHIC TOPO, AND USGS, ACCESSED 8/6/2018. OHIO DEPARTMENT OF TRANSPORTATION CITIES, TOWNSHIPS, ROADS, 2017. U.S. GEOLOGICAL SURVEY'S NATIONAL HYDROGRAPHY DATASET LOCAL RESOLUTION, 2018.

This foregoing document was electronically filed with the Public Utilities

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2/1/2019 11:48:50 AM

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Case No(s). 18-1259-EL-BTX

Summary: Application for a Certificate of Environmental Compatibility and Public Need for the West Milton-Eldean 138 kV Transmission Line Project electronically filed by Mr. Alan M. O'Meara on behalf of The Dayton Power and Light Company