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File #: 167847

February 3, 2017

VIA HAND DELIVERY

Rosemary Chiavetta, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

Re: Letter of Notification of PPL Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Reconductor Approximately 0.64 Miles of the Brunner Island - Yorkana 230 kV Transmission Line in York County, Pennsylvania - Docket No. A-2017-

Dear Secretary Chiavetta:

Enclosed for filing is the Letter of Notification of PPL Electric Utilities Corporation in the above-referenced proceeding. A CD containing a copy of the Letter of Notification and Attachments in Support of the Letter of Notification is also enclosed.

As indicated on the Certificate of Service, copies of the Letter of Notification are being served by certified mail, return receipt requested upon the involved governmental agencies, municipalities and property owners.

Subject to Commission approval, construction is scheduled to begin in April 2017 to support an in-service date of June 2019.

If you have any questions concerning this matter, please contact me at the address or telephone numbers provided above.

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Rosemary Chiavetta, Secretary
February 3, 2017
Page 2

Respectfully submitted,



Christopher T. Wright

CTW/jl
Enclosures

cc: Certificate of Service
Office of Consumer Advocate
Office of Small Business, Advocate
Bureau of Investigation &, Enforcement
Robert F. Young
Paul T. Diskin
Yasmin Snowberger
Kimberly Hafner

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CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing **Letter of Notification** has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 1.54 (relating to service by a participant).

VIA CERTIFIED MAIL RETURN RECEIPT REQUESTED

Pennsylvania Historical and
Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120-0053
Attn: Douglas C. McLearn, Chief

Pennsylvania Department of Transportation
Honorable Leslie S. Richards, Secretary
c/o Office of Chief Counsel
Commonwealth Keystone Building
400 North Street, 2nd Floor
Harrisburg, PA 17120-0053
Attn: William J. Cressler

Chairman of the Historical and
Museum Commission
PO Box 1026
Harrisburg, PA 17120

Pennsylvania Department of Transportation
Engineering District 8
2140 Herr Street
Harrisburg, PA 17103-1699

Pennsylvania Department of Conservation
and Natural Resources
Rachel Carson State Office Building
PO Box 8767
400 Market Street
Harrisburg, PA 17105-8767

Pennsylvania Fish and Boat Commission
Office of Field Operations
450 Robinson Lane
Bellefonte, PA 16823-9685

Pennsylvania Department of
Environmental Protection
South Central Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
Attn: John Taucher

Department of Environmental Resources
Bureau of Environmental Planning
PO Box 2357
101 S. Second Street
Harrisburg, PA 17120

US Fish and Wildlife Service
110 Radnor Road
Suite 101
State College PA 16801-7987

Secretary of the Department of Transportation
Transportation and Safety Building
Room 1200
Forster Street & Commonwealth Avenue
Harrisburg, PA 17102

US Army Corps of Engineers
Baltimore District
City Crescent Building
10 South Howard Street
Baltimore, MD 21201

East Manchester Planning Commission
East Manchester Township
5080 North Sherman Street Extended
Mt. Wolf, PA 17347

East Manchester Supervisor
East Manchester Township
5080 North Sherman Street Extended
Mt. Wolf, PA 17347

York County Administrator
York County Administrative Center
28 East Market Street
York, PA 17401-1588

York County Commissioner
York County Administrative Center
28 East Market Street
York, PA 17401-1588

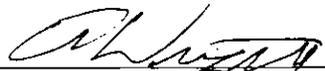
York County Conservation District
118 Pleasant Acres Road
York, PA 17402

Date: February 3, 2017

Alvin Hendrich
5544 Board Road
Mt. Wolf, PA 17347

Talen Energy – Brunner Island Power Plant
1400 Wago Road
York Haven, PA 17370

Pennsylvania Lines, LLC
Norfolk Southern Corp.
Three Commercial Place
Norfolk, VA 23510
Attn: Norfolk Southern Railway



Christopher T. Wright

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**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric :
Utilities Corporation, Filed Pursuant to :
52 Pa. Code Chapter 57 Subchapter G, :
for Approval to Reconductor : Docket No. A-2017-_____
Approximately 0.64 Miles of the :
Brunner Island-Yorkana 230 kV :
Transmission Line in York County, :
Pennsylvania :

LETTER OF NOTIFICATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

PPL Electric Utilities Corporation (“PPL Electric”) hereby files, pursuant to 52 Pa. Code § 57.72(d), this Letter of Notification to request approval from the Pennsylvania Public Utility Commission (“Commission”) to reconductor approximately 0.64 miles of the existing Brunner Island-Yorkana 230 kV Transmission Line in the City of York Haven, York County, Pennsylvania (the “Project”). The Project is needed to resolve transmission line congestion as identified by PJM Interconnection, LLC (“PJM”) in the 2014 Regional Transmission Expansion Plan (“RTEP”) Market Efficiency Analysis. The proposed Project was approved as a baseline project in the PJM 2015 RTEP. Subject to the Commission’s approval, construction is scheduled to begin in April 2017 to support the in-service date of June 2019. In support thereof, PPL Electric states as follows:

I. INTRODUCTION

1. This Letter of Notification is filed by PPL Electric, a public utility that provides electric distribution, transmission, and provider of last resort services in Pennsylvania subject to the regulatory jurisdiction of the Commission.

2. PPL Electric's address is PPL Electric Utilities Corporation, Two North Ninth Street, Allentown, Pennsylvania 18101.

3. PPL Electric's attorneys are:

Kimberly A. Klock (ID #89716)
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101
Voice: 610-774-5696
Fax: 610-774-6726
E-mail: kklock@pplweb.com

David B. MacGregor (I.D. # 28804)
Christopher T. Wright (I.D. # 203412)
Devin T. Ryan (I.D. # 316602)
Post & Schell, P.C.
17 North Second Street
12th Floor
Harrisburg, PA 17101-1601
Voice: 717-731-1970
Fax: 717-731-1985
E-mail: dmacgregor@postschell.com
E-mail: cwright@postschell.com
E-mail: dryan@postschell.com

PPL Electric's attorneys are authorized to receive all notices and communications regarding this Letter of Notification.

4. PPL Electric furnishes electric service to approximately 1.4 million customers throughout its certificated service territory, which includes all or portions of 29 counties and encompasses approximately 10,000 square miles in eastern and central Pennsylvania. PPL Electric is a "public utility" and an "electric distribution company" as defined in Sections 102 and 2803 of the Pennsylvania Public Utility Code, 66 Pa.C.S. §§ 102, 2803.

5. PPL Electric owns approximately 5,000 miles of transmission lines operating at 69 kV (kilovolts) or higher, approximately 375 substations with a capacity of 10 MVA

(megavolt amperes) or more, and approximately 43,000 miles of distribution lines operating at less than 69 kV.

6. This Letter of Notification includes the following accompanying attachments:

- Attachment 1 Necessity Statement.
- Attachment 2 Engineering Description.
- Attachment 3 Description of the Right-of-Way.
- Attachment 4 PPL Electric Design Criteria and Safety Practices.

7. This Letter of Notification and accompanying Attachments, which are incorporated herein by reference, contain all the information required by 52 Pa. Code § 57.72(d)(4).

II. THE PROJECT

A. NEED FOR THE PROJECT

1. Existing System

8. The existing Brunner Island-Yorkana 230 kV Transmission Line extends between the Brunner Island Power Plant and the Yorkana Substation, which supplies approximately 7,150 customers.

9. PPL Electric owns and operates an approximately 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line from the Brunner Island Power Plant to a tap point with Metropolitan Edison Company (“Met-Ed”) at a transmission tower owned by Met-Ed. This segment currently is operated as a single-circuit 230 kV line.

10. A description, aerial map, and one-line diagram are provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

2. Need for the Project

11. The Brunner Island-Yorkana 230 kV Transmission Line has been in service since 1967 and currently utilizes 1033 kcmil¹ 54/7 steel-reinforced (“ACSR”) conductors supported by steel lattice towers.

12. In the 2014 Market Efficiency Analysis, PJM identified the Brunner Island-Yorkana 230 kV Transmission Line as being congested along the 0.64-mile segment between the Brunner Island Power Plant and the Met-Ed tap point.² Specifically, PJM found that this binding constraint produces congestion costs of approximately \$22.6 million and \$34.5 million using the 2019 and 2022 forecasts, respectively. These congestion costs increase the amounts paid by ratepayers for delivery of electric service.

13. Detailed descriptions of the PJM Market Efficiency Analysis and RTEP process are provided in Attachment 1 to this Letter of Notification.

14. In addition, portions of the Brunner Island-Yorkana 230 kV Transmission Line located within the Brunner Island Power Plant property currently cross over coal stockpiles.

B. THE PROPOSED PROJECT

15. To address the congestion issues identified by PJM’s 2014 Market Efficiency Analysis, PPL Electric submitted a proposal in the 2014/2015 FERC Order 1000³ Market Efficiency Long Term Proposal Window to re-conductor the 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line between the Brunner Island Power Plant and the Met-

¹ Kcmil stands for thousand circular mills. Kcmil wire size is the equivalent cross sectional area in thousands of circular mils. A circular mil is the area of a circle with a diameter of one thousandth (.001) of an inch.

² Congestion occurs when there is heavy use of the transmission system in a specific area. When congestion occurs, lower-priced energy is prevented from flowing freely to a specific area on the grid because heavy electricity use is causing parts of the grid to operate near their limits. As a result, congestion generally raises the locational marginal pricing for electricity in congested areas.

³ A summary of FERC Order No. 1000 is available at: <http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp>.

Ed tap point. PPL Electric's proposal was selected by PJM as the winning bid because it provides the highest benefit to cost ratio.⁴

16. Pursuant to Schedule 6 of the Operating Agreement with PJM, as the successful bidder, PPL Electric must complete the baseline project.

17. PPL Electric herein seeks Commission approval to reconductor the approximately 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line with high capacity conductors. The existing conductors will be removed and replaced with new high capacity conductors using the existing tower structures. No new structures will be installed.

18. The existing conductors will be replaced with three power conductors and two overhead ground wires. The power conductors will be six 1590 kcmil 45/7 stranding ACSR conductors. The overhead ground wires will be two 0.791-inch diameter Optical Ground Wires.

19. The Project also will increase the clearance between the new conductors and the coal stockpiles located on the Brunner Island Power Plant property by repositioning the phase conductors on the existing steel lattice towers.

20. The proposed Project was presented at a PJM Transmission Expansion Advisory Committee meeting on October 14, 2015, and was approved as baseline project B2691 in the PJM 2015 RTEP.

21. The total estimated cost to design and construct the Project is approximately \$954,000.⁵

⁴ Project benefits are measured by comparing the benefits in the form of net load payments and/or production costs with and without the proposed project for a 15-year study period. The economic benefit/cost ratio threshold test is set forth in PJM Manual 14B, Attachment E, available at: <http://www.pjm.com/~media/documents/manuals/m14b.ashx>.

⁵ The estimated cost for the proposed Project is an order-of-magnitude estimate developed using averages of recent costs for similar projects and without an in-depth analysis of field investigation. The estimated cost is subject to change as the constructability of the Project, sequence of construction, and other factors that may affect cost are identified and analyzed as the Project progresses.

22. Upon Commission approval, the Project has a scheduled construction start date of April 2017 to support the in-service date of June 2019.

III. HEALTH AND SAFETY

23. The proposed Project will not create any unreasonable risk of danger to the public health or safety.

24. The Project will be designed, constructed, operated, and maintained in a manner that meets or surpasses all applicable National Electrical Safety Code (“NESC”) minimum standards and all applicable legal requirements. Descriptions PPL Electric’s design criteria and safety practices are provided in Attachment 4 to this Letter of Notification.

25. Consistent with PPL Electric’s Magnetic Field Management Program, the reconducted segment of the Brunner Island-Yorkana 230 kV Transmission Line will exceed the NESC standards for ground clearance. A description of PPL Electric’s Magnetic Field Management Program is provided in Attachment 2 to this Letter of Notification.

IV. DESCRIPTION OF THE PROJECT AREA

26. The Brunner Island-Yorkana 230 kV Transmission Line is located in York County, Pennsylvania and runs parallel to the existing Brunner Island-West Shore 230 kV Transmission Line.

27. As explained above, PPL Electric proposes to reconductor the 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line between Brunner Island Power Plant and a Met-Ed tap point. The proposed Project will be located entirely within the existing right-of-way for the Brunner Island-Yorkana 230 kV Transmission Line. No additional

right-of-way is required to accommodate the construction, operation and maintenance of the reconducted segment of the Brunner Island-Yorkana 230 kV Transmission Line.

28. The proposed Project will use the existing tower structures. No new tower structures are required for the Project.

29. As explained in Attachment 3 to this Letter of Notification, land use and environmental impacts are anticipated to be minimal because the Project will be constructed using the existing tower structures and will be located entirely within the right-of-way for the Brunner Island-Yorkana 230 kV Transmission Line. Where practical, PPL Electric will use previously established access roads for construction to further reduce interference with existing land uses.

30. The Project area previously has been cleared of vegetation. As a result, limited vegetation management will be required for this project. In areas where vegetation management is required to complete the project, PPL Electric will apply its "Specifications for Transmission Vegetation Management LA-79827" to mitigate any impacts.

31. No communication towers, pipelines, or other utilities will be affected by the proposed Project.

32. PPL Electric does not anticipate any interference with airport operations because of the distance from the Project area, the presence of existing electrical facilities in the Project area, and the use of the existing tower structures. However, PPL Electric will file any required documentation with both the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

33. The Project area contains no state lands, national parks, state parks, or local parks.

34. The Project will not traverse or affect any unique geological, scenic, or natural areas.

35. The Project will not cross the boundaries of any archaeological sites.

36. The Project will cross two historic resources, both of which are historic railroads that are located within 0.5 miles of the Project. One railroad, the Pennsylvania Railroad Enola Branch, has been recommended eligible for listing in the National Register of Historic Places ("NRHP"). No impacts to this eligible historic site are anticipated because the Company will not conduct any ground disturbing activity to the railroad alignment.

37. Because the Project will utilize existing transmission structures and will be located entirely within the existing right-of-way, no impacts to archeological, historic or cultural resources are anticipated.

38. Although the Project will not cross any waterbodies, it will cross 0.1 acres of wetlands. PPL Electric will avoid temporary impacts to the wetland area to the extent practicable and will obtain all necessary permits from the Pennsylvania Department of Environmental Protection and the United States Army Corps of Engineers. The Project will not result in any permanent wetland impacts.

39. PPL Electric will prepare any required soil erosion and sedimentation control plans and will obtain National Pollutant Discharge Elimination System ("NPDES") permits.

40. PPL Electric has consulted with state and federal agencies to obtain information regarding endangered and threatened species in close proximity to the Project. As explained in Attachment 3 to this Letter of Notification, to minimize potential impacts to threatened and endangered species and/or special concern species and resources, PPL Electric will install and maintain erosion and sedimentation controls before, during, and after construction.

V. NOTICE

41. PPL Electric has provided information regarding the Project to representatives of the City of York Haven and York County.

42. Copies of this Letter of Notification will be served on the governmental agencies, municipalities, and other entities in accordance with 52 Pa. Code § 57.72(d)(3).

43. Copies of this Letter of Notification will be served on the owners of land subject to the right-of-way and easement in accordance with 52 Pa. Code § 57.72(d)(3).

VI. LETTER OF NOTIFICATION

44. PPL Electric is proceeding by means of a Letter of Notification, instead of a full Application, pursuant to the Commission's regulations at 52 Pa. Code § 57.72(d)(1)(vi).

45. The proposed Project qualifies for use of a Letter of Notification because the proposed the reconductored 230 kV segment will be less than 2 miles (approximately 0.64 miles).

46. This Letter of Notification is filed on the date set forth below. As provided in 52 Pa. Code § 57.72(d)(5), the Commission will review and, by order, approve or disapprove this Letter of Notification. If the Commission approves this Letter of Notification, the proposed Project will be constructed as proposed herein without the formal application process set forth at 52 Pa. Code §§ 57.71, *et seq.*

VII. CONCLUSION

WHEREFORE, PPL Electric Utilities Corporation respectfully requests Pennsylvania Public Utility Commission approval to reconductor approximately 0.64 miles of the existing Brunner Island-Yorkana 230 kV Transmission Line in York County, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,



David B. MacGregor (I.D. # 28804)
Christopher T. Wright (I.D. # 203412)
Devin T. Ryan (I.D. #316602)
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Kimberly A. Klock (ID #89716)
PPL Services Corporation
Two North Ninth Street
Allentown, PA 18101
Voice: 610-774-5696
Fax: 610-774-6726
E-mail: kklock@pplweb.com

Date: February 3, 2017

Attorneys for PPL Electric Utilities Corporation

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SECRETARY'S BUREAU

VERIFICATION

I, Stephanie Raymond being the Vice President-Transmission and Substations at PPL Electric Utilities Corporation, hereby state that the facts above set forth are true and correct to the best of my knowledge, information and belief and that I expect PPL Electric Utilities Corporation to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. § 4904 relating to unsworn falsification to authorities.

Date: 1/26/17

Stephanie Raymond

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Before the
Pennsylvania Public Utility Commission

**BRUNNER ISLAND - YORKANA
230 kV TRANSMISSION LINE
RECONDUCTOR PROJECT**

ATTACHMENTS IN SUPPORT OF THE
Letter of Notification

Application Docket No. _____

Submitted by: PPL Electric Utilities Corporation



PA. P.U.C.
SECRETARY'S BUREAU

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ATTACHMENT 1
BRUNNER ISLAND-YORKANA
230 KV TRANSMISSION LINE RECONDUCTOR PROJECT
NECESSITY STATEMENT

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A. INTRODUCTION

PPL Electric Utilities Corporation (“PPL Electric”) is requesting Pennsylvania Public Utility Commission (“PUC” or the “Commission”) approval to reconductor approximately 0.64 miles of the Brunner Island-Yorkana 230 kV Transmission Line in the City of York Haven, York County, Pennsylvania (the “Project”). The proposed Project addresses the Brunner Island-Yorkana 230 kV market efficiency constraint identified by PJM Interconnection, LLC (“PJM”) in the 2014 RTEP Market Efficiency Analysis. The Project upgrade addresses congestion relief to PPL Electric and FirstEnergy ratepayers. The Project also will increase the clearance over coal stockpiles located at the Brunner Island Power Plant by repositioning the phase conductors on the existing steel lattice towers. PPL Electric submitted and was awarded the proposed Project in the 2014/2015 FERC Order 1000 Market Efficiency Long Term Proposal, and the proposed Project was approved as baseline project B2691 in the PJM 2015 RTEP.

The estimated cost to design and construct the Project is approximately \$954 thousand.¹ Subject to the Commission’s approval, the Project has a scheduled construction start date of April 2017 to meet an in-service date of June 2019.

B. SYSTEM PLANNING PROCESS

The nation’s interconnected transmission system (“transmission grid”) serves as the backbone for the safe and reliable delivery of large amounts of electricity from generating stations over substantial distances to customers served by transmission and local distribution systems. It is critically important that this transmission grid be planned and designed to be highly reliable so that electric service can be provided under peak and all loading conditions and when certain elements of the

¹ The estimated cost for the proposed Project is an order-of-magnitude estimate developed using averages of recent costs for similar projects and without an in-depth analysis of field investigation. The estimated cost is subject to change as the constructability of the Project, sequence of construction, and other factors that may affect cost are identified and analyzed as the Project progresses.

system are out of service (system contingencies) due to planned or unplanned outages.

System Planning is the process that assures that the transmission system can supply electricity to all customer loads in a manner that is reliable and economical. This System Planning process assures that both the Bulk Electric System ("BES")² and non-Bulk Electric System ("non-BES")³ are planned and constructed so that:

- they are able to accommodate forecasted system flows during summer and winter peak load;
- they can adequately serve each customer's need with regard to capacity, voltage, and reliability for all load levels throughout the daily load cycle;
- they can sustain probable contingencies and disturbances with minimal customer service interruptions; and
- they are in conformance with North American Electric Reliability Corporation ("NERC"), PJM Interconnection, LLC ("PJM"), and the Transmission Owner's reliability criteria for all normal and emergency operating conditions.

PJM is a Federal Energy Regulatory Commission ("FERC")-approved Regional Transmission Organization ("RTO") charged with ensuring the reliability of the electric transmission system under its functional control (100 kilovolts ["kV"] and above), and coordinating the movement of electricity in all or parts of 13 states and the District of Columbia, including most of Pennsylvania. In order to ensure reliable transmission service, PJM prepares an annual Regional Transmission Expansion Plan ("RTEP")⁴ to identify system reinforcements that are required to, among other

² BES - Includes transmission facilities operated at voltages of 100 kV or higher.

³ Non-BES - Includes transmission facilities operated at voltages less than 100 kV.

⁴ PJM's RTEP process is currently set forth in Schedule 6 of PJM's Amended and Restated Operating Agreement ("Schedule 6"). Schedule 6 governs the process by which PJM's members rely on PJM to prepare an annual regional plan for the enhancement and expansion of the transmission facilities to ensure long-term, reliable electric service consistent with established

things, meet the NERC Reliability Standards, PJM reliability planning criteria, and Transmission Owner reliability criteria.

PJM conducts RTEP studies in conjunction with its Transmission Owners and applies NERC, regional, and Transmission Owner reliability criteria to specific conditions on the transmission system. PJM's RTEP is an annual process that encompasses a comprehensive series of detailed analyses to ensure power continues to flow reliably to customers under stringent reliability criteria set by NERC. PJM's Manual 14B⁵ outlines the RTEP process and reliability criteria use for this process. As mentioned in Manual 14B, every year PJM performs various reliability tests such as Baseline Thermal, Baseline Voltage, Load Deliverability, Generation Deliverability and Baseline Stability to ensure safe, reliable operation of the electric grid.

When the studies show an inability of the transmission system to meet specific reliability criteria under these conditions, PJM opens an RTEP Window in accordance with FERC Order 1000⁶ to identify the optimal solution to resolve the criteria violation.

In addition to the reliability analysis, PJM also performs a Market Efficiency Analysis to identify congestion on transmission lines and improvements to transmission economic efficiencies. The Market Efficiency Analysis is performed over a 24-month planning cycle, and PJM opens a Market Efficiency Long Term Proposal Window to identify the most economical solution to relieve congestion on the transmission facilities. PJM's Market Efficiency Analysis is currently set forth in the section 1.5.2 of PJM Manual 14 B.

reliability criteria. In addition, Schedule 6 addresses the procedures used to develop the RTEP, the review and approval process for the RTEP, the obligation of transmission owners to build transmission upgrades included in the RTEP, and the process by which interregional transmission upgrades will be developed.

⁵ PJM Manual 14B is available at <http://www.pjm.com/~media/documents/manuals/m14b.ashx>.

⁶ <http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp>

PPL Electric, as a Transmission Owner and member of PJM, undertakes an independent analysis of both its BES transmission facilities and its non-BES transmission facilities in concert with the PJM RTEP process. PPL Electric identifies all conditions where the future system does not meet the NERC criteria, PJM reliability criteria, or PPL Electric Transmission Owner criteria. In this way, PPL Electric actively participates in the PJM RTEP process, and through this participation PPL Electric provides results of its independent studies to PJM for consideration and inclusion in the PJM RTEP.

Alternatives that can mitigate violations to the reliability criteria or transmission congestion identified by PJM are developed and analyzed to ensure that the PPL Electric transmission system meets the reliability criteria. Estimated costs and lead times to implement the reinforcements are prepared. PPL Electric then proposes solutions to PJM through an RTEP window. If the Project is awarded to PPL Electric, it then becomes a baseline RTEP project.

C. **EXISTING SYSTEM**

The existing Brunner Island-Yorkana 230 kV Transmission Line has been in service since 1967. PPL Electric owns and operates an approximately 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line in the City of York Haven, York County, Pennsylvania that extends from the Brunner Island Power Plant to a tap point with FirstEnergy's subsidiary Metropolitan Edison (Met-Ed) at a Met-Ed owned transmission tower. The Brunner Island-Yorkana 230 kV Transmission Line serves the Yorkana Substation, which currently supplies approximately 7,150 customers. This segment of the line currently is operated as a single-circuit 230 kV line. The existing Brunner Island-Yorkana 230 kV Transmission Line parallels the Brunner Island - West Shore 220 kV Transmission Line.

Figure 1-1 provides a map of the existing facilities. Figure 1-2 provides a one-line diagram of the existing facilities.

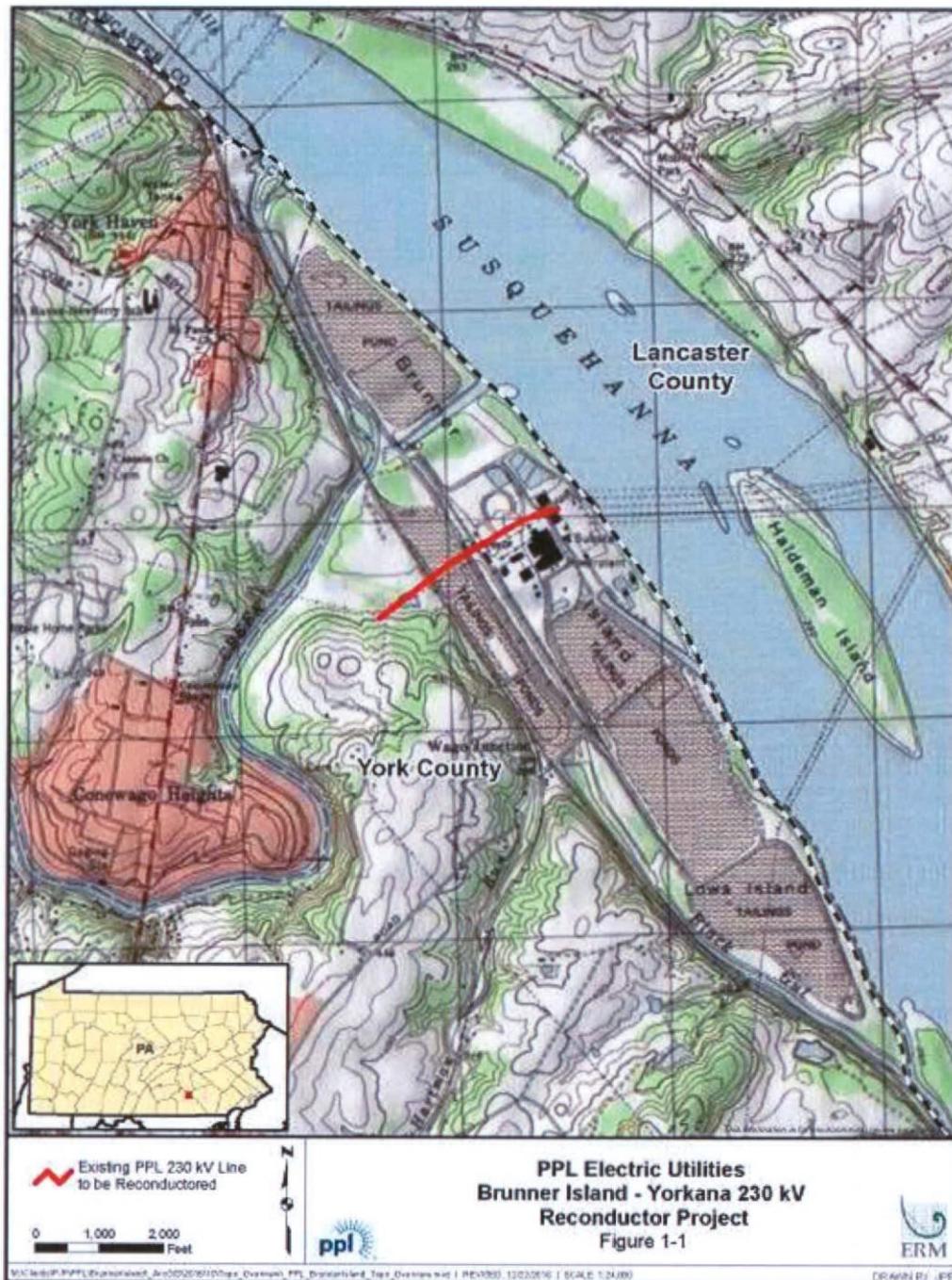


Figure 1-1. Project Overview Map

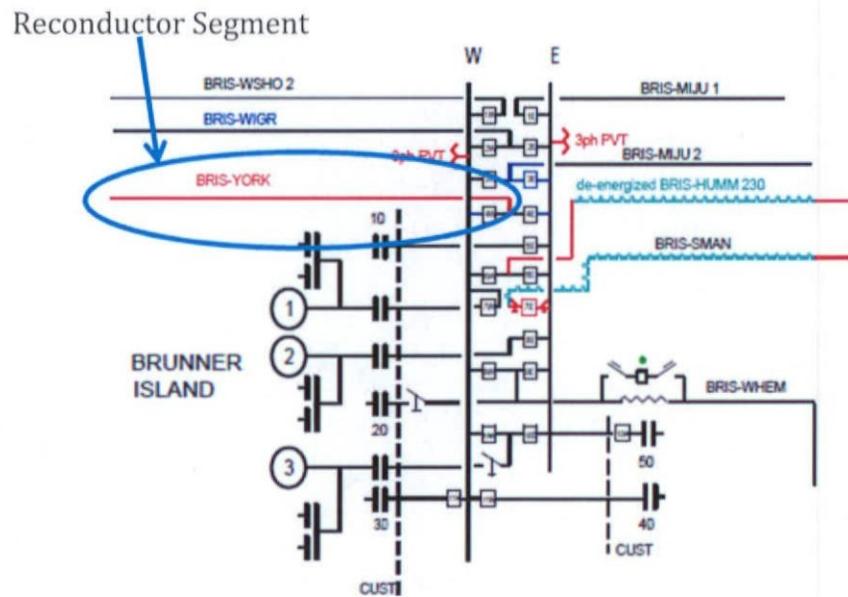


Figure 1-2 – Diagram of Existing Facilities

D. DEFINITION OF THE PROBLEM

The Brunner Island-Yorkana 230 kV Transmission Line has been in service since 1967. The transmission line currently utilizes 1033 kcmil ⁷ 54/7 steel-reinforced (ACSR ⁸) conductors supported by steel lattice towers.

In the 2014 Market Efficiency Analysis, PJM identified the Brunner Island-Yorkana 230 kV Transmission Line to be congested along the 0.64-mile segment between the Brunner Island Power Plant and the Met-Ed tap point. Specifically, PJM found that this binding constraint produces Market Congestion of approximately \$22.6 million and \$34.5 million using the 2019 and 2022 forecast respectively. These congestions costs increase the amounts paid by ratepayers for delivery of electric service.

⁷ Kcmil stands for thousand circular mils. Kcmil wire size is the equivalent cross sectional area in thousands of circular mils. A circular mil is the area of a circle with a diameter of one thousandth (.001) of an inch.
⁸ ACSR stands for aluminum conductor steel reinforced.

Additionally, portions of the Brunner Island-Yorkana 230 kV Transmission Line located within the Brunner Island Power Plant property currently cross over a coal stockpile, and the Project will increase clearance over the coal stockpile at Brunner Island Power Plant's request.

E. PROPOSED SOLUTION

In response to PJM's 2014 Market Efficiency Analysis findings, PJM opened a proposal window (FERC 1000 Proposal Window 3) in November of 2014 for proposers to bid on solutions to resolve the market congestion. PPL Electric submitted a proposal in the 2014/2015 FERC Order 1000 Market Efficiency Long Term Proposal Window to reconnector the 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line between the Brunner Island Power Plant and the Met-Ed tap point. Met-Ed is a FirstEnergy subsidiary. PJM analyzed the proposed costs, benefits, schedule and constructability to determine a proposed winner, and PPL Electric's proposal was selected by PJM as the winning bid because it provides the highest benefit to cost ratio. In addition to replacing the existing conductors with high capacity conductors to address the efficiency constraint identified by PJM, the Project will also increase the clearance between the new conductors and the coal stockpile located on the Brunner Island Power Plant property by repositioning the phase conductors on the existing steel lattice towers.

The proposed Project was presented at a PJM Transmission Expansion Advisory Committee meeting on October 14, 2015 and was approved as baseline project B2691 in the PJM 2015 RTEP. Pursuant to Schedule 6 of the Operating Agreement with PJM (after given construction responsibility, the Transmission Owner is obligated to construct the project), as the successful bidder, PPL Electric must complete the Project.

PPL Electric herein seeks Commission approval to reconnector the approximately 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line with

high capacity conductors. An engineering description of the recondoctored line is provided in Attachment 2.

ATTACHMENT 2
BRUNNER ISLAND-YORKANA
230 KV TRANSMISSION LINE RECONDUCTOR PROJECT
ENGINEERING DESCRIPTION

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A. DESCRIPTION OF THE PROPOSED LINES

PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or the "Commission") approval to reconductor an approximately 0.64-mile segment of the existing single-circuit Brunner Island-Yorkana 230 kV Transmission Line located in City of York Haven, York County, Pennsylvania (the "Project"). As explained in Attachment 1, the Project addresses the Brunner Island-Yorkana 230 kV market efficiency constraint identified by PJM Interconnection, LLC ("PJM") in the 2014 RTEP Market Efficiency Analysis, addresses congestion relief for PPL Electric and FirstEnergy customers, and is designed to increase the conductor clearance over coal stockpiles located on the Brunner Island Power Plant.

To address the market efficiency constraint identified by PJM, PPL Electric herein seeks Commission approval to reconductor the approximately 0.64-mile segment of the Brunner Island-Yorkana 230 kV Transmission Line with high capacity conductors. The existing conductors will be removed and replaced with new high capacity conductors using the existing tower structures. No new structures will be installed.

The Project will also increase the clearance between the new conductors and the coal stockpiles located on the Brunner Island Power Plant property by repositioning the phase conductors on the existing steel lattice towers.

The Brunner Island-Yorkana 230 kV Transmission Line currently utilizes 1033 kcmil¹ 54/7 steel-reinforced (ACSR²) conductors supported by steel lattice towers. The existing conductors will be replaced with three power conductors and two overhead ground wires. The power conductors will be six 1590 kcmil, 45/7 stranding, ACSR conductors. The overhead ground wires will be two 0.791-inch diameter Optical Ground Wires. The transmission line will continue to operate as a single-circuit 230 kV line.

As explained above, the proposed Project will use the existing tower structures, which will be reinforced by supplementing angle structures within the lattice towers, as necessary. The size and appearance of the existing structures will not change. The existing insulators will be replaced with current PPL standard glass insulator assemblies. The existing structures are 230 kV lattice structures. The existing structure heights from east to west are 222 feet, 222 feet and 92 feet in height. The span lengths between the aforementioned structures from east to west are 555 feet, 1,370 feet, and 1,380 feet respectively. Figure 2-1 below provides a diagram of the existing tower structures.

¹ Kcmil stands for thousand circular mills. Kcmil wire size is the equivalent cross sectional area in thousands of circular mills. A circular mil is the area of a circle with a diameter of one thousandth (.001) of an inch.

² ACSR stands for aluminum conductor steel reinforced.

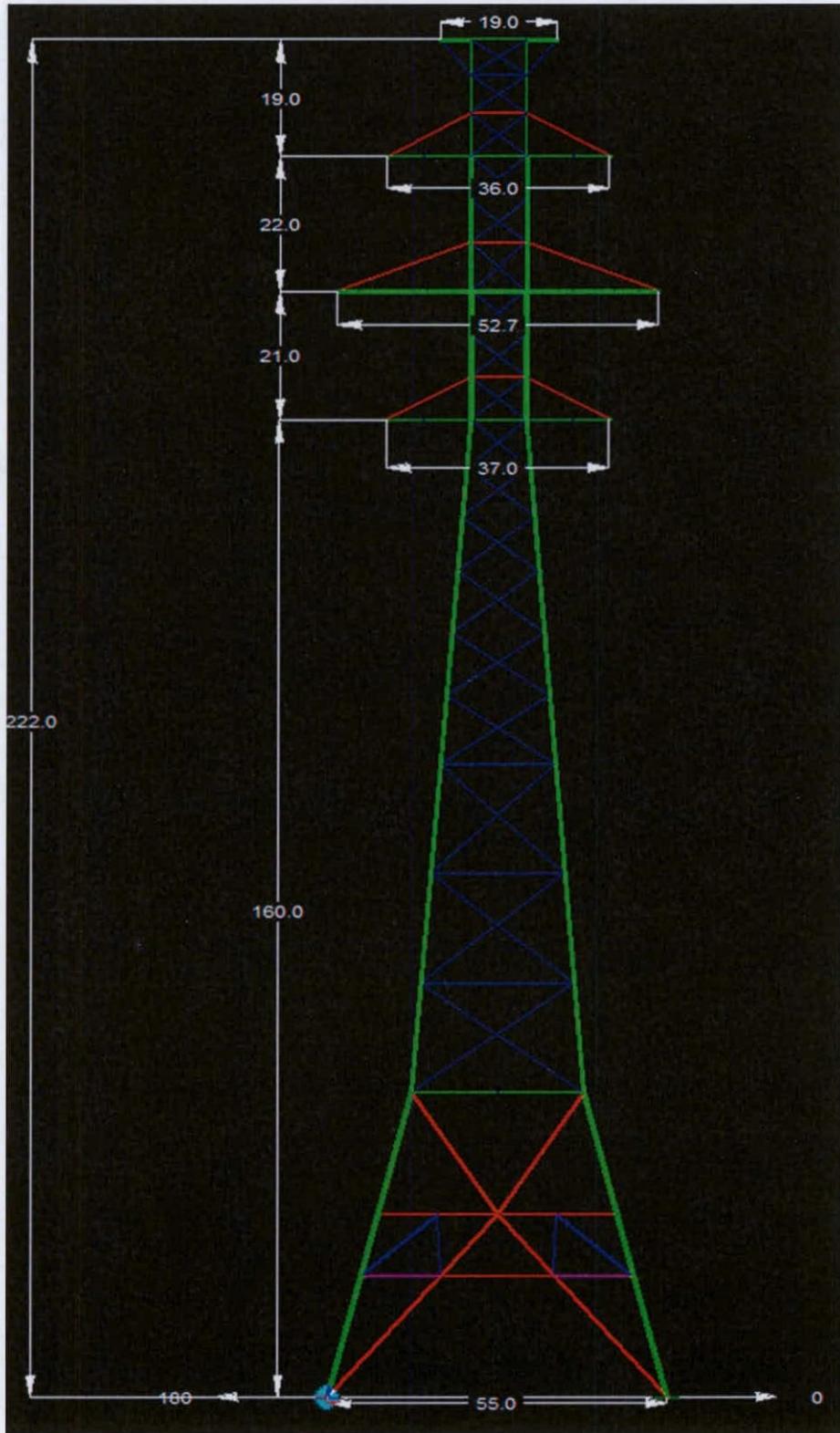


Figure 2-1 - 230-kV Double Circuit Lattice Deadend Tower Diagram

The design minimum conductor clearances and conductor thermal ratings for the reconducted line are shown in Tables 2-1 and 2-2.

Conductor	Transmission Double-Circuit Design Clearance-to-Ground
Heavy Ice (1-inch Ice at 0°C ambient temperature)	35 feet
Predicted extreme thermal load (125°C conductor temperature)	35 feet
Predicted blowout (6 pounds, 16°C, ambient temperature)	35 feet

Condition	Ambient Temperature (°C)	Wind Speed (feet/second)	Ampacity (amps, day/night)
Summer Normal	35	0	1626/1758
Winter Normal	10	0	1873/1989
Summer Emergency	35	2.5	2013/2122
Winter Emergency	10	2.5	2267/2363

Following completion of the Project, this section of the Brunner Island-Yorkana 230 kV Transmission Line will meet all current PPL Electric and National Electrical Safety Code standards. Further, the use of high capacity conductors, optical overhead ground wires, and new lightning protection will help improve the reliability of the system and the electric service received by customers served from the transmission line.

The total estimated cost of the proposed Yorkana Project is \$954,000 ⁴. Subject to

³ Clearances based on an initial maximum tension of 6,000 to 10,000 pounds at 14-inch ice, 0 Fahrenheit, 4# wind and maximum ruling span of 200 to 1,250 feet.

⁴ The estimated cost for the proposed project is an order-of-magnitude estimate developed using averages of

the Commission approval, the Project has a scheduled construction start date of April 2017 to meet an in-service date of June 2019.

B. MAGNETIC FIELD MANAGEMENT

PPL Electric's Magnetic Field Management Program is applied to new and reconstructed transmission line projects. The company does not believe that the current scientific evidence demonstrates that magnetic fields cause any adverse health effects or pose a health or safety danger to the public. Nevertheless, PPL Electric has determined, as a matter of policy, to design its new and rebuilt transmission lines to reduce magnetic fields when that can be done at low or no cost and consistent with functional requirements.

PPL Electric's Magnetic Field Management Program has been developed to implement that policy decision. To reduce magnetic field exposures, the Project will exceed the NESC standards for ground clearance. The Project will be designed to comply with PPL Electric's Magnetic Field Management Program.

recent costs for similar projects and without an in-depth analysis of field investigation. The estimated cost is subject to change as the constructability of the project, sequence of construction, and other factors that may affect cost are identified and analyzed as the project progresses.

ATTACHMENT 3
BRUNNER ISLAND-YORKANA
230 KV TRANSMISSION LINE RECONDUCTOR PROJECT
DESCRIPTION OF THE RIGHT-OF-WAY

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FIGURES

NO TABLE OF FIGURES ENTRIES FOUND.

A. INTRODUCTION

PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or the "Commission") approval to reconductor an approximately 0.64-mile segment of the existing single-circuit Brunner Island-Yorkana 230kV Transmission Line located in City of York Haven, York County, Pennsylvania (the "Project"). As explained in Attachment 1, the Project addresses the Brunner Island-Yorkana 230 kV market efficiency constraint identified by PJM Interconnection, LLC ("PJM") in the 2014 RTEP Market Efficiency Analysis, addresses congestion relief for PPL Electric and FirstEnergy customers, and is designed to increase the conductor clearance over coal stockpiles located on the Brunner Island Power Plant. The Project will be located in the City of York Haven, York County, Pennsylvania. An aerial map and one-line diagram depicting the transmission facilities are provided as Figures 1-1 and 1-2 to Attachment 1.

B. DESCRIPTION OF THE RIGHT-OF-WAY

As explained in Attachment 2, PPL Electric proposes to reconductor the Brunner Island-Yorkana 230 kV Transmission Line using the existing structures located within the existing right-of-way, which varies in width from 100 to 200 feet. The entire length of the Project is parallel to the existing Brunner Island - West Shore 220-kilovolt ("kV") Transmission Line. Figure 3-1 is an aerial map of the Project that identifies the location and properties crossed by the Project.

The existing right-of-way is located within an industrial area, and there are no residences adjacent to the right-of-way in the Project area. The right-of-way passes through the Brunner Island Power Plant, and vacant land to east of the power station. The Project crosses one state road, two rail yards serving the power station, and one mainline railroad.

Beginning from the east at the Brunner Island Power Plant, the existing transmission line crosses power station facilities and parking lots, before crossing the coal stockpiles located on the Brunner Island Power Plant property. After crossing the coal stockpiles, the Project crosses two rail yards separated by a grassy median and State Route 1019 (Wago Road). After crossing another small grassy median, the Project crosses a mainline railroad with two tracks and vacant land before reaching the existing Met-Ed (a FirstEnergy subsidiary) monopole structure. The total Project length is 0.64-miles.

No visual impacts are anticipated from this Project because the conductor replacement will take place on existing transmission structures within existing PPL Electric right-of-way. The structures will not be moved or increased in height, and the right-of-way will not be expanded or otherwise modified. The area surrounding the Project is a mix of heavy industrial, utility, and transportation uses. The Project is not out of character for the area given the existing development. As previously stated, the Project will take place entirely within PPL Electric right-of-way.

C. CULTURAL RESOURCES

PPL Electric's contractor reviewed Pennsylvania's Cultural Resources Geographic Information System to identify cultural resources, including archaeological sites, aboveground historic resources, and surveys conducted within 0.5 mile of the Project. Historic properties are defined as properties that are included in the National Register of Historic Places ("NRHP") or that meet the criteria for inclusion on the NRHP.

The file search identified two historic resources, both of which are historic railroads, located within 0.5 mile of the Project. One railroad, the Pennsylvania Railroad Enola Branch, has been recommended eligible for listing in the NRHP. The Project will cross the railroad alignment but will not conduct any ground disturbing activity to the railroad alignment. Therefore, no impacts to this eligible historic site are anticipated.

The file search identified six archaeological sites (five prehistoric and one historic) located within 0.5 mile of the Project corridor. These sites have not been evaluated for their eligibility for listing in the NRHP. However, the Project does not cross the boundaries of any of the six archaeological sites.

As explained above, the Project will utilize existing transmission structures and will be located entirely within the existing right-of-way. Therefore, no impacts to archeological, historic or cultural resources are anticipated.

D. LAND USE AND NATURAL FEATURES

Impacts to land use are anticipated to be minimal because the proposed Project will be constructed entirely within an existing right-of-way and will utilize existing transmission structures. No additional property acquisition will be required to complete the proposed Project. PPL Electric will use previously established access roads for construction to the extent practicable to further reduce interference with existing land uses. Some minor upgrades to one access route may be needed to access the western-most transmission structure.

PPL Electric identified wetlands and waterbodies within the area of the proposed Project. The proposed Project will cross 0.1 acres of wetlands (one wetland site) and will not cross any waterbodies. The Project may temporarily impact the wetland area during Project construction. Other wetland features are spanned by the transmission line and will not be disturbed during the conductor replacement activities.

PPL Electric will avoid temporary impacts to wetlands to the extent practicable and will obtain all necessary permits from the Pennsylvania Department of Environmental Protection and the United States Army Corps of Engineers. The Project will not result in any permanent wetland impacts. PPL Electric will comply with all of the terms and conditions placed on those permits. PPL Electric also will

prepare required soil erosion and sedimentation control plans and, if necessary, will obtain National Pollutant Discharge Elimination System ("NPDES") permits.

E. THREATENED AND ENDANGERED SPECIES

PPL Electric conducted an online Pennsylvania Natural Diversity Inventory ("PNDI") database review on November 3, 2016.¹ Based on this review, the Pennsylvania Game Commission ("PGC") has requested further review of the Project. The Pennsylvania Department of Conservation and Natural Resources ("DCNR"), and the U.S. Fish and Wildlife Service, have not requested further review, and the Pennsylvania Fish and Boat Commission ("PFBC") has recommended conservation measures be used for the Project, but does not require further review.

The PNDI search results identified two PGC threatened species, the osprey and peregrine falcon, are located in the vicinity of the Project. PPL Electric consulted with the PGC in November 2016, and the PGC determined that no impact is likely due to the nature of the project, timing of the project, and immediate location of the species of concern.

The PFBC recommended that PPL protect the natural flow regime and water quality by installing and maintaining appropriate erosion and sedimentation control measures before, during and after the construction of the Project. Further the PFBC asked that if instream work is required, and if mussels are identified, that a qualified mussel surveyor relocates mussels from the area of direct impact. PPL Electric will install, and maintain erosion and sedimentation controls before, during and after construction pursuant to the PFBC recommendation. The Project does not include instream work; therefore, the relocation of mussels will not be necessary for the completion of the Project.

¹ PNDI Project Search ID: PNDI-611157

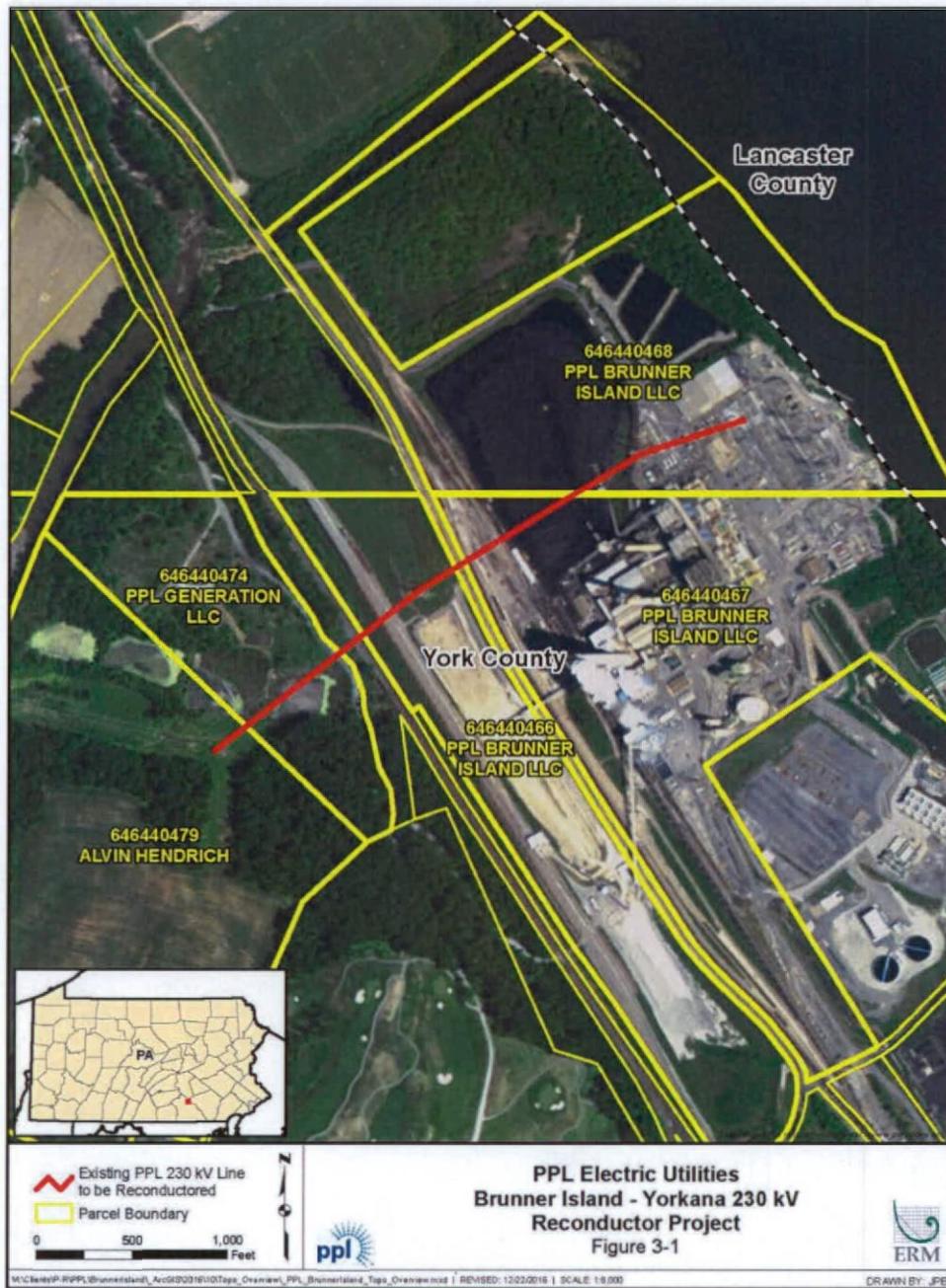


Figure 3-1 Project Aerial Map

ATTACHMENT 4

BRUNNER ISLAND-YORKANA 230 KV TRANSMISSION LINE RECONDUCTOR PROJECT PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corporation (PPL Electric) has developed design specifications and safety rules which meet or surpass all requirements specified by the NESC.

Engineering Design Criteria and Parameters

The NESC includes loading requirements and clearances for the design, construction, and operation of power lines. The "loads" on conductors and supporting structures are the mechanical forces that develop from the weight of the conductors, the weight of ice on the conductors, plus wind pressure on the conductors and supporting structures. Loading requirements are the loads on the conductors and structures that are anticipated assuming certain ice and wind conditions. Loading requirements always contain "safety factors" to allow for unknown or unanticipated contingencies. The clearances and loading requirements contained in the NESC were developed to ensure public safety and welfare.

PPL transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL designs all of its transmission lines for Grade B construction. The use of Grade B design and

construction specifies enhancements such as larger-minimum cross-arm dimensions, larger-minimum conductor size, and increased safety factors.

Another example is the design parameters utilized to account for ice and wind loadings on the overhead ground wire (OHGW) and power conductors. The NESC standard ice and wind design magnitudes for the PPL territory are 0.5 inch thickness of radial ice combined with four pounds per square foot horizontal wind pressure (equivalent to 40 mile per hour wind velocity). The conductor sags and tensions used in line designs are the result of various ice and wind combinations, depending on the elevation at the line location and line design voltage. The conductor sags and tensions used in the design of all PPL transmission lines are at least 0.5-inch ice combined with eight pounds wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	21 Ft.	31 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.	21 Ft.	31 Ft.
Spaces accessible to pedestrians only	17 Ft.	31 Ft.
Railroad tracks	29 Ft.	35 Ft.

230 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	23 Ft.	33 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.	23 Ft.	33 Ft.
Spaces accessible to pedestrians only	19 Ft.	33 Ft.
Railroad tracks	31 Ft.	35 Ft.

500 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Design</u>
Roads, streets, alleys	29 Ft.	40 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.	29 Ft.	40 Ft.
Spaces accessible to pedestrians only	25 Ft.	40 Ft.
Railroad tracks	37 Ft.	53 Ft.

A relay protection system is used to protect the public safety and welfare as well as equipment and the transmission system. Relay protection is installed for all transmission lines to automatically de-energize the line in the unlikely event that the line or supporting structure fails and the line contacts the ground.

Periodic Maintenance Program on All Transmission Lines

To ensure continued public safety and integrity of service, a periodic maintenance and inspection program is implemented for every transmission line. The program is administered through the use of helicopter patrols, with supplemental foot and structure

climbing patrols. A number of helicopter patrols are performed on all lines annually. The two-man helicopter crew flies parallel, to the left, and above the line so that the observer can look for signs of line damage or deterioration and observe clearances between vegetation and conductors. The observations are included in a report that is forwarded to the appropriate department for corrective action.

Foot and structure climbing patrol programs for a transmission line begin approximately three to five years after the line is energized, unless a helicopter patrol reports a need for earlier action. The frequency of foot patrols varies from once every year to once every several years depending on line type and age.

An assigned foot patroller checks right-of-way conditions, including access roads, bridges, pole washouts, tower footers, vegetation height and clearance to conductors, pole and tower deterioration and, with the use of binoculars, insulators, and condition of hardware. Identified problems are included in a report that is forwarded to the appropriate department for corrective action.

A scheduled line outage is required to perform an overhead patrol because of "hands-on" inspection of hardware. Overhead patrols are conducted on a schedule determined by line age, operating record, and observed general condition. The necessary repairs are also done during the inspection outage.

Personnel Safety Rules

The following are a few of the PPL Electric safety rules that demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energize facilities in a safe manner. When lines or apparatus are removed from service to be worked on, The Energy Control Process system is applied. This system provides that a red tag must be physically placed on the control handle of the de-energized equipment. The red tag may be removed only after proper authorization to energize the equipment. Various other tags area used for limited operations and

informational purposes. Employees will not apply or remove a tag or change the status of tagged equipment unless authorized.

- Temporary safety grounds are used on de-energized facilities for employee safety during maintenance, construction or reconstruction work. Safety grounds are wires connecting the de-energized facility to an electrical ground. If the facility should be energized, the safety grounds will divert the current directly to ground and reduce the likelihood of personal injury. The conductor size and attachment clamps of temporary safety grounds must be capable of conducting anticipated fault currents. Rubber gloves, rubber sleeves, and additional rubber protective equipment are used as required when applying or removing temporary safety grounds to or from the lines or apparatus to be grounded. An approved nonconductive working stick of sufficient length to allow works to maintain the following required minimum clearances is used to test that the line has been de-energized and to apply temporary safety grounds.

<u>Voltage kV</u>	<u>Minimum Clearance</u>
138	3'-7"
230	5'-3"
500	11'-3"

Before applying grounds, a test is done to confirm that the line is de-energized. The voltage test device is checked before and after use to assure reliability. When ground pins are used to establish proper ground points, they are driven to a depth of not less than four feet as near vertical as possible.

- Poles or structures are inspected and examined for structural integrity before climbing. If there is any reason to believe that a pole is unsafe, it is stabilized before work is performed. Appropriate safety gear in the form of body belts, safety straps, hard hats, gloves, etc., is worn by linemen during line work activity.