APPLICATION

TO THE

OHIO POWER SITING BOARD

FOR

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY & PUBLIC NEED

FOR THE

TIMBER ROAD III TRANSMISSION LINE WITH POINT OF INTERCONNECT SWITCHYARD

Case No. 15-1737-EL-BTX

Harrison and Benton Townships
Paulding County, Ohio

December 2015

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COMMONLY USED ACRONYMS and ABBREVIATIONS

AEP	American Electric Power
ASTM	American Society for Testing and Materials
dBA	Decibels, A-weighted
EDR	Environmental Design and Research, Landscape Architecture, Engineering & Environmental Services, D.P.C
EMF	Electric and Magnetic Fields
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Administration
GIS	Geographic Information System
Hz	Hertz
kV	Kilovolt
MW	Megawatts
NERC	North American Electric Reliability Corporation
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OHI	Ohio Historic Inventory
OHPO	Ohio Historic Preservation Office
OPSB	Ohio Power Siting Board
ORAM	Ohio Rapid Assessment Method
OWI	Ohio Wetlands Inventory
PJM	PJM Interconnection LLC
POI	Point of Interconnect
ROW	Right-of-way
SPCC	Spill Prevention Control and Countermeasure Plan
SWP3	Stormwater Pollution Prevention Plan
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

4906-15-01 PROJECT SUMMARY

(A) PROJECT SUMMARY AND FACILITY OVERVIEW

Paulding Wind Farm III LLC (hereafter referred to as the "Applicant"), a wholly owned subsidiary of EDP Renewables North America LLC, is proposing to construct a 138 kilovolt (kV) transmission line (Timber Road III Transmission Line) with a point of interconnect (POI) switchyard (Timber Road III POI Switchyard), collectively referred to as the "Facility". The Facility is associated with Timber Road I Wind Farm (see Case No. 09-0980-EL-BGN) and Timber Road III Wind Farm (see Case No. 10-369-EL-BGN), both located in Paulding County. The materials contained herein and attached hereto constitute the Applicant's submittal for a Certificate of Environmental Compatibility and Public Need for the Facility. The submittal is collectively referred to herein as the "Application" and the sought certificate is collectively referred to hereafter as the "Certificate". The Application was prepared in compliance with Section 4906.06 of the Ohio Revised Code (Revised Code) and in accordance with Chapter 4906-15 of the Ohio Administrative Code (OAC), Instructions for the Preparation of Certificate Applications for Electric Power, Gas, and Natural Gas Transmission Facilities. This Application has been prepared by the Applicant, with support from Environmental Design and Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) of Syracuse, New York. EDR has over 25 years of experience with siting, impact analysis, and permitting associated with electric transmission facilities.

(1) General Purpose of the Facility

The primary purpose of the Timber Road III Transmission Line is to deliver electricity generated by the Timber Road I Wind Farm and the Timber Road III Wind Farm from the collection substation for the Timber Road III Wind Farm (see Case No. 10-369-EL-BGN) to the proposed Timber Road III POI Switchyard, to be located adjacent to the existing American Electric Power (AEP) 138 kV Lincoln – Sterling circuit. The purpose of the Timber Road III POI Switchyard is to allow for and make the interconnection to the AEP 138 kV Lincoln – Sterling circuit. The Timber Road III POI Switchyard will not require a voltage step-up, and will not require voltage transformers.

Due to the fact that the Applicant's queue position for this PJM interconnection point totals 150 MW, the Applicant will build out the switchyard to accommodate 150 MW. The Applicant does not have specific future expansion plans; therefore, this Application focuses on the need to interconnect 100.8 MW of electricity from the Timber Road I Wind Farm and Timber Road III Wind Farm.

(2) Description of the Facility

The Facility consists of a new 138 kV transmission line and a new POI Switchyard, which will be used to deliver power generated by Timber Road I Wind Farm and Timber Road III Wind Farm to the regional power grid. The Timber Road III Wind Farm collection substation (see Case No. 10-0369-EL-BGN) will be located along Road 124 just west of intersection with Road 33 in Harrison Township. The Timber Road III Transmission Line will run south from the collection substation to the existing 138 kV Lincoln – Sterling circuit ("Primary Transmission Route"), where the proposed Timber Road III POI Switchyard will be constructed ("POI Switchyard Location"). An alternate route has been identified for the transmission line ("Alternate Transmission Route"). The Applicant, however, has requested a waiver from the requirement to provide fully developed information on the Alternate Transmission Route (see Exhibit A).

Each of the components of the proposed Facility is further described below:

Transmission Line: The Primary Transmission Route traverses approximately 8.6 miles of land in Harrison and Benton Townships, connecting the Wind farm collection substation and the Timber Road III POI Switchyard. The Alternate Transmission Route traverses approximately 11.6 miles of land in Harrison and Benton Townships, connecting the Wind Farm collection substation and the Timber Road III POI Switchyard. The transmission line will be installed within a150 foot wide right-of-way (ROW), which will be comprised of private land secured under easement and will extend on average 75 feet from the centerline of the transmission line along each side. To minimize potential clearing impacts to forestland, the Primary Transmission Route is located almost entirely within open agricultural land (with the exception of one riparian crossing), while the Alternate Transmission Route avoids forestland to the extent practicable. There may be a variety of different structure types used for the Facility, due to different constraints at different locations (e.g., angle structures). However, all of the structures along the transmission line are expected to utilize a single-pole design, which minimizes the amount of soil disturbance when compared to double-pole, H-frame designs. Approximately 90 structures are proposed along the 8.6-mile Primary Route, which equates to an average spacing of approximately 515 feet between structures. The type of materials used for the structures will be steel for the poles, and concrete and rebar steel for the foundation. Structure height will range from approximately 80 to 120 feet above the ground, with a direct embedded foundation underground. Temporary access will primarily be through farm roads, farm fields, and public roads as well as other access roads already planned as part of the Wind farm.

POI Switchyard: The transmission line will connect to the existing AEP Lincoln – Sterling 138 kV circuit via a new interconnect switching station. The Timber Road III POI Switchyard will be approximately 410 by 230

feet in size (2.1 acres in area), and enclosed by a chain link fence. The POI Switchyard site is located on the south side of State Route 114 in Benton Township, just east of the intersection with Town Highway 27, immediately west of the existing Timber Road II POI Switchyard. The Timber Road III POI Switchyard design includes three 138 kV circuit breakers configured in a three ring bus arrangement, along with 138 kV metering units, relays, a control house, and associated equipment. Land for the Timber Road III POI Switchyard will be provided to the Applicant by land that is currently owned by Paulding Wind II LLC and the Applicant. The Applicant will obtain all necessary permits and construct the Timber Road III POI Switchyard. The Applicant expects to own and construct all structures and equipment associated with the Timber Road III POI Switchyard, and then transfer ownership of the Switchyard to the transmission operator when the Project goes into operation.

Note that the term "Primary Facility" refers jointly to both the Primary Transmission Route and POI Switchyard, while the "Alternate Facility" refers jointly to both the Alternate Transmission Route and POI Switchyard.

(3) Description of the Project Area Selection Process

The Study Area for the route selection process was established based on the location of the Timber Road III Wind Farm collection substation and the existing 138 kV Lincoln – Sterling circuit. The collection substation will be located along Road 124 just west of intersection with Road 33 in Harrison Township, and will step up voltage from the 34.5 kV produced by the wind turbines to 138 kV. The proposed transmission Facility will begin at this site, and end at a new point of interconnect substation to be constructed along the existing Lincoln – Sterling 138 kV transmission line. Within this Study Area, routes/sites were sought that would utilize land owned by participants of various phases of the Timber Road projects. These landowners are supportive of the projects and amenable to entering into Easement agreements with the Applicant. Applicant is currently working with all landowners along the route to secure these transmission line easements and all easement rights will be secured prior to the start of construction. Using these parameters, the most direct primary route with the fewest turns was selected for further evaluation.

The Applicant met with OPSB staff October 21, 2015 for a pre-application meeting. Feedback from various staff members present at the meeting included advising the Applicant to consider utilizing the same location for crossing Flat Rock Creek for the Alternate Route as the Primary Route as a means for reducing overall impacts.

The Applicant analyzed the feedback and determined that utilizing the same crossing was a better approach for the Alternate Route and reduced the overall length of the line by 1 mile. The updated Alternative Route impacts 15 less acres over all; reduced over 2,000 feet to wetland impacts, over 1,500 feet less impact to the 100 year flood plain, and crosses 5 less streams.

(4) Environmental and Socioeconomic Considerations

(a) *Land Use Impacts*

Land use in the vicinity of both the Primary and Alternate Facilities is predominantly agricultural, accounting for 94% and 95% of the 1,000-foot Study Areas, respectively. Developed open space (rural residences and associated lawns) and scattered woodlots also occur in the area. There are 25 residential structures within 1,000 feet of the Primary Transmission Route, and 23 residential structures within 1,000 feet of the Alternate Transmission Route. There are no residential structures within 100 feet of either the Primary or Alternate Facilities. No sensitive land uses (e.g., recreational or institutional) were identified along either route. Temporary impacts to land use during Facility construction could include damage to crops, fences, gates, subsurface drainage systems (tile lines), and/or temporarily block farmers' access to agricultural fields. However, construction impacts will be temporary in nature, followed by site restoration, and confined to the properties of participating landowners. Only very minor changes in land use are anticipated within the easement for the Primary Transmission Route and the POI Substation Location as a result of Facility operation.

(b) *Economic Impact*

The Timber Road III Transmission Line and Timber Road III POI Switchyard are dedicated radial facilities and will not be constructed unless the Wind Farm is constructed. The combination of the proposed Facility and the Wind Farm will have a positive impact on the local economy, through construction employment, lease and easement payments to landowners, and increased tax revenues for local school districts and other taxing districts that service the area. Taxing districts include Paulding County, Harrison Township, Benton Township, Wayne Trace Local School District and Antwerp Local School District. It is important to note that the Wind Farm and proposed Facility will make few, if any, demands on local government services. Therefore, payments made to local taxing jurisdictions will be net positive gains and represent an important economic benefit to the local area. In addition, easement payments will be provided to local landowners participating in the Facility.

(c) *Ecological Impact*

Facility design has been conducted with care to help avoid and minimize impacts to ecological communities, streams, and wetlands. EDR conducted ecological investigations within the Study Areas (the Primary Study Area and the Alternate Study Area) and wetland/stream delineations within the ROWs (Exhibit F). This investigation included a desktop review of streams and wetlands data, vegetation, and major species, along with field delineations of streams and wetlands, habitat observations, and sensitive species assessments.

The field delineation revealed that three wetlands occur within the ROW of the Primary Facility, totaling 3.63 acres. Two wetlands occur along the Alternate Transmission Route, totaling 3.85 acres within the proposed ROW, and these wetlands could be impacted if construction activities take place associated with the Alternate Transmission Route. However, at this time the Applicant intends to develop only the Primary Facility, which poles and pulling locations have been sited in uplands to the extent practicable, thereby avoiding most temporary soil disturbance and permanent direct (fill) impacts to wetlands. It is anticipated that only minimal direct impacts to wetlands will occur as a result of Facility construction or operation. Approximately 50 square feet (25 square feet per pole) of permanent impact will occur along both the Primary and Alternate Routes where two poles will be installed within Wetland G.

Twenty-one agricultural ditches and streams were delineated in the vicinity of the proposed Facility, which were generally characterized as low quality waterbodies, primarily due to ongoing agricultural use of the adjacent uplands, lack of shade, variable stream flow, and lack of pools and riffles. Project construction and operation activities do not require crossing of streams or any in-water work, and therefore are not anticipated to cause any direct impacts. The Applicant will not be installing any vehicle crossings during construction, with the field crews utilizing existing farm roads and crop areas to access either side of ditches. Avoidance measures during construction will ensure protection of the streams, which could include pre-construction field preparation such as flagging and signage of regulated resources, environmental training for construction crews and the use of environmental monitors during construction as determined necessary. Siting of access roads to utilize existing farm infrastructure and not crossing any streams will further avoid potential impacts.

The federally- and state-listed species that could potentially occur in Paulding County are generally found in woodland, wetland, and stream habitats, which are uncommon at the proposed Transmission Routes and POI Substation site. Construction of the Primary Facility will require limited clearing of trees along the Flatrock Creek riparian corridor, totaling approximately 0.53 acre (WEST, 2015).

Construction of the Alternate Facility, based on WEST (2015), would require the clearing of approximately 0.94 acre of riparian forest. However, there will be no net loss of wetlands as a result of clearing activities. As described in Sections 4906-15-07(C) and (D), most of the water features intersecting the proposed Facility are part of a regional ditch and agricultural drainage system. These wetlands consist of man-made drainages that have become dominated by emergent wetland vegetation, and are unlikely to provide habitat for any protected species (West, 2015b, Appendix F). Furthermore, impacts to wetlands and streams have been avoided to the extent practicable. Facility-related impacts to federally- or state-listed species are not anticipated.

(d) *Cultural Impacts*

Data on cultural and archaeological resources was collected and compiled into a report on the cultural impact of the proposed Facility (Exhibit E). The purpose of the records review was to identify known cultural resources in the vicinity of the Facility so that impacts to these resources can be minimized. The report focuses on a Study Area consisting of a 1,000-foot radius around both the Primary and Alternate Transmission Routes and the POI Substation Location, consistent with OPSB guidelines. The records review revealed that no NRHP-listed properties, OAI properties, or NHL properties have been recorded within 1,000 feet of the Primary or Alternate Transmission Routes and POI Substation Locations. Two OGS cemeteries have been recorded within 1,000 of the Primary or Alternate Transmission Routes. Lehman Cemetery is located 0.16 miles east of the common portion of the Primary and Alternate Transmission Routes, along TR 70. The Brady-Finnan-Pleasant Valley Cemetery is located 0.18 miles west of the Alternate Transmission Route along CR 48. Two OHI properties have been previously recorded within 1,000 feet of the Primary or Alternate Transmission Routes. The A. Worm Farmstead (PAU0340804), a Craftsman dwelling constructed circa 1890-1900 is located at 3985 CR 124 in Harrison Township, approximately 940 feet northeast of the Primary Route. The Leopold Baldwin Farmstead (PAU0343504), a vernacular farmstead constructed circa 1890-1900, is located at 3354 CR 124 in Harrison Township, approximately 824 feet northwest of the Alternate Route. According to OHPO records, both OHI resources are residences, constructed circa 1890 to 1900. Additional information about these resources can be found in Exhibit E.

There will be no direct impacts to above ground cultural resources (i.e., cemeteries or historic structures) from Facility construction. Because construction and/or operation of the Facility will not physically alter any known cultural resources, potential impacts are limited to indirect visual effects. The introduction of the Facility to the area may alter people's perceptions of the historic resources and landscapes in the area. Given local land use patterns, which are largely categorized by open

agricultural fields interspersed with scattered rural residences, it is likely that the Transmission Line will be visible from most locations in the Study Area.

(e) *Other Environmental Impacts*

No other potential environmental impacts beyond those discussed above are expected as a result of Facility construction or operation.

(5) Project Schedule

Acquisition of land rights for the Timber Road I Wind Farm and Timber Road III Wind Farm began in June 2008 and will continue through the winter of 2015/16. Acquisition of easement rights for the Transmission Line began in mid-2015 and is on-going. Preparation of the Application occurred in the fall of 2015, with data and analyses added as various studies were completed. A public information meeting was held on October 26, 2015. This Certificate Application was officially submitted in the fourth quarter of 2015, and it is anticipated that the Certificate will be issued in the first quarter of 2016. Final designs will be completed in the first quarter of 2016. Construction is anticipated to begin following issuance of the Certificate, and will be completed within approximately 9 months, on or around November 30, 2016, at which point the Facility will be placed in service. Additional information about the Project schedule, including a bar chart, can be found in Section 4906-15-02(F)(1) of this Application.

(B) GENERAL OVERVIEW

Information filed by the Applicant in response to the requirements of this section are intended to provide an overview of the proposed Facility, and are not intended as responses to any other sections of the Application requirements.

(C) ELECTRONIC COPY OF DATA

The Applicant prepared the required hard copy maps using digital, geographically referenced data. An electronic copy of all such data has been provided to the board staff concurrently with the filing of this Application (excluding data obtained under a licensing agreement which prohibits distribution).

4906-15-02 NEED FOR THE PROPOSED FACILITY

(A) NEED FOR THE PROPSED FACILITY

The primary purpose of the proposed 138 kV Timber Road III Transmission Line is to deliver electricity generated by the Timber Road I Wind Farm and the Timber Road III Wind Farm from the Timber Road III Wind Farm collection substation (see Case No. 10-0369-EL-BGN) to the proposed Timber Road III POI Switchyard, to be located adjacent to the existing 138 kV Lincoln – Sterling circuit. The Timber Road III Transmission Line and Timber Road III POI Switchyard are needed in order to connect the Timber Road I Wind Farm and the Timber Road III Wind Farm to the regional power grid. This Facility will allow the power generated to be distributed through the AEP transmission grid. While other interconnection options were investigated, the Primary Transmission Route and POI Switchyard Site were determined to be the best option available.

(1) Purpose of the Facility

The Applicant is proposing to construct the Timber Road III Transmission Line and Timber Road III POI Switchyard in Paulding County (collectively referred to as the "Facility" or "the Project"). This Facility is associated with the Timber Road I Wind Farm (see Case No. 09-0980-EL-BGN) and Timber Road III Wind Farm (see Case No. 10-369-EL-BGN), both located in Paulding County. Timber Road III Wind Farm is being developed by Paulding Wind Farm III LLC, which is the same Applicant proposing the Facility in this Application. This Facility is designed to deliver power generated by the Timber Road I Wind Farm and the Timber Road III Wind Farm to AEP's transmission grid, which is operated by PJM Interconnection LLC (PJM), the regional grid operator.

The Facility in conjunction with the Timber Road I Wind Farm and the Timber Road III Wind Farm (such wind farms collectively for purposes of this application, the "Wind Farm") will be used to contribute renewable wind energy to the PJM transmission grid. For example, the Facility and Wind Farm can be used:

- By an energy off-taking customer under a term power purchase agreement;
- As a pure energy resource either participating in the PJM day-ahead and hourly energy markets or as a Federal Energy Regulatory Commission (FERC) Qualifying Facility for avoided cost credit under a tariff; and/or
- As a resource that enables a mercantile customer to utilize renewable wind energy.

(2) System Conditions and Local Requirements

The Timber Road III Transmission Line is required to deliver electricity from the Wind Farm to the regional transmission power grid. If the wind generation is sold into the wholesale market on a competitive basis, potential customers include large wholesale purchasers, such as energy marketers and municipalities, as well as the forward and real-time PJM-operated markets. It is expected that most of the Wind Farm's power will be sold and used in Ohio. Thus, the Wind Farm will generate clean, reliable, low cost electricity that can assist the state in meeting its current renewable energy objectives as well as supporting new investment in Ohio such as new data centers seeking long term contracts for renewable energy.

The area where the Wind Farm and Facility are located enjoys a quality of wind resource that is sufficient to make the development of a wind generation facility both productive and profitable. Linking the favorable environmental conditions, a suitable transmission interconnection, and meeting the demands of customers eager to match new infrastructure investments with renewable energy development as well as the new job and economic investments for the state and local area allows the Applicant to conclude that there is a need for the Wind Farm, and thus, the Facility.

(3) Load Flow Studies and Contingency Analyses

Because the Timber Road III Transmission Line and Timber Road III POI Switchyard are being used to connect the Wind Farm to the regional power grid, there are no relevant load studies and contingency analyses existing that identify the need for system improvement.

The Wind Farm and the Facility will be engineered and constructed to comply with all applicable electrical safety codes and good engineering practices. The proposed method of service is to inject the output from the Wind Farm into the existing Lincoln – Sterling 138 kV circuit. Diagram 02-1 shows the location of the proposed interconnection, labeled T131 (the Generation Interconnection Request Queue Position assigned by PJM), with respect to existing substations in the region.

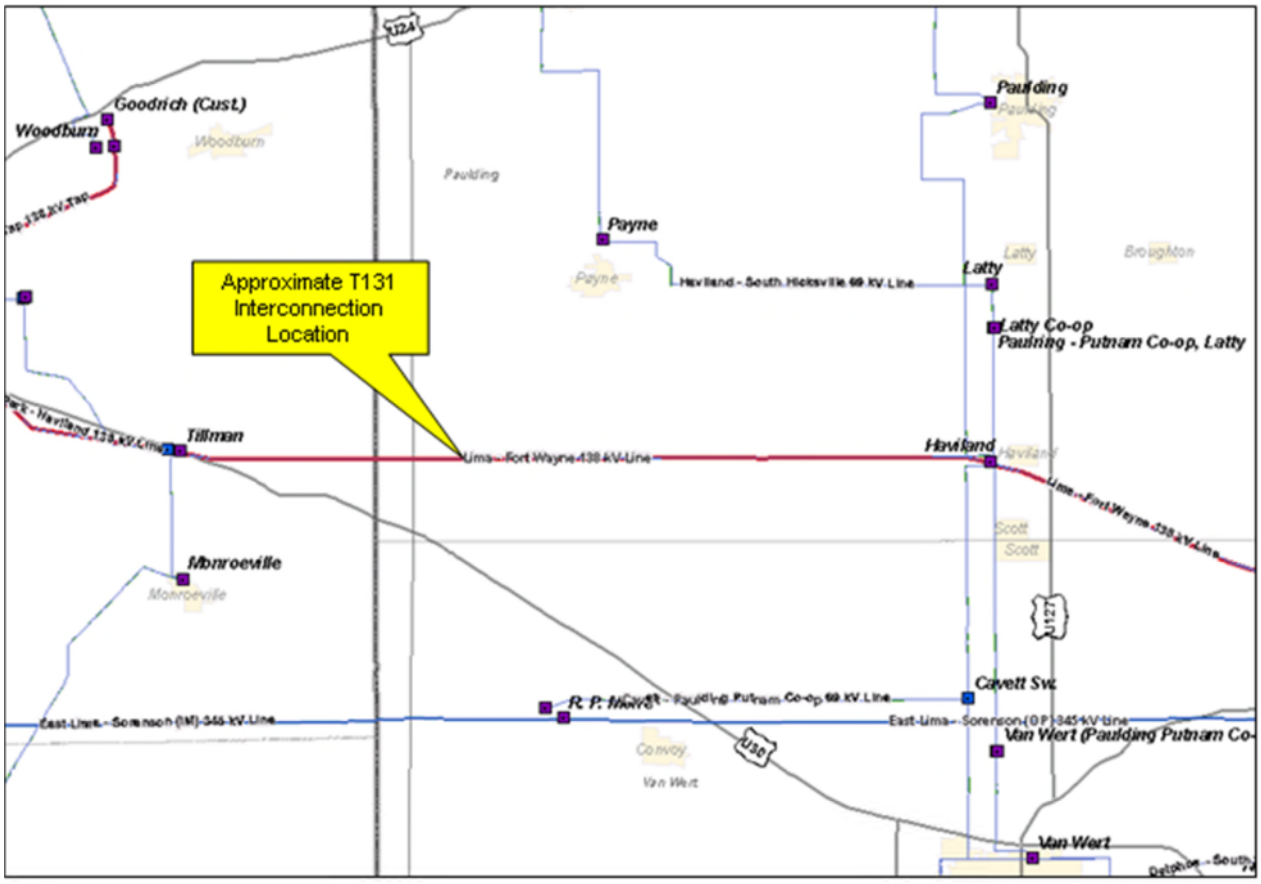


Diagram 02-1

The Timber Road III Wind Farm collection substation will be located along Road 124 just west of intersection with Road 33 in Harrison Township. An application to amend the Timber Road I Wind Farm will be submitted to allow this substation to be used for both the Timber Road I Wind Farm and the Timber Road III Wind Farm. The Timber Road III Transmission Line will run south from the collection substation to connect the existing 138 kV Lincoln – Sterling circuit through the new Timber Road III POI Switchyard (see Diagram 02-2 below).

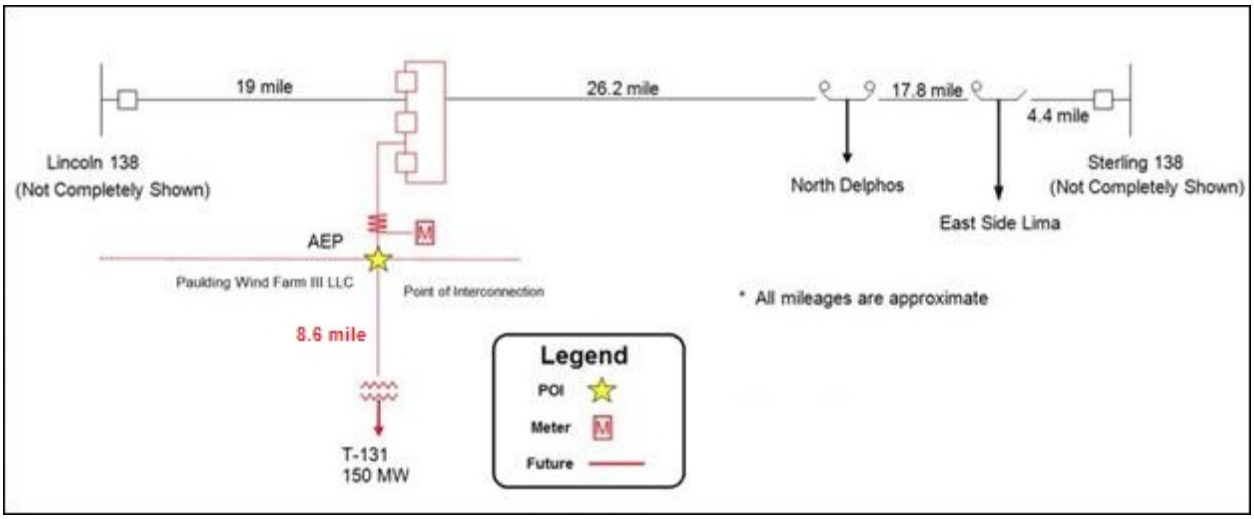


Diagram 02-2

The Wind Farm will interconnect and operate in conformance with the requirements of PJM and the transmission line owner. These requirements will also meet the reliability criteria and standards for the North American Electric Reliability Corporation (NERC). PJM has established procedures and requirements for generators that propose to interconnect with facilities under the control of the PJM Interconnection. Specifically, PJM requires a series of electrical studies for each proposed generator, including a Feasibility Study, a System Impact Study, and a Facilities Study. All of these studies have been completed, and an update to the Facilities Study is expected to be issued by the end of the year 2015.

PJM performed the System Impact Study on the Wind Farm interconnection request. This study was completed in June 2009, re-tooled in July 2012, and revised again in October 2015. Potential local AEP and overall PJM network impacts were evaluated for compliance with reliability criteria for summer peak conditions in 2013 in the following categories: Generator Deliverability, Multiple Facility Contingency, and Short Circuit Analysis. The 2015 System Impact Study concluded “no problems identified” for each of these categories. The System Impact Study studied three additional categories to assess the impact of the Wind Farm on the system: (1) Contribution to Previously Identified Overloads; (2) New System Reinforcements, and (3) Contribution to Previously Identified System Reinforcements. No contingency overloads, network upgrades, or contributions to overloads were identified in the 2015 System Impact Study. Finally, the Wind Farm successfully met the stability requirements associated with the connection standards for Low Voltage Ride Through; Voltage Recovery; and Transient Stability.

(4) System Performance Transcription Diagrams

Diagram 02-3 shows the power flows on the line with the proposed Wind Farm in service. With the generation out of service, there is a 150 MW reduction on the Lincoln – Sterling 138 kV Line flow. The normal and contingency flows on the line with and without the Wind Farm are well below the design rating of the Lincoln – Sterling 138 kV Line as well as the surrounding system facilities.

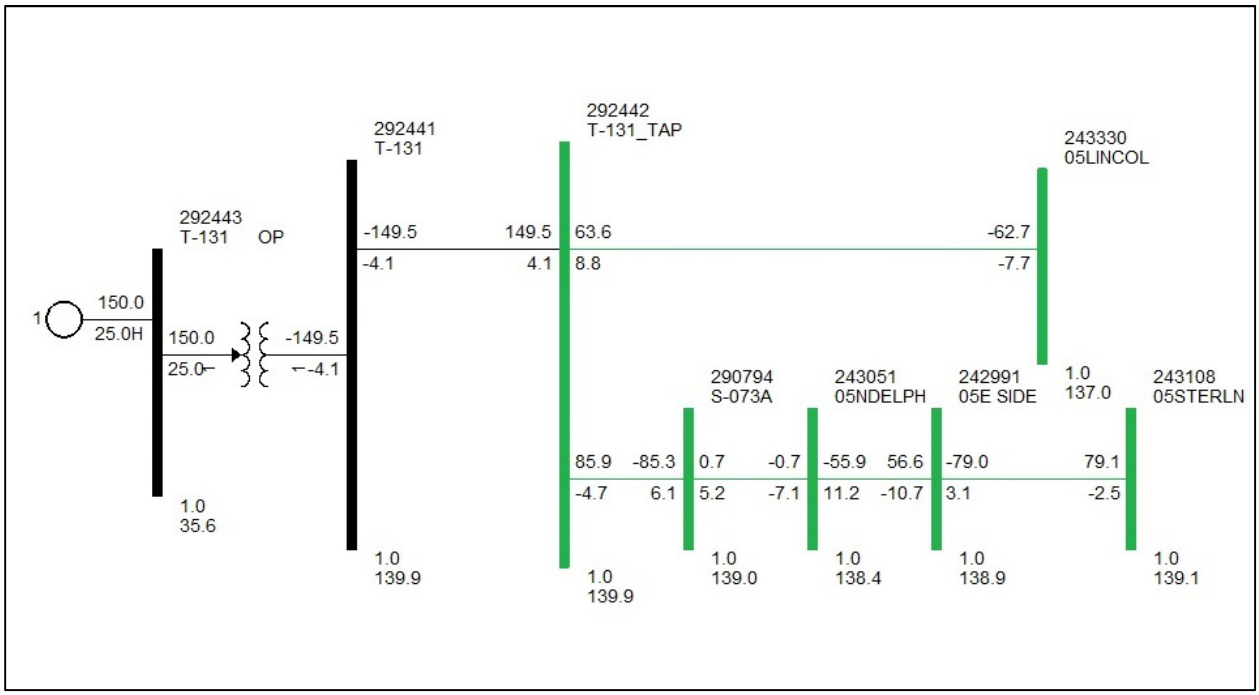


Diagram 02-3

(5) Base Case Data for Natural Gas Transmission Line

Since the proposed Project does not install gas transmission facilities, this section is not applicable.

(B) EXPANSION PLANS

(1) Long-Term Forecast and Regional Planning

(a) *Reference in Long-Term Forecast*

The Applicant is not an electric distribution company or an electric distribution utility, and as such, does not have responsibility for planning for transmission and distribution for franchised service areas. Therefore, the Applicant does not maintain or file long-term electric forecast reports, and this section is not applicable.

(b) *Explanation If Not Referenced*

As noted above, the Applicant is not required to file long-term electric forecast reports, and therefore, this section is not applicable.

(c) *Effect on Regional Expansion Plans*

As indicated above, PJM performed the System Impact Study on the Wind Farm interconnection request. The 2015 System Impact Study concluded "no problems identified" for generator deliverability, multiple facility contingency, and short circuit analysis. No contingency overloads, network upgrades, or contributions to overloads were identified, and stability requirements associated with the connection standards for Low Voltage Ride Through; Voltage Recovery; and Transient Stability were successfully met. In summary, the Wind Farm and the proposed Facility will have no adverse impacts on grid reliability. As such, the Facility will not affect regional plans.

(2) Gas Transmission Lines and Associated Facilities

Since the proposed Project does not install gas transmission facilities, this section is not applicable.

(C) SYSTEM ECONOMY AND RELIABILITY

Based on the results of the System Impact Study for the Wind Farm and Facility, PJM identified no new network upgrades associated with the categories that were assessed. The Wind Farm and Facility successfully met the requirements associated with the connection standards for Low Voltage Ridge Though; Voltage Recovery; and Transient Stability (PJM, 2015). In addition, no system reinforcements are required as the result of adding the Wind Farm and Facility, and there is no change in any previously identified system improvements (PJM, 2015).

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

Several possibilities were considered before the Applicant determined that the proposed Facility is the most viable option to connect the energy from the Wind Farm to the transmission grid.

The first option the Applicant considered was the possibility of connecting to the grid at the nearest possible point of interconnection, which is the Antwerp to Payne 69 kV Line. The Applicant conducted load flow analysis and PJM studied this point of interconnection, and it was determined that the maximum project size that could interconnect to the Antwerp to Payne 69 kV Line is 48.3 MW. Given that the proposed Facility needs to deliver power from a collectively 100.8 MW Wind Farm in order to satisfy customer demand and maintain cost

economies of scale, the Applicant deemed that building a smaller project to enable connection to the nearby Payne 69 kV substation was not a viable option.

Another alternative that was considered by the Applicant was routing the energy from the project 8 miles underground from the center of the project area to the point of interconnection, and stepping the electricity up to 138 kV at that location. This alternative would require four circuits to be buried underground the length of the route at considerably more cost and local impact than the above ground option. EDPR staff consulted with landowners about the underground option and received significant support for the above ground alternative, in part due to the amount of drainage tile that would be damaged by the underground route. The cost increase of constructing four underground circuits would also push up the electricity buyer's price up to a point that would jeopardize the viability of the project. A final point is that due to the smaller conductor sizing and thermal losses of the underground circuits, the above ground option is much more efficient from an electrical losses standpoint.

The final option that was considered by the Applicant was interconnecting the Wind Farm to the Robinson Park – East Lima 345 kV Line. This alternative would require more cost to the Timber Road III POI Switchyard breakers, and the Timber Road III Transmission Line cable and poles would be more expensive. The route would require the Transmission Line to be over 14 miles long, and therefore would impact more acres than the recommended interconnection plan. Additionally, the Applicant does not have the land rights to route the line to this location.

(E) FACILITY SELECTION RATIONALE

Successful development of the Wind Farm requires the ability to share facilities between the two projects making up the Wind Farm. The Facility was selected because it is the most efficient way to deliver electricity generated by the Wind Farm to the existing regional power grid. Electricity generated by the Wind Farm cannot be delivered without the proposed Timber Road III Transmission Line and Timber Road III POI Switchyard. As noted herein, the alternatives evaluated would have greater environmental and social impacts, and/or would be more expensive.

(F) FACILITY SCHEDULE

This section describes the anticipated schedule for Facility permitting and construction, and is immediately followed by the schedule in bar chart format. Please note that some of the dates/timelines provided herein are estimates. As the actual information becomes known, Staff will be informed of the actual dates of construction commencement, construction completion, and commencement of commercial operation.

(1) Schedule

(a) *Preparation of the Certificate Application*

Preparation of the Application occurred in the fall of 2015, with data and analyses added as various studies were completed. A public information meeting was held October 26, 2015. Comments from the public were documented and the Applicant has addressed all feedback to the greatest extent possible.

(b) *Submittal of the Application for Certificate*

This Application was officially submitted in December 2015.

(c) *Issuance of the Certificate*

It is anticipated that the Certificate will be issued in the first quarter of 2016.

(d) *Acquisition of Easements and Land Rights for the Certified Facility*

Acquisition of easements began in Mid-2015 and acquisition of lease rights for the Timber Road I Wind Farm and Timber Road III Wind Farm began in June 2008, and will continue through the fall and winter of 2015.

(e) *Preparation of the Final Design*

It is expected that final designs and detailed construction drawings will be completed in the first quarter of 2016.

(f) *Construction of the Facility*

Construction is anticipated to begin in the first or second quarter of 2016 and be completed within 9 months, with completion of the project scheduled for approximately November 30, 2016.

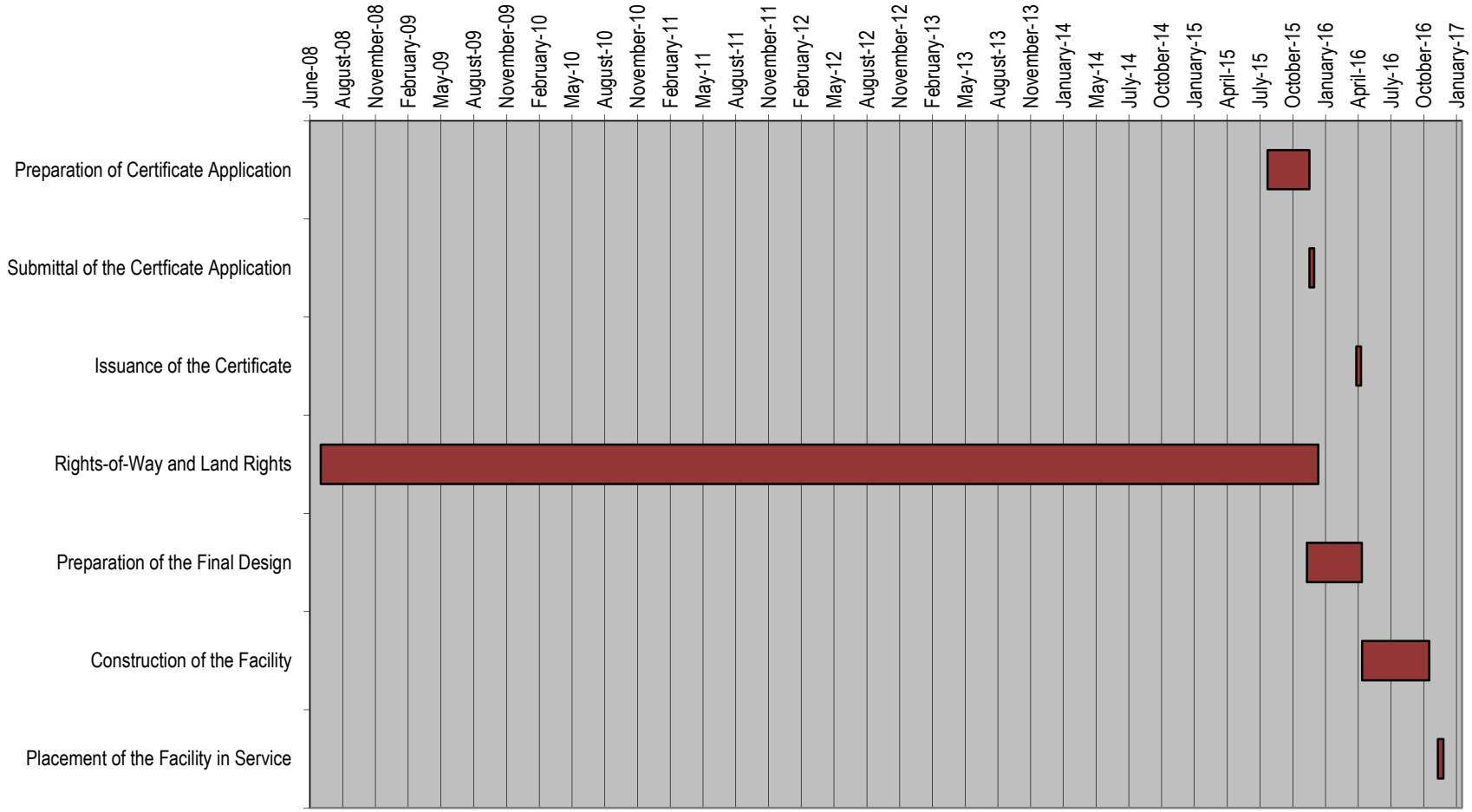
(g) *Placement of the Facility in Service*

The Facility will be placed in service upon completion of construction, anticipated for December 2016. As-built specifications will be provided to Staff within one year of the commencement of commercial operation.

(2) Impact of Critical Delays

Critical delays may have material, adverse effects on the financing of both this Facility and the associated Wind Farm, including the Applicant's ability to procure turbines and other Facility components. Such delays may push back the in-service date. In addition, because the associated Wind Farm cannot deliver electricity to the regional grid without the proposed Timber Road III Transmission Line and Timber Road III POI Switchyard, considerable costs would be incurred if delays in completing the Facility prevent the Wind Farm from meeting contractual deadlines for delivering energy to the regional transmission grid.

Timber Road III Transmission Line and POI Switchyard Facility Schedule



4906-15-03 SITE AND ROUTE ALTERNATIVES ANALYSIS

(A) SITE AND ROUTE SELECTION STUDY SUMMARY

The Applicant has identified Primary and Alternate Transmission Routes and a POI Switchyard Location, which are set forth in this Application. Given that PJM has completed its initial studies (System Impact Study and Facilities Study Report) based on the POI Switchyard Location, shifting to an alternate interconnection point would result in PJM requiring the Applicant to submit a new interconnection queue request that would add significant delay to the project. For this and other reasons, the Applicant has submitted a request for waiver from the requirement to provide fully developed information on the alternate route for the Timber Road III Transmission Line. See Exhibit A for a copy of the Motion for Waiver. The Applicant is providing the following information on the process for selecting the Primary Transmission Route.

(1) Route/Site Selection Details

As previously indicated, the primary purpose of the proposed Facility is to deliver the electricity generated by the proposed Timber Road I and III Wind Farms (Case No. 09-980-EL-BGN and 10-0369-EL-BGN respectively) to the existing Lincoln – Sterling 138 kV circuit. Therefore, the Study Area focused on the area between these two features. The Primary and Alternate Transmission Routes and the POI Switchyard Location were identified based on the route/site selection process described below.

(a) *Description of Study Area and Rationale for Selection*

The Study Area for the route selection process was established based on the location of the Timber Road III Wind Farm collection substation and the existing 138 kV Lincoln – Sterling circuit. The collection substation will be located along Road 124 just west of intersection with Road 33 in Harrison Township, and will step up voltage from the 34.5 kV produced by the wind turbines to 138 kV. The proposed Timber Road III Transmission Line will begin at this site, and end at a new point of interconnect substation (the Timber Road III POI Switchyard) to be constructed along the existing 138 kV Lincoln – Sterling transmission line. The Study Area for the route selection process encompasses Harrison and Benton Townships in Paulding County.

(b) *Study Area Map and Evaluated Routes*

The Study Area and evaluated routes/sites are illustrated on Figure 03-1. As indicated above, the Study Area for the route selection process was established based on the location of the Timber Road III Wind Farm collection substation and the existing 138 kV Lincoln – Sterling circuit, as depicted in Figure 03-1.

(c) *Siting Criteria*

The siting criteria used to identify and evaluate potential route corridors are based on the primary purpose of the proposed Facility (i.e., delivery electricity generated by the Timber Road I and III Wind Farms to the existing electric power grid), OPSB guidelines, and standard transmission line routing practices, as well as the expertise of project engineers and consultants. The following design goals guided the route and site selection process:

- Proximity to the proposed Wind Farm and the identified POI location;
- Landowners willing to provide easement rights for the transmission line;
- Route previously permitted by OPSB for underground collection line;
- Minimize total length of transmission line;
- Minimize number of turns;
- Minimize number of parcels crossed;
- Minimize crossings of public roads and railroads;
- Minimize forest clearing;
- Minimize crossings of wetlands, streams, and other water bodies;
- Minimize crossing/activities within floodplains;
- Minimize proximity to residences and areas of intensive land use; and
- Minimize proximity to sensitive land uses (e.g., schools, churches, hospitals, cemeteries, historic sites, recreation area, parks, preserves, etc.).

Identifying routes that minimize impact and cost requires a balancing and prioritizing of many various factors. For example, a route with minimal impacts on wildlife habitat may have greater impacts on residential land uses, and vice versa. In addition to the criteria listed above, the Applicant does not have eminent domain authority therefore all routes must have landowners willing to participate in the project.

(d) *Route Selection Process*

The evaluation of alternate routes included a comparison of the alternative based on social, environmental, and engineering factors listed above in 4906-15-03(A)(1)(c). These factors were utilized to identify and evaluate potential transmission line routes as described below. The primary source of data used in this analysis was recent color aerial imagery and field reconnaissance. Sources of mapping/GIS data consulted include National Wetlands Inventory (NWI) data, Ohio Wetlands Inventory (OWI) data, Federal Emergency Management Agency (FEMA) floodplain data, Ohio Department of

Natural Resources (ODNR) hydrography data, National Register of Historic Places (NRHP) data, and Ohio Historic Inventory (OHI) resources. In addition, reconnaissance-level field investigations and landowner consultations were significant factors that assisted in the route selection process.

Table 03-1: Siting Factors for Transmission Route

Factor	Units Evaluated
Length of each transmission line	Miles
Area of each ROW	Acres
Number of turns	Number
Number of parcels in ROW	Number
Area of woodland in ROW	Acres
Amount of NWI and OWI wetland	Linear Feet
Amount of floodplain	Linear Feet
Stream crossings	Number
Road crossings	Number
Residences within 1,000 feet	Number
Residences within 500 feet	Number
Residences within 100 feet	Number
NRHP-listed properties within 1,000 feet	Number
OHI-listed properties within 1,000 feet	Number
Cemeteries within 1,000 feet	Number
Agricultural District land	Linear Feet

Additional information on each of these factors is as follows:

- **Length** is related to cost of the transmission facility, including increased easement payments, design, engineering, materials, and construction. In addition, a longer transmission generally has more potential to result in increased environmental impact.
- **Area** is related to the locations that were reviewed, studied, and analyzed. The larger the area the more costly the review.
- **Number of turns**, and type of turns (shallow vs. right angles), is related to cost and design/construction complexity.
- **Number of parcels crossed** is related to cost and design/construction complexity.
- **Amount of woodland** is related to potential environmental impacts. Minimizing or avoiding impacts to woodland typically also minimizes and avoids impacts to diverse ecological communities, and potentially minimizes and avoids impacts to habitat for rare species.

- **Amount of wetland and floodplains** is related to potential environmental impacts. Minimizing or avoiding impacts to wetlands and floodplains also minimizes and avoids impacts to diverse ecological communities, and potentially minimizes and avoids impacts to habitat for rare species.
- **Stream crossings** are related to potential environmental impacts. Minimizing or avoiding impacts to streams typically also minimizes and avoids impacts to diverse ecological communities, and potentially minimizes and avoids impacts to habitat for rare species.
- **Road crossings** are related to potential visual impacts. Minimizing the number of road crossings has the potential to minimize visual impacts, depending on the sensitivity of the setting.
- **Proximity to residences** is related to potential impacts to local residents. Minimizing the number of residences proximate to the transmission line typically also minimizes community wide impacts.
- **Listed properties (NRHP and OHI) and cemeteries** are related to potential impacts on cultural resources. Minimizing proximity to such resources typically minimizes the potential for impact.
- **Agricultural district land**, while it is desirable to site transmission facilities in agricultural land to avoid various environmental impacts, it is also desirable to minimize activities within agricultural districts because agriculture districts are protected from development unless agreed to by the landowner.

In addition, the Applicant's familiarity with this general area as a result of its activities associated with developing the operational Timber Road II Wind Farm was also utilized during the route selection process. Specifically, the Applicant used its knowledge of the area to site the Primary Transmission Route on parcels owned by landowners willing to participate in the project, and on parcels that are primarily flat, are dominated by agricultural land use, generally have existing access through established farm lanes/roads, and have essentially no environmental constraints. Routes were sought within land already under lease for the Wind Farm, and avoid socioeconomic and ecological impacts to the extent possible. Using these parameters, the most direct routes with the fewest of turns were identified for further evaluation.

(e) *Identified Routes, Evaluation, and Ranking*

As indicated above, the location of the Timber Road III Transmission Line is dictated in large part by the location of the collection station and the location of the Timber Road III POI Switchyard. Prior to

defining the location of the Timber Road III POI Switchyard, other options were explored, which are summarized as follows:

Interconnect the Wind Farm to the Antwerp to Payne 69 kV Line

This option is not economical and was not selected for the following reasons:

- The Timber Road III and Timber Road I Wind Farms are being developed and permitted with100.8 MW of nameplate capacity. The Applicant evaluated this potential point of interconnection and determined that the maximum possible capacity is 48.3 MW.
- Scaling back the total MW size of the total output of the two projects would require a power price that would not be acceptable for a buyer and the project could not be built.
- Adding a transformer at the point of interconnection on the 69 kV line in order to step the power up to a 138kV line and then running a 138 kV overhead transmission line down to the POI, would add cost and disturb more land than the Primary Route and jeopardize the viability of the project economics.
- Delivering only 48.3 MW of nameplate capacity would not satisfy customer demand.

Collector Substation Adjacent to Interconnection Substation at Proposed Location

This option was not selected for the following reasons:

- The Wind Farm would require approximately 32 linear miles of underground conductor to permit siting the project step up transformer adjacent to the switchyard.
- The disturbed land during construction would be a minimum of 300 feet wide for the entire 8 mile underground collection to construct 4 homerun circuits;
- Landowners expressed concern regarding the amount of drain tile breaks and repairs that would need to happen in order to bury the cable 5 feet underground.
- The cost increase for construction of the underground 34.5 kV connection option as opposed to building the 138 kV transmission line would run in the millions.
- The low voltage underground cables would have significantly higher line losses than the high voltage above ground transmission line. These losses would result in an increase to the power price and make the project uneconomical for the energy buyer.

Interconnect the Wind Farm to the Robinson Park – East Lima 345kV Line

This option is not economical and was not selected for the following reasons:

- The interconnecting of the Wind Farm to the 345 kV transmission line was not chosen because the distance from the collection substation to the point of interconnect on the 34k kV

line would be 6 miles longer and there for this option has greater impacts, greater cost, and the Applicant does not have land control.

The Primary Transmission Route, Alternate Transmission Route, and POI Switchyard site were identified as the best siting options. In addition to the options discussed above, which would result in significantly different design options, the Applicant examined multiple alternate routes that were similar to, but did not exactly follow the path of either the Primary or Alternate Routes. The Applicant determined that these routes were not the best siting options due to increased impacts to Siting Factors listed Table 03-1 as well as conflicts with existing wind turbine locations.

The Applicant did not conduct a formal, stand-alone route/site ranking process (see Exhibit A for the associated Motion for Waiver). However, with respect to comparing potential ecological impacts associated with the Primary and Alternate Transmission Routes, please note the following (Exhibit F; WEST, 2015; WEST, 2015b).

- No significant populations of commercially or recreationally important species (other than agricultural crops) were observed within the Study Area for either the Primary or Alternate Transmission Route.
- The Primary and Alternate Transmission Routes have limited to no viable habitat for rare, threatened or endangered species.
- No viable bat habitat was found in the Study Area for the Primary and Alternate Transmission Routes.
- The Study Areas for the Primary and Alternate Transmission Routes did not contain suitable freshwater mussel habitat.

With respect to comparing potential land use impacts, there are few differences in the existing land use between the Primary and Alternate Study Areas. Cropland comprises approximately 2,018 acres (94%) of the total Primary Study Area and 2,700 acres (95%) of the Alternate Study Area. Deciduous forest lands constitute the second largest type of land use with 43 acres (2%) in the Primary Study Area and 67 acres (2%) in the Alternate Study Area. Land use patterns are also similar within the ROWs. The majority of the land use is cropland: 155 acres (99%) of the Primary ROW and 210 acres (99%) of the Alternate ROW.

(2) Constraint Map

As indicated above, Figure 3-2 depicts constraints used in the route/site selection process, and also illustrates the Primary and Alternate Transmission Routes and the POI Switchyard Location.

(B) SUMMARY TABLE

Following the selection of the Primary and Alternate Transmission Routes, a more thorough comparison of the attributes of each potential route was conducted. Table 03-2 summarizes the results of this analysis, which are discussed in greater detail in the subsequent sections of this Application.

Table 03-2: Summary Comparison Table

Factor	Transmission Routes	
	Primary	**Alternate**
Length of each line	8.6 miles	11.6 miles
Area of each ROW[1]	156 acres	212 acres
Number of turns	11	19
Number of parcels in ROW	27	41
Area of woodland in ROW	1.1 acres	1.6 acres
Amount of NWI wetland[2]	144 feet	144 feet
Amount of OWI wetland[2]	0 feet	0 feet
Amount of 100-year floodplain[2]	1,648 feet	1,287 feet
Mapped stream crossings	9	13
Road crossings	12	14
Residences within 1,000 feet	25	23
Residences within 500 feet	8	4
Residences within 100 feet	0	0
NRHP-listed properties within 1,000 feet	0	0
OHI-listed properties within 1,000 feet	12	12
Cemeteries within 1,000 feet	1	1
Agricultural District land[2]	0 feet	6,467 feet

[1] Based on 150-foot ROW.
[2] Linear feet crossed by Transmission Line.

(C) SITE AND ROUTE SELECTION STUDY

The Applicant's rationale for selecting the Primary Transmission Route and POI Switchyard Location, along with the Alternate Transmission Route, have been presented in the preceding sections. Therefore, a separate site selection study report has not been attached to this Application. See also Exhibit A for the Applicant's Motion for Waiver.

4906-15-04 TECHNICAL DATA

(A) SITE AND ALTERNATIVE ROUTES DATA

The following sub-sections provide information on the location, major features, and the topographic, geologic, and hydrologic suitability of the Primary and Alternate Transmission Routes and the POI Switchyard Locations.

(1) Geography and Topography Map(s)

Figure 04-1 depicts the geography and topography at a 1:24,000 scale, and includes all areas in the vicinity of the 1,000-foot Study Area for both the Primary and Alternate Facilities.

(a) *The proposed transmission line alignments, including proposed turning points*

The proposed alignments for both the Primary and Alternate Transmission Routes are shown on Figure 04-1, including the proposed turning points.

(b) *The proposed substation or compressor station site locations*

Figure 04-1 depicts two substations. The POI Switchyard is illustrated on Sheet 2, at the southern terminus of the Primary and Alternate Transmission Routes, adjacent to the existing 138 kV Lincoln – Sterling circuit. The Wind Farm collector substation (see Case No. 10-0369-EL-BGN) is shown on Sheet 1, at the northern end of both the Primary and Alternate Transmission Routes.

(c) *Major highway and railroad routes*

All public roads are depicted on Figure 04-1. Neither the Primary nor Alternate Transmission Routes cross any U.S. highways. In order of crossing from north to south, the Primary Transmission Route crosses the following State Routes (SR), County Roads (CR), and Township Roads (TR): CR 106, TR 96, TR 94, SR 613, TR 70, SR 500, TR 60, TR 33, TR 52, CR 48, SR 114, and TR 33 (second crossing). In order of crossing from north to south, the Alternate Transmission Route crosses TR21, CR 106, TR 96, TR 94, CR11 (two separate crossings), SR 613, TR 21, TR 70, SR 500, TR 60, CR 48, TR 27, and SR114.

There is one active railroad in the vicinity of the 1,000-foot Study Area. The Norfolk Southern Railroad runs east-west in the area, passing through Fort Wayne, Indiana and continuing eastward through Payne, Latty, and points beyond. Both the Primary and Alternate Transmission Routes cross this railroad ROW in Harrison Township, just north of SR613 and the Benton Town Line. As illustrated on

Figure 04-1, the Primary Transmission Route crosses the railroad approximately 0.26 mile west of TR33, while the Alternate Transmission Route crossing is approximately 0.16 mile west of TR21.

(d) *Identifiable air transportation facilities, existing or proposed*

There are no air transportation facilities in the vicinity of the proposed Facility or 1,000-foot Study Area, and hence none are depicted on Figure 04-1. The Van Wert County Airport, the nearest air transportation facility, is located approximately 13 miles southeast of the POI Switchyard (and the southern end of both the Primary and Alternate Transmission Routes). There are no structures or equipment associated with the construction or operation of the proposed Facility that would trigger Federal Aviation Administration (FAA) or Ohio Department of Transportation (ODOT) review or jurisdiction.

(e) *Utility corridors*

Figure 04-1 depicts the following utility corridors:

- AEP 138 kV Lincoln – Sterling circuit,
- AEP 138 kV Milan – Haviland circuit,
- Panhandle Eastern Pipe Line,
- Norfolk Southern Railroad, and
- Existing Timber Road II Wind Farm underground collection lines.

(f) *Proposed permanent access roads*

There are no permanent access roads proposed as part of the Facility, and hence none are illustrated on Figure 04-1.

(g) *Lakes, ponds, reservoirs, streams, canals, rivers, and swamps*

Streams, rivers, and lakes are depicted on Figure 04-1, along with field-delineated wetlands and streams. There are no canals or reservoirs within the 1,000-foot Study Area, and hence none are depicted. Ohio Wetland Inventory (OWI) wetlands are illustrated on Figure 07-1.

(h) *Topographic contours*

Figure 04-1 depicts 10- and 50-foot topographic contours, generated from USGS Digital Elevation Model (DEM) data.

(i) *Soil associations or series*

Soil series are illustrated on Figure 04-1, based on the National Resources Conservation Service (NRCS) Soil Survey Geographic Database.

(j) *Population centers and legal boundaries of cities, villages, townships, and counties*

Township boundaries are depicted on Figure 04-1. Part of the village of Payne, located approximately 0.8 mile east of the Primary Transmission Route, is visible in the southeastern corner of Figure 04-1, Sheet 1. There are no population centers, cities, or county boundaries in the vicinity of the 1,000-foot Study Area, and hence none are depicted.

(2) Slope and Soil Mechanics

(a) *Soil Descriptions*

Soils in the vicinity of the proposed Facility generally consist of silty clays and silty clay loams, with Hoytville and Nappanee as the dominant soil series. These soils formed in till, and are very deep, nearly level, and somewhat poorly drained to very poorly drained. Available water capacity is moderate. Permeability is moderately slow in the upper part of the subsoil and slow in the lower subsoil and substratum (USDA NRCS, 2006).

Terrain in the vicinity of the proposed Facility is generally level. Slopes exceed 2 percent for 465 feet (approximately 1%) of the 8.6-mile Primary Transmission Route, and exceed 6 percent for just 103 feet (approximately 0.2%). Along the Alternate Transmission Route, slopes exceed 2 percent for 696 feet (approximately 1.1%) of the 11.6-mile route, and exceed 6 percent for just 167 feet (approximately 0.3%). Slopes are 0-2 percent across the entire POI Switchyard Site (ODNR, 1995a; USDA NRCS, 2006). See Table 07-5 for a detailed breakdown of the slopes and soil series found at the Primary and Alternate Facilities.

(b) *Soil Suitability*

All the soil series found along the Primary and Alternate Transmission Routes and at the POI Switchyard Site are identified in the Paulding County Soil Survey as having a high risk of corrosion to uncoated steel, and all have severe limitations for building development due to wetness, ponding, flooding, shrink/swell, frost action, and/or low strength (USDA NRCS, 2006). However, no slope or soil mechanics conditions were found that would prevent construction of the proposed Facility, and final engineering designs will account for any potential limitations of the soils. Furthermore, the proposed

Facility will be constructed almost exclusively within active agricultural land, where the soil is drained (i.e., less susceptible to wetness and ponding) and routinely disturbed by farming operations. As discussed above in 4906-15-04(A)(2)(a), the proposed Facility is not expected to impact, or be impacted by, steep slopes.

As part of the Groundwater, Hydrogeology, and Geotechnical Summary Report prepared in support of the Timber Road II Wind Farm application, Hull (2010) contacted ODOT Districts 1 to review boring logs from historic projects that were located near and within the proposed Facility. The projects reviewed included the roadway soil profile reports and geotechnical boring logs for portions of SR24, as well as soil profile reports for several bridges and abutments over North and South Creek. Based on a review of the soil survey information, consultation with the staff at the Paulding County Engineer's Office, and Hull's experience with earthwork in the area, significant geotechnical constraints for construction of the Wind Farm were not anticipated (Hull, 2010). Therefore, soils should also be suitable for construction of the proposed Facility.

(B) LAYOUT AND CONSTRUCTION

(1) Site Activities

(a) *Surveying and Soil Testing*

The Timber Road III Transmission Route will be surveyed to establish centerline, ROW, and pole locations. The surveying will be completed using conventional or aerial methods. Topographic features and man-made structures in the vicinity of the Primary Transmission Route that may affect the final design will be located during the survey.

Soil testing will be conducted at the Timber Road III POI Switchyard site, and at representative sites along the Primary Transmission Route. The borings will extend to the proposed depth or competent bedrock, whichever is encountered first. Split-barrel sampling of soil will be performed in accordance with American Society for Testing and Materials (ASTM) D1586 for each boring in increments of 2.5 feet to the depth of 10 feet, and at 5-foot intervals below 10 feet to the depth of the borings. In all the borings, Standard Penetration Test (SPT) data will be developed and representative samples preserved. Water observations in the boreholes will be recorded during (and at the completion of) drilling. A truck-mounted drill rig will be used to perform the borings, unless unfavorable weather

conditions make the site inaccessible, in which case an ATV-mounted drill rig will be used. All borings will be backfilled at the completion of drilling with bentonite chips and drill cuttings.

A laboratory testing program will be established by the geotechnical engineer based on the observations made during the drilling activities and experience. All samples will be classified in the laboratory based on the visual-manual examination (ASTM D 2488) Soil Classification System and the laboratory test results. Formal boring logs will be prepared using the field logs and the laboratory classifications. For a limited number of samples considered to be representative of the borings across the Study Area, laboratory testing will include moisture content, particle-size analyses, and Atterberg limits. Unconfined compression and consolidation tests will be performed if low strength and/or highly compressible cohesive soils are encountered, as deemed necessary by the geotechnical engineer. All laboratory testing will be performed in accordance with ASTM or other specified standards. A report will be prepared documenting the findings of the borings and laboratory testing, along with recommendations on construction considerations and foundation designs.

(b) *Pre-Construction Conference*

The Applicant will conduct a pre-construction conference prior to the start of construction activities, to be attended by Staff and representatives of the construction contractors and subcontractors. Prior to the conference, the Applicant will provide a proposed agenda for Staff review. The agenda will include a presentation of the measures to be taken to ensure compliance with all conditions of the issued Certificate, and a discussion of the procedures for on-site investigations by Staff during construction. The Applicant will submit to Staff detailed engineering drawings of the final project design at least 30 days before the pre-construction conference, and copies of all NPDES permits at least seven days before the conference.

(c) *Grading and Excavation*

No significant grading is anticipated in order to construct either the Primary or Alternate Transmission Routes and the POI Switchyard, as the existing terrain within the ROWs generally provides a suitable surface for construction vehicle operations.

As described below in 4906-15-04(C)(1)(c), the transmission poles will be direct embedded or placed on concrete and steel foundations depending on geotechnical and engineering specifications. The excavation for pole placement is anticipated to be conducted using an auger. A portion of the

excavated soil may be used for backfill, although gravel or concrete will likely make up most backfill. Excess excavated soils will be placed around the structure or hauled off-site.

(d) *Construction of Temporary and Permanent Access Roads and Trenches*

Access to the Timber Road III Transmission Line ROW during construction and for long-term operation and maintenance will be through the use of existing farm lanes and paths and public roads already in place and in use today. However, additional stabilization of existing field roads with gravel may be required in order to improve the all-weather accessibility. Most of the existing field roads are approximately 12 feet in width; if they are narrower, some widening and improvement will be performed. Aside from the crossing of the Flatrock Creek riparian area, very limited tree clearing is anticipated for the Primary Facility. Impacts will be largely restricted to active agricultural areas. No new or improved bridges or stream crossings (other than overhead wire crossings) are planned. Access to all Transmission Route locations will be via public roads, existing farm lanes, and over pasture or cultivated farmland.

The POI Switchyard is located along SR 114, and will be accessed by a short gravel-surfaced driveway.

Stabilized construction entrances will be developed to reduce erosion and sedimentation, and to limit the amount of mud tracked off-site. A construction entrance is a stabilized pad of stone underlain with geotextile, which helps to prevent potholes from developing. Proper drainage may include culverts to direct water under the road or water bars to direct muddy water off the roadway. The area of the entrance will be cleared of all vegetation, roots, and other objectionable materials. Geotextile will then be placed the full width and length of the entrance. Stone will be placed to a depth of at least 6 inches. Surface water shall be conveyed under the entrance, through culverts, or diverted via a water bars or mountable berms so as to convey sediment laden runoff to sediment control practices or to allow clean water to pass by the entrance. New and/or improved stabilized construction entrances may be developed at the following locations:

- CR 124 approximately 0.19 mile west of TR 33,
- CR 106 approximately 0.2 mile west of TR 33,
- TR 96 approximately 0.23 mile west of TR 33,
- TR 94 approximately 0.23 mile west of TR 33,
- SR 613 approximately 0.26 mile west of TR 33,
- TR 70 approximately 0.09 mile west of TR 33,

- SR 500 approximately 0.12 mile southwest of TR 33, and/or
- TR 60 approximately 0.21 mile west of Road 33.
- TR 33 approximately 0.24 miles North of TR 52
- TR 52 approximately 0.18 miles East of TR 33
- TR 48 approximately 0.18 miles East of TR 33
- SR 114 approximately 0.19 miles East of TR 33
- TR 33 approximately 0.02 miles South of SR 114

The access plan for both construction and maintenance activities will be confirmed based on final designs and detailed construction drawings, expected to be completed in the first quarter of 2016.

(e) *Stringing of Cable and/or Laying of Pipe*

After the structures are erected, the conductors will be installed by establishing stringing setup areas. The equipment set up will include a wire puller, conductor reels, groundwire reels, and the wire tensioner. Conductor installation will be accomplished using the tension stringing method. Conductors will be pulled through under sufficient tension to keep the conductor off the ground. Temporary guard or clearance poles will be used as a safety precaution at locations where the conductors could create a hazard to either crew members or the general public.

Wire stringing locations will be used at turns in the line, to support pulling equipment and cable trailers. Each dead-end structure will have a stringing location setup consisting of two pulling spots, ahead and back. Each pulling site will be approximately 60 feet x 50 feet, for a total of 3,00 square feet per stringing location. Exact means and methods for stringing will be determined by the contractor and presented to the OPSB prior to the pre-construction meeting. Impacts from wire stringing activities will temporary.

(f) *Post-Construction Reclamation*

Once Facility construction is complete, temporarily disturbed areas will be restored (including removal of excess materials, de-compaction, and rock removal in agricultural areas) and returned to their approximate pre-construction contours. Exposed soils will be stabilized by seeding, mulching, and/or agricultural planting. Any drainage ditches, field drainage tiles, or fencing damaged by construction activities will be repaired.

(2) Layout of Associated Facilities

(a) *Associated Facilities Map*

Detailed plans illustrating the preliminary designs for the POI Switchyard have been included as Exhibit B. These plans include one drawing at a scale greater than 1:2,400 on an aerial base, that is enlarged to better show detail. The plans include the following:

(i) Final Grades after Construction, Including the Site and Access Roads

The Applicant has requested a waiver of this requirement (see Exhibit A).

(ii) Proposed Location of Major Structures and Buildings

The locations of all major structures associated with the POI Switchyard are depicted in Exhibit B.

(iii) Fenced-In or Secured Areas

The perimeter of the chain-link fence that will enclose the POI Switchyard is illustrated in Exhibit B.

(iv) Estimated Overall Dimensions

The POI Switchyard will be approximately 410 by 230 feet in size, or 2.1 acres in area.

(b) *Reason for Proposed Layout and Unusual Features*

Structure locations were selected based on the nature of the terrain, property lines, roads, and other landscape features in the area. The proposed Facility will allow for delivery of electricity from the Wind Farm to the regional power grid with minimal impact on sensitive land uses and natural habitats. There are no unusual features associated with construction of the proposed Facility.

(c) *Plans for Future Modifications*

As indicated above, the purpose of the proposed Facility is to deliver electricity generated by the proposed Timber Road I Wind Farm and Timber Road III Wind Farm from the collection substation (see Case No. 10-0369-EL-BGN) to the existing 138 kV Lincoln – Sterling circuit. This point of interconnection has a maximum capacity of 150 MW. Due to the fact that the Applicant's queue position for this PJM interconnection point totals 150MW's the Applicant will build out the switchyard to accommodate 150MW's. The Applicant does not have specific future plans, therefore the remainder of this Application will focus on the need to interconnect 100.8MWs of power from the Timber Road I and Timber Road III Wind Farm's.

(C) TRANSMISSION EQUIPMENT

(1) Electric Transmission Line Data

(a) *Design Voltage*

The proposed Timber Road III Transmission Line will be designed and operated at 138 kV.

(b) *Pole, Conductor, and Insulator Design*

The proposed Timber Road III Transmission Line will be supported on multiple mono-pole structures with either direct embedment or concrete/rebar pole foundations to the extent that geotechnical evaluation and engineering calls for. All poles will be weathering steel, and all poles will be self-supported. While multiple pole types may be used the two most common structure types will consist of single-pole tangent braced post structures and single-pole dead-end corner structures. A detailed list of all pole types is currently being developed and will be provided to the OPSB prior to the preconstruction meeting. The various structure types are illustrated in Diagrams 04-1 through 04-3, prepared by SGC Engineering and described below:

- For tangent configurations (assumes an angle range of 0-1 degree), the tower design will be a single, mono-pole design with a delta configuration. A photograph and a conceptual drawing of the proposed tangent structures is included as Diagram 04-1 and 04-2, respectively.
- For dead-end configurations (assuming an angle range of 0-90 degrees), the tower design will be a single, mono-pole design with anchors. A conceptual drawing of the proposed dead-end structures is included as Diagram 04-3.

Diagram 04-1. Typical Tangent Structures

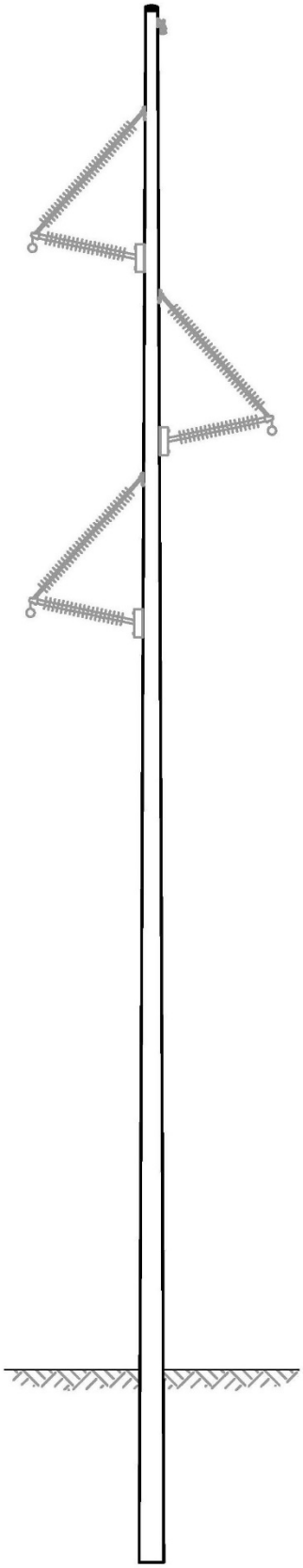


Diagram 04-2. Typical Tangent Structure

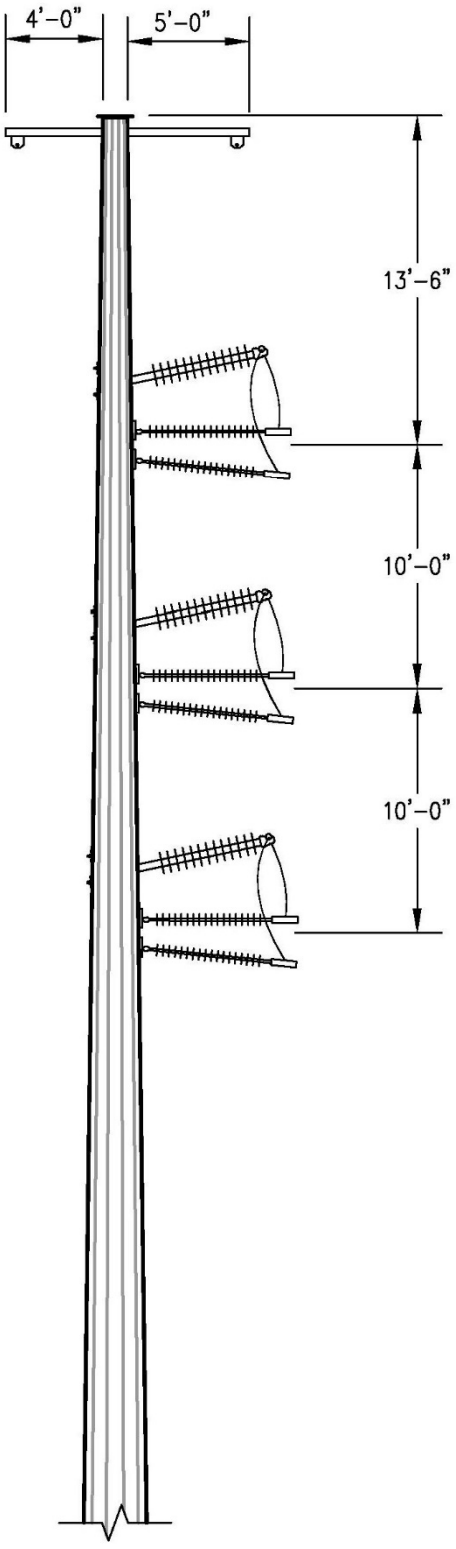


Diagram 04-3. Typical Dead End Structure

The Timber Road III Transmission Line will be installed within a 150-foot wide right-of-way, which on average will extend 75 feet from the centerline of the transmission line along each side. To minimize potential clearing impacts to forestland, the Primary Transmission Route is located entirely within open agricultural land, with the exception of one riparian corridor crossing. Approximately 90 structures are proposed along the 8.6-mile Primary Route, which equates to an average spacing of approximately 515 feet between structures.

The type of materials used for the structures will be steel for the poles, and concrete and rebar steel for the foundations when direct embedment is not applicable. All structures will be designed to meet the National Electric Safety Code's heavy loading and extreme wind condition ratings. Although steel poles were used for the preliminary design basis, the final design material may vary. The conductor size will be 795 kcmil[1] "Drake" 26/7. For grounding and communications needs, there will be two Optical Ground Wires (OPWGs) with 24 fibers. The insulator arrangement will be a "delta" configuration.

Aboveground pole heights will range from 80 to 120 feet. Pole diameter at ground line will range from 36-50 inches depending on the pole (e.g., dead end versus tangent), with slightly larger dimensions at the base. The auger diameter is typically the next largest size (i.e., 36 inch pole diameter at ground surface, 48 inch auger; 50 inch pole diameter at ground surface, 60 inch auger). The pole hole is typically backfilled with gravel to facilitate drainage and ensure consistency of the nearby soil.

(c) *Base and Foundation Design*

The mono-pole structures will be either concrete and rebar foundations or direct embedded in the soil utilizing appropriate backfill materials as required by the engineering design. Gravel or concrete as backfill material for the poles is presently planned though native soil could also be used.

Construction equipment (line trucks, cranes, digging equipment) will be accessing the pole locations during installation in order to dig poles, set poles, and to connect the conductors to the pole insulators. It is anticipated that construction vehicles and cranes will cause temporary disturbance of approximately 22 feet x 22 feet around each pole during Facility construction. The permanent impact from each pole foundation will be approximately 5 feet x 5 feet around each pole.

[1]"kcmil" wire size is the equivalent cross sectional area in thousands of circular mills. A circular mill is the area of a circle with a diameter of one thousandth (0.001) of an inch.

(d) *Underground Cable Design*

No underground 138 kV circuitry is proposed.

(e) *Other Major Equipment or Special Structures*

Standard electric utility transmission digger derrick trucks and bucket lift trucks will be utilized for installation of the 138 kV transmission line. No special structures are included in the Facility design.

(2) Electric Transmission Substation Data

The proposed Timber Road III POI Switchyard will be located in Paulding County between AEP's Lincoln and Sterling Stations. The Switchyard design includes three 138 kV circuit breakers configured in a three ring bus arrangement operated as a ring-bus, along with 138 kV metering units, relays, and associated equipment (see Exhibit B). A 138 kV line extension is required to loop through the proposed POI Switchyard. The SCADA and associated equipment are expected to be located in a control house within the fence. The control house will provide all weather protection and security for the control equipment. No power transformers will be installed.

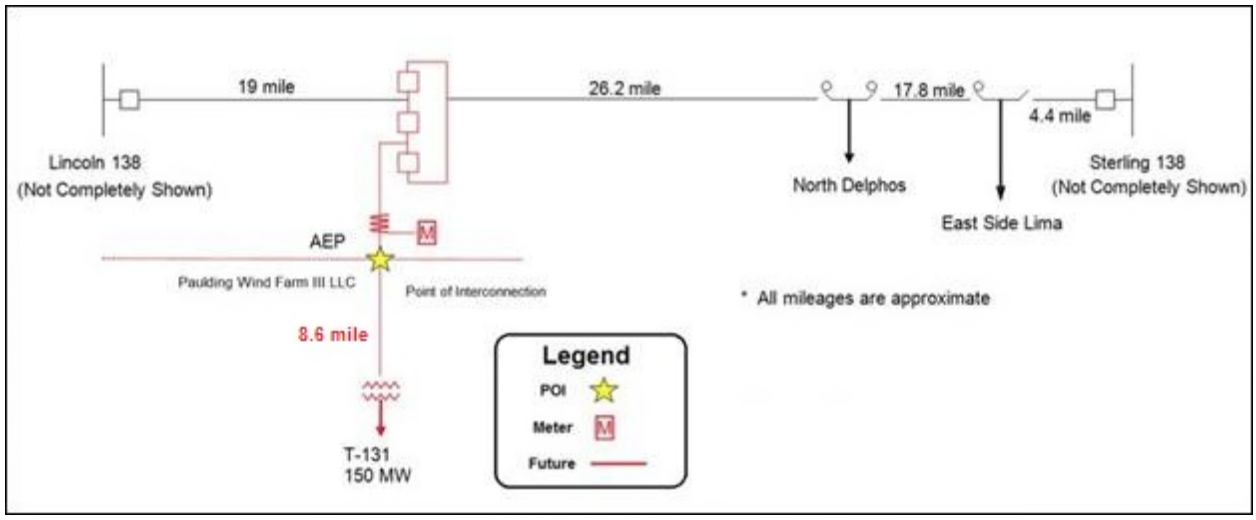


Diagram 02-2

(3) Gas Transmission Line Data

Since the proposed Project does not install gas transmission facilities, this section is not applicable.

(4) Gas Transmission Facilities

Since the proposed Project does not install gas transmission facilities, this section is not applicable.

(D) ENVIRONMENTAL AND AVIATION COMPLIANCE INFORMATION

(1) Permits

The Applicant anticipates submitting a Notice of Intent ("NOI") to the Ohio Environmental Protection Agency authorization of storm water discharges associated with construction activity under the National Pollutant Discharge Elimination System (NPDES). In addition, multiple highway crossing permits will be required. A Paulding County Building Permit and a State Driveway Permit may also be required for the Timber Road III POI Switchyard.

As described in Section 4906-15-07(D), the field delineation effort identified three wetlands within the 150-foot ROW for the Primary Transmission Route, and five wetlands within the 150-foot ROW for the Alternate Transmission Route. There are no wetlands at the POI Switchyard Site. The Primary Transmission Route has been designed to minimize impacts to wetlands to the extent practicable, by placing poles in uplands and spanning wetlands. However, minor impacts to the wetlands in the Flatrock Creek riparian corridor are unavoidable, and will be permitted under Nationwide Permit 12. No in-stream work is anticipated as part of this project.

The Applicant will be responsible for obtaining all applicable permits and authorizations prior to the commencement of construction activities. Copies of the permits and authorizations will be provided to Staff within seven days of issuance or receipt by the Applicant.

(2) Debris

A variety of debris will be generated during construction of the Facility; these waste materials will be properly disposed of in accordance with any local, state, or federal requirements. As construction work proceeds, the ROW and area surrounding the POI Switchyard Location will be kept clean of all rubbish and debris resulting from transmission line and substation construction activities. Debris associated with construction of the transmission line and substation is expected to consist of conductor scrap, construction material packaging (including pallets, cartons, boxes, insulator crates, conductor reels and wrapping), wire scraps, and used storm water erosion control materials. Construction materials with salvage value will be removed from the construction area for reuse or salvage. Construction debris will be hauled away in construction dumpsters and disposed of in accordance with state and federal requirements. It is estimated that construction of the substation will result in up to 100 cubic yards of debris, while construction of the transmission line will only result in minimal debris (e.g., packaging materials).

(3) Stormwater and Erosion Control Plans

A stringent soil erosion and sedimentation control plan will be developed and implemented as part of the Stormwater Pollution Prevention Plan (SWP3) required by the NPDES General Permit for the Facility. The SWP3 will address all minimum components of the NPDES permit, and conform to the specifications of the Rainwater and Land Development manual, which describes Ohio's standards for storm water management, land development, and urban stream protection. The SWP3 will identify potential sources of pollution that may reasonably be expected to affect the quality of storm water discharges associated with construction activities. If applicable, the SWP3 will clearly identify all activities that will be authorized under Section 401 of the Clean Water Act and be subject to an anti-degradation review.

The SWP3 will also describe and ensure the implementation of best management practices that reduce pollutants in storm water discharges during construction. To protect surface waters, wetlands, groundwater, and storm water quality, erosion and sediment control measures will be installed and maintained throughout site development. Such measures could include silt fence, hay bales, and/or temporary siltation basins. The location of these features will be detailed on the construction drawings, approved by the Ohio EPA as part of the NPDES review, and reviewed by the contractor prior to construction. A duly qualified, Staff-approved environmental specialist will inspect these features throughout the period of construction to assure that they are functioning properly until completion of all restoration work (final grading and seeding). Based upon field conditions, additional sediment and erosion control measures may be required, beyond what is depicted on the drawings.

(4) Disposition of Contaminated Soil and Hazardous Materials

All materials stored on-site shall be kept in a neat, orderly manner in appropriate tightly sealed and clearly labeled containers. Manufacturer's recommendations for proper use and disposal will be followed. Material Safety Data Sheets (MSDS) will be retained and available on-site at all times. All sanitary waste will be collected in portable units and emptied regularly by a licensed sanitary waste management contractor.

In addition, a Spill Prevention, Control, and Countermeasure (SPCC) Plan will be prepared that outlines procedures to be implemented to prevent the release of hazardous substances into the environment. This plan will not allow refueling of construction equipment within 100 feet of any stream or wetland, and contractors will be required to keep materials on hand to control and contain a petroleum spill, including a shovel, tank patch kit, and oil-absorbent materials. Any spills will be cleaned up immediately after discovery, and reported in accordance with Federal and Ohio EPA Division of Emergency and Remedial Response regulations.

(5) Height of Tallest Structure

As described above, aboveground pole heights will range from 80 to 120 feet. The lightning mast will be the tallest structure associated with the Switchyard, and it will not exceed 50 feet in height. Additionally, no structures associated with either the Transmission Line or POI Switchyard are anticipated to exceed 120 feet in above ground height, and therefore, FAA/ODOT jurisdiction will not apply.

(6) Plans for Construction during Dusty or Muddy Soil Conditions

The SWP3 will include provisions that address construction during both excessively dusty and excessively muddy conditions. These measures are briefly described below.

(a) *Dust Control*

Best management practices will be utilized and implemented to comply with fugitive dust control rules and minimize the amount of dust generated by construction activities. In addition, the extent of exposed/disturbed areas on the site at any one time will be minimized and restored/stabilized as soon as possible. Water or a dust suppressant such as calcium carbonate will be used to suppress dust on unpaved roads (public roads as well as Facility access roads) as needed throughout the duration of construction activities. Any unanticipated construction-related dust problems will be identified and immediately reported to the construction manager and contractor.

(b) *Excessively Muddy Conditions*

Construction entrances will be established and maintained to a condition which will prevent tracking or flowing of sediment onto public roads and ROWs. The SWP3 will provide guidance on the need to grade construction entrances to provide positive drainage and avoid the formation of standing water. Should muddy soils develop, stabilization measures may be employed, including the placement of dry materials, such as soil or gravel, to lower the overall water content. Any sediment spilled, dropped, washed, or tracked onto public roads or ROWs will be removed immediately.

4906-15-05 FINANCIAL DATA

(A) OWNERSHIP

The Applicant will permit, construct, own, operate, and maintain all structures and equipment associated with the proposed Transmission Line. Limited portions of the transmission line will span the public road right-of-ways where the lines cross roads from one participating parcel to another. However, the proposed Facility will not change the ownership status of such right-of-ways. Transmission Line components will be located entirely on privately owned land, and voluntary easement agreements between the Applicant and private landowners will accommodate the Facility. Lease agreements granting rights for Wind Farm improvements other than the proposed Facility along the Preferred Transmission Route have already been signed, as have a majority of those along the Alternate Transmission Route. Acquisition of easement rights for the proposed Facility commenced in mid-2015 and is on-going. The proposed Facility and associated easement agreements are not expected to change the ownership status of these private lands.

Land that is currently owned by Paulding Wind Farm II LLC and the Applicant will be provided to the Applicant for the Timber Road III POI Switchyard. The Applicant will obtain all necessary permits and be responsible for construction of the POI Switchyard. However, the Applicant currently anticipates transferring ownership of the land and POI Switchyard equipment to the transmission operator when the Wind Farm becomes operational.

(B) ELECTRIC CAPITAL COST

Estimates of applicable intangible and capital costs for the proposed Facility are presented in Table 05-1. The Preferred Facility consists of the Preferred Transmission Route and POI Switchyard, while the Alternate Facility consists of the Alternate Transmission Route and POI Switchyard.

Table 05-1. Estimated Capital and Intangible Costs

Description	Primary Facility	Alternate Facility
Land and Land Rights	$[redacted]	$[redacted]
Structures and Improvements	n/a	n/a
POI Switchyard Equipment	$[redacted]	$[redacted]
Poles and Fixtures	$[redacted]	$[redacted]
Towers and Fixtures	n/a	n/a
Overhead Conductors	$[redacted]	$[redacted]
Underground Conductors and Insulation	n/a	n/a
Underground to Overhead Conversion Equipment	n/a	n/a
Right-of-way Clearing and Access Roads	$[redacted]	$[redacted]
Total	**$**[redacted]	**$**[redacted]

(C) GAS CAPITAL COST

Since the proposed Project does not install gas transmission facilities, this section is not applicable.

4906-15-06 SOCIOECONOMIC AND LAND USE IMPACT ANALYSIS

(A) SOCIOECONOMIC CHARACTERISTICS

A literature search and map review study was conducted for the area within 1,000 feet on either side of the Primary and Alternate Transmission Route centerlines and within 1,000 feet of the proposed POI Switchyard ("Study Area"). The purpose of this review was to identify specific land use areas as required by 4906-15-06(B)(3) below. In addition, on-site investigations were conducted within 100 feet to either side of the Transmission Route centerlines and within 100 feet of the POI Switchyard site to characterize the potential effects of construction, operation, and maintenance of the proposed Facility on such uses.

The entire Study Area is located in Paulding County. The Primary Transmission Route and Alternate Transmission Route are located in Harrison and Benton Townships. The POI Switchyard Site is in Benton Township. The closest incorporated community is Payne, located in Harrison and Benton Townships, approximately 0.6 mile east of the Primary Transmission Route. The estimated population density is 47 persons per square mile in Paulding County compared to 282 persons per square miles statewide (U.S. Census Bureau, 2015). Table 06-01 summarizes the population statistics in the Study Area.

Table 06-1. Study Area Population Data

Municipality	2000	2010	% Change 2000-2010
Harrison Township	1,566	1,459	-6.8%
Benton Township	1,035	1,046	1.1%
Paulding County	20,293	19,614	-3.3%

Source: U.S. Census Bureau, 2010.

According to the U.S. Census Bureau, 24% of the population of Paulding County is comprised of persons less than 18 years of age, while 17% is comprised of persons 65 years and over. Among persons 25 years or older, approximately 89% are high school graduates, and 12% have a bachelor's degree or higher. The homeownership rate is 78%, with a median value of $92,300 for owner-occupied housing units. The median household income is $44,861 per year, and approximately 14% of persons live below poverty level (U.S. Census Bureau, 2015).

(B) ROUTE ALIGNMENT AND LAND USE MAP(S)

Figure 06-1 illustrates the area 1,000 feet to all sides of the Primary and Alternate Transmission Routes and within 1,000 feet of the POI Switchyard, at a 1:24,000 scale. The land use data was derived from ODNR Land Use/Land Cover data for Paulding County, created as part of the Ohio Capability Analysis Program Tax Project in 1995 in

cooperation with the Paulding County Commissioners and the Paulding County Auditor for Paulding County (ODNR, 1995a), and was verified based on field review. Among other information, Figure 06-1 shows the following features:

(1) Approximate Centerline for Each Alternative

The centerlines for both the Primary and Alternate Transmission Routes are depicted on Figure 06-1.

(2) Proposed Substation or Compressor Station Locations

The proposed POI Switchyard Location is depicted on Figure 06-1.

(3) General Land Use, Including, but not limited to:

(a) *Residential Use*

Residential land use is depicted in yellow on Figure 06-1.

(b) *Commercial Use*

Commercial land uses are depicted in pink on Figure 06-1.

(c) *Industrial Use*

There are no industrial land uses within 1,000 feet of the proposed Facility, or in the surrounding area, and hence none are depicted on Figure 06-1.

(d) *Cultural Use*

Cemeteries are depicted in grey on Figure 06-1.

(e) *Agricultural Use*

Agricultural land use is depicted in light green on Figure 06-1.

(f) *Recreational Use*

Recreational land use is depicted in olive on Figure 06-1.

(g) *Institutional Use (e.g., schools, hospitals, churches, government facilities, etc.)*

There are no institutional land uses within 1,000 feet of the proposed Facility. However, there are schools and churches within the Village of Payne, approximately 0.8 mile east of the Primary Transmission Route, and these areas are depicted in brown on Figure 06-1.

(4) Transportation Corridors

The existing transportation network is illustrated on Figure 06-1, including county and township roads.

(5) Existing Utility Corridors

The existing Lincoln – Sterling 138 kV circuit is illustrated on Figure 06-1 in yellow. Utility land use is illustrated on Figure 06-1 with purple and green lines.

(6) Noise-Sensitive Areas

Residences are depicted on Figure 06-1 as small black squares.

(7) Agricultural and Agricultural District Land

Agricultural land use is depicted on Figure 06-1 in light green, while Agricultural District Land is depicted with brown cross-hatching.

(C) LAND USE IMPACTS

Table 06-2 present the existing land use within the Primary and Alternate Study Areas. The Primary Study Area consists of the area within 1,000 feet on either side of the Primary Transmission Route centerline and within 1,000 feet of the proposed POI Switchyard. The Alternate Study Area consists of the area within 1,000 feet on either side of the Alternate Transmission Route centerline and within 1,000 feet of the proposed POI Switchyard. This data is based on the ODNR Land Use/Land Cover dataset for Paulding County (ODNR, 1995a), and was verified through comparison to recent aerial imagery and field review.

Table 06-2. Land Use within the Primary and Alternate Study Areas

Land Use Category	Primary Study Area		Alternate Study Area	
	Acres	% of Study Area	Acres	% of Study Area
Cropland	2,018	94	2,700	95
Deciduous Forest Land	43	2	67	2
Residential	37	2	36	1
Farmsteads	34	2	18	1
Pasture	12	<1	13	<1
Cemeteries	7	<1	7	<1
Shrub and Brush Rangeland	<1	<1	<1	<1
Total	**2,151**	**100**	**2,842**	**100**

Based on review of databases, aerial photography, and site visits, the current land use within 1,000 feet of the Facility consists primarily of agricultural production (approximately 94% and 95% of the Primary and Alternate Study Areas, respectively). A description of the impact of the proposed Facility on land use is provided below in Sections 4906-15-06(C)(2) and (3). Mitigation measures are discussed below in Section 4906-15-06(C)(4).

(1) Number of Residential Structures

There are twenty-five (25) residential structures within 1,000 feet of the Primary Transmission Route, including three participating landowners and seventeen non-participating landowners. There are no (0) residential structures within 100 feet of the Primary Transmission Route.

There are twenty-three (23) residential structures within 1,000 feet of the Alternate Transmission Route, including nine participating landowners and nine non-participating landowners. There are zero (0) residential structures within 100 feet of the Alternate Transmission Route.

There are zero (0) residential structures within 1,000 feet of the POI Switchyard.

(2) Construction Impacts

As presented in Table 06-2, above, cropland is the dominant land use in the region, comprising approximately 2,018 acres (94%) of the total Primary Study Area and 2,700 acres (95%) of the Alternate Study Area. Corn and soybeans are the most commonly cultivated crops in the area. Deciduous forest lands constitute the second largest type of land use with 43 acres (2%) in the Primary Study Area and 67 acres (2%) in the Alternate Study Area. The majority of this forestland occurs in riparian areas along Flatrock Creek. Land use patterns are similar within the ROW, the 150-foot wide right-of-way that will on average extend 75 feet to either side of the Transmission Line. The majority of the land use is cropland: 155 acres (99%) of the Primary ROW and 210 acres (99%) of the Alternate ROW. The Applicant will use existing farm roads where available to limit the amount of crop area disturbed during construction.

Land use at the POI Switchyard Site is entirely (100%) agricultural.

As indicated above, agriculture is the primary land use within and adjacent to the proposed Facility. The transportation and use of construction equipment and material could impact growing crops, fences and gates, subsurface drainage systems (tile lines), and/or temporarily block farmers' access to agricultural fields. However, construction impacts will be temporary in nature, and confined to the properties of participating landowners.

Project infrastructure within the Primary ROW is anticipated to include approximately 90 mono-pole structures with permanent foundations, 8 Stone entrances, and 15 temporary stringing locations. Each mono-pole structure will have a temporary footprint of approximately 484 square feet during construction for the required construction vehicles and cranes. Poles will either be placed on concrete and rebar

foundations or directly embedded in soil with appropriate backfill materials as required. Each pole is anticipated to have a maximum permanent footprint of 100 square feet. The wire stringing locations will temporarily disturb approximately 3,000 square feet each, in order to support pulling equipment and cable trailers. The POI Switchyard is anticipated to have a permanent footprint of 2.1 acres. All construction activities for the POI Switchyard are planned to occur within the permanent footprint.

Access to all locations is anticipated to be via public roads, farm field roads, and over pasture or cultivated farmland. The Applicant will not build any temporary nor permanent access roads for the Project.

During construction of the Facility, temporary impacts to land use are anticipated within the ROW (156 acres for the Primary Route and 212 acres for the Alternate Route). As described above, the agricultural land that dominates the ROWs and larger Study Areas are largely used for cultivated crops. Impacts to forestland are restricted to the Flatrock Creek crossing, which has been carefully sited on the Primary Route to minimize impacts by crossing where the riparian corridor is narrowest. Construction of the proposed Facility will not result in any temporary or permanent impacts to managed wood lots, orchards, nurseries, or agricultural-related structures.

Residential development within and around the Facility consists almost entirely of single-family homesteads along rural roads. No residences occur within the Primary ROW, Alternate ROW, or POI Switchyard Site. No residences or other buildings are expected to be destroyed, acquired, or removed in order to construct the Transmission Line or POI Switchyard. It is expected that some incremental increase in noise will be audible during some portions of construction of the new transmission line and switchyard. However, the current ambient noise levels associated with local roads and farming operations, and the distance to the residences, will mitigate overall noise impacts during construction. Duration of construction at any one location along the route is expected to be short.

(3) Operation and Maintenance Impacts

Only very minor changes in land use are anticipated within the Transmission Line ROW and the POI Switchyard Site as a result of Facility operation, and no changes are predicted outside the Study Area. Approximately 2.15 acres of permanent impacts to agricultural land use are anticipated from the Primary Facility. These impacts are associated with the POI Switchyard and pole bases, which are mostly located in cultivated cropland. During Facility operation, additional impacts over the years on land use should be infrequent and minimal. Aside from occasional maintenance and repair activities, Facility operation will not interfere with on-going land use (i.e., farming activities).

(4) Mitigation Procedures

Various procedures will be used to reduce impacts during construction, including impact minimization measures and site restoration. The Facility is sited in agricultural land, which is land that has already been disturbed. The Applicant will use existing farm roads and public rights of way where available to limit the amount of crop area disturbed during construction. Following construction activities, temporarily disturbed areas will be seeded (and stabilized with mulch and/or straw if necessary) to re-establish vegetative cover in these areas. 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.

Ongoing Operation and Maintenance impacts will likely be limited; and not require heavy equipment.

(D) PUBLIC INTERACTION INFORMATION

(1) Counties, Townships, Villages, and Cities within 1,000 Feet of the Route Alternatives

The Primary and Alternate Study Areas are both located entirely within Paulding County, and both include portions of Benton and Harrison Townships. The entire area within 1,000 feet of the POI Switchyard is in Benton Township. There are no cities or villages within 1,000 feet of any portion of the Facility.

(2) Public Officials Contacted

The following public officials have been contacted regarding the application:

- Harrison Township Fiscal Officer Kathy Feasby
  115 Proxmire Drive
  Payne, OH 45880
  Phone: (419) 769-5544 cell

- Harrison Township Trustee Edward (Ed) Lanny Stabler
  5783 SR 500
  Payne, OH 45880
  Phone: (419) 769-0463 cell
  Phone: (419) 263-2104 home

- Harrison Township Trustee Chad Benschneider
  PO Box 474
  Payne, OH 45880
  Phone: (419) 769-4708

- Harrison Township Trustee Dan Olwin
  5361 CR 94
  Payne, OH 45880
  Phone: (419) 769-5544 cell
  Phone: (419) 263-2507 home

- Benton Township Fiscal Officer Julie Dinger
  3708 SR 500
  Payne, OH 45880
  Phone: (419) 263-2678

- Benton Township Trustee Mark Crosby
  1065 SR 114
  Payne, OH 45880
  Phone: (419) 263-2267

- Benton Township Trustee Randy Noggle
  6437 SR 114
  Haviland, OH 45851
  Phone: (419) 263-2459

- Paulding County Commissioner Tony Zartman
  115 N Williams Street
  Paulding, OH 45879
  Phone: (419) 399-8215

- Paulding County Commissioner Roy Klopfenstein
  115 N Williams Street
  Paulding, OH 45879
  Phone: (419) 399-8215

(3) Public Information Programs

The Applicant held a public information meeting on October 26, 2015 at the Paulding County Fairground, inviting the public to review maps and studies performed on the Primary and Alternate Transmission Routes and POI Switchyard. Local landowners are updated through periodic newsletters, as well as personal contacts with the Applicant's representatives. During construction phase the Applicant will use phone calls, emails, and face to face meeting to communicate progress. During Facility operation, the Applicant will maintain an informational website about the Wind Farm and Facility, and will operate a local maintenance facility that will be a source of information to the community.

(4) Liability Compensation

The Applicant will effect and maintain throughout the term of the Facility, at its sole cost, insurance policies against claims and liabilities arising out of personal injury, death, and property damage arising from operation of the Facility. The insurance policy or policies will insure the Applicant to the extent of their interests. The limits of the insurance policy described shall be $10,000,000 per occurrence and $10,000,000 in annual aggregate. The Applicant may choose any combination of primary and excess liability policies to reach the aforementioned insurance limits.

(5) Public Interest, Convenience, and Necessity

The proposed Facility will serve the public interest, convenience, and necessity by delivering renewable energy to the electric power grid. Specifically, this Facility will deliver up to 100.8 MW of energy from the Timber Road I Wind Farm and the Timber Road III Wind Farm. The purpose of which is to produce wind-powered electricity that will maximize energy production from existing wind resources in order to deliver clean, renewable electricity to the PJM bulk power transmission system which in turn can be used to serve the needs of electric utilities and their customers, including mercantile customers. See Section 4906-15-02 of this Application for a more detailed discussion of the need for the proposed Facility.

(6) Tax Revenues

According to the Public Utilities Chapter 5727 of the Ohio Revised Code, the Facility is part of a "Energy Facility." ORC Section 5727.01(P) states that,

> *""Energy facility" means one or more interconnected wind turbines, solar panels, or other tangible personal property used to generate electricity from an energy resource owned by the same person, including:*
>
> *(1) All interconnection equipment, devices, and related apparatus connected to such tangible personal property; and*
>
> *(2) All cables, equipment, devices, and related apparatus that connect the generators to an electricity grid or to a building or facility that directly consumes the electricity produced, that facilitate the transmission of electrical energy from the generators to the grid, building, or facility, and, where applicable, that transform voltage before ultimate delivery of electricity to the grid, building, or facility.*

Furthermore, the Facility will not be constructed unless the associated wind turbines are constructed. Therefore, the increase in tax revenues as a result of Facility placement will be the same as those

anticipated from the associated wind turbines. The proposed wind turbines (and thus the associated Facility) 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 Facility and proposed wind turbines are to be located. Taxing districts include Paulding County, Harrison Township, Benton Township, Wayne Trace Local School District and Antwerp Local School District.

The amount of the annual service payment depends on the ratio of Ohio-domiciled full-time equivalent employees to total full-time equivalent employees during construction or installation during the preceding tax year. The base payment ranges from $6,000 and $8,000 per MW of nameplate capacity. In addition, the county may also require that an additional tax exempt payment be made to be allocated to the county's general fund. However, in accordance with the Ohio Revised Code, the total annual payment cannot exceed $9,000 per megawatt.

The Applicant anticipates that it will pay real and personal property taxes at the maximum rate set under Senate Bill 232, $9,000 per MW of nameplate capacity per year during the life of the wind farm turbines. The nameplate capacity of the associated wind turbines will be 100.8 MW, therefore the increase in local tax revenues associated with the Facility will be $907,200.

It is important to note that the proposed wind turbines and Facility will make few, if any, demands on local government services. Therefore, payments made to local governments will be net positive gains and represent an important economic benefit to the local area.

(7) Impact on Regional Development

As indicated above, the Timber Road III Transmission Line and Timber Road III POI Switchyard will not be constructed unless the Timber Road I Wind Farm and the Timber Road III Wind Farm are constructed. Therefore, assuming these facilities are constructed they will cumulatively have a positive impact on regional development. For example, as discussed in the Application for the Timber Road III Wind Farm (see Case No. 10-0369-EL-BGN), construction and operation of the proposed wind farm will have a positive impact on commercial and industrial development in Paulding County, as well as throughout northwest Ohio and the entire State. According to a 2007 report prepared by Environment Ohio, the development of additional wind energy facilities in Ohio will have significant and positive economic impacts within the region. If the State of Ohio increased wind power production to 20% of the state's total energy portfolio by 2020, such development would create 3,100 permanent, full-time positions within the state, and result in cumulative wages totaling $3.7 billion (Bowser et al., 2007). These impacts are principally due to the impact

of wind energy development on the manufacturing sector. The Plan that covers Paulding County is the Comprehensive Economic Development Strategy (CEDS) developed by the Maumee Valley Planning Organization (MVPO) in 2012. Objectives are: 1. Establish a regional marketing and business attraction voice for the five-county region; 2. Expand the economic development role of the MVPO; 3. Increase awareness of schools, cost of living, housing, health care facilities, recreational amenities; 4. Increase the educational attainment and skillset of the workforce; 5. Continue to expand and develop all categories of infrastructure. The project will "Increase employment growth and investment" (Goal 1) by facilitating the building of the Timber Road I Wind Farm and the Timber Road III Wind Farm, an investment of approximately $200 million dollars in Paulding County that will employ approximately 700 workers in some aspect of the construction of the projects. Additionally, the Project will "Improve the efficiency and effectiveness of economic development" (Goal 2) given its impact on economic development in the local and state economies. Finally, by putting in place key transmission infrastructure the project will "facilitate meeting investment in new infrastructure which is also a stated goal of the Regional plan" (Goal 5).

No negative impacts on regional development are anticipated as a result of the Timber Road III Transmission Line or Timber Road III POI Switchyard. See Section 4906-15-02 of this Application for a more detailed discussion of the need for the proposed Facility.

(E) HEALTH, SAFETY, AND AESTHETIC INFORMATION

(1) Compliance with Safety Regulations

Safety is the Applicant's highest priority. Therefore, the Applicant will assure that the Facility will be constructed and operated to 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 (OSHA).

(2) Electric and Magnetic Fields

Electric fields in the home, on average, range from 0 to 10 volts per meter. Electric fields directly beneath power lines may vary from a few volts per meter for some overhead distribution lines to several thousands of volts per meter for extra high voltage power lines. Electric fields from power lines rapidly weaken with distance and can be greatly reduced by walls and roofs of buildings (NIH, 2002; EPRI, 2009).

In contrast, magnetic fields are not blocked by most materials. Magnetic fields encountered in homes vary greatly and exponentially weaken with distance from the source. Magnetic fields close to electrical appliances are often much stronger than those from other sources, including magnetic fields directly under power lines. Appliance fields decrease in strength with distance more quickly than do power line fields. Alternating magnetic fields produced by AC electricity can induce the flow of weak electric currents in the body. However, such currents are estimated to be smaller than the measured electric currents produced naturally by the brain, nerves, and heart (NIH, 2002; EPRI, 2009).

Due to public concern that the use of electricity, electrically-powered devices, and electrical power distribution networks may adversely affect health, numerous research studies and scientific reviews have been conducted to address this topic. Initial concerns were raised in the late 1970s, and scientists continue to investigate possible relationships between electric and magnetic fields (EMFs) and positive or negative health effects. However, there is no conclusive evidence that exposure to EMF causes health effects. Additional discussion of potential health effects of EMF is included below in Section 4906-15-06(E)(2)(b). During the public information meeting, no public health concerns were raised.

Currently, there are no federal standards for occupational or residential exposure to 60 Hz Extra Low Frequency – Electromagnetic Frequencies (ELF-EMF) of the levels produced by power lines. However, there are national and international guidelines for the exposure of workers in occupational settings and to members of the public (ICNRP, 1998; IEEE, 2002; AGCIH, 2001). These exposures are complex and come from multiple sources within the home, the workplace, and power lines. Although scientists are still debating whether EMF is a hazard to health, the National Institute of Environmental Health Sciences (NIEHS) recommends continued education on ways of reducing exposures without adding other safety concerns.

The unit measurement for the strength of magnetic fields is the Gauss (G). Since magnetic fields from power lines and other low level sources are typically much lower than a Gauss, a smaller unit of 1/1000th of a Gauss, called a milli Gauss (mG), is used. This unit of measurement of a magnetic field is also sometimes referred to as the "magnetic flux density" or the "magnetic induction". The electric field is measured by the change in voltage potential over a certain distance. The unit of electric field is kilovolts per meter or kV/m. An electric field of 1 kV/m indicates a difference in electric potential of 1000 volts (1 kilovolt) measured over a 1 meter distance.

It is the intention of the Applicant to design the overhead transmission and substation interconnection line with magnetic and electric field levels well below the Institute of Electrical and Electronics Engineer guidelines (IEEE, 2002) given in Table 06-3.

Table 06-3. Institute of Electrical and Electronics Engineer EMF Exposure Guidelines

Exposure Population	Electric Field	Magnetic Field
Worker	20 kV/m	27,100 mG
Public	5 kV/m	9,040 mG

The following analysis provides a demonstration of the magnetic and electric fields strengths of the proposed Facility.

(a) *Calculated Electric and Magnetic Field Strength*

The design of the Timber Road III transmission line will be the same for either the Primary or Alternate Route, so this EMF analysis applies to either route. The EMF related to the Timber Road III Transmission Line were modeled with the Corona and Field Effects Program Version 3 (Corona 3) computer model. Corona 3 is an EMF modeling program written by the Bonneville Power Administration (BPA, 1999). The following calculations provide an approximation of the magnetic and electric fields strengths of the proposed Timber Road III Transmission Line. The calculations provide an approximation of the electric and magnetic field levels based on specific assumptions. Current flows are assumed in the direction expected under winter normal, emergency line, and normal maximum system operating conditions. For the Timber Road III transmission line, the three loading conditions are all 200 MVA (maximum). The location of transmission line poles, attached conductors and static wire, and the phasing are based on preliminary conceptual engineering layouts.

Other EMF calculation assumptions and notes include:

- All calculations are based on the Electric Power Research Institute (EPRI, 2005) Transmission Line Red Book Methods 3rd Edition, 2005 - infinite straight wire with flat earth approximation.
- All EMF approximations are only valid for low frequency (50-60 Hz) AC transmission lines.
- The Corona 3 program is able to model bundled conductors; however, the Project will only have one conductor per phase, which is what was modeled in this analysis.
- The effects of earth return currents (earth resistivity) are included when calculating the magnetic field.

- The conductor height used in the modeling was the height of the wire at mid-span where conductors sag to their lowest elevation between transmission towers. A minimum ground clearance of 25 feet was used for the lowest conductor.
- All calculations assume that the ground plain is flat.
- The calculated field levels assume a reference point at approximately 3 feet (1 meter) above ground. This is the height where a field meter would be held for measuring the fields.

Typical EMF studies investigate various transmission line conductor ratings and loading conditions; typically winter normal conductor rating, emergency line loading, and normal maximum loading. These calculations provide various energy production levels that maximize the power flow across the transmission line. As required by 4906-15 (E)(2)(a), these studies have been completed. However, the 138 kV transmission line proposed is a radial feed in that it only supports the transmission of the power from the Wind Farm to the existing transmission grid. The amount of power transmitted across this line will be limited by the maximum generating capacity (100.8 MW) of the Wind Farms. The interconnection studies and wind turbine build out have a maximum output of 200 MW. Due to the relatively low transmission voltage (138 kV) at the nearest point of interconnection, single large diameter 795 ACSR (Drake) conductors are used to minimize corona effects. Due to the large conductors, there is significant excess current carrying capacity in the winter normal conductor rating of the 138 kV transmission line, above the 100.8 MW combined nameplate capacity of the Timber Road I and III Wind Farms. Therefore, the winter normal conductor rating, emergency line loading, and normal maximum loading cases studied below in section (i) are included for completeness, but may exceed the actual loading of the proposed facility.

(i) Winter Normal Conductor Rating

The conductor being specified for the 138 kV transmission line is a single 795 Drake conductor per phase rated at a maximum ampacity of 907 amperes. For this project, the winter normal conductor rating is 836 Amperes. At 138 kV, this calculates to a rating of 200 MVA (maximum). Diagram 06-1 provides an illustration of the magnetic field strengths under this hypothetical scenario, and shows that a reference point of approximately 3 feet above ground, the maximum magnetic field would be 125 mG near the center of the 150-foot right of way. The distance from the center to the edge of the ROW is 75 feet, indicated by vertical dashed lines in Diagram 06-1.

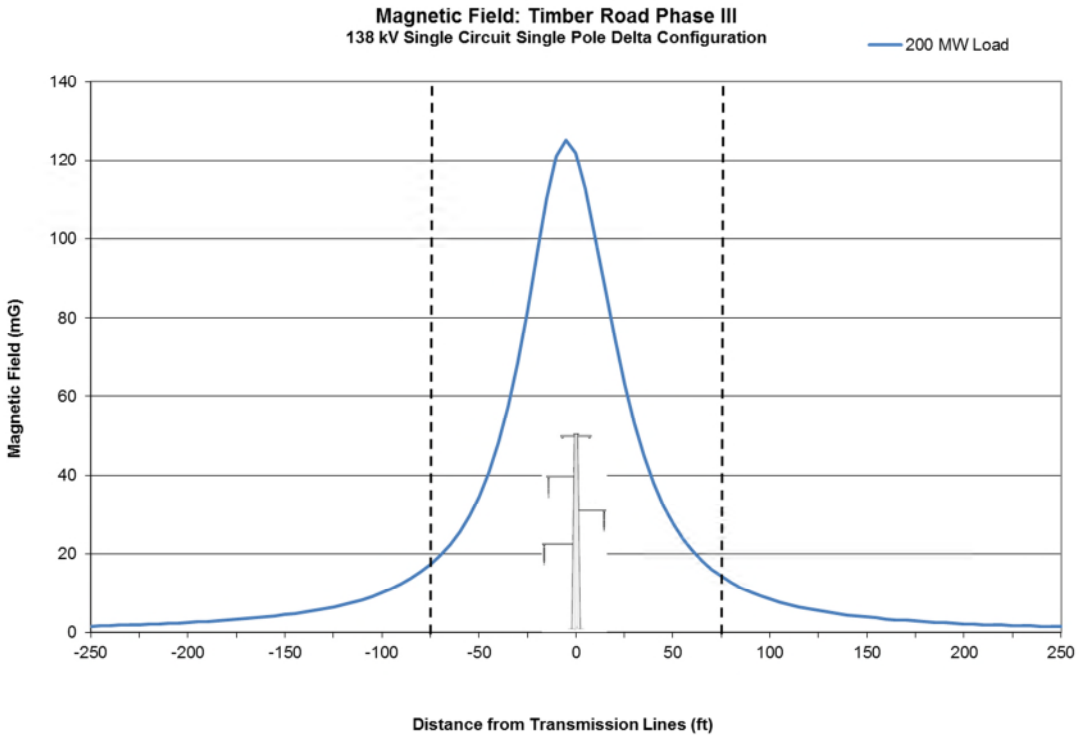


Diagram 06-1. Magnetic Fields, Hypothetical Winter Normal Rating

Diagram 06-2, below, provides an approximation of the electrical field strengths under this hypothetical scenario, with the vertical dashed lines again indicating the edges of the ROW. At a reference point of approximately 3 feet above ground, the maximum electric field from the Timber Road III Transmission Line would be 1.81 kV/m.

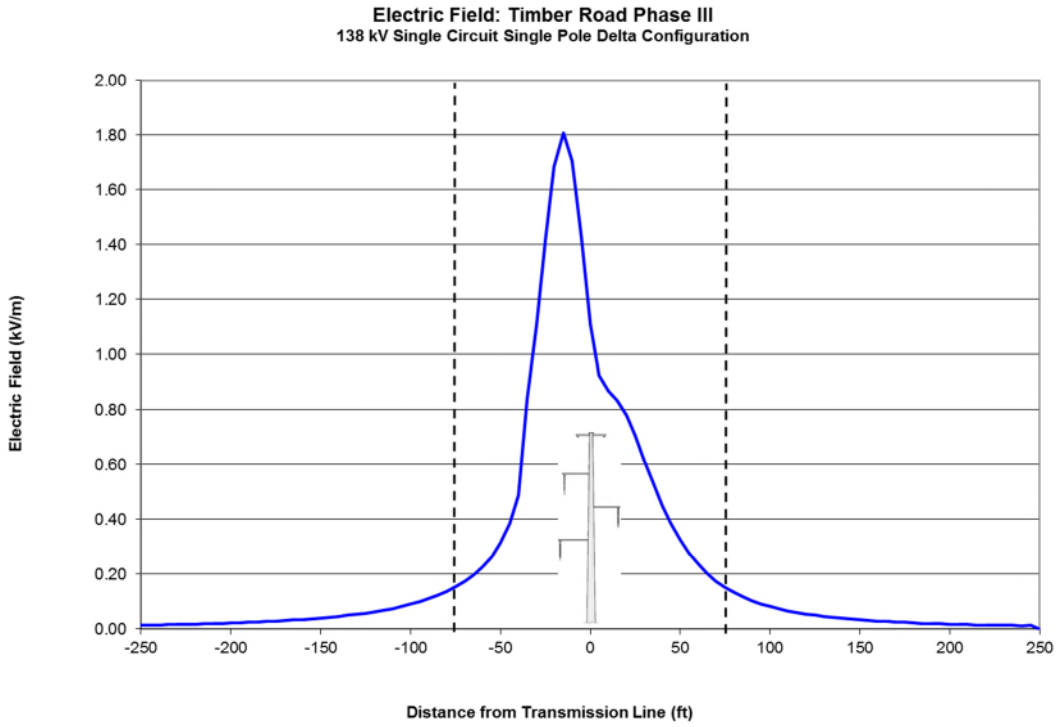


Diagram 06-2. Electric Fields, Hypothetical Winter Normal Rating

(i) Emergency Line Loading

The emergency line loading values are also 200 MVA. Again, the 138 kV transmission line proposed is a radial feed, in that it only supports the transmission of the power from the Wind Farms to the existing transmission grid. The emergency amount of power transmitted across this line will be limited by the generating capacity of the Wind Farms. Diagram 06-1, above, also provides an approximation of the magnetic field strengths under this maximum output scenario, and shows that a reference point of approximately 3 feet above ground, the maximum magnetic field would be 125 mG.

Diagram 06-2 provides an approximation of the electrical field strengths under this same maximum output scenario, and shows that a reference point of approximately 3 feet above ground, the maximum electric field would be 1.81 kV/m.

(ii) Normal Maximum Loading

The normal maximum loading values in this study are based on the maximum output of the Wind Farm, which is 200 MVA. Again, because the 138 kV transmission line proposed is a radial feed, it only supports the transmission of the power from the Wind Farms to the existing AEP transmission

grid. The maximum amount of power transmitted across this line will be limited by the generating capacity of the Wind Farms. Therefore, the normal maximum loading is the same as the emergency line loading (200 MVA, 138 kV). At a reference point of approximately 3 feet above ground under this normal maximum loading scenario, the maximum magnetic field would be 125 mG and the maximum electric field would be 1.81 kV/m. See Diagrams 06-1 and 06-2 above.

(b) *Current State of EMF Knowledge*

Electric transmission lines produce EMF when they are in operation. These fields are caused by different aspects of the operation of a transmission line and can be evaluated separately. Electric fields are produced whenever a conductor is connected to a source of electrical voltage. An example of this is the plugging of a lamp into a wall outlet in a home. When the lamp is plugged in, a voltage is induced in the cord to the lamp which causes an electric field to be created around the cord. Magnetic fields are produced whenever an electrical current flows in a conductor. In the lamp example, if the lamp is turned on allowing electricity to flow to the lamp, a magnetic field is created around the lamp cord in addition to the electric field.

Electric and magnetic fields are naturally occurring in the environment and can be found in the Earth's interior and in the human body. EMFs are generated essentially where ever there is a flow of electricity, including electrical appliances and power equipment. Electric fields are associated with the voltage of the 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. Scientists have conducted extensive research over the past two decades to determine whether EMFs are associated with adverse health effects. At this time there is no firm basis to conclude that EMFs from transmission lines cause adverse health effects (NIH, 2002).

Included in the National Energy Policy Act of 1992, the Electric and Magnetic Fields Research and Public Information Dissemination program was initiated as a five-year effort under the National EMF Research Program. The culmination of this five-year effort resulted in a final RAPID Working Group report, which was released for public review in August 1998. The Director of the NIEHS then prepared a final report to Congress after receiving public comments. The NIEHS Director's final report, released to Congress on May 4, 1999, concluded that “the scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak”. However, ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence suggesting that exposure may pose a leukemia

hazard. The Director further stated that the conclusion of this report is insufficient to warrant aggressive regulatory concern (NIEHS, 1999).

Congress also directed the National Academy of Science (NAS) to undertake a comprehensive review of the EMF scientific literature. The NAS also submitted its report to Congress in 1999 (NAS, 1999). In their report, they concluded "the results of the EMF RAPID program do not support the contention that the use of electricity poses a major unrecognized public health danger." The NAS went further and recommended that Congress stop federal funding of EMF research, which Congress did.

In 2007, a comprehensive World Health Organization EMF health risk assessment was published which generally concluded: "A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include other types of cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications, neurological disease and cardiovascular disease. The scientific evidence supporting a linkage between exposure to ELF magnetic fields and any of these diseases is weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease" (WHO, 2007).

From these and other similar reports, the overall conclusion from more than 10,000 scientific studies conducted around the world over the past 40 years is there is no demonstrated biological linkage between human exposure to power line EMF and the occurrence of a disease.

(c) *Line Design Considerations*

The strength of electric and magnetic fields can potentially be reduced by installing the transmission line conductors in a compact configuration and, for multiple circuit transmission lines, by selecting conductor phasing that reduces the field strengths. The Applicant will design its transmission facilities according to the requirements of the National Electric Safety Code (NESC). The heights of the transmission line pole and the configuration of the conductors will be based on NESC requirements, engineering parameters, and cost. The Applicant will install the 138 kV Timber Road III Transmission Line primarily on mono-pole tangent structures; this is a compact design that reduces EMF field strengths in comparison to other structure designs.

(d) *Procedures for Addressing Public Inquiries Regarding EMF*

Information on electric and magnetic fields is available on AEP Ohio's website (https://www.aepohio.com/info/projects/emf/). It describes the basics of electromagnetic field theory, scientific research activities and EMF exposures encountered in everyday life. Similar material will be made available to those that inquire for additional information.

In addition, a complaint resolution procedure will be implemented to ensure that any complaints regarding construction or operation of the proposed Facility are adequately investigated and resolved. A hotline will be setup to receive and formally document all complaints, which will then be investigated by onsite Facility staff. The complaint resolution process will be developed by the Applicant in consultation with the OPSB, and be in place at least 30 days before the pre-construction conference.

(3) Aesthetic Impacts

Construction of the proposed Timber Road III Transmission Line and POI Switchyard will have an effect on the aesthetic character of the existing landscape. The analysis presented below is based on EDR's significant experience with evaluating the potential visual impacts of proposed electric transmission facilities.

Introduction of new poles and overhead conductors, the associated clearing of vegetation along the ROW, and the POI Switchyard, will introduce new man-made, utilitarian features into the landscape. However, the extent of Transmission Line and Switchyard visibility and its visual impact are likely to be highly variable, depending on a number of factors, including proximity to viewers; viewer sensitivity; the extent of screening provided by intervening topography, vegetation, and structures; and the presence of other built features in the view. In most instances, the visibility and visual impact of a transmission line and substation diminishes quickly with distance. Viewpoints located over 0.5-mile from a transmission line or substation will generally not experience a substantial impact. The highest degree of visibility and potential visual impact will occur when the built feature is directly adjacent to, or in the case of a transmission line actually crosses, a receptor location. Certain viewers, such local residences and recreational users, are particularly sensitive to visual change, while others are less so.

Landscape characteristics such as topography, vegetation, and land use also influence how visible a transmission line or cleared ROW will be, and how well it fits in the context of the existing landscape. Hills can be effective in blocking views of transmission lines from many locations within a landscape. However, a transmission line structure located on a hilltop will often be highly visible against the sky. Hilltop viewing locations can also provide long distance views of significant portions of transmission lines (including the

cleared (ROW) that are not available in flatter terrain. In general, transmission lines and substations will be less visible in forested settings due to the screening provided by mature trees. However, where they are seen in such settings, the contrast presented by transmission lines can be high due to the clearing required for the ROW and the lack of other visible man-made features in the landscape. In open agricultural settings transmission lines are typically more visible, but their contrast is often reduced due to the limited ROW clearing required and the presence of other structures in the landscape. Similarly, because transmission lines and substations are typically viewed as industrial or utilitarian features, they appear most compatible in landscapes that already include industrial facilities or utility infrastructure, and are less compatible with residential or recreational settings.

(a) *Views of the Proposed Facility*

Both the Primary and Alternate Transmission Routes traverse an agricultural landscape, which is also the setting for the POI Switchyard. This landscape is characterized by level topography with a mix of farms and rural residences, open fields, hedgerows, and small woodlots. Dominant agricultural uses include crop farming (primarily soybeans and corn) along with a small amount of pasture, according to publicly available data (ODNR, 1995a). Due to the presence of open fields, views within this landscape are more open and longer in distance than those available in more forested or developed settings. These views typically include a level foreground field, often with a woodlot in the distance, and, in places, existing transmission lines crossing or framing the view. Views also include widely scattered homes, barns, and silos, with working farm equipment occasionally seen in the fields.

The area in the vicinity of the Primary and Alternate Transmission Routes and POI Switchyard includes three distinct types of viewers. These viewers and their sensitivity to visual change in the landscape are described below.

<u>Local Residents</u>

Local residents include those who live and work in the area. They generally view the landscape from their yards, homes, local roads, and places of employment. Except when involved in local travel, residents are likely to be stationary and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable; however, it is assumed that residents may be sensitive to changes in particular views that are important to them.

<u>Through Travelers/Commuters</u>

Commuters and travelers passing through the area view the landscape from motor vehicles on their way to and from work or other destinations. Commuters and through travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Their sensitivity to visual change tends to be relatively low. Drivers will generally be focused on the road and traffic conditions, and have limited opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment.

Tourists/Recreational Users

Recreational users and tourists include local residents and out-of-town visitors involved in cultural and recreational activities at parks, recreational facilities, and historic sites, as well as in undeveloped natural settings such as forests and fields. Due to the lack of recreational facilities in the vicinity of the proposed Facility, members of this group will likely view the landscape in the vicinity of the Primary and Alternate Transmission Routes and POI Switchyard only from area highways while on their way to their recreational destinations, rather than from the destinations themselves. Visual quality may or may not be an important part of the recreational experience for these viewers, but their sensitivity to visual change while on-route to their destination is generally similar to that of through-travelers.

Both the Primary and Alternate Transmission Routes are proposed to run cross country. Neither follows an existing transmission or distribution line, or runs along the ROW of an existing road. The Primary and Alternate Transmission Routes run almost exclusively through agricultural land. To minimize potential clearing impacts to forestland, the Primary Transmission Route is located entirely within open agricultural land (with the exception of one riparian crossing), while the Alternate Transmission Route avoids forestland to the extent practicable. The southern half of both the Primary and Alternate Transmission Routes run among the existing turbine of the Timber Road II Wind Farm, while the northern half of both routes will be surrounded by the turbines of the proposed Timber Road I Wind Farm and the Timber Road III Wind Farm. As a result, the Transmission Line and POI Switchyard will be seen among multiple new utilitarian structures that will be substantially taller and will represent the dominant focal points within the landscape. Both routes are relatively short (approximately 8.6 miles for the Primary Transmission Route and 11.6 miles for the Alternate Transmission Route) which limits the geographic area where views of the line will be available.

Viewers in the vicinity of the Primary and Alternate Transmission Routes and the POI Switchyard are almost exclusively local residents and travelers along adjacent roads. Sixty-five (65) residences occur within 0.5 mile of the Primary Transmission Route, primarily along the frontage of CR 124, TR 94, TR 96, TR 33, and SR 500. Seventy-eight (78) residences occur within 0.5 mile of the Alternate Transmission Route, and are concentrated along CR 124, TR 96, CR 11, TR 21, SR 613, TR33, and SR 500. The Primary Transmission Route includes 12 road crossings and the Alternate Transmission Route includes 14 road crossings. These crossing locations will offer the closest, most unobstructed views of the line, but these views will be of brief duration and peripheral to the orientation of the driver's view along the roadway. Residential density and traffic volume are low in the vicinity of the Primary and Alternate Transmission Routes and POI Switchyard, thus limiting the number of viewers affected by the proposed Facility.

- Based on the sensitive site inventory conducted for the Timber Road II Wind Farm Visual Impact Assessment (EDR, 2010), there are three sensitive sites (one historic site and two cemeteries) located in the vicinity of the proposed Transmission Line:

    - The Former Worm School/Grange Hall, located along CR 124, has been determined eligible for the National Register of Historic Places, and is located 0.14 miles from the edge of the Collection Substation that is the northern end of both the Primary and Alternate Transmission Routes. The Former Worm School/Grange Hall will experience largely uninterrupted views of the Facility due to its close proximity and lack of screening.
    - The Lehman Cemetery is located 0.16 miles east of the common portion of the Primary and Alternate Transmission Routes, along TR 70. From this cemetery, views of the proposed line will be mostly open and unscreened.
    - The Brady-Finnan-Pleasant Valley Cemetery is located 0.18 miles west of the Alternate Transmission Route along CR 48. From this cemetery, views of the proposed line will be mostly open and unscreened due to its close proximity.

- There are no National or State Parks, Forests, or Wildlife Refuges/Management Areas with 0.5 mile of the Primary or Alternate Transmission Route or POI Switchyard. There are also no sites or districts within this 0.5-mile area listed on the State or National Register of Historic Places (NRHP), and no State- or Federally-designated trails, scenic roads, scenic overlooks, or wild, scenic or recreation rivers.

(b) *Structure Design Features*

The Timber Road III Transmission Line will be designed and constructed to operate at 138 kV. The Transmission Line will be installed within a 150 foot-wide right-of-way (ROW) which will extend approximately 75 feet from the centerline of the transmission line along each side. To minimize potential clearing impacts to forestland, the Primary Transmission Route is located entirely within open agricultural land (with the exception of one riparian crossing), while the Alternate Transmission Route avoids forestland to the extent practicable. There may be a variety of different structure types used for the Facility, due to different constraints at different locations (e.g., angle structures). However, all of the structures along the transmission line are expected to utilize a single-pole design, which minimizes the amount of soil disturbance when compared to double-pole, H-frame designs. Approximately 90 structures are proposed along the 8.6-mile Primary Route, which equates to an average spacing of approximately 515 feet between structures. The type of materials used for the structures will be steel for the poles, and concrete and rebar steel for the foundations for poles that will not be direct embedded. Structure height will range from approximately 80 to 120 feet above the ground, with a direct embedded foundation underground or for poles placed on concrete foundations.

Although transmission line structures, conductors, and associated hardware are primarily determined by engineering requirements, several features of the proposed line will reduce their potential visual impact. The proposed use of monopoles for most of the structures will give the line a simple and clean appearance. The delta and vertical configuration of the conductors reduces the total number of poles required and the width of any required ROW clearing (although it also results in a somewhat taller structure height). Access roads for construction and operation of the line will utilize existing farm roads to the extent practicable, thus minimizing the need for new access road construction.

The Timber Road III POI Switchyard will be approximately 410 by 230 feet in size (2.1 acres in area), enclosed by a chain link fence. The POI Switchyard design includes three 138 kV circuit breakers configured in a three ring bus arrangement operated as a ring-bus, along with 138 kV metering units, relays, a control house, and associated equipment.

(c) *Facility Effect of the Site and Surrounding Area*

As described above, the proposed Facility will change the visual character of the area by adding a new, built, utilitarian feature into a rural agricultural landscape. It will be visible from public roads and nearby residences, but should be well screened/removed from sensitive aesthetic resources. While nearby residences may be sensitive to this visual change, the rural nature and low population density of the

area, as well as the lack of major thoroughfares, limits the number of viewers potentially affected by the line. In addition, transmission lines are a common feature of rural landscapes, and do not appear entirely out of place in a working agricultural setting. Finally, the presence of the Timber Road II Wind Farm and proposed Timber Road I Wind Farm, and Timber Road III Wind Farm will further reduce any visual impact associated with the proposed Transmission Line and POI Switchyard. The wind turbines will be the dominant man-made features of the landscape. Their greater height and movement will make them focal points within the view, which will limit the prominence of the proposed Facility and any landscape contrast it presents.

(d) *Visual impact Minimization*

As mentioned above certain routing and design features of the proposed Facility will help to mitigate visual impact. These include the following:

- Routing through open/agricultural land that minimizes the need for ROW clearing.
- Relatively short overall line length (8.6 miles for Primary and 11.6 miles for Alternate) that limits the geographic area and number of viewers potentially affected.
- Avoidance of major road crossings, areas of concentrated settlement, and recognized sensitive aesthetic resources, to limit the number and sensitivity of potentially affected viewers.
- Use of single monopole structures to minimize the number of poles required and present a simple clean appearance.
- Using existing farm roads to the extent practicable.
- Location of the line among or adjacent to the Timber Road II and Timber Road III wind turbines, which will be the dominant visual features of the landscape.

(4) Estimate of Radio and Television Interference

To evaluate the potential for the Facility to impact existing telecommunication signals, Comsearch was contracted to determine if there would be electromagnetic interference from the Facility on existing AM/FM radio and television broadcast signals in the area (see Exhibit C). As part of these analyses, Comsearch defined an "Area of Interest" that included the Primary and Alternate Transmission Lines and POI Switchyard. All off-air television stations within 150 kilometers (93 miles) of the Area of Interest were identified, along with all AM and FM radio stations within 30 kilometers (19 miles) of the Area of Interest. These stations are mapped and listed in tabular format in Exhibit C. To determine whether there will be interference, Comsearch modeled the electric field emitted from the proposed Timber Road III Transmission Line across a wide range of frequencies that includes the AM, FM, and television broadcast signal bands.

Electromagnetic interference from a transmission line is the result of the induction field created by the 60 Hz electrical voltage and by the harmonics of the 60 Hz fundamental signal. The interference can also be the results of arcing or corona that can occur at high voltage interconnect points on the transmission line. In either case, the interfering signal is amplitude modulated (AM), and the propagation of the interference occurs over very short distances. These distances are generally less than 500 feet. Also, the frequency of the interference does not normally extend above 50 MHz. The emissions from the proposed Transmission Line are many orders of magnitude below the signal levels of the broadcast stations providing FM radio and television signal service to the area.

Therefore, the interference signals generated by the Transmission Line and POI Switchyard will not affect most communication devices including microwave systems, FM radio, television, wireless telephones, and other personal communication devices because they operate at higher frequencies. Furthermore, their modulation schemes prevent their susceptibility to amplitude modulated interference. The only reception devices that could potentially be affected are AM radios, which operate between 0.5 and 1.6 MHz. The degree of degradation to AM reception is a function of the separation distance of the AM radio from the transmission line, as well as the strength of the received signal from the broadcast station. Degradation to the reception of AM broadcast signals caused by the proposed transmission line may be similar what occurs to AM stations on car radios when they pass under or near existing high voltage transmission lines.

The exclusion distance for AM broadcast stations varies as a function of the antenna type and broadcast frequency. For directional antennas, the exclusion distance is calculated by taking the lesser of 10 wavelengths or 3 kilometers (1.8 miles). For non-directional antennas, the exclusion distance is equal to one wavelength. Potential problems with AM broadcast coverage are only anticipated when AM broadcast stations are located within their respective exclusion distance limit from transmission lines. The closest AM station to the proposed Facility, WERT, is more than 14 miles southeast of the POI Switchyard. As there were no AM stations found within 3 kilometers of the Primary or Alternate Transmission Routes or POI Switchyard, the proposed Facility should not impact the coverage of local AM stations.

As indicated above, transmission lines do not typically create reception problems for television signals. This includes transmission lines carrying high voltages such as those planned for the proposed Timber Road III Facility. However, if transmission lines are not kept in good maintenance condition there may be corona and arcing at the insulators and/or conductor connectors of the transmission line, creating broadband noise. The broadband noise could cause interference to television receivers in residences near the transmission

line, particularly any residents whose homes are within approximately 100 meters (328 feet) of the transmission line. There are two residences within 100 meters of the Primary Transmission Route, and residence within 100 meters of the Alternate Route.

As described above, no impacts to FM or AM radio signal reception are anticipated. The Applicant will maintain the Transmission Line in good condition, which should avoid impacts to television reception at the residences closest to the Facility. A complaint resolution procedure, to be developed with OPSB Staff, will be implemented to ensure that any complaints regarding impacts to television reception as a result of construction or operation of the proposed Facility are adequately investigated and resolved.

(F) IMPACT ON CULTURAL RESOURCES

This section summarizes previously collected cultural and archaeological resources data for the area within 1,000 feet on either side of the Primary and Alternate Transmission Route centerlines and within 1,000 feet of the proposed POI Substation Site ("Study Area"). In 2010, JFNew prepared three reports on the potential impacts to cultural resources of the proposed Timber Road II Wind Farm Project (JFNew, 2010a, 2010b, and 2010c). These reports focus on a Study Area consisting of a 5-mile buffer around the Timber Road II Wind Farm, consistent with OPSB guidelines. The entire Study Area for the Timber Road III Primary and Alternate Transmission Routes and the POI Substation is located within the previously surveyed areas covered in the studies conducted by JFNew for the Timber Road II Wind Farm.

(1) Cultural Resources and Agency Correspondence

EDR prepared a cultural resources records review of online resources from the Ohio Historic Preservation Office (OHPO) for the Timber Road III Primary and Alternate Transmission Routes and the POI Substation (see Exhibit E). This review summarizes previously collected cultural and archaeological resources data for the Study Area. Per the requirements of Ohio Administrative Code Chapter 4906-15-06 (F)(1): the cultural resources records review prepared by EDR included the following records available from the Ohio State Historic Preservation Office (OHPO):

- National Register of Historic Places (NRHP),
- NRHP Determination of Eligibility (DOE) properties,
- National Historic Landmarks (NHL) List,
- Ohio Historic Inventory (OHI),
- Ohio Archaeological Inventory (OAI),

- Ohio Genealogical Society (OGS) cemetery files,
- Mills *Archaeological Atlas of Ohio* (1914), and
- Previous Phase I, II, and III cultural resources surveys conducted within the Study Area.

Archives and repositories consulted during EDR's research for the Project included the online Geographic Information Systems (GIS) mapping system of the Ohio Historic Preservation Office (OHPO), the David Rumsey map collection, Ancestry.com and other on-line history resources, and EDR's in-house collection of reference materials. The results of the cultural resources records review for the Study Area associated with the Facility are described below, and depicted on Figures 3 and 4 of Exhibit E.

The records review of the OHPO online GIS mapping revealed the following:

- No properties listed on or determined eligible for the NRHP have been recorded within 1,000 of the Primary or Alternate Transmission Routes or within 1,000 feet of the POI Substation.
- No NHL properties have been recorded within 1,000 of the Primary or Alternate Transmission Routes or within 1,000 feet of the POI Substation.
- No OAI properties have been recorded within 1,000 of the Primary or Alternate Transmission Routes or within 1,000 feet of the POI Substation.
- Two OHI properties have been previously recorded within 1,000 of the Primary or Alternate Transmission Routes. The A. Worm Farmstead (PAU0340804), a Craftsman dwelling constructed circa 1890-1900 is located at 3985 CR 124 in Harrison Township, approximately 940 feet northeast of the Primary Route. The Leopold Baldwin Farmstead (PAU0343504), a vernacular farmstead constructed circa 1890-1900, is located at 3354 CR 124 in Harrison Township, approximately 824 feet northwest of the Alternate Route.
- Two OGS cemeteries have been recorded within 1,000 of the Primary or Alternate Transmission Routes. Lehman Cemetery is located 0.16 miles east of the common portion of the Primary and Alternate Transmission Routes, along TR 70. The Brady-Finnan-Pleasant Valley Cemetery is located 0.18 miles west of the Alternate Transmission Route along CR 48.

A review of the 1914 Mills *Archaeological Atlas of Ohio* indicated that although six prehistoric sites have been recorded in Paulding County, none are located within 1,000 of the Primary or Alternate Transmission Routes. In addition, review of the 1892, 1894, 1905 and 1917 land owner atlases for Harrison Township indicate that numerous map-documented structures are present within the Study Area for the Primary and Alternate Transmission Routes. However, most if not all of these structures were field surveyed as part of

the 2010 Phase I historic structure inventory and assessment for the Timber Road II Wind Farm (JFNew, 2010c; see below).

In addition, JFNew (2010a) previously conducted cultural resources surveys for the Timber Road II Wind Farm Certificate Application in Case No. 10-0369-EL-BGN. As described above, the entire Study Area for the Timber Road III Primary and Alternate Transmission Routes and the POI Substation is located within the previously surveyed areas covered in the studies conducted by JFNew for Timber Road II. Although these studies were conducted in 2010, the results of the surveys are not currently available in the OHPO online mapping system. Therefore, the results of these cultural resources surveys are described below.

JFNew conducted a cultural resources records review (JFNew, 2010a), Phase I archaeological reconnaissance survey (JFNew, 2010b) and a Phase I historic structure inventory and assessment (JFNew, 2010c) for the Timber Road II Wind Farm in 2010. The results of the cultural resources records review for the Timber Road II Phase I archaeological reconnaissance included a summary of the cultural resources records review, fieldwork conducted within the Timber Road II Wind Farm, consistent with OHPO guidelines (OHPO, 1994). Archaeological surveys conducted by JFNew identified nine new archaeological sites within the wind farm, including two prehistoric sites, six historic sites, and one multiple component prehistoric and historic site. JFNew concluded that none of the prehistoric or historic sites identified appeared to meet the criteria for listing in the NRHP, and no further work was recommended at any of the sites (JFNew, 2010b). None of the archaeological sites identified by JFNew are located within 1,000 feet of the Primary and Alternate Routes of the Timber Road III Transmission Line or within 1,000 feet of the POI Substation.

The Phase I historic structure inventory and assessment included background research, historic contexts, and photographic fieldwork conducted within the Timber Road II Wind Farm, followed by additional research to help determine historic significance of the properties surveyed. The historic structures inventory identified 126 newly recorded resources and 32 previously recorded sites within the wind farm and adjacent area. Of these, eight properties were determined to be NRHP-eligible, and six additional properties were classified as notable in terms of significance, and potentially eligible for the NRHP, but requiring additional research and assessment (JFNew, 2010c). Of the total 158 properties identified by JFNew, 20 are located within 1,000 feet of the Primary or Alternate Routes of the Timber Road Transmission Line or within 1,000 feet of the POI Substation. (see Table 3 and Figure 3 in Exhibit E). Of the eight properties recommended NRHP-eligible by JFNew, none are located within 1,000 feet of the Primary or Alternate Routes of the Timber Road Transmission Line or within 1,000 feet of the POI Substation.

(2) Construction Impacts

There will be no direct impacts to previously documented archaeological resources or above ground cultural resources (i.e., cemeteries or historic structures) from construction of the Timber Road III Transmission Line or the Timber Road III POI Switchyard. Indirect impacts to such resources are addressed below in 4906-15-06(F)(3). However, the proposed Primary and Alternate Transmission Routes have not been systematically surveyed for archaeological resources. After the final route has been selected and all land rights procured, an archaeological survey for those portions of the proposed Facility where direct ground disturbance is proposed may be conducted if required by OHPO.

(3) Operation and Maintenance Impacts

In estimating the impact of the proposed Facility on the preservation and continued meaningfulness of known historic landmarks, direct, indirect, and reasonably foreseeable future impacts to aboveground historic resources were considered. Direct effects to aboveground resources will not occur. Indirect visual effects are most likely, as the introduction of the Facility to the area may alter people's perceptions of the historic resources and landscapes, altering important characteristics of the historic setting. Given local land use patterns, which are largely categorized by open agricultural fields interspersed with scattered rural residences and a few small woodlots, it is likely that the Transmission Line will be visible from most locations within the Study Area. See Section 4906-15-06(E)(3) of this Application for additional detail.

The extent to which the proposed Facilities may impact any individual historic property will depend on the property's area of significance and its orientation on the landscape relative to the proposed Facility. As part of the Phase I archaeological assessment conducted for the Timber Road II Wind Farm, JFNew concluded that none of the prehistoric or historic sites identified appeared to meet the criteria for listing in the NRHP, and no further work was recommended at any of the sites (JFNew, 2010b). In addition, none of these sites are located within the Study Area. As a part of the Phase I historic structure inventory and assessment for the proposed Timber Road II Wind Farm, JFNew concluded that the alteration of the viewshed of the five-mile Study Area due to operation of the wind farm would not affect the qualities or attributes that qualifies each for the NRHP, and that none of the recommended NRHP-eligible resources had been determined significant for their relation to overall setting, viewshed or cultural landscape (JFNew, 2010c).

(4) Mitigation Procedures

As described above, the proposed Timber Road III Transmission Line and Timber Road III POI Switchyard will not directly (physically) impact any known archaeological or historic resources within the Study Area, and no specific mitigation measures related to archaeological resources are proposed at this time. However,

to address the potential that previously unidentified archaeological resources may be encountered during Project construction, it is anticipated that an Unanticipated Discovery Plan will be developed. The Unanticipated Discovery Plan will describe a response protocol to identify and evaluate previously unidentified archaeological resources that are disturbed during construction. In the event that unanticipated archaeological resources are encountered during construction, the Unanticipated Discovery Plan will include provisions to stop all work in the vicinity of the archaeological finds until those resources can be evaluated and documented by a Registered Professional Archaeologist.

The proposed Facility has the potential to cause indirect (visual) impacts to aboveground historic resources within the Study Area. However, since the previously conducted cultural resources studies conducted by JFNew within the current Study Area did not identify any adverse impacts to properties that are listed or determined eligible for listing in the NRHP (JFNew, 2010a, 2010b, 2010c), there are no known impacts to aboveground historic properties at this time, and no mitigation measures are proposed.

(G) NOISE EMISSIONS

Tetra Tech Inc. was retained by the Applicant to evaluate potential noise impacts from the proposed Facility. The Acoustic Assessment (see Exhibit D) provides an overview of the mechanisms of corona sound generation, describes applicable requirements, describes the acoustic modeling methodologies, and presents results. An assessment of construction noise is also provided.

(1) Construction

Transmission line construction will periodically generate audible noise levels. Additional noise sources may include commuting workers and trucks, moving material to and from the work sites. The construction equipment that will be used is similar to that used during typical public-works projects and tree service operations (e.g., road resurfacing, storm-sewer installation, natural gas line installation, tree removal, etc.). Transmission line construction will occur sequentially, moving along the length of the Project route, or in other areas such as near access roads, structure sites, conductor pulling sites, and staging and maintenance areas. Although multiple construction crews will be operating simultaneously, and as a result, various construction activities may overlap, transmission line construction is typically completed in the following stages:

1. Site Access and Preparation. This phase consists of preparing the ROW and removing any trees. Tree clearing work is expected to be largely restricted to the Flatrock Creek crossing, as both the Primary and Alternate Transmission Routes are located within agricultural land.

2. Installation of Structure Foundations. The next step in the construction process is drilling foundations for the new transmission structures. This involves drilling large holes, which are then typically filled with concrete for the steel structure foundation.
3. Erecting of Support Structures: Once the foundation is cured, transmission structure installation can begin. The new steel poles often come in sections that are assembled on or near the foundation. Cranes or bucket trucks are used to lift the poles and set them into position on the foundations.
4. Stringing of Conductors. With the new steel structures in place, the next step is to install the conductor wire. The wire-stringing operation requires equipment at each end of the section being strung. Wire is pulled between these "pulling sites" through stringing blocks (pulleys) at each structure. These pulling sites are set up at various intervals along the ROW, typically 1 to 3 miles apart.

Noise levels from overhead transmission line construction were evaluated using a screening-level analysis approach. The calculation methodology requires the input of the number and type of construction equipment used by phase, as well as typical noise levels associated with each piece of equipment. Construction sound source level data were obtained from the Federal Highway Administration's (FHWA) Roadway Construction Noise Model. These data were used to determine the composite sound levels per construction phase at distances of 50 feet and 1,000 feet. The analysis conservatively assumes all phased construction equipment operating simultaneously. Table 06-4 summarizes results for the four conceptual construction phases.

Table 06-4. Summary of Transmission Line Construction Noise

Construction Phase	Equipment	Equipment Noise Level at 50 feet	Composite Noise Level at 50 feet	Composite Noise Level at 1,000 feet
Site Access and Preparation	Bulldozer	85 dBA	88 dBA	53 dBA
	Grader	85 dBA		
	Roller-Compactor	85 dBA		
	Loader	80 dBA		
	Water Truck	84 dBA		
	Dump Truck	84 dBA		
Installation of Structure Foundations	Bulldozer	85 dBA	90 dBA	56 dBA
	Loader	80 dBA		
	Backhoe-Loader	80 dBA		
	Forklift	80 dBA		
	Mobile Crane	85 dBA		
	Auger Rig	85 dBA		
	Drill Rig	85 dBA		
	Compressor	80 dBA		
	Pump	77 dBA		
	Portable Mixer	82 dBA		
	Jackhammer	85 dBA		
	Cement Mixer Truck	85 dBA		
	Dump Truck	84 dBA		
	Slurry Truck	78 dBA		
	Specialty Truck	84 dBA		
	Water Truck	84 dBA		
Erecting of Support Structures	Forklift	80 dBA	86 dBA	52 dBA
	Mobile Crane	85 dBA		
	Compressor	80 dBA		
	Flatbed Truck	84 dBA		
	Flatbed Truck	84 dBA		
	Water Truck	84 dBA		
Stringing of Conductors	Tracked Dozer	85 dBA	88 dBA	54 dBA
	Backhoe-Loader	80 dBA		
	Compressor	80 dBA		
	Line Puller	81 dBA		
	Mixed Trucks	84 dBA		
	Specialty Truck	84 dBA		
	Specialty Truck	84 dBA		
	Water Truck	84 dBA		

(a) *Dynamiting or Blasting Activities*

Blasting is not anticipated.

(b) *Operation of Earth Moving and Excavating Equipment*

During construction of the Facility, a temporary increase in noise will result from the equipment used to excavate, install equipment and, where necessary, clear the area of any woody brush. Standard construction techniques will be used. Typical noise levels of equipment used in each phase of construction are provided above in Table 06-4.

(c) *Driving of Piles*

Driving of piles is not anticipated.

(d) *Erection of Structures*

Structures will be erected by vehicle-mounted cranes. As indicated above in Table 06-4, this phase of construction could produce a maximum composite sound level of 86 dBA at 50 feet and 52 dBA at 1,000 feet.

(e) *Truck Traffic*

Beyond construction equipment access, delivery of construction supplies, and pole and hardware equipment delivery, no additional truck traffic is anticipated for the Project.

(f) *Installation of Equipment*

The equipment will be installed using standard practices and equipment. As indicated above in Table 06-4, the stringing of conductors phase could produce a maximum composite sound level of 88 dBA at 50 feet and 54 dBA at 1,000 feet.

Construction sound will attenuate with increased distance from the ROW. Other factors, such as vegetation, terrain, and obstacles such as buildings could also act to further limit the impact of construction noise levels, but were not considered in the analysis. Actual received sound levels will fluctuate, depending on the construction activity, equipment type and operation mode, the amount of equipment used simultaneously, and separation distances between source and receiver. Work in the proximity of any single general location will likely last no more than a few days to a week as construction activities move along the corridor. Therefore, no single receptor will be exposed to significant noise levels for an extended period.

(2) Operation and Maintenance

High voltage transmission lines can generate noise during corona discharges. This occurs primarily in foul weather when water droplets form on the conductors. Dirty conductors can also lead to corona discharge. The acoustic assessment of the Timber Road III Transmission Line involved two separate analytical methods. The Bonneville Power Administration (BPA) Corona and Field Effects (CAFE) program Version 3 was used to determine anticipated corona noise levels generated along the transmission line conductors. DataKustik's Computer-Aided Noise Abatement (CadnaA) was then used to model how the sound will propagate from the transmission line to nearby residences. Representative broadband and octave band center frequencies were derived using the BPA CAFÉ program and from standardized engineering technical guidelines, based on measurements from similar equipment types and line types operating after the burn-in period. It is expected that the transmission line installed will exhibit sound source characteristics similar to the sound data used in the acoustic modeling analysis. The parameters used in the BPA CAFE and CadnaA models are summarized in Table 3-1 in Exhibit D.

The BPA CAFE program calculated the anticipated audible noise levels in both foul and fair weather at the edges of the ROW. In fair weather, noise levels at the edges of the ROW are negligible. In foul weather, the noise levels will be approximately 21.7 dBA directly beneath the line, decreasing to 16.6 dBA at the edge of the ROW, and diminishing further with increased distance from the line. Diagram 06-3, below, plots the noise levels at mid-span out to a distances of 250 feet from the transmission line, well beyond the edge of the ROW. At this distance, even under foul weather (i.e., rainy) conditions, maximum sound levels will be approximately 11 dBA. Given that sound levels attenuate with distance, audible noise from the transmission line will be even less at most nearby homes. The closest residences are located approximately 250 and 300 feet from the Primary and Alternate Transmission Lines, respectively.

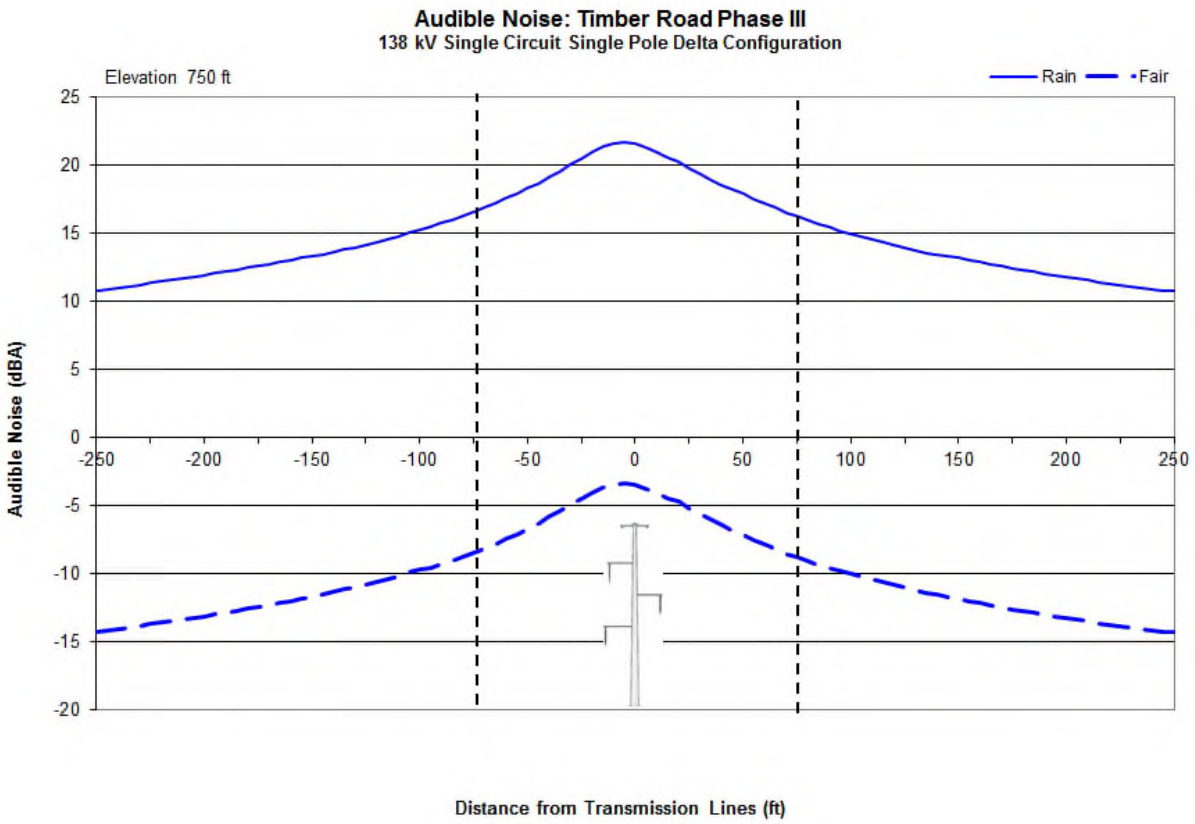


Diagram 06-3. Audible Noise Profile at Mid-span for Timber Road III Transmission Line

Figures 4-2 and 4-3 in Exhibit D illustrate the anticipated sound contours that will be generated by operation of the Primary and Alternate Facilities during foul weather conditions. The highest predicted sound levels at nearby residences will be less than 25 dBA, which is well below the noise criterion prescribed by the OPSB for the Timber Road II Wind Farm, and well below other well-recognized noise guidelines provided by the U.S. Environmental Protection Agency and World Health Organization. The interconnect switchyard will not include any transformers only breaker equipment, therefore the switchyard is not anticipated to generate any appreciable noise (see Exhibit D).

(3) Mitigation Procedures

During construction of the transmission line and POI Switchyard, mitigation procedures will include properly maintaining construction equipment with mufflers and generally limiting construction activities to occur during daylight hours, to the extent feasible. Noise-related procedures will be implemented according to OSHA requirements. No additional noise mitigation is expected as noise sources are primarily associated with operation of construction equipment and will be temporary in nature.

Noise levels associated with operation of the proposed Timber Road III Transmission Line and POI Switchyard will be well below the noise criterion prescribed by the OPSB for the Timber Road II Wind Farm, and well below other well-recognized noise guidelines. Potential impacts at nearby residences are expected to be minimal. The line will be maintained in good condition to minimize broadband noise associated with corona and arcing at the insulators. No additional mitigation measures are necessary.

(H) OTHER SIGNIFICANT ISSUES

There are no other significant socioeconomic or land use impact issues anticipated beyond those addressed elsewhere in this Application.

4906-15-07 ECOLOGICAL IMPACT ANALYSIS

(A) SUMMARY OF NATURAL ENVIRONMENT STUDIES

In support of the preparation of this Application, environmental consultants have conducted site visits within Study Areas encompassing the proposed Transmission Routes and POI Substation sites. EDR conducted and coordinated ecological investigations within the Study Areas (the Primary Study Area and the Alternate Study Area) and wetland/stream delineations within the ROWs. The Primary Study Area consists of the area within 1,000 feet on either side of the Primary Transmission Route centerline and within 1,000 feet of the proposed POI Switchyard. The Alternate Study Area consists of the area within 1,000 feet on either side of the Alternate Transmission Route centerline and within 1,000 feet of the proposed POI Switchyard. For each route, the ROW consists of a 150-foot wide corridor.

(B) ECOLOGICAL FEATURES MAP

Figure 07-1 illustrates the area within 1,000 feet of the Primary and Alternate Routes at a 1:24,000 scale. Among other information, Figure 07-1 shows the following features:

(1) Proposed Transmission Line Alignments

The Primary and Alternate Transmission Routes are depicted in Figure 07-1.

(2) Proposed Substation or Compressor Station Locations

The POI Switchyard is depicted in Figure 07-1

(3) All Areas Currently Not Developed for Agricultural, Residential, Commercial, Industrial, Institutional, or Cultural Purposes Including:

(a) *Streams and Drainage Channels*

Streams, rivers, and lakes data, as depicted on Figure 07-1, are derived from Environmental Systems Research Institute (ESRI) data. However, the delineated stream/wetland data, as also depicted on Figure 07-1, are derived from site specific delineations conducted by EDR and Mannik & Smith Group, Inc. (MSG) in the fall of 2015. Therefore, with respect to any discrepancies between these two data sets in relation to proposed Project infrastructure locations, the delineated stream/wetland data is more accurate.

(b) *Lakes, Ponds, and Reservoirs*

No such water features were identified within the Study Areas.

(c) *Marshes, Swamps, and Other Wetlands*

Figure 07-1 includes NWI mapped wetlands, Ohio Wetland Inventory mapped wetlands, and wetlands field-delineated by EDR.

(d) *Woody and Herbaceous Vegetation Land*

The aerial photograph in Figure 07-1 displays vegetative cover.

(e) *Locations of Threatened or Endangered Species*

No threatened or endangered species are known to occur within the study Areas.

(4) Soil Associations

Soil associations from the NRCS U.S. General Soil Map are depicted in Figure 07-1.

(C) IMPACT OF ROUTE AND ALTERNATIVES ON WATERBODIES

The POI Switchyard and the majority of the Primary and Alternate Transmission Lines are located within the Auglaize Watershed (HUC 04100007) and the Flatrock Creek sub-watershed (HUC 04100007120050). The wind farm collection substation and the northern-most portions of the Primary and Alternate Transmission Lines are located in the Upper Maumee Watershed (HUC 04100005) and the Zuber Cutoff sub-watershed (HUC 04100005020020).

Beneficial use designations describe existing or potential uses of water bodies in Ohio. The Ohio EPA takes into consideration the use and value of water for public water supplies, protection and propagation of aquatic life, recreation in and on the water, agricultural, industrial and other purposes. Two beneficial use streams are found in the Study Areas: Flatrock Creek and Wildcat Creek. Both of these waterbodies are designated for warm water habitat (WWH), agricultural water supply (AWS), industrial water supply (IWS), and primary contact recreation (PCR). Table 07-1 summarizes the length of beneficial use streams found within the Study Areas and ROWs for each transmission line route under consideration. There are no beneficial use waterbodies at the POI Switchyard Site, and no superior high quality waters or outstanding state waters found in the Study Areas.

Table 07-1. Beneficial Use Waterbodies at the Proposed Facility

Waterbody	Linear Feet within Study Area[1]	
	Primary Facility	Alternate Facility
Wildcat Creek	2,320	2,103
Flatrock Creek	3,577	5,007
Total	5,897	7,110
Waterbody	**Linear Feet within ROW[2]**	
	Primary Facility	**Alternate Facility**
Wildcat Creek	154	150
Flatrock Creek	151	151
Total	305	301

[1] Based on 2004 ODNR hydrography data.
[2] Based on 2015 field delineation data.

Desktop review also included review of the most recent FEMA maps dated 1974 for Paulding County. Within the 1,000-foot Study Areas, FEMA has designated 100-year floodplains adjacent to Flatrock Creek and portions of Wildcat Creek. Along the Primary Route, impacts to floodplains would include clearing of approximately 0.53 acre of riparian forest along Flatrock Creek, and the installation of three poles within the FEMA mapped 100-year floodplain. Impacts to floodplains along the Alternate Route would be the same, since the Flatrock Creek crossing occurs in the common portion of the route and no additional floodplains would be impacted. Please see section 4906-15-07(E) below for additional information on impacts to vegetation.

Streams within the Study Areas were delineated during the field survey. Stream features were documented for their general dimensional, substrate, morphology, and flow regimen characteristics. Potentially regulated water boundaries were mapped with sub-meter accuracy Global Positioning System (GPS) equipment. Data points were recorded to represent the stream high water marks. EDR and MSG evaluated streams in the field using the Ohio Headwater Habitat Evaluation Index (HHEI) and/or the Ohio Qualitative Habitat Evaluation Index (QHEI) scoring method, as applicable. Both methods yield a numerical score for the section of streams evaluated, which is then used to estimate the probable existing aquatic life use of each stream. Jurisdictional streams were identified as those waters that had an Ordinary High Water Mark (OHWM), a defined channel, and an open water feature, such as surface water or at least a non-vegetated area through the channel that indicated periodic flowing water. Channels that parallel the roadway, do not have an identifiable OHWM, are dominated by upland vegetation, and do not represent a relocation of natural channel were eliminated as jurisdictional.

Primary Facility

A total of eight waterbodies within the Primary ROW were delineated, totaling 1,205 linear feet. Based on review of HHEI scores, all but one waterbody was classified as a Class II PHWH (intermittent, warm water streams) with scores ranging from 50 to 59. Except for Wildcat and Flatrock Creeks, delineated as Streams B and G, respectively, the waterbodies consist of roadside and agricultural drainage ditches with maintained vegetated banks and trapezoidal cross sections. The banks are generally covered with grassy vegetation and lack any significant shade. Substrates are primarily silt, clay, and muck. The banks of Wildcat Creek are vegetated with shrubby willows and emergent wetland plants, and minnows were observed in the channel. Flatrock Creek flows through a mature riparian corridor, and contains instream cover in the form of rootwads, logs, and other debris. Characteristics of delineated streams in the Primary ROW are summarized below in Table 07-2.

Table 07-2. Delineated Streams within the Primary ROW

Stream ID	HHEI Score[1]	QHEI Score[1]	PHWH Class[1]	Linear Feet within Primary ROW[2]
Stream A	50	n/a	Modified Class II PHWH	150
Stream B (Wildcat Creek)	n/a	38	Class II PHWH	154
Stream D	51	n/a	Modified Class II PHWH	150
Stream E	52	n/a	Modified Class II PHWH	150
Stream F	52	n/a	Modified Class II PHWH	150
Stream G (Flatrock Creek)	n/a	57	Modified Class II PHWH	151
Stream AAA	55	n/a	Modified Class II PHWH	150
Stream BBB	30	n/a	Modified Class I PHWH	150

[1] Subject to verification by Ohio EPA.
[2] Stream length within the 150-foot ROW; waterbody may continue off-site.

Alternate Facility

A total of 13 waterbodies within the Alternate ROW were delineated, totaling 3,090 linear feet. Based on review of HHEI/QHEI scores, 12 of these waterbodies were classified as Modified Class II PHWH (intermittent, warm water streams) with scores ranging from 40 to 59. Streams DD and NB had a moist channel, but no flow or pools, and were classified as a Modified Class I PHWH, with scores of 13 and 20 respectively. Waterbodies are generally roadside or agricultural drainage ditches with trapezoidal cross sections and maintained banks vegetated with grasses. Significant shading is lacking, and substrates are primarily silt and muck. Characteristics of delineated streams in the Alternate ROW are summarized below in Table 07-3.

Table 07-3. Delineated Streams within the Alternate ROW

Stream ID	HHEI Score[1]	QHEI Score[1]	PHWH Class[1]	Linear Feet within Alternate ROW[2]
Stream AA	40	n/a	Modified Class II PHWH	1,180
Stream BB	53	n/a	Modified Class II PHWH	150
Stream CC	51	n/a	Modified Class II PHWH	150
Stream DD	13	n/a	Modified Class I PHWH	150
Stream EE	43	n/a	Modified Class II PHWH	150
Stream FF	40	n/a	Modified Class II PHWH	150
Stream GG	56	n/a	Modified Class II PHWH	176
Stream HH	50	n/a	Modified Class II PHWH	150
Stream II	50	n/a	Modified Class II PHWH	150
Stream F	52	n/a	Modified Class II PHWH	150
Stream G (Flatrock Creek)	n/a	57	Class II PHWH	151
Stream H	n/a	25	Class II PHWH	202
Stream NB	20	n/a	Modified Class I PHWH	181

[1] Subject to verification by Ohio EPA.
[2] Stream length within the 150-foot ROW; waterbody may continue off-site.

(1) Construction Impacts

Project construction and operation activities do not require the crossing of streams by equipment or any in-water work. The Applicant will not be installing any vehicle crossings during construction. Field crews will utilize existing farm roads and crop areas to access either side of waterbodies/ditches.

Poles and pulling locations have been sited in outside waterbodies, thereby avoiding temporary soil disturbance and permanent direct (fill) impacts to waterbodies.

The Facility will require minimal forest clearing. With the exception of the riparian corridor along Flatrock Creek, the Facility is sited entirely within active agricultural land. To minimize impacts to Flatrock Creek, the Applicant carefully selected the narrowest riparian section for the crossing along a route that was already disturbed by underground collection line from the Timber Road II project. See section 4906-15-07(E) below for additional information on impacts to vegetation.

Avoidance measures during construction will ensure protection of the streams, which could include pre-construction field preparation such as flagging and signage of regulated resources, environmental training

for construction crews and the use of environmental monitors during construction as determined necessary. Siting of access roads to utilize existing farm infrastructure and not crossing any streams will further avoid potential impacts. The Construction General Permit that is required for Project construction and the SWP3 that will be prepared will also identify additional controls and best management practices to be followed during construction and operation, further avoiding potential impacts.

The waterbodies found within the Study Areas are highly impacted by the surrounding existing land use, and have low potential to support rare species. Waterbodies located between agricultural fields lack any significant sources of shade since the banks are regularly mowed. The lack of cover leads to higher temperatures in the summer, which is further compounded by the relative lack of depth in many of the streams. The surrounding land use also results in significant nutrient loading from fertilizer run off in the overland flow during rain events. The implementation of field tilling may also increase the loading onto streams.

(2) Operation and Maintenance Impacts

As stated above, Facility construction and operation activities do not require crossing of streams or any in-water work, and therefore are not anticipated to cause any direct impacts. In addition, the Construction General Permit that is required for Project construction and the SWP3 that will be prepared will also identify additional controls and best management practices to be followed during construction and operation, further avoiding potential impacts.

(3) Mitigation Procedures

To avoid or minimize Facility-related impacts on waterbodies, preliminary and final Facility design is guided by the following criteria during the siting of the transmission line and related infrastructure:

- The POI Switchyard and the transmission line pole locations have been sited to completely avoid waterbodies.
- Stream impacts will be avoided by the field crews utilizing existing farm roads and crop areas to access either side of ditches.
- Potential impacts to waterbodies within the Primary ROW will be minimized due to the nature of overhead transmission line stringing, which utilizes aerial methodologies to minimize potential disturbance to streams.

Various procedures will be used to reduce impacts during Facility construction, including impact minimization measures and site restoration. Each of these procedures is described further in Section 4906-15-07(E)(3) below.

(D) IMPACT OF ROUTE AND ALTERNATIVES ON WETLANDS

EDR conducted a preliminary desktop review of the Facility Study Areas, incorporating environmental datasets such as Ohio Wetland Inventory (OWI), National Wetland Inventory (NWI), streams and rivers, land use/land cover, soils, aerial photographs, and topographic maps. Wetland delineations were subsequently conducted within the Facility ROWs. Wetland delineations were completed in accordance with the United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: North central and Northeastern Region (USACE, 2012). The wetland delineations consisted of field jurisdictional determinations and documentation of regulated waters using U.S. Army Corps of Engineers (USACE) criteria. Potentially regulated water boundaries were mapped with sub-meter accuracy Global Positioning System (GPS) equipment. Data points were recorded to represent the upland and wetland boundary interface (see Appendix F).

Wetland qualitative assessments were conducted by EDR and MSG utilizing the Ohio Rapid Assessment Method (ORAM) for Wetlands methodology (Appendix F). The ORAM wetland functional assessment was developed to determine the ecological "quality" and level of function of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into sub-categories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 to 100. Based on these scores, there are three possible Ohio Wetland Antidegradation categories to which wetlands may be assigned (Category 1 – lowest value category, Category 2 – middle value category, Category 3 – highest value category).

<u>Primary Facility</u>

Three wetlands were delineated, totaling 3.63 acres within the Primary ROW (see Appendix F). Please note that each wetland continues off-site; the area provided herein refers to the portion of the wetland within the ROW. Each delineated wetland is described briefly below:

- Wetland B is 0.2 acre of a Category 1 emergent wetland complex located along Wildcat Creek (delineated Stream B). Herbaceous vegetation is dominated by canary reed grass, water-plantain, and rice cutgrass, with scattered willow and dogwood shrubs. The soils are a saturated loamy mucky mineral with redox depressions.

- Wetland C is 0.14 acre of a manmade swale that is located between railway tracks and a soybean field. Emergent vegetation in this Category 1 wetland is dominated by cattails, sedges, and rushes, with duckweed in pockets of open water. The soils are a saturated loamy mucky mineral with redox depressions.
- Wetland G is 8.24 acres of a large floodplain terrace located along Flatrock Creek (delineated Stream G). Vegetation in this Category 3 wetland is dominated by purple-stemmed aster, moneywort, and various sedges, with occasional black ash saplings. The saturated soils have a redox dark surface.

Alternate Facility

Two wetlands were delineated, totaling 3.85 acres within the Alternate ROW (see Appendix F). Please note that each wetland continues off-site; the area provided herein refers to the portion of the wetland within the ROW. Each delineated wetland is described briefly below:

- Wetland AA is 0.16 acre of a Category 1 emergent wetland adjacent to an agricultural drainage ditch. Vegetation is dominated by sedges and reed canary grass. The saturated soils have a thick dark surface.
- Wetland G is 8.24 acres of a large floodplain terrace located along Flatrock Creek (delineated Stream G). Vegetation in this Category 3 wetland is dominated by purple-stemmed aster, moneywort, and various sedges, with occasional black ash saplings. The saturated soils have a redox dark surface.

(1) Construction Impacts

Poles and pulling locations have been sited in uplands to the extent practicable, thereby avoiding most temporary soil disturbance and permanent direct (fill) impacts to wetlands. The Applicant will not be installing any vehicle crossings during construction. Field crews will utilize existing farm roads and crop areas to access either side of wetlands. However, some minor impacts will occur. Along both the Primary and Alternate Routes, two poles will be installed within Wetland G. This will result in 484 square feet of temporary disturbance, and approximately 50 square feet of permanent impact. Because one pole is located at a turn in the line, a stringing location setup will also be sited within the wetlands, resulting in an additional 3,000 square feet of temporary disturbance.

Construction of the Transmission Line will require creation of a 150-foot ROW that will result in clearing impacts to the forested riparian corridor along Flatrock Creek. Construction of the Primary Facility will require limited clearing of trees along the Flatrock Creek riparian corridor. According to WEST (2015), approximately 0.53 acre of forested riparian habitat exists within the Primary ROW along Flatrock Creek. Of this, approximately 0.43 acre is forested wetland, which would be cleared during Construction. Construction

of the Alternate Facility, based on WEST (2015), would require the clearing of approximately 0.94 acre of deciduous forest, of which approximately 0.48 acre consists of forested wetlands. When clearing trees in forested wetlands, all stumps will be left in place and no soils will be disturbed, therefore there will be no net loss of wetlands as a result of clearing activities.

(2) Operation and Maintenance Impacts

Ongoing operation and maintenance impacts are expected to be limited, and will generally not require heavy equipment. The Applicant will implement a vegetation management plan for use during Facility operation. Herbicide use shall be prohibited in proximity to surface waters and wetlands. Woody vegetation within the forested wetland at the Flatrock Creek crossing will be manually pruned periodically to avoid development of hazard trees and no soils will be disturbed.

(3) Mitigation Procedures

To avoid or minimize Facility-related impacts on wetlands, preliminary and final Facility design is guided by the following criteria during the siting of the transmission line and related infrastructure:

- The POI substation has been sited to completely avoid wetlands. Transmission line poles and temporary stringing locations have been sited to avoid wetlands to the extent practicable.
- Wetlands will be avoided by the field crews, who will utilize existing farm roads and crop areas to access construction areas.

Various procedures will be used to reduce impacts during Facility construction, including impact minimization measures and site restoration. Each of these procedures is described further in Section 4906-15-07(E)(3) below.

(E) IMPACT OF ROUTE AND ALTERNATIVES ON VEGETATION

Vegetative communities within the Project Study Areas have been identified based on the ODNR Land Use/Land Cover dataset for Paulding County (ODNR, 1995a) and recent aerial imagery and field review. Field verification was performed within the ROWs and at the POI Switchyard. The purpose was to characterize the dominant ecological communities that occur in the Study Areas and identify any potential habitat for federally- or state-listed species.

Primary Facility

Approximately 98% of the Primary Study Area (2,082 acres) consists of manipulated landscapes, with cropland most prevalent. Only 2% of the Primary Study Area (43 acres) contain of natural vegetation, consisting of riparian forest

located along the banks of Flatrock Creek. Plant community distribution is quite similar within the Primary ROW, where agricultural land comprises more than 99% of the area. Approximately 0.53 ace of riparian forest occurs along the banks of Flatrock Creek. The most commonly observed tree species in this area were American elm (*Ulmus americana*), cottonwood (*Populus deltoides*), and black willow (*Salix nigra*). Common herbaceous species include sedges (*Carex spp*.), moneywort (*Lysimachia nummularia*), purplestem aster (*Symphyotrichum puniceum*), poison ivy (*Toxicodendron radicans*), and rice cutgrass (*Leersia oryzoides*). No unique vegetative communities were identified within the Primary ROW that would provide viable habitat for federally- or state-listed species.

Alternate Facility

Approximately 98% of the Alternate Study Area (2,700 acres) consists of manipulated landscapes, with cropland most prevalent. Only 2% of the Primary Study Area (67 acres) contain of natural vegetation, consisting of riparian forest located along the banks of Flatrock Creek and an unnamed tributary (field delineated as Stream H). Plant community distribution is quite similar within the Alternate ROW, where agricultural land comprises more than 99% of the area. A total of 0.94 acre of forest occur within the Alternate ROW, with 1.1 aces of riparian forest along the banks of Flatrock Creek and 0.4 acre adjacent to Stream H. The Flatrock Creek crossing is shared with the Primary Facility, and is described immediately above. The forest along Stream H is successional, and consists of maples (*Acer spp*.), honey locust (*Gleditsia triacanthos*), and hawthorn (*Crataegus spp.*). No unique vegetative communities were identified within the Alternate ROW that would provide viable habitat for federally- or state-listed species.

(1) Construction Impacts

Facility construction will result in temporary and permanent impacts to vegetation within the ROW and POI Switchyard Site. Construction activities that will result in impacts to vegetation include the use of temporary access routes, and excavation/backfilling activities associated with construction/installation of the Transmission Line and POI Substation. These activities will result in damage to onsite vegetation (largely agricultural crops, specifically corn and soybeans) and increased exposure/disturbance of soil. Along with direct loss of vegetation, these impacts can result in loss of wildlife food and cover, increased soil erosion and sedimentation, increased risk of colonization by non-native invasive species, and disruption of normal nutrient cycling. However, it is not anticipated that any plant species occurring within the ROW or POI Switchyard will be extirpated or significantly reduced in abundance as a result of construction activities.

As previously mentioned, the majority of the vegetation is actively manipulated within both the Primary and Alternate ROWs, and at the POI Switchyard. Because these areas currently contain monocultures of species, primarily commercial corn or soybeans in the cultivated areas and non-native grasses within the developed portion (e.g., residential yards and cemeteries), they do not provide significant habitat to any

federally- or state-listed species. The Applicant will use existing farm roads where available to limit the amount of crop area disturbed during construction. In addition, to the extent practicable, construction will take place outside of growing seasons to minimize impacts to commercially valuable crops. Construction of the Primary Facility will require limited clearing of trees along the Flatrock Creek riparian corridor, totaling approximately 0.53 acre. Construction of the Alternate Facility would require the clearing of approximately 0.41 acre of deciduous forest. Trees removed during Facility construction will be harvested for timber if economically feasible, or chipped if not.

(2) Operation and Maintenance Impacts

Ongoing operation and maintenance impacts will likely be limited, and will generally not require heavy equipment. The Applicant will implement a vegetation management plan for use during Facility operation. Herbicide use shall be prohibited in proximity to surface waters and wetlands.

(3) Mitigation Procedures

The Timber Road III Transmission Line is proposed to be primarily built on land that has already been impacted by land clearing; and is actively disturbed annually for agriculture. However, various procedures will be used to reduce impacts during Facility construction, including impact minimization measures and site restoration. Each of these procedures is described in detail below:

Impact Minimization Measures

Mitigation measures to avoid or minimize impacts to vegetation will include identifying/delineating sensitive areas (such as waterbodies and wetlands) where no disturbance or vehicular activities will be allowed, limiting areas of disturbance to the smallest size practicable, siting Facility components in previously disturbed areas (e.g., existing farm lanes), educating the construction workforce on respecting and adhering to the physical boundaries of off-limit areas, employing best management practices during construction, and maintaining a clean work area within the designated construction sites. Following construction activities, temporarily disturbed areas will be seeded (and stabilized with mulch and/or straw if necessary) to reestablish vegetative cover in these areas. Native species will be allowed to re-vegetate these areas, except in active agricultural fields or to otherwise meet the desires of the landowner.

Restricted Activity Areas: A buffer zone of 50 feet, referred to as a "Restricted Activity Area", will be established wherever Facility construction traverses, or comes in proximity to sensitive areas (such as waterbodies and wetlands). The 50-foot buffer zones will be depicted on construction drawings.

Construction vehicles will be allowed in this zone, if necessary. However, in order to provide further protection to wetlands and surface waters, restricted activities within this buffer zone will include:

- No deposition of slash
- No accumulation of construction debris
- No application of herbicide
- No degradation of stream banks
- No equipment washing or refueling and
- No storage of any petroleum or chemical material

Storm Water Pollution Prevention Plan (SWP3): To avoid and minimize impacts to aquatic resources resulting from construction-related siltation and sedimentation, an approved SWP3 will be implemented. To protect surface waters, wetlands, and groundwater, silt fencing, hay bales and other sediment and erosion control measures will be installed and maintained throughout Facility development. Location of these features will be indicated on construction drawings and reviewed by the contractor prior to construction.

Spill Prevention, Containment, and Countermeasure (SPCC): SPCC measures will be implemented to prevent the release of hazardous substances into the environment. These measures will not allow refueling of construction equipment within 100 feet of any stream or wetland, and all contractors will be required to keep materials on hand to control and contain a petroleum spill. These materials will include a shovel, tank patch kit, and oil-absorbent materials. Any spills will be reported in accordance with ODNR regulations. Contractors will be responsible for ensuring responsible action on the part of construction personnel.

Site Restoration

Following completion of construction, temporarily impacted areas will be restored to their pre-construction condition. Restoration activities are anticipated to include the following:

- Pre-construction contours and soil/substrate conditions will be established in all disturbed areas, to the extent practicable.
- Restoration of disturbed agricultural fields will be accomplished by de-compacting the soil, removing rocks, and re-spreading stockpiled topsoil, as necessary.
- Disturbed soils throughout the Project Area will be re-seeded with an annual cover crop to stabilize exposed soils and control sedimentation and erosion. Seeding outside of active agricultural fields will be restricted to native seed mixes, unless otherwise requested by the landowner.

- Any drainage ditches, field drainage tiles, or fencing damaged by construction activities will be repaired.
- These actions will assure that, as much as possible, the site is returned to its pre-construction condition and that long-term impacts are minimized.

(F) IMPACT OF ROUTE AND ALTERNATIVES ON MAJOR SPECIES

Major species are defined by the OPSB as species of commercial or recreational value, and species designated as endangered or threatened in accordance with the U.S. and Ohio threatened and endangered species lists. Commercial species consist of those trapped or hunted for fur or other byproducts, while recreational species consist of those hunted as game.

Commercial and Recreational Species

The Study Areas primarily consist of agricultural land used for pasture and cultivated crops, mainly corn and soybeans. Other than the agricultural crops in the area, no commercially valuable species are anticipated to be present in the Study Areas.

Common game species in northwestern Ohio include cottontail rabbit, northern bobwhite (quail), Canadian geese, gray and fox squirrels, mallard and other ducks, mourning doves, ring-necked pheasants, ruffed grouse, white-tailed deer, and wild turkey. No established hunting grounds are located within the Facility Study Areas. Independence Dam State Park is the closest State Park to the Project Study Area, located approximately 15 miles to the east-northeast. This 525-acre facility is situated along the banks of the Maumee River, and fishing is permitted with a valid Ohio fishing license. Common catches include northern pike, smallmouth bass, crappie, catfish, and occasional walleye. The closest State Wildlife Areas to the Project Study Area are Oxbow Lake Wildlife Area, located approximately 22 miles to the northeast; and Cascade Wayside Wildlife Area, located approximately 24 miles to the east-southeast. The 416-acre Oxbow Lake Wildlife Area contains two lakes that have been stocked with largemouth bass, northern pike, brown bullheads, smallmouth bass, rock bass, redear sunfish, and channel catfish. The Division of Wildlife maintains substantial amounts of brushland and meadow habitat for upland game species, including cottontail rabbit, fox squirrel, woodcock, and white-tailed deer. Cascade Wildlife Area is a 36-acre woodlot with frontage along the Auglaize River.

The proposed Facility will have limited (if any) impacts to commercially/recreationally valuable game species within the Project Study Areas.

Federally-Listed Species

Review of the United States Department of the Interior's federally listed species by Ohio counties list indicates that the proposed Facility is within the range of two federally-listed species: Indiana bat (endangered) and northern long-eared bat (threatened). Each of these species is briefly described below:

- Indiana bat (*Myotis sodalis*): The Indiana bat is a migratory species that hibernates in caves and mines in the winter. In spring, reproductive females emerge from their hibernaculum and migrate, forming maternity colonies in wooded areas to bear and raise their young. Trees (dead, dying, or healthy) with exfoliating or defoliating bark, or trees containing cracks or crevices, provide suitable summer roosts. Indiana bats require a mosaic of habitats for feeding, preferring to forage along streams/rivers and above waterbodies, but also utilizing upland forests, clearings with successional old field vegetation, the borders of croplands, wooded fencerows, and pastures (USFWS, 2007). Bat acoustic surveys were conducted for the Timber Road II Wind Farm (WEST, 2010). Acoustic surveys cannot identify bat species with certainty; however, bat calls were sorted into three groups, based on frequency, that correspond roughly to species groups. Approximately 7% of the calls recorded were >40 kHz, the frequency range emitted by *Myotis* and *Perimyotis* bat species (i.e., Indiana bat, little brown bat, northern long-eared bat, and tri-colored bat).
- Northern Long-eared Bat (*Myotis septentrionalis*). Northern long-eared bats also hibernate in in caves and mines over the winter and migrate to forested areas to bear young under the bark or in crevices of trees. Northern long-eared bats primarily forage in forested areas, catching insects as they fly through the understory. As mentioned above, high frequency calls that could have been emitted by northern long-eared bats were recorded in the Project Study Area in 2009 (WEST, 2010).

With the exception of the Flatrock Creek crossing, the entire Primary Facility is located within active agricultural land. The Alternate Transmission Route also avoids forestland to the extent practicable. Construction of the Primary and Alternate Facilities would require the clearing of approximately 0.53 and 0.94 acres of deciduous forest, respectively. To avoid possible direct impacts to the federally listed bat species that could potentially roost in such trees during the summer months, all forest clearing activities will take place during the winter hibernation period (i.e., between October 1 and March 31). On November 23, 2015 the USFWS issued a letter to the Applicant confirming that the implementation of seasonal work restrictions is anticipated to avoid impacts to federally listed bat species. This letter specifically states, "Due to the project type, size, location, and the proposed implementation of seasonal tree cutting (clearing of trees ≥3 inches diameter at breast height between October 1 and March 31) to avoid impacts to Indiana bats and northern long-eared bats, we do not anticipate adverse effects to any federally endangered, threatened, proposed or candidate species."

State-Listed Species

Review of the Ohio Division of Wildlife's Natural Heritage Database state listed species by county list indicates that the proposed Facility is within the range of five state-listed plant species and five state-listed animal species (one amphibian, one bird, and three mussels). Table 07-4 shows the state-listed species with potential habitat in the vicinity of the proposed Facility, along with general habitat requirements and the Ohio state status for each species.

Table 07-4. Protected Species with Potential Habitat within the Vicinity of the Proposed Facility

Scientific Name	Common Name	General Habitat	Ohio Status
Plants			
Carex crus-corvi	raven-foot sedge	moist/shaded	T
Cuscuta cuspidata	cuspidate dodder	openings along creeks/streams	E
Iris brevcaulis	leafy blue flag	variety wet	T
Rorripa aquatica	lake cress	ponds, slow-moving streams	T
Vernonia fasciculata	prairie ironweed	wet prairies	E
Reptiles and Amphibians			
Hemidactylium scutatum	four-toed salamander	variety wet	SC
Birds			
Accipiter striatus	sharp-shinned hawk	deep woods	SC
Mussels			
Cyclonaias tuberculata	purple wartyback	medium and large rivers	SC
Truncilla truncata	deertoe	medium and large rivers	SC
Uniomerus tetralasmus	pondhorn	ponds, creeks, headwaters	T

Notes: E = Endangered, T = Threatened, SC = Species of Concern
Sources: Cusick, 1984; Gardner, 2004; Burns, 1984; Burns & Cusick, 1983; Cusick, 1985; Badra, 2004.

The state-listed species that could potentially occur in Paulding County are generally found in woodland, wetland, and stream/river habitats, which are uncommon within the area. With the exception of the Flatrock Creek crossing, the Primary Transmission Route is sited entirely within active agricultural land, and the Alternate Transmission Route avoids forestland to the extent practicable. Based on ODNR Land Use data, the Primary Transmission Route would result in the clearing of approximately 0.53 acre of deciduous forest along Flatrock Creek. The Alternate Transmission Route would require the clearing of approximately 0.94 acre of deciduous forest. The POI Switchyard is located entirely within agricultural land and requires no tree clearing.

As described above in Sections 4906-15-07(C) and (D), most of the water features intersecting the proposed Facility are part of a regional ditch and agricultural drainage system. These wetlands consist of man-made drainages that periodically undergo maintenance activities, and are unlikely to provide habitat for any of the protected species listed above in Table 07-4. Furthermore, impacts to streams have been completely avoided during the Facility siting

process, and impacts to wetlands avoided to the extent practicable. In addition, mussels are not expected to occur at any of the streams or wetlands within the ROW (WEST, 2015b).

The Transmission Line and the POI Switchyard are not anticipated to impact any federally- or state-listed species. Should federally- or state-listed threatened or endangered species be unexpectedly encountered during construction, the Applicant will contact Staff, ODNR, and USFWS within 24 hours, and construction activities that could adversely impact the identified species will be halted until an appropriate course of action has been agreed upon.

(1) Construction Impacts

To the extent practicable, Facility components have been sited away from sensitive habitats, such as forestland, streams and wetlands, which will minimize impacts to wildlife. Construction-related impacts to wildlife are anticipated to be limited to incidental injury and mortality due to vegetation clearing and vehicular movement, potential silt and sedimentation impacts on aquatic organisms, and displacement of wildlife due to increased noise and human activities. Each of these potential impacts is described below. It is not anticipated that these potential construction-related impacts will be significant enough to affect local populations of any resident or migratory wildlife species.

Incidental Injury and Mortality

Incidental injury and mortality should be limited to sedentary/slow-moving species such as small mammals, reptiles, and amphibians that are unable to move out of the area being disturbed by construction. If construction occurs during the nesting season, wildlife subject to such mortality could also include the eggs and/or young offspring of ground-nesting birds, as well as immature mammalian species that are not yet fully mobile. More mobile species and mature individuals should be able to vacate areas that are being disturbed. Furthermore, because the Facility is sited in active agricultural land that provides limited wildlife habitat, and which currently (and historically) experiences frequent agricultural-related disturbances, such impacts are anticipated to be very minor.

Siltation and Sedimentation

Earth-moving activities associated with Facility construction have the potential to cause siltation and sedimentation impacts down slope of the area of disturbance. Facility components will be sited away from wetlands and streams to the extent practicable. To prevent adverse effects to water quality and aquatic habitat during construction, runoff will be managed under an NPDES construction storm water permit and the associated SWP3. An erosion and sediment control plan will be developed prior to construction that will use appropriate runoff diversion and collection devices. Also, because the Facility is being sited in active

agricultural land, soil disturbance/exposure due to Facility construction will generally occur in areas already subject to regular soil disturbance/exposure (plowing, tilling, harvesting, etc.).

Disturbance/Displacement

Some displacement of wildlife species will likely occur during Facility construction due to increased noise and human activity, resulting in temporary loss of habitat. The significance of this impact will vary by species and the seasonal timing of construction activities. The Facility will be built in agricultural land, which generally provides habitat for only a limited number of wildlife species. In addition, these areas are already subject to periodic disturbance in the form of mowing, plowing, harvesting, etc. Displaced species are expected to return to the area after construction is complete.

(2) Operation and Maintenance Impacts

Impacts as a result of operations and maintenance of the Facility are not anticipated to significantly adversely affect wildlife species. The proposed Facility was sited to minimize forest clearing/conversion impacts. With the exception of the Flatrock Creek crossing, the Primary Transmission Route is sited entirely within active agricultural land, and the Alternate Transmission Route avoids forestland to the extent practicable. The POI Switchyard is also located in agricultural land. To minimize the potential for bird and power line collisions and/or electrocutions, Facility design will incorporate best practices described by the Avian Power Line Interaction Committee (e.g., APLIC, 2012; APLIC & USFWS, 2005). Infrequent maintenance activities may temporarily displace resident wildlife from agricultural habitat within the ROW, but ample similar habitat is located in adjacent fields and throughout the general area in the vicinity of the Facility.

(3) Mitigation Procedures

No significant impacts to commercial, recreational, or protected wildlife species are anticipated as a result of Facility construction or operation. Therefore, no mitigation measures are proposed.

(G) SLOPES AND ERODIBLE SOILS

Terrain in the vicinity of the proposed Facility is generally level. Slopes exceed 2 percent for 465 feet (approximately 1%) of the 8.6-mile Primary Transmission Route, and exceed 6 percent for just 103 feet (approximately 0.2%). Along Alternate Transmission Route, slopes exceed 2 percent for 696 feet (approximately 1.1%) of the 11.6-mile route, and exceed 6 percent for just 167 feet (approximately 0.3%). Slopes are 0-2 percent across the entire POI Switchyard Site (ODNR, 1995a; USDA NRCS, 2006). Table 07-5 summarizes the slopes found at the proposed Facility.

Table 07-5. Slopes at the Proposed Facility

Slope	Linear Feet	Percent of Route	Soil Series
Primary Transmission Route			
0-2%	44,787 feet	99%	Definace silty clay loam, frequently flooded Hoytville silty clay loam Hoytville silty clay Latty silty clay Mermill loam Nappanee loam Nappanee silty clay loam Wabasha silty clay loam, frequently flooded
2-6%	362 feet	0.8%	Nappanee silty clay loam Nappanee silty clay loam, eroded
12-25%	103 feet	0.2%	St. Clair silty clay loam, severely eroded
Alternate Transmission Route			
0-2%	60,747 feet	98.9%	Definace silty clay loam, frequently flooded Haskins loam Hoytville silty clay loam Hoytville silty clay Latty silty clay Mermill loam Nappanee loam Nappanee silty clay loam Wabasha silty clay loam, frequently flooded
2-6%	529 feet	0.8%%	Nappanee silty clay loam Nappanee silty clay loam, eroded
12-18%	64 feet	0.1%	St. Clair silty clay loam, eroded
12-25%	103 feet	0.2%	St. Clair silty clay, severely eroded
POI Switchyard Site			
0-2%	2.1	100%	Hoytville silty clay

Sources: USDA NRCS, 2006; ODNR, 1995a.

(1) Construction Impacts

As shown in Table 07-5, slopes rarely exceed 2 percent along either the Primary or Alternate Transmission Routes. Slopes only exceed 6 percent at the crossing of the Flatrock Creek riparian corridor. Slopes are 0-2% at the entire POI Switchyard Site. For both the Primary and Alternate Transmission Routes, construction activities will disturb the soil, which could result in moderate erosion. However, an erosion and sediment control plan will be developed prior to construction that will use appropriate runoff diversion and

collection devices. Implementation of this plan, in conjunction with the SWP3, will prevent erosion and associated adverse effects to soil productivity and water quality.

(2) Operation and Maintenance Impacts

Once construction is complete, temporarily disturbed areas will be restored (including de-compaction and rock removal in agricultural areas, as necessary) and returned to their approximate pre-construction contours. Exposed soils will be stabilized by seeding, mulching, and/or agricultural planting. Once construction and restoration activities are complete, operation and maintenance will not adversely affect soils or result in soil erosion.

(3) Mitigation Procedures

Because the Facility is sited in active agricultural land, soil disturbance/exposure due to Facility construction will generally occur in areas already subject to regular soil disturbance/exposure (plowing, tilling, harvesting, etc.). To prevent adverse impacts from stormwater runoff, a soil erosion and sedimentation control plan will be developed and implemented as part of the SWP3. Erosion and sediment control measures will be installed and maintained throughout site development, which will effectively protect surface waters, wetlands, groundwater, and storm water quality. Such measures could include silt fence, hay bales, and/or temporary siltation basins. The location of these features will be detailed on the construction drawings, approved by the Ohio EPA as part of the NPDES review, and reviewed by the contractor prior to construction. A duly qualified individual will also inspect these features throughout the period of construction to assure that they are functioning properly until completion of all restoration work (final grading and seeding).

(H) OTHER SIGNIFICANT ISSUES

The Timber Road III Transmission Line will interconnect and operate in conformance with the requirements of PJM Interconnection and American Electric Power. The Applicant is committed to safety and will use industry standard guidelines for safe work practices, and meet the reliability criteria and standards for the North American Electric Reliability Corporation (NERC) during construction, maintenance, and operation of the Facility. No other significant issues of concern are anticipated.

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Summary: Application narrative electronically filed by Mr. Michael J. Settineri on behalf of Paulding Wind Farm III LLC