

Staff Report of Investigation

Gable Substation

Case Number
14-1280-EL-BSB

March 23, 2015



Power Siting
Board

John Kasich, Governor Thomas W. Johnson, Chairman

**In the Matter of the Application by AEP Ohio Transmission
Company for a Certificate of Environmental Compatibility and
Public Need for the Gable Substation Project**

) **Case Number**
) **14-1280-EL-BSB**
)

Staff Report of Investigation

Submitted to the
OHIO POWER SITING BOARD

BEFORE THE POWER SITING BOARD OF THE STATE OF OHIO

In the Matter of the Application by AEP Ohio Transmission	)	Case Number
Company for a Certificate of Environmental Compatibility and	)	14-1280-EL-BSB
Public Need for the Gable Substation Project	)	

Members of the Board:

Chairman, Public Utilities Commission	Ohio House of Representatives
Director, Development Services Agency	Ohio Senate
Director, Department of Health	
Director, Department of Agriculture	
Director, Environmental Protection Agency	
Director, Department of Natural Resources	
Public Member	

To the Honorable Power Siting Board:

In accordance with provisions of the Ohio Revised Code (ORC) Section 4906.07(C), and the Commission's rules, the Staff has completed its investigation in the above matter and submits its findings and recommendations in this staff report for consideration by the Ohio Power Siting Board (Board).

The *Staff Report of Investigation* has been prepared by the Staff of the Public Utilities Commission of Ohio. The findings and recommendations contained in this report are the result of Staff coordination with the Ohio Environmental Protection Agency, the Ohio Department of Health, the Ohio Development Services Agency, the Ohio Department of Natural Resources, and the Ohio Department of Agriculture. In addition, the Staff coordinated with the Ohio Department of Transportation, the Ohio Historic Preservation Office, the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the Federal Aviation Administration.

In accordance with ORC Sections 4906.07 and 4906.12, copies of this staff report have been filed with the Docketing Division of the Public Utilities Commission of Ohio on behalf of the Ohio Power Siting Board and served upon the Applicant or its authorized representative, the parties of record, and the main public libraries of the political subdivisions in the project area.

The staff report presents the results of the Staff's investigation conducted in accordance with ORC Chapter 4906 and the rules of the Board, and does not purport to reflect the views of the Board nor should any party to the instant proceeding consider the Board in any manner constrained by the findings and recommendations set forth herein.

Respectfully submitted,



Executive Director
Ohio Power Siting Board

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ACRONYMS

kV	kilovolts
MW	megawatts
OAC	Ohio Administrative Code
ODNR	Ohio Department of Natural Resources
Ohio EPA	Ohio Environmental Protection Agency
OPSB	Ohio Power Siting Board
ORC	Ohio Revised Code
PUCO	Public Utilities Commission of Ohio
SWPPP	Stormwater Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service

I. POWERS AND DUTIES

Ohio Power Siting Board

The Ohio Power Siting Board (Board or OPSB) was created in 1972. The Board is a separate entity within the Public Utilities Commission of Ohio (PUCO). The authority of the Board is outlined in Ohio Revised Code (ORC) Chapter 4906.

The Board is authorized to issue certificates of environmental compatibility and public need for the construction, operation, and maintenance of major utility facilities as defined in ORC Section 4906.01. Included within this definition are: electric generating plants and associated facilities designed for, or capable of, operation at 50 megawatts (MW) or more; electric transmission lines and associated facilities of a design capacity greater than or equal to 125 kilovolts (kV); and gas and natural gas transmission lines and associated facilities designed for, or capable of, transporting gas or natural gas at pressures in excess of 125 pounds per square inch. In addition, per ORC Section 4906.20, the Board authority applies to economically significant wind farms, defined in ORC 4906.13(A) as wind turbines and associated facilities with a single interconnection to the electrical grid and designed for, or capable of, operation at an aggregate capacity of five MW or greater but less than 50 MW.

Membership of the Board is specified in ORC Section 4906.02(A). The voting members include: the Chairman of the PUCO who serves as Chairman of the Board; the directors of the Ohio Environmental Protection Agency (Ohio EPA), the Ohio Department of Health, the Ohio Development Services Agency, the Ohio Department of Agriculture, and the Ohio Department of Natural Resources (ODNR); and a member of the public, specified as an engineer, appointed by the Governor from a list of three nominees provided by the Ohio Consumers' Counsel. Ex-officio Board members include two members (with alternates) from each house of the Ohio General Assembly.

Nature of Investigation

The OPSB has promulgated rules and regulations, found in Chapter 4906 of the Ohio Administrative Code (OAC), which establish application procedures for major utility facilities and wind farms.

Application Procedures

Any person that wishes to construct a major utility facility or economically significant wind farm in this state must first submit to the OPSB an application for a certificate of environmental compatibility and public need (ORC 4906.04 and 4906.20). The application must include a description of the facility and its location, summary of environmental studies, a statement explaining the need for the facility and how it fits into the Applicant's energy forecasts (for transmission projects), and any other information the OPSB may consider relevant (ORC 4906.10(A)(1) and 4906.20(B)(1)).

Within 60 days of receiving an application, the OPSB must determine whether the application is sufficiently complete to begin an investigation (OAC 4906-5-05(A)). If an application is considered complete, the Chairman of the OPSB will cause a public hearing to be held 60 to 90 days after the official filing date of the completed application. At the public hearing, any person may provide written or oral testimony and may be examined by the parties (ORC 4906.07).

Parties include the Applicant, public officials, and any person who has been granted a motion of leave for intervention (ORC 4906.08(A)).

Staff Investigation and Report

The Chairman will also cause each application to be investigated and a report published not less than 15 days prior to the public hearing. The report sets forth the nature of the investigation and contains the findings and conditions recommended by Staff. The Board's Staff, which consists of career professionals drawn from the Staff of the PUCO and other member agencies of the OPSB, coordinates its investigation among the agencies represented on the Board and with other interested agencies such as the Ohio Department of Transportation, the Ohio Historic Preservation Office, and the U.S. Fish and Wildlife Service (USFWS).

The technical investigations and evaluations are conducted under guidance of the OPSB rules and regulations in OAC Chapter 4906. The recommended findings resulting from the Staff's investigation are described in the staff report pursuant to ORC Section 4906.07(C). The report does not represent the views or opinions of the OPSB and is only one piece of evidence that the Board may consider when making its decision. Once published, the report becomes a part of the record and is served upon all parties to the proceeding and is made available to any person upon request (4906.07(C) and 4906.10). A record of the public hearings and all evidence, including the staff report, may be examined by the public at any time (ORC 4906.09 and 4906.12).

Board Decision

The OPSB may approve, modify and approve, or deny an application for a certificate of environmental compatibility and public need. If the OPSB approves, or modifies and approves an application, it will issue a certificate subject to conditions. The certificate is also conditioned upon the facility being in compliance with standards and rules adopted under ORC 4906.10(A) and (B).

Upon rendering its decision, the OPSB must issue an opinion stating its reasons for approving, modifying and approving, or denying an application for a certificate of environmental compatibility and public need (ORC 4906.11). A copy of the OPSB's decision and its opinion is memorialized upon the record and must be served upon all parties to the proceeding (ORC 4906.10(C)). Any party to the proceeding that believes its issues were not adequately addressed by the OPSB may submit within 30 days an application for rehearing (ORC 4903.10 and 4906.12). An entry on rehearing will be issued by the OPSB within 30 days and may be appealed within 60 days to the Supreme Court of Ohio (ORC 4903.11, 4903.12, and 4906.12).

Criteria

The recommendations and conditions in this *Staff Report of Investigation* were developed pursuant to the criteria set forth in ORC Section 4906.10(A), which reads in part:

The Board shall not grant a certificate for the construction, operation, and maintenance of a major utility facility, either as proposed or as modified by the Board, unless it finds and determines all of the following:

- (1) The basis of the need for the facility if the facility is an electric transmission line or gas pipeline;
- (2) The nature of the probable environmental impact;
- (3) That the facility represents the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, and other pertinent considerations;
- (4) In the case of an electric transmission line or generating facility, that the facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems and that the facility will serve the interests of electric system economy and reliability;
- (5) That the facility will comply with Chapters 3704., 3734., and 6111. of the Revised Code and all rules and standards adopted under those chapters and under sections 1501.33 , 1501.34 , and 4561.32 of the Revised Code. In determining whether the facility will comply with all rules and standards adopted under section 4561.32 of the Revised Code, the board shall consult with the office of aviation of the division of multi-modal planning and programs of the department of transportation under section 4561.341 of the Revised Code.
- (6) That the facility will serve the public interest, convenience, and necessity;
- (7) In addition to the provisions contained in divisions (A)(1) to (6) of this section and rules adopted under those divisions, what its impact will be on the viability as agricultural land of any land in an existing agricultural district established under Chapter 929. of the Revised Code that is located within the site and alternative site of the proposed major utility facility. Rules adopted to evaluate impact under division (A)(7) of this section shall not require the compilation, creation, submission, or production of any information, document, or other data pertaining to land not located within the site and alternative site.
- (8) That the facility incorporates maximum feasible water conservation practices as determined by the board, considering available technology and the nature and economics of the various alternatives.

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II. APPLICATION

Applicant

American Electric Power (AEP) was founded in 1906, and is based in Columbus, Ohio. With nearly 38,000 MW of generating capacity, AEP provides service to 11 states and more than 5 million customers. AEP's utility units operate as AEP Ohio, AEP Texas, Appalachian Power (in Virginia and West Virginia), Kentucky Power, Public Service Company of Oklahoma, and Southwestern Electric Power Company (in Arkansas, Louisiana, and east Texas).

AEP also owns the largest transmission system in the nation, and is part of the Eastern Interconnection, an interconnected transmission system that provides electricity to 38 states and eastern Canada. In 2009, AEP created a wholly-owned transmission subsidiary company called AEP Transco. AEP Transco focuses on in-state transmission and the exploration of new transmission opportunities within the 11 states where AEP currently provides service.

History of the Application

Prior to formally submitting its application, the Applicant consulted with the Staff and representatives of the Board regarding application procedures.

On September 23, 2014, the Applicant held a public information meeting at the Wells Township Community Center, 107 Steuben Street, Brilliant, Ohio 43913.

On October 14, 2014, the Applicant filed a motion for waiver and memorandum in support of the requirement of OAC (4906-5-04(A)) that an application for a proposed substation site contain fully developed information on an Alternate Site.

On November 6, 2014, the Applicant filed the Gable Substation Project application.

On January 6, 2015, the Chairman of the OPSB issued a letter of compliance to the Applicant regarding the application.

On January 14, 2015, Staff filed a response to the Applicant's waiver request, stating no objections to the request.

On January 23, 2015, the Administrative Law Judge granted the Applicant's waiver request regarding fully developed information for the Alternate Site.

On February 24, 2015, the Applicant filed a supplement to its application, providing technical clarification and an updated substation layout.

The OPSB has scheduled a local public hearing for April 7, 2015 at 6:00 p.m., at the Wells Township Community Center, 107 Steuben Street, Brilliant, Ohio 43913. The adjudicatory hearing will commence on April 23, 2015, at 10:00 a.m., in Hearing Room 11-D, 11th Floor, 180 East Broad Street, Columbus, Ohio 43215. As of this date, no Petitions for Leave to Intervene have been filed in this case.

This summary of the history of the application does not include every filing in case number 14-1280-EL-BSB. The docketing record for this case, which lists all documents filed to date, can be found online at <http://dis.puc.state.oh.us>.

Project Description

AEP Ohio Transmission Company (Applicant, AEP) proposes to construct the Gable Substation Project in Wells Township, Jefferson County. The Gable Substation Project is proposed to be comprised of a 138 kV switching substation and associated electric transmission line interconnections.¹ The proposed substation is the subject of this application. Any associated electric transmission line interconnections and/or additional circuits from this substation requiring new infrastructure would need to be filed with the Ohio Power Siting Board as separate applications.

The Preferred Site of the Gable Substation Project is located on approximately three acres of property owned by AEP, on the east side of County Road 15, approximately 400 feet south of County Road 17. AEP owns this property which is currently used principally for agricultural purposes. The Alternate Site is located on the southern side of Township Road 154, approximately 0.7 mile east of County Road 15 and 1.1 miles southeast of the Preferred Site. A permanent access drive to the Preferred Site is proposed from County Road 15. Permanent access to the Alternate Site is proposed from Township Road 154.

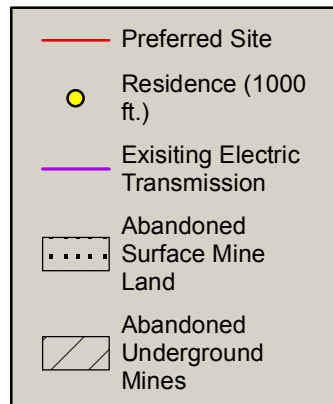
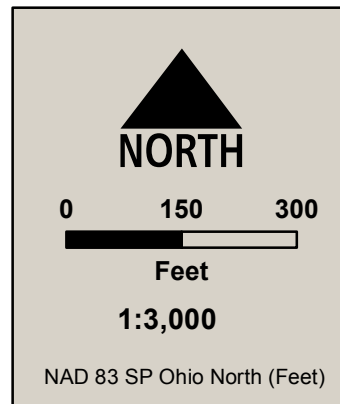
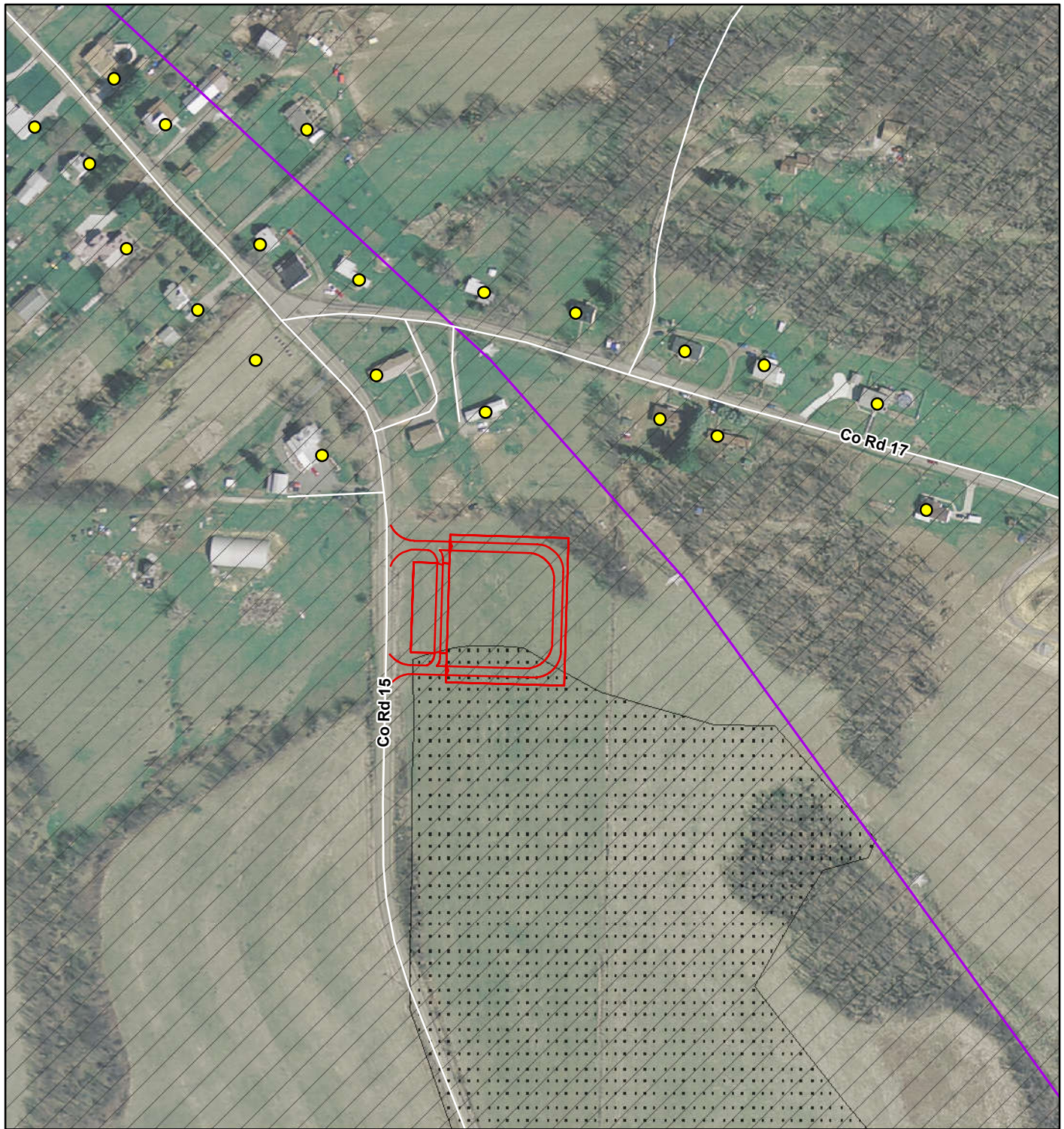
The total proposed fenced footprint at either the Preferred Site or Alternate Site is approximately 1.6 acres. The Applicant would own and operate the substation facility, structures, and equipment. The Applicant would also construct and operate all associated interconnection lines.

New circuits from the proposed substation would utilize the existing AEP Windsor-Canton and Tidd-South Cadiz 138 kV corridors, forming the Gable-Carrollton, Gable-Tidd, and Gable-South Cadiz 138 kV transmission lines. The existing Windsor-Canton 138 kV line extends from northwest to southeast through western Jefferson County, crossing the existing Tidd-South Cadiz 138 kV line in Wells Township, approximately two miles southeast of the village of Smithfield. They are generally perpendicular and diverge from the intersection.

The Applicant stated that it has adequate acreage for a temporary equipment laydown yard at either site. The Applicant has indicated a willingness to allow continued farming of the undeveloped portions at either site.

The Preferred and Alternate sites as well as the existing Windsor-Canton 138 kV transmission line corridor are shown on the map in this report.

¹ “Application by AEP Ohio Transmission Company for a Certificate of Environmental Compatibility and Public Need for the Gable Station Project” (Application), AEP Ohio Transmission Company, November 6, 2014, 01-1 – 01-2

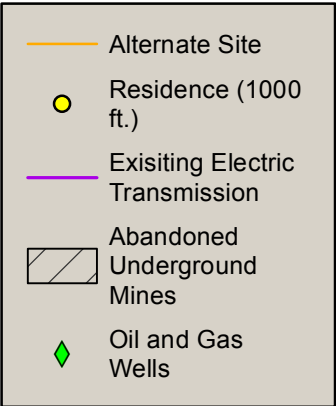
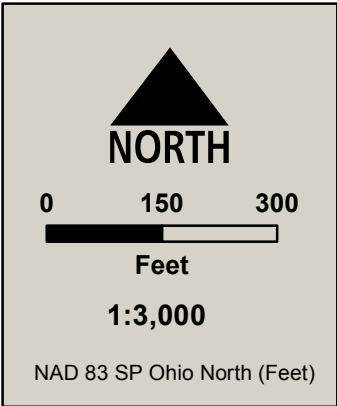
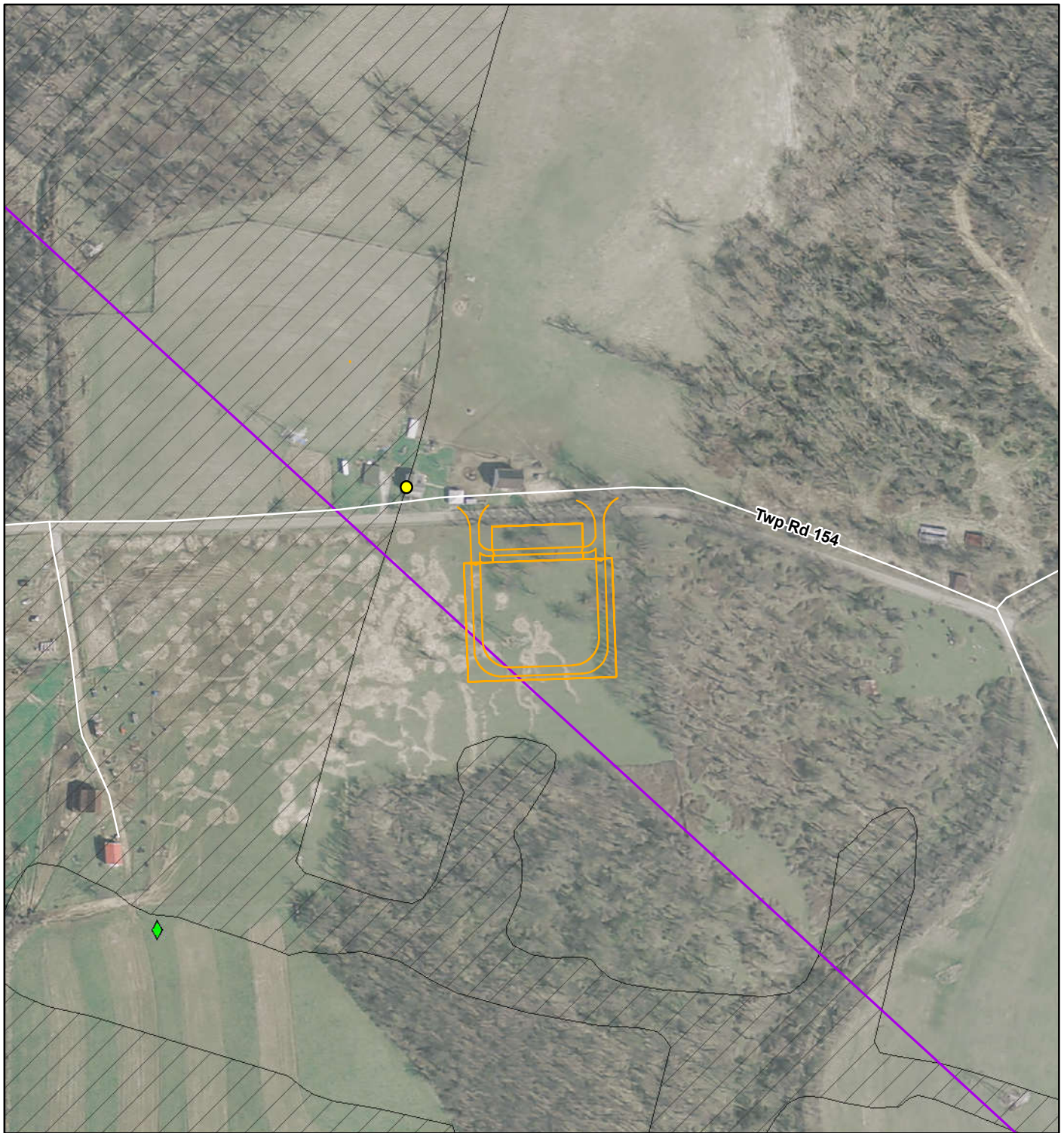


Overview Map

14-1280-EL-BSB

**Gable Substation
Preferred Site**

Maps are presented solely for the purpose of providing a visual representation of the project in the staff report, and are not intended to modify the project as presented by the Applicant in its certificate application and supplemental materials.



Overview Map

14-1280-EL-BSB

Gable Substation Alternate Site

Maps are presented solely for the purpose of providing a visual representation of the project in the staff report, and are not intended to modify the project as presented by the Applicant in its certificate application and supplemental materials.

III. CONSIDERATIONS AND RECOMMENDED FINDINGS

In the matter of the application of AEP Ohio Transmission Company, the following considerations and recommended findings are submitted pursuant to ORC Section 4906.07(C) and ORC Section 4906.10(A).

Considerations for ORC Section 4906.10(A)(1)

Basis of Need

Purpose of Proposed Facility

The purpose of the facility is to avoid potential operating limitations, including thermal overloads and voltage concerns, in the AEP electric grid in eastern Ohio, including the communities of Cadiz, Carrollton, and Brilliant. AEP stated that it would be unable to maintain compliance with North American Electric Reliability Corporation (NERC) and ReliabilityFirst Corporation (RFC) reliability standards; as well as PJM Interconnection (PJM) planning and operating manuals for the bulk electric system. This section focuses on reviewing the need of the proposed facility.

Long Term Forecast

The OAC requires electric utilities and transmission owners to annually file a forecast report with the PUCO.² The report requires a 10-year plan of committed or tentatively projected projects on the bulk power transmission network. The proposed facility is not listed in a Long-Term Forecast Report.

PJM Regional Transmission Expansion Plan

PJM is the Regional Transmission Organization charged with planning for upgrades to the regional transmission system in Ohio. PJM annually issues the Regional Transmission Expansion Plan (RTEP) report. The RTEP analyzes reliability criteria, operational performance of the transmission system, and economic and environmental factors. The RTEP provides for the construction of expansions and upgrades of the PJM transmission system, as needed to maintain compliance with reliability criteria and, when appropriate, to enhance the economic and operational efficiency of wholesale electricity markets in the PJM region.

The proposed facility was identified as a baseline RTEP upgrade by PJM.³ A baseline upgrade resolves a PJM, NERC, RFC, or transmission owner reliability criteria violation. Baseline projects are required to be constructed to keep the bulk electric system operating reliably. Approval was received by the PJM Board. The Applicant's baseline project was assigned the upgrade identification number "b1887." The construction status of transmission projects can be tracked on PJM's website.⁴

² Ohio Administrative Code, Chapter 4901:5-5.

³ "2012 Regional Transmission Expansion Plan Report," PJM Interconnection, accessed February 25, 2015, 327, <http://pjm.com/documents/reports/rtep-documents/2012-rtep.aspx>.

⁴ "Transmission Construction Status," PJM Interconnection, accessed February 25, 2015, <http://pjm.com/planning/rtep-upgrades-status/construct-status.aspx>.

System Economy and Reliability

The proposed facility would improve system reliability by sectionalizing the Carrollton-South Cadiz-Tidd 138 kV transmission line, enabling faults to be better isolated. Isolating faults enables AEP to maintain reliability in the area. AEP load flow studies verify that the construction of the proposed facility would improve reliability. A more-detailed investigation of voltage concerns can be found in the Electric Grid section of this report.

Conclusion

Staff concludes that AEP has demonstrated the basis of need due to the reliability problems caused by certain contingencies in the project area. PJM listed this project as a required baseline upgrade, meaning that if this project were not constructed, AEP would be unable to comply with the required NERC, RFC, and PJM planning criteria, making the system unstable and unreliable, resulting in possible penalties from the Federal Energy Regulatory Commission. The proposed facility would allow the transmission system to provide safe, reliable electric service, while meeting all the applicable planning criteria.

Recommended Findings

Staff recommends that the Board find that the basis of need for the project has been demonstrated and therefore complies with the requirements specified in ORC Section 4906.10(A)(1), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(2)
Nature of Probable Environmental Impact

Pursuant to ORC Section 4906.10(A)(2), the Board must determine the nature of the probable environmental impact of the proposed facility. Staff has found the following with regard to the nature of the probable environmental impact.

Socioeconomic Impacts

Demographics

The project is located within an unincorporated area of Wells Township in Jefferson County. The project area contains large agricultural tracts, residences, and wooded areas. According to the U.S. Census, the population of Jefferson County in 2010 was 69,709, a 5.7 percent decrease from the county population in 2000 and a 13.2 percent decrease since the 1990 Census. The population of Wells Township was 2,835 in 2010, a 9.4 percent decrease since the 2000 Census and a 12.7 percent decrease since the 1990 Census. The largest city in Jefferson County is Steubenville (population of 18,659 in 2010, or roughly 27 percent of the population of Jefferson County).⁵ Wells Township is located approximately 7.5 miles to the south of Steubenville, and is bordered by the Ohio River on the east. The project is intended to improve and maintain the quality of electric service and reliability to the eastern Ohio area, and is not expected to have a negative impact on the demographics of the region as a whole.

Land Use

Approximately 76 percent of Jefferson County's Land Use/Land Cover is comprised of forested areas.⁶ The Preferred Site is located on a 3-acre parcel owned by the Applicant and is an agricultural property most recently utilized as a hay field. The Preferred Site is bordered by County Road 15 on the west, and the terrain of the site slopes up to a ridge located to the north and east of the property, with the upper ridge being wooded. The Alternate Site is not owned by the Applicant, and is presently used for agricultural production. The Alternate Site has relatively flat terrain.

Both the Preferred and Alternate sites were sited to be adjacent to the existing Windsor-Canton 138 kV transmission line corridor. The Preferred Site is located two miles southeast of the village of Smithfield, and is located just south of the intersection of County Road 15 and County Road 17. Twenty-two residences were identified by the Applicant to be located within 1,000 feet of the Preferred Site. No residences were identified within 100 feet of the Preferred Site, the nearest being approximately 200 feet to the north. One residence was located within 1,000 feet of the Alternate Site, at approximately 150 feet northwest of the fence line. No residential structures would be removed for construction of the substation at either the Preferred or Alternate site.

The Preferred Site has immediate access off of the east side of County Road 15, a paved two-lane county road. The Alternate Site has access off of Township Road 154, a narrow, unimproved township road that intersects with County Road 15.

⁵ "Ohio County Profiles: Jefferson County," Ohio Development Services Agency: Office of Policy, Research, and Strategic Planning, accessed March 10, 2015, <http://development.ohio.gov/files/research/C1042.pdf>.

⁶ Ibid.

There are no commercial or industrial facilities located within 1,000 feet of either the Preferred or Alternate site. There is an active surface mining operation (Oxford Mining) located east of the Alternate Site. Oxford owns property within approximately 200 feet of the Alternate Site. Staff is not aware of future expansion plans for this mining complex.

No recreational or institutional land uses exist within 1,000 feet of either site. Additionally, no recreational areas, such as parks, preserves and athletic fields, are located within 1,000 feet of either site.

Neither the Applicant nor Staff identified any land use plans for the Preferred or Alternate site in the Jefferson County, Ohio Land Use Plan (2013) that might conflict with development of either property as an electric utility substation.

Aesthetics

The Preferred and Alternate sites are both located on rural, agricultural property. The facility would be visible from nearby residences at both sites. The Preferred Site is immediately adjacent to several residences to the north northeast, and northwest. The Alternate Site is directly across the street from a residence. Existing transmission infrastructure (steel lattice towers and transmission lines) in the vicinity as well as terrain limits the overall change to the aesthetic nature of the area to a degree, but the station would add aesthetic impacts to the rural area.

The Alternate Site has the closest proximity to a residence, which is approximately 60 feet at the closest point to the main access drive. This residence would have a direct frontal view of the facility on the Alternate Site with little to no screening.

The Preferred Site is located nearer to more residences. However, the site would be graded for access from County Road 15, meaning the station site could be graded in such a way that a portion of the ridge to the north and east could remain and be an effective screening tool to the residences located at the north and east toe of the slope.

The access road for the Preferred Site is located across the street from a storage shed and barn located west of the site across County Road 15. There is a residence north of this shed and barn that would not likely benefit from the screening that the existing topography would otherwise offer (the residence is located northwest of the Preferred Site). In order to reduce impacts to this residence, Staff recommends the Applicant incorporate screening for this residence into an aesthetic impact mitigation plan for the entire site, should the Preferred Site be selected by the Board.

Associated Interconnection Lines

In order to increase reliability, the Applicant ultimately plans to interconnect the substation with additional circuits following the existing Windsor-Canton transmission line corridor to the existing Tidd-South Cadiz 138 kV transmission line and to Carrollton. The Applicant has identified these new future circuits as the Gable-Carrollton, Gable-Tidd, and Gable-South Cadiz 138 kV transmission circuits. Any additional transmission line work would require a subsequent filing(s) with the Board.

The Preferred and Alternate sites are approximately equidistant from the Tidd-Cadiz transmission line, an east-west transmission line that two future circuits from this proposed substation would follow. Following the Windsor-Canton 138 kV transmission line corridor, the

Preferred Site is approximately 2,600 feet northwest of the intersection of the Windsor-Canton and Tidd-Cadiz transmission line corridors. The Alternate Site is approximately 2,800 feet to the southeast of the same intersection of utility corridors.

From the Preferred Site, the Gable-Tidd and Gable-South Cadiz circuits would run to the southeast, away from the residential pocket that is located north of the Preferred Site and across predominately open field. From the Alternate Site, the Gable-Tidd and Gable-South Cadiz circuits would travel to the northwest, potentially impacting the residence to the north of the Alternate Site and traversing through a densely-wooded area. The Applicant has indicated that the existing right-of-way would need to be cleared of accumulated vegetation and potentially expanded in this corridor in order to accommodate new circuits. The Gable-Carrolton circuit would run northwest within the existing Windsor-Canton right-of-way to Carrolton, from either the Preferred or Alternate site.

Cultural and Archaeological Resources

The Applicant conducted a cultural historic investigation for the Preferred Site during fall 2014. This investigation included a literature review and a Phase I archaeological survey, as well as a cultural historic (architectural) survey of the Preferred Site. No previously recorded archaeological sites or National Register of Historic Places (NRHP) structures or districts were identified within or adjacent to the Preferred Site.

The literature review did not identify any previously identified archaeological resources. Phase I field survey work did not reveal any cultural resources at the Preferred Site. No further cultural resources work was deemed necessary for the substation project at the Preferred Site. The architectural survey at the Preferred Site concluded that no properties within the Area of Potential Effect were eligible for listing in the NRHP. As of the writing of this report, the State Historic Preservation Office was still reviewing these recommendations.

No known cultural resources should be adversely impacted by the construction and operation of this substation project at the Preferred Site. Should the Board select the Alternate Site, Staff recommends that the Applicant complete a literature review, Phase I archaeological survey, and cultural historic (architectural) survey to determine the potential for effects of the substation on historic properties and cultural resources.

Economics

AEP would construct, own, operate, and maintain the proposed Gable Substation. The Applicant estimated the applicable intangible and capital costs for the Preferred Site at \$1,422,600. The intangible and capital costs for the Alternate Site are estimated at \$1,622,600.⁷

The Preferred and Alternate sites are located within Wells Township in Jefferson County. In addition to the township and county, the local school districts and public library would receive tax revenue from the project. The approximate annual property tax associated with both the Preferred and the Alternate site over the first year of operation is estimated by the Applicant at \$67,000. Based on the 2014 tax rates, the Applicant estimated the distribution of taxes by township and county: Jefferson County: \$16,000; Wells Township: \$2,000; Wells Township Executive New Alexandria, Inc., Brilliant: \$8,000; Buckeye Local School District: \$36,000;

⁷ Application, 05-1

Jefferson County Joint Vocational School District: \$3,000; Eastern Gateway Community College: \$1,000; Public Library of Jefferson County and Steubenville: \$1,000.⁸

The proposed project would have a positive impact on regional development through the generation of tax revenue.

Geology

Jefferson County lies within the unglaciated, dissected Allegheny Plateau section of the Appalachian Plateau Province.⁹ The county is characterized by relatively high relief and rugged topography that features narrow ridges, steep slopes, and a high degree of stream dissection that empty into the Ohio River. The underlying bedrock is mainly sandstone, shale, and limestone, all of which were deposited during the Pennsylvanian and Permian period.

Much of Jefferson County, including the Preferred and Alternate sites in Wells Township, has been extensively surface and underground mined. Coal mining operations extracted coal from the Pittsburgh (#8) seam primarily by surface mining north of State Route 151 and by underground mining south of State Route 151. The Preferred Site at a surface elevation of about 1,250 feet above sea level is situated above the Crow Hollow #1 and #2 (Jfn-179) abandoned underground coal mine. The owner abandoned coal mining operations in 1944. The Alternate Site is surrounded as well by the abandoned Crow Hollow #1 and #2 underground coal mine. However, mapping indicates the site does not overlay the deep mine.¹⁰ The surface elevation is approximately 1,240 feet above sea level at this site.

It is also of note that Ohio Coal & Construction Corporation operated the surface coal mine, permit #D-410, located just west of the Alternate Site along Wells Township Road 154. The Waynesburg (#11) coal seam was mined at this location. On the south boundary of the Preferred Site, the Ohio Coal & Construction Corporation operated the surface coal mine permit #C-983. No information was available indicating what coal seam was mined at this permit location. Both mines have been reclaimed and are now inactive.

Outside of the Alternate Site is the active surface mining operation permit #D-2408, located east of the proposed site and the termination of Wells Township Road 154 along the east side of Jefferson County Road 17. Oxford Mining is extracting the Pittsburgh (#8) and the Pomeroy (8A) coal seams at an average elevation of 970 feet above sea level for the #8 coal and 1,000 feet above sea level for the #8A coal.

None of these coal mining operations (abandoned or active) should have an effect on the construction or long term operation of the substation. The abandoned underground mine is more than 200 feet below the surface elevation at the Preferred Site. Mine subsidence is a potential concern, but there are limiting factors controlling the likelihood of impact arising from the possibility of mine subsidence activity. Mining factors include mining method, mine geometry, extraction ratio, the height of the mine workings, and mining rate. Geologic factors include depth of the coal seam, along with the thickness, lithology, strength, structure, fracture and joint set orientation, and bulking.

⁸ Ibid., 06-8

⁹ "Physiography of Eastern United States," Fenneman, Nevin, M., McGraw-Hill, New York, 1938.

¹⁰ "Ohio Mines Viewer," Ohio Department of Natural Resources, Division of Mineral Resources Management, accessed March 10, 2015, <http://www.minerals.ohiodnr.gov/abandoned-mine-land-reclamation/mine-locators>.

The bulking or swell factor of the overburden and the vertical distance between the surface and the mined out cavity are the influencing factors of note at the Preferred Site. The bulking of the caving rocks would progressively reduce the vertical distance between the caved rock and the upper fractured strata, ultimately to nil. At that time, no additional caving (subsidence movement) is possible for the upper strata.¹¹

Soils

According to the Soil Survey of Jefferson County, the Morristown silty clay loam (MnC), 3 to 15 percent slopes, is the dominant soil unit at the Preferred Site.¹² This soil unit is characterized by deep, well drained, gently sloping and strongly sloping soil found on mine spoil ridgetops, benches, and side slopes in areas that have been surface mined for coal. After the removal of the coal, the area has been reclaimed by grading and by resoiling the surface with a layer of material removed from other soils.

At the Alternate Site, the Steinsburg-Rigley Variant fine sandy loams (StC), 8 to 15 percent slopes, is a strongly sloping, well drained soils found on narrow ridgetops and on side slopes just below the ridgetops in the uplands. The side slopes range from 200 to 500 feet long. Steinsburg soils formed in material weathered from weakly cemented sandstone. Slopes range from 3 to 25 percent.

Erosion is a concern for both MnC and StC soils as a result of site preparation and cutting where the soils are exposed along roads and trails during construction. Engineering design, careful grading, and best management practices such as silt fencing would reduce the impacts of erosion during construction. No other soil conditions were identified that would prevent the Applicant from constructing or operating the facility.

Test Borings

The Applicant will conduct a limited number of soil tests for the design and construction of the foundation and facility. Soil samples will be obtained for further laboratory analysis and identification purposes. The Applicant proposes to perform sampling at 2.5-foot intervals for the first 10 feet and 5-foot intervals beyond 10 feet in depth and at any identified change in strata or conditions. Specific tests will include split barrel sampling in non-cohesive soils or standard penetration test and thin walled tube samples (Shelby tubes) in cohesive soils.

If rock is encountered during soil testing, rock coring will be performed with NX-size, double-tube rock coring techniques. The depth of auger refusal will determine the minimum length of rock that will be cored.

Seismology

There is no recorded seismic activity in Jefferson County.

All Staff recommendations for the requirements discussed in this section can be found under the **Socioeconomic Conditions** heading of the Recommended Conditions of Certificate.

¹¹ "Engineering Geology Applied to the Design and Operation of Underground Coal Mines," C. Richard Dunrud, U.S. Geological Survey Bulletin 2147, 1998, 103-104 and "Critical review of the state-of-the-art subsidence prediction methods," Mining Science and Technology, M. Zhang and A.K. Bhattacharyya, 1996, 411.

¹² "Soil Survey of Jefferson County, Ohio" United States Department of Agriculture, Soil Conservation Service in cooperation with the Ohio Department of Natural Resources, Division of Lands and Soils, 1995.

Ecological Impacts

Surface Waters

No streams, wetlands, lakes, ponds, reservoirs, or Federal Emergency Management Agency flood zones were delineated within 100 feet of either the Preferred or Alternate site. No in-water work is proposed for this project. Impacts to nearby surface waters would be further minimized by the implementation of a Stormwater Pollution Prevention Plan (SWPPP) and best management practices. Additionally, no impacts would be expected as a result of operation or maintenance of the facility.

Threatened and Endangered Species

The project is within the range of the Indiana bat (*Myotis sodalis*), a federally endangered species; eastern hellbender (*Cryptobranchus alleganiensis*), a federal species of concern and state endangered species; and black bear (*Ursus americanus*), a state endangered species. With the exception of the Indiana bat, the project would not be expected to impact any federal or state listed species.

The Indiana bat has a historical range that includes the project area. As a tree-roosting species during the non-winter months, the Indiana bat, if present at the site, could be negatively impacted as a result of tree clearing associated with construction and maintenance of the project. Limiting tree removal, particularly in the areas identified as potential Indiana bat habitat, would help reduce potential impacts to this species. In order to reduce potential negative impacts to this species, the USFWS, the ODNR, and Staff recommend that the Applicant be required to adhere to seasonal cutting dates for the clearing of trees that exhibit suitable Indiana bat summer habitat, such as roosting and maternity roost trees.

Vegetation

Both the Preferred and Alternate sites are located on agricultural land currently used as hay fields. Tree clearing is expected to be limited to very few trees at either site. Herbaceous vegetation clearing is expected to be limited to approximately 2.5 acres within and immediately adjacent to the substation fence line.

All Staff recommendations for the requirements discussed in this section can be found under the **Ecological Conditions** of the Recommended Conditions of Certificate.

Public Services, Facilities, and Safety

Roads and Bridges

Neither the Preferred nor the Alternate site is located within 1,000 feet of any major highways or railroads. Equipment deliveries to the Preferred or Alternate site would primarily be by truck and would utilize existing local roads and attempt to minimize impacts by complying with load limits as required by the local jurisdiction. The Applicant would make construction deliveries to the Preferred Site via County Road 15. Deliveries to the Alternate Site would be made via Township Road 154. The Applicant will construct an access road to either site as a permanent and maintained feature.

Staff recommends that the Applicant be required to work with county or township authorities to ensure that roads and bridges are maintained during the course of construction. The Applicant would repair any damaged public roads or bridges promptly to their previous condition under the

guidance and authority of the appropriate county or township authority. The Applicant will remove any temporary improvements needed for the construction of the substation unless the appropriate regulatory agency requests that they remain.

Noise

Most noise impacts associated with the facility would be confined to the eight month construction period. The Applicant proposes to mitigate noise impacts by ensuring that construction equipment is properly maintained with installed mufflers, limiting construction to mostly during daylight hours, and implementing noise related procedures according to Occupational Safety and Health Administration requirements.

The Applicant anticipates minimal incremental increases in noise at nearby residences during some portions of construction. However, the current ambient noise levels associated with local roads, as well as the distance between the substation and the residences, would likely mitigate overall noise impacts during construction.

No transformers are proposed for this project. Therefore, during operation, only a slight increase in background noise from substation equipment, if any, is likely to occur. No commercial, industrial, institutional, or recreational areas would experience noise impacts from this project.

Safety

The Applicant will comply with safety standards set by the Occupational Safety and Health Administration, the PUCO, NERC Mandatory Reliability Standards, and equipment specifications. The Applicant will design the facility to meet the requirements of the National Electric Safety Code. The Applicant also administers a contractor safety program. Contractors working for AEP are required to adhere to similar safety programs and training.

Communications

The tallest anticipated structure is designed to be approximately 60 feet in height. According to the Federal Aviation Administration (FAA) Office of Aeronautical Information Services, four airports, landing strips, or heliports are located in Jefferson County. The Applicant submitted the coordinates for the tallest structures for both the Preferred and the Alternate sites to the FAA. Based on the coordinates, elevations, and heights of these locations, no notice criteria were exceeded. Construction and operation at the Preferred and Alternate sites would not impact airports, landing strips, or heliports.

Radio or television interference is not expected to occur from the operation of the facility.

All OPSB Staff recommendations for the requirements discussed in this section can be found under the **Public Services, Facilities, and Safety Conditions** of the Recommended Conditions of Certificate.

Recommended Findings

The Staff recommends that the Board find that the nature of the probable environmental impact has been determined for the proposed facility, and therefore complies with the requirements specified in ORC Section 4906.10(A)(2), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(3)
Minimum Adverse Environmental Impact

Pursuant to ORC Section 4906.10(A)(3), the proposed facility must represent the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, along with other pertinent considerations.

Site Selection

The Applicant conducted a site selection study to identify the Preferred and Alternate sites. The study area was defined as a one-mile-radius circle centered at the intersection of the two transmission lines to which the proposed station would connect. The Applicant used maps and field observation to identify six candidate sites within the study area that were generally consistent with their priority siting criteria. The priority criteria included relatively flat ground; the absence of trees, wetlands, and man-made obstructions; road adjacency; and the availability of the property for purchase.

The Applicant next calculated a variety of ecological, cultural, land use, and engineering metrics to characterize the six candidate sites. These quantitative criteria included, but were not limited to, woodlot acreage, wetland acreage, counts of nearby cultural sites and residences, and the distance to the transmission lines to which the proposed substation will connect.

The six candidate sites were individually assessed based upon the qualitative and quantitative criteria. The Preferred Site was selected primarily due to its immediate adjacency to one of the transmission lines to which the proposed substation would connect, and because it is already owned by the Applicant. The Alternate Site was selected because it is also immediately adjacent to one of the transmission lines, and the Applicant stated the current owner is potentially receptive to the property's sale or option. The other four sites were judged less suitable due to their proximity to the frontage of adjacent residences, presumed difficulties in property acquisition, and/or the necessity to cross multiple properties for transmission line connection.

The site selection study has several shortcomings related to the selection and calculation of siting criteria, differentiation between the Preferred and Alternate sites, and general lack of objectivity. First, relatively flat ground was cited as a priority criterion, but the Applicant did not calculate or use average site slope as a quantitative criterion (the Preferred Site is actually more severely sloped than the Alternate Site). Second, the Applicant stated the potential impacts of transmission line connections were a siting criterion, but did not attempt to quantify the impact beyond measuring the linear distance between the candidate sites and the existing lines. Third, the Applicant cited property availability as an issue for several of the sites, but it is only speculation. The Applicant only states true knowledge of property availability for the Preferred and Alternate sites. Fourth, the Applicant fails to state precisely why the Preferred Site is more suitable than the Alternate, merely stating that the residents nearer to one site tend to prefer the other. Finally, while the Applicant did quantify some site characteristics, no site scoring was used to rank the sites' suitability, raising some doubt as to the objectivity of the study.

Despite the above concerns, the site selection study led to the identification of viable Preferred and Alternate sites in an area with high average slopes and where most viable sites are already in use.

Minimizing Impacts

Land use at the Preferred and Alternate sites and surrounding properties is predominantly agricultural. The Preferred Site is situated in closer proximity to more residences, but the majority of those residences are located on or near the toe of the backside of the existing slope on the subject property. Cutting into the hill/slope and keeping a ridge as well as some of the existing trees on-site, rather than eliminating the ridge, would help screen the station to neighbors to the east and north. Additionally, access off of the paved County Road 15 should be able to handle construction traffic and loads carrying equipment better than Township Road 154, which is narrow and unimproved. Once completed the Applicant does not object to the return of undeveloped portions of either site to continued agricultural purposes.

Both sites are located on agricultural land and have adequate open area for laydown yards. The Preferred Site would require less interconnection infrastructure to tie into the existing Windsor-Canton and Tidd-South Cadiz 138 kV transmission lines and would run in a direction away from local residences. The Preferred Site would also require less vegetative clearing and grubbing along the transmission corridor than the Alternate Site.

The project should not negatively impact future growth in the region and would support economic development by improving the supply and reliability of the regional electrical system. The project would reinforce the transmission system in eastern Ohio, including all of Jefferson County and surrounding areas.

Conclusion

The project would result in both temporary and permanent impacts to the project area. While both the Preferred and Alternate sites are viable, each site has unique issues, and neither site would be without impact to the surrounding community. Staff has analyzed each site independently for potential direct impacts associated with residences, roadways and planned future interconnection lines.

When analyzing future interconnections planned for this substation, the greater impact appears to be from the Alternate Site, as the three interconnection lines would need to run in a northwest direction, potentially impacting a residence and requiring additional clearing of wooded land. Two of the three planned interconnections from the Preferred Site would run in a southeasterly direction, away from residences and across predominately open field.

Due to its accessibility, the fact that the Applicant owns the parcel, and that two of the three interconnections allow the Applicant to interconnect in a direction away from the local residences, Staff concludes that the Preferred Site represents the minimum adverse impact.

Recommended Findings

The Staff recommends that the Board find that the proposed facility represents the minimum adverse environmental impact, and therefore complies with the requirements specified in ORC Section 4906.10(A)(3), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(4)

Electric Grid

Pursuant to ORC Section 4906.10(A)(4), the Board must determine that the proposed electric facilities are consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facilities will serve the interests of electric system economy and reliability.

The purpose of this section is to evaluate the impact of integrating the proposed facility into the existing regional transmission grid. The present system serves approximately a 375 MW load area, consisting of Cadiz, Carrollton, and Brilliant. The load area is served by a single, 50-mile, 138 kV transmission line. The 50-mile span does not have any fault interrupting devices to sectionalize the line during a contingency. An outage of this line may cause system criteria violations and the inability to serve load.

Analysis shows that without the proposed facility and during certain N-1 contingencies, AEP would be unable to maintain compliance with AEP, NERC, RFC, and PJM, reliability criteria.

The proposed station will:

- Sectionalize the Carrollton-South Cadiz-Tidd 138 kV transmission line into three shorter 138 kV transmission line sections: Gable–Carrollton, Gable–Tidd, Gable–South Cadi;
- Improve grid reliability by adding three motorized switches, which will sense faults, isolate the fault, and restore unaffected portions of the line;
- Improve voltage profile for the eastern Ohio transmission system, maintaining voltages within AEP Planning Criteria; and,
- Accommodate a future distribution source into the Smithfield area.

NERC/AEP Planning Criteria

NERC is responsible for the development and enforcement of the federal government’s approved reliability standards, which are applicable to all owners, operators, and users of the bulk power system. The bulk electric system, with the exception of a few exclusions, includes all Transmission Elements operated at 100 kV or higher and Real Power and Reactive Power resources connected at 100 kV or higher.¹³ NERC requires planners of the bulk electric transmission system to meet Reliability Standards TPL-001-0.1 through TPL-004-0 under transmission outage conditions for categories A, B, C, and D contingencies.¹⁴ According to NERC, a contingency is an unexpected failure or outage of a system component, such as a generator, transmission line, circuit breaker, switch, or other electrical element. Below is a partial list of the NERC categories and their meanings:

¹³ North American Electric Reliability Corporation, Glossary of Terms Used in NERC Reliability Standards. February 20, 2014. From <http://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx>.

¹⁴ North American Electric Reliability Corporation, Reliability Standards, Transmission Planning (TPL-001-0.1-TPL-004-0). February 20, 2014. From <http://www.nerc.com/pa/Stand/Pages/ReliabilityStandards.aspx>.

- Category A (no contingencies, all facilities in-service (system normal));
- Category B (loss of a single bulk electric system element, N-1), the planning authority and transmission planner shall demonstrate that the interconnected transmission system can operate to supply projected customer demands and firm transmission service at all demand levels over the range of forecast system demand; and,
- Category C (loss of two or more bulk electric system elements, N-1-1), the planning authority shall demonstrate that the interconnected transmission system can operate to supply projected customer demands and firm transmission service at all demand levels over the range of forecast system demand and may rely upon the controlled interruption of customers or curtailment of firm transmission service. The N-1-1 criterion anticipates that a second N-1 contingency will occur on the system after the first N-1 event occurs.

AEP follows internal transmission planning criteria to plan their system. The planning criteria are required by law. The AEP criteria comply with NERC and RFC standards and PJM planning and operating manuals for the bulk electric system. This figure highlights a portion of AEP's planning criteria:¹⁵

AEP Planning Criteria		
System Condition	Voltage Performance	Thermal Performance
Normal	• 0.95 - 1.05 per unit. • 8% voltage change not acceptable	100 kV - 765 kV: No facility may exceed its normal rating
Contingency	• 0.92 - 1.05 per unit. • Voltage change from system normal of 8% or greater is not acceptable	N-1, < 344 kV: Not to exceed emergency rating N-1, > 345 kV: Not to exceed its normal rating N-2 or Bus or Breaker Failure, >100 kV: Not to exceed emergency rating

Load Flow Analysis

AEP used summer 2015 peak load flow to analyze system load flows. Staff reviewed transcription diagrams provided by the Applicant. Analysis shows that without the facility, and under certain single contingencies, the system is unstable, having voltage issues. Without the proposed facility AEP would be unable to maintain compliance, violating AEP, NERC and PJM planning criteria.

¹⁵ Transmission Planning Criteria-American Electric Power. Document available from OPSB Staff upon request.

The table below displays station voltages during an N-1 outage of the Carrollton-South Cadiz-Tidd 138 kV transmission line and the improvement with the proposed facility in-service.

System Violations Under Single Contingency 2015 Summer Peak Case				
Station	Contingency Voltage		Voltage Drop	
	<i>Before Improvement</i>	<i>After Improvement</i>	<i>Before Improvement</i>	<i>After Improvement</i>
Freebyrd 138 kV	0.917	0.978	8.47%	2.48%
Stone Plant 138 kV	0.918	0.978	8.62%	2.46%

PJM

The proposed facility was identified as a baseline RTEP upgrade by PJM. A baseline upgrade resolves a PJM, NERC, RFC, or transmission owner reliability criteria violation. Baseline projects are required to be constructed to keep the bulk electric system operating reliably. Studies showed that without this facility, there would be voltage violations.

The PJM Board approved the facility. The Applicant's baseline project was assigned the upgrade identification number "b1887." The construction status of transmission projects can be tracked on PJM's website.¹⁶

Conclusion

The Applicant provided details on load flow studies that were performed by AEP and PJM. The study demonstrated that, without the proposed facility, AEP would be unable to provide safe, reliable electric service under future projected load. In addition, AEP would be unable to comply with the federal reliability standards. The proposed facility is a PJM RTEP baseline upgrade and approved by the PJM Board, it is needed to maintain system reliability. The proposed facility is consistent with plans for expansion of the regional power system, and serves the interests of electric system economy and reliability.

Recommended Findings

The Staff recommends that the Board find that the proposed facility is consistent with regional plans for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, and that the facility would serve the interests of electric system economy and reliability. Therefore, the facility complies with the requirements specified in ORC Section 4906.10(A)(4), provided that any certificate issued by the Board for the proposed facilities include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

¹⁶ PJM Transmission Construction Status. <http://pjm.com/planning/rtep-upgrades-status/construct-status.aspx>.

Considerations for ORC Section 4906.10(A)(5)

Air, Water, Solid Waste, and Aviation

Pursuant to ORC Section 4906.10(A)(5), the facility must comply with specific sections of the ORC regarding air and water pollution control, withdrawal of waters of the state, solid and hazardous wastes, and air navigation.

Air

Air quality permits are not required for construction of the proposed facility. However, fugitive dust rules adopted pursuant to the requirements of ORC Chapter 3704 (air pollution control laws) may be applicable to the proposed facility. The Applicant would control fugitive dust through dust suppression techniques such as irrigation, mulching, or application of tackifier resins. These methods of dust control are sufficient to comply with fugitive dust rules.

Water

Neither construction nor operation of the proposed facility would require the use of significant amounts of water, so requirements under ORC Sections 1503.33 and 1501.34 are not applicable to this project.

No surface water resources would be directly impacted by construction or operation at the Preferred or Alternate site. Therefore, neither a 404 Army Corps Permit nor an Ohio EPA 401 Water Quality Certification would be required for construction or operation of this facility.

The Applicant has indicated that it intends to submit a Notice of Intent (NOI) for coverage under the Ohio EPA's National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction Activity, and a related SWPPP. This SWPPP will be developed for the project pursuant to Ohio EPA regulations and will conform to ODNR's Rainwater and Land Development Manual. Following the SWPPP, as well as using BMPs for construction activities, would help minimize erosion-related impacts. Construction of this facility would comply with requirements of ORC Chapter 6111, and the rules and laws adopted under this chapter.

Solid Waste

The Applicant indicates that solid waste generated from construction activities would be primarily conductor scrap, construction material packaging including cartons, insulator crates, conductor reels and wrapping, and used stormwater erosion control materials. Clearance poles, conductor reels, and other materials with salvage value would be removed from the construction area for reuse or salvage. The Applicant estimates that approximately 50 cubic yards of construction debris could be generated from the project. All construction-related debris would be disposed of in Ohio EPA-approved landfills, or other appropriately-licensed and operated facilities.

Any contaminated soils discovered or generated during construction would be handled in accordance with applicable regulations. The Applicant states that all on-site vehicles would be monitored for leaks and receive regular preventative maintenance to reduce the chance of leakage, and workers would follow manufacturer's recommendations for any spill cleanup. Petroleum products would be stored in tightly-sealed, clearly-labeled containers. The Applicant's

solid waste disposal plans comply with solid waste disposal requirements in ORC Chapter 3734 and the rules and laws adopted under this chapter.

Aviation

The height of the tallest anticipated above ground structure for the proposed project is designed to be approximately 60 feet. The closest airport is a publically owned airport located approximately eight miles to the northeast of the Preferred and Alternate sites. Coordinates for the tallest structures were submitted by AEP to the FAA via the Notice Criteria Tool. Based on the coordinates, elevations, and heights of these locations, no notice criteria were exceeded. Therefore, construction and operation at the Preferred or Alternate site is not anticipated to impact any airports, landing strips, or heliports.

In accordance with ORC 4561.32, Staff contacted the Ohio Office of Aviation during review of this application in order to coordinate review of potential impacts of the facility on local airports. As of the date of preparation of this report, no such concerns have been identified. Construction and operation at neither the Preferred Site nor the Alternate Site is expected to have an impact on aviation.

All Staff recommendations for the requirements discussed in this section can be found under the **Air, Water, Solid Waste, and Aviation Conditions** heading of the Recommended Conditions of Certificate.

Recommended Findings

The Staff finds that the proposed facility complies with the requirements specified in ORC Section 4906.10(A)(5), provided that any certificate issued by the Board for the certification of the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(6)

Public Interest, Convenience, and Necessity

Pursuant to ORC Section 4906.10(A)(6), the Board must determine that the facility will serve the public interest, convenience, and necessity.

The purpose of the Gable Substation is to maintain, improve, and reinforce electric service quality and reliability for the eastern Ohio service area communities of Cadiz, Carrollton, and Brilliant. The Gable Substation would allow AEP Ohio the ability to sectionalize the Windsor-Canton 138 kV transmission line in the local transmission system. The substation project would serve the public interest because it would ensure that future electrical supply needs are met and regional reliability is enhanced.

Public Interaction

AEP held public informational meetings for this project on September 23, 2014 at the Wells Township Community Center in Brilliant. During these meetings, local residents were provided the opportunity to speak with the Applicant's representatives concerning the proposed substation and view maps of the proposed sites. AEP maintains a webpage with information about the project, and members of the public may also contact AEP with questions, comments, or concerns at (614) 552-1929.

Following the public informational meeting, AEP received four identical letters from area residents in support of the Alternate Site. One letter was signed by residents located at 12 different addresses. The letters express concern with environmental and health impacts, noise and light pollution, and property devaluation associated with the Preferred Site, and state that fewer landowners would be impacted at the Alternate Site. AEP forwarded the letters to Staff, and Staff filed the letters in the public comments section of the case record between November 10 and 20, 2014.

The Administrative Law Judge issued an entry on January 23, 2015, scheduling a local public hearing and an adjudicatory hearing for this proceeding. The local public hearing, at which the Board will accept written or oral testimony from any person, is scheduled for 6:00 p.m. on April 7, 2015, at the Wells Township Community Center, 107 Steuben Street, Brilliant, Ohio 43913. The adjudicatory hearing will commence on April 23, 2015, at 10:00 a.m. at the offices of the PUCO, Hearing Room 11-D, 11th Floor, 180 East Broad Street, Columbus, Ohio 43215. As of this date, no Petitions for Leave to Intervene have been filed in this case.

EMF

Transmission lines, when energized, generate electromagnetic fields (EMF). Laboratory studies have failed to establish a strong correlation between exposure to EMF and effects on human health. However, there have been concerns that EMF may have impacts on human health.

Because these concerns exist, the Applicant is required to compute the EMF associated with the new circuits. The fields were computed based on the maximum loadings of the lines, which would lead to the highest EMF values that might exist at the proposed substation. The magnetic fields are a function of the electric current, the configuration of the conductors, and the distance from transmission lines. The electric field is a function of the voltage, the line configuration, and the distance from the substation.

The magnetic fields were estimated at the substation fence to be less than 42.38 milligauss, and the electric field would be less than 0.24 kilovolt/meter. The magnetic field output is comparable to that of common household appliances. For example, a corded power tool has a magnetic field output of 123 milligauss. The maximum magnetic field scenarios for the proposed substation sites are listed in the application (Table 06-2). Electric fields are produced by voltage or electric charge. For example, a plugged in lamp cord produces an electric field, even if the lamp is turned off.

Daily current load levels would normally operate below the maximum load conditions, thereby further reducing nominal EMF values. The electric fields are easily shielded by physical structures such as the walls of a house, foliage, or earthen berms. The magnetic fields generated by the substation are attenuated very rapidly as the distance from them increases. Past experience has shown that within 100 feet of the fence line of a substation, the magnetic field is not of sufficient strength to be measureable, because the background effects overwhelm the measurements. The nearest residence is more than 200 feet from the Preferred Site, and more than 150 feet from the Alternate Site. Therefore, the Applicant expects that EMF will not significantly affect residences near the Gable substation.

Recommended Findings

Staff recommends that the Board find that the proposed facility would serve the public interest, convenience, and necessity, and therefore complies with the requirements specified in ORC Section 4906.10(A)(6), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(7)

Agricultural Districts

Pursuant to ORC Section 4906.10(A)(7), the Board must determine the facility's impact on the agricultural viability of any land in an existing agricultural district within the Preferred and Alternate sites of the proposed utility facility. The agricultural district program was established under ORC Chapter 929. Agricultural district land is exempt from sewer, water, and electrical service tax assessments. Agricultural land can be classified as an agricultural district through an application and approval process that is administered through the local county auditor's office. Eligible land must be devoted exclusively to agricultural production or be qualified for compensation under a land conservation program for the preceding three calendar years. Furthermore, eligible land must be at least 10 acres or produce a minimum average gross annual income of \$2,500.

The parcel subject to the construction and operation of either the Preferred or Alternate site is not presently classified as an Agricultural District property in Jefferson County. The Applicant has indicated there are five agricultural district land parcels within 1,000 feet of the Preferred Site and four agricultural district land parcels within 1,000 feet of the Alternate Site.

Recommended Findings

The Staff recommends that the Board find that the impact of the proposed facility on the viability of existing agricultural land in an agricultural district has been determined, and therefore complies with the requirements specified in ORC Section 4906.10(A)(7), provided that any certificate issued by the Board for the proposed facility include the conditions specified in the section of this report entitled Recommended Conditions of Certificate.

Considerations for ORC Section 4906.10(A)(8)

Water Conservation Practice

Pursuant to ORC Section 4906.10(A)(8), the proposed facility must incorporate maximum feasible water conservation practices, considering available technology and the nature and economics of the various alternatives.

Because the facility would not require the use of water for operation, water conservation practice as specified under ORC 4906.10(A)(8) is not applicable to the project.

Recommended Findings

The Staff recommends that the Board find that the requirements specified in ORC Section 4906.10(A)(8) are not applicable to this project.

IV. RECOMMENDED CONDITIONS OF CERTIFICATE

Following a review of the application filed by AEP Ohio Transmission Company and the record compiled to date in this proceeding, Staff recommends that a number of conditions become part of any certificate issued for the proposed facility. These recommended conditions may be modified as a result of public or other input received subsequent to issuance of this report.

General Conditions

Staff recommends the following conditions to ensure conformance with the proposed plans and procedures as outlined in the case record to date, and to ensure compliance with all conditions listed in this staff report:

- (1) The facility shall be installed at the Applicant's Preferred Site as presented in the application and Applicant's supplemental filing and further clarified by recommendations in this *Staff Report of Investigation*.
- (2) The Applicant shall utilize the equipment and construction practices as described in the application and as modified and/or clarified in supplemental filings, replies to data requests, and recommendations in this *Staff Report of Investigation*.
- (3) The Applicant shall implement the mitigation measures as described in the application and as modified and/or clarified in supplemental filings, replies to data requests, and recommendations in this *Staff Report of Investigation*.
- (4) The Applicant shall conduct a preconstruction conference prior to the start of any construction activities. Staff, the Applicant, and representatives of the prime contractor and all subcontractors for the project shall attend the preconstruction conference. The conference shall include a presentation of the measures to be taken by the Applicant and contractors to ensure compliance with all conditions of the certificate, and discussion of the procedures for on-site investigations by Staff during construction. Prior to the conference, the Applicant shall provide a proposed conference agenda for Staff review.
- (5) As the information becomes known, the Applicant shall provide to Staff the date on which construction will begin, the date on which construction was completed, and the date on which the facility begins commercial operation.
- (6) Within 60 days after the commencement of commercial operation, the Applicant shall submit to Staff a copy of the as-built specifications for the entire facility. If the Applicant demonstrates that good cause prevents it from submitting a copy of the as-built specifications for the entire facility within 60 days after commencement of commercial operation, it may request an extension of time for the filing of such as-built specifications. The Applicant shall use reasonable efforts to provide as-built drawings in both hard copy and as geographically-referenced electronic data.
- (7) The certificate shall become invalid if the Applicant has not commenced a continuous course of construction of the proposed facility within five years of the date of journalization of the certificate.

Socioeconomic Conditions

Staff recommends the following condition to address the impacts discussed in the **Socioeconomic Impacts** section of the Nature of Probable Environmental Impact:

- (8) At least 30 days prior to the preconstruction conference, the Applicant shall have in place a complaint resolution procedure to address potential public grievances resulting from project construction and operation. The resolution procedure must provide that the Applicant will work to mitigate or resolve any issues with those who submit either a formal or informal complaint and that the Applicant will immediately forward all complaints to Staff. The Applicant shall provide the complaint resolution procedure to Staff, for review and confirmation that it complies with this condition, prior to the preconstruction conference.
- (9) Prior to commencement of any construction, the Applicant shall prepare a landscape and lighting plan that addresses the aesthetic impacts of the facility. The Applicant shall consult with adjacent property owners in the development of this plan and endeavor to incorporate the existing topographic ridge and trees on the site to the extent practicable, and provide the plan to Staff for review and confirmation that it complies with this condition.
- (10) Prior to construction, the Applicant shall conduct a Phase I archaeological survey and an assessment of potential impacts to historical and architectural resources at the Alternate Site if the Alternate Site is certificated by the Board. If the Phase I survey discloses a find of cultural or architectural significance, or a structure that could be eligible for inclusion in the National Register of Historic Places, then the Applicant shall submit an amendment, modification, or mitigation plan. Any such mitigation effort, if needed, shall be developed in coordination with the Ohio Historic Preservation Office and submitted to Staff to ensure compliance with this condition.
- (11) The Applicant shall avoid, where possible, or minimize to the maximum extent practicable, any damage to field tile drainage systems and soils resulting from construction, operation, and/or maintenance of the facility in adjacent agricultural areas. Damaged field tile systems shall be promptly repaired to at least original conditions at the Applicant's expense.

Ecological Conditions

Staff recommends the following conditions to address the impacts discussed in the **Ecological Impacts** section of the Nature of Probable Environmental Impact:

- (12) The Applicant shall adhere to seasonal cutting dates of October 1 to March 31 for the removal of suitable Indiana bat habitat trees, if avoidance measures cannot be achieved.

Public Services, Facilities, and Safety Conditions

Staff recommends the following conditions to address the impacts discussed in the **Public Services, Facilities, and Safety** section of the Nature of Probable Environmental Impact:

- (13) The Applicant shall obtain all required county and/or township transportation permits and any necessary permits from the Ohio Department of Transportation (ODOT). Any temporary or permanent road or lane closures and traffic control for access/egress off of County Road 15 necessary for construction and operation of the proposed facility shall be coordinated with the appropriate entities including, but not limited to, the County Engineer, ODOT, local law enforcement, and health and safety officials.
- (14) General construction activities shall be limited to the hours of 7:00 a.m. to 7:00 p.m., or until dusk when sunset occurs after 7:00 p.m. Impact pile driving and hoe ram operations, if required, shall be limited to the hours between 10:00 a.m. to 5:00 p.m., Monday through Friday. The Applicant shall notify Staff when construction activities that do not involve noise increases above ambient levels at sensitive receptors are permitted outside of daylight hours are necessary. The Applicant shall notify property owners or affected tenants, within the meaning of Rule 4906-5-08(C)(3), Ohio Administrative Code, of upcoming construction activities including potential for nighttime construction activities.

Air, Water, Solid Waste, and Aviation Conditions

Staff recommends the following conditions to address the impacts discussed in **Air, Water, Solid Waste, and Aviation**:

- (15) Prior to the commencement of construction activities that require permits, licenses, or authorizations by federal or state laws and regulations, the Applicant shall obtain and comply with such permits, licenses, or authorizations. The Applicant shall provide copies of permits and authorizations, including all supporting documentation, to Staff within seven days of issuance or receipt by the Applicant. The Applicant shall provide a schedule of construction activities and acquisition of corresponding permits for each activity at the preconstruction conference.



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Summary: Staff Report of Investigation electronically filed by Mrs. Yvonne W Cooper on behalf of Staff of OPSB