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File #: 140066

October 24, 2014

**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 Site and Construct Approximately 0.75 of New 230 kV Transmission Line to Interconnect the Laushtown 500-230 138/69 kV Substation in Brecknock Township, Lancaster County, Pennsylvania with the 230 kV System  
Docket No. A-2014-**

RECEIVED  
2014 OCT 24 PM 3:28  
PA PUBLIC UTILITIES COMMISSION  
SECRETARY'S OFFICE

Dear Secretary Chiavetta:

Enclosed for filing are an original and six (6) copies of the Letter of Notification of PPL Electric Utilities Corporation together with seven (7) copies of the accompanying attachments which are contained in a separately-bound volume in the above-referenced proceeding. Also enclosed is a CD containing copies of the Letter of Notification and attachments.

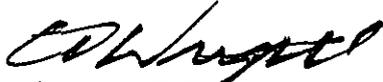
As indicated on the Certificate of Service, copies of the Letter of Notification and accompanying exhibits and appendices are being served by certified mail, return receipt requested upon the involved governmental agencies, municipalities and property owners.

Subject to Commission approval, construction is scheduled to begin in the second quarter of 2015 to support an in-service date of May 2017.

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

Rosemary Chiavetta, Secretary  
October 24, 2014  
Page 2

Respectfully submitted,



Christopher T. Wright

CTW/jl  
Enclosures

cc: Certificate of Service  
Robert F. Young  
Paul T. Diskin  
Nicholas Okoro  
Kimberly Hafner

**BEFORE THE  
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric :  
Utilities Corporation, Filed Pursuant to :  
52 Pa. Code Chapter 57 Subchapter G, : Docket No. A-2014- \_\_\_\_\_  
for Approval to Site and Construct :  
Approximately 0.75 of New 230 kV :  
Transmission Line to Interconnect the :  
Laushtown 500-230-138/69 kV :  
Substation in Brecknock Township, :  
Lancaster County, Pennsylvania with :  
the 230 kV System :

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**LETTER OF NOTIFICATION**

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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 construct four new 230 kV transmission lines needed to interconnect the proposed new Laushtown 500-230-138/69 kV Substation with the existing 230 kV transmission system (the “Laushtown Project”). The Project is needed to resolve multiple North American Electric Reliability (“NERC”) and PJM Interconnection, LLC (“PJM”) reliability violations, and to reinforce the 230 kV systems in Lancaster, Berks, and Chester Counties. The proposed Project is located in Brecknock Township, Lancaster County, Pennsylvania. PPL Electric has provided information regarding this Project to these political subdivisions, which have not objected to the Project.

Subject to the Commission’s approval, construction is scheduled to begin in the second quarter of 2015 to support the in-service date of May 2017. In support thereof, PPL Electric states as follows:

**RECEIVED**  
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PA PUC  
SECRETARY'S BUREAU

**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:

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*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 twenty-nine 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. Presently, customers in Lancaster, Berks, and Chester Counties receive their bulk electric power supply from multiple 230 kV lines. These 230 kV transmission lines provide power to regional transmission substations. Each of these regional substations supply several 69 kV or 138 kV transmission lines, which in turn supply various 138-12 kV and 69-12 kV distribution substations in Lancaster, Berks, and Chester Counties. The 230 kV system in Lancaster, Berks, and Chester Counties serves approximately 223,000 customers.

9. Currently, the 230 kV system in Lancaster, Berks and Chester Counties is not interconnected with a 500 kV source of supply. The Three Mile Island – Hosensack 500 kV Transmission Line traverses the area in close proximity to the exiting 230 kV system; however, it has no connections to the 230 kV system.

10. A description and one-line diagram of the existing system is provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

## **2. Need for the Project**

11. The Portland (Unit 1 & 2), Shawville (Unit 1, 2, 3 &4), Titus (Unit 1, 2 & 3), and Glen Gardner (CT 1-8) generating facilities are scheduled to be deactivated in 2015.

12. Studies conducted for PPL Electric's transmission system, in conjunction with the PJM Regional Transmission Expansion Plan ("RTEP") process, revealed several transmission line thermal overload and voltage violations to the 230 kV system serving the Lancaster area by summer 2015 after these generating facilities are retired. Detailed descriptions of the PJM RTEP process and PPL Electric's system planning process are provided in Attachment 1 to this Letter of Notification.

13. Specifically, the 2013 RTEP identified the following violations of the NERC and PJM reliability standards on PPL Electric's 230 kV electric system in Lancaster, Berks, and Chester Counties after the declared generator deactivations:

By the summer of 2015, an outage of the South Akron – Millwood 230 kV Transmission Line followed by the outage of the South Lebanon – Berks 230 kV Transmission Line would cause the following overloads: the Brunner Island – South Manheim 230 kV Transmission Line would exceed its summer emergency rating by 6% and the South Akron – South Manheim 230 kV Transmission Line would exceed its summer emergency rating by 9%.

By the summer of 2015, an outage of the South Manheim – Brunner Island 230 kV Transmission Line followed by an outage of the South Lebanon - Berks 230 kV Transmission Line would overload the Millwood – South Akron 230 kV Transmission Line, causing it to exceed its summer emergency rating by 20%.

By the summer of 2015, an outage of the South Akron - Millwood 230 kV Transmission Line followed by subsequent outage of the Brunner Island – South Manheim 230 kV Transmission Line would cause a voltage drop of 8% on the 230 kV bus at the South Akron 230-138-69 kV Substation. This voltage drop would exceed

the maximum allowable voltage deviation threshold of 5% for buses that remain networked post contingency as set forth in both the PJM Planning Criteria and PPL Electric's system reliability criteria.

14. The electric reliability violations identified on the 230 kV system supplying Lancaster, Berks, and Chester Counties are the result of transmission line thermal overload and voltage violations. Overloading transmission lines may cause sustained damage to transmission infrastructure and catastrophic long duration power outages. Voltage drop violations will affect the voltage and power quality provided to customers served from the affected transmission lines.

15. Detailed descriptions of the NERC and PJM reliability violations identified in the 2013 RTEP are provided in Attachment 1 to this Letter of Notification.

**B. THE PROPOSED PROJECT**

16. To resolve the NERC and PJM reliability violations identified in the 2013 RTEP, PPL Electric proposes to construct the new Lauschtown 500-230-138/69 kV Substation in Brecknock Township, Lancaster County, Pennsylvania, east of Reading Route (State Route 625).

17. The new Lauschtown 500-230-138/69 kV Substation will provide a new 500 kV backbone source to the area and will alleviate the overload conditions on the 230 kV system identified in the 2013 RTEP.

18. The proposed Lauschtown 500-230-138/69 kV Substation is located at the intersection of an existing 500 kV transmission line, which will supply the Substation, and two existing 230 kV transmission lines, which will be interconnected with and supplied by the Substation. The site for the Lauschtown 500-230-138/69 kV Substation is ideal for a substation given the proximity to the existing 500 kV and 230 kV transmission lines, as well as the fact that the property is largely undeveloped, cleared of trees, not bordered by dense residential development, and easily accessible from State Route 625.

19. The proposed Lauschtown 500-230-138/69 kV Substation will be interconnected with the existing Hosensack – Three Mile Island 500 kV Transmission Line. This part of the Lauschtown Project will be completed by Metropolitan Edison Company (“Met-Ed”), a FirstEnergy Company, and will involve the construction of two single-circuit 500 kV transmission lines that will extend approximately 0.2 miles from the 500 kV yard at the proposed Lauschtown 500-230-138/69 kV Substation to the existing Hosensack – Three Mile Island 500 kV Transmission Line. The new single-circuit 500 kV line will supply one 500-230 kV 750 MVA transformer within the Lauschtown 500-230-138/69 kV Substation, which in turn will provide power supply to the 230 kV yard at the Lauschtown 500-230-138/69 kV Substation. Met-Ed will seek Commission approval to site and construct the 500 kV portion under a separate filing. The 500 kV portion of the project is explained in greater detail in the Met-Ed separate filing.

20. To interconnect the 230 kV yard at the Lauschtown 500-230-138/69 kV Substation with the 230 kV system, PPL Electric requests Commission approval to interconnect two existing 230 kV lines with the Lauschtown 500-230-138/69 kV Substation: the South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line. This part of the Project will involve the construction of four new single-circuit 230 kV transmission lines (two for each interconnected circuit).

21. The total length of the four new 230 kV transmission lines to be constructed is approximately 0.75 miles, and each new 230 kV transmission line will be less than 0.25 miles. The new 230 kV circuits will be referred to as the Lauschtown – South Reading 230 kV, the Lauschtown – South Akron #3 230 kV, the Lauschtown – South Akron #4 230 kV, and the Lauschtown – Berks 230 kV line.

22. A description and one-line diagram of the proposed Project is provided in the Necessity Statement included as Attachment 1 to this Letter of Notification. An aerial exhibit showing the location of the proposed facilities is provided as Figure 3-1 to Attachment 3.

23. Each of the new 230 kV transmission lines to be constructed as part of this Project will utilize three power conductors and an overhead ground wire for lightning protection and for communications between the transmission system facilities. The minimum conductor-to-ground clearance will be 32 feet, which occurs at a maximum conductor temperature of 140° C. An engineering description of the Project is provided in Attachment 2 to this Letter of Notification.

24. The construction of the new 230 kV transmission lines requires the removal of five existing steel structures and the installation of nine new steel monopole structures. The new steel monopoles will have an average height of approximately 120 to 135 feet. All new poles for the proposed Project will be self-supporting structures on drilled shaft, reinforced concrete foundations. A typical 230 kV monopole is shown in Figure 2-1.

25. In addition, as part of the Project, a portion of one of the circuits on the existing double-circuit South Akron – Berks 230 kV Transmission Line that has been abandoned will be removed from the PPL Electric-owned site for the Laushtown 500-230-138/69 kV Substation. Therefore, as part of this Project, PPL Electric will construct a new steel monopole dead-end structure on the Laushtown 500-230-138/69 kV Substation property in order to terminate and remove the abandoned circuit from the site for the Laushtown 500-230-138/69 kV Substation.

26. The proposed Project resolves all the overloads and the voltage drop violations identified in the 2013 RTEP. The proposed Project will provide the region with the required electric power supply reinforcement and will meet all NERC, PJM, and PPL Electric reliability

criteria. The proposed Project also will provide additional capacity for future electric system load growth in Lancaster, Berks, and Chester Counties.

27. PPL Electric submitted the proposed Project to PJM on March 23, 2012, for review and inclusion in the RTEP. The Project was presented before stakeholders at the Transmission Expansion Advisory Committee meeting on April 27, 2012, and approved by the PJM Board.<sup>1</sup>

28. The total estimated cost to site, design, and construct the proposed Laushtown 500-230-138/69 kV Substation and the 230 kV connecting lines is approximately \$82.7 million, which includes approximately \$79.5 million for the substation work and \$3.2 million for the 230 kV transmission line work.<sup>2</sup>

29. Upon Commission approval, the Project has a scheduled construction start date of the fourth quarter of 2015 to support the in-service date of May 2017.

### **III. HEALTH AND SAFETY**

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

31. 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.

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<sup>1</sup> The proposed Project was included in the 2013 RTEP Report as a baseline project b2006.1.

<sup>2</sup> 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 filed 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.

32. Consistent with its Magnetic Field Management Program, PPL Electric will construct the Project for ground clearances that are a minimum of five feet higher than the required NESC minimum ground clearance for 230 kV lines in order to reduce the magnetic field exposure. A description of PPL Electric's Magnetic Field Management Program is provided in Attachment 2 to this Letter of Notification.

#### IV. DESCRIPTION OF RIGHT-OF-WAY

33. PPL Electric proposes to site and construct four new 230 kV transmission lines to interconnect the proposed Lauschtown 500-230-138/69 kV Substation located in Brecknock Township, Lancaster County, Pennsylvania with the existing 230 kV transmission system. An aerial plot plan is provided at the end of Attachment 3 to this Letter of Notification.

34. The proposed 230 kV lines will be constructed entirely within Lauschtown 500-230-138/69 kV Substation site owned by PPL Electric, within the rights-of-way for the existing South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line, and within new rights-of-way previously acquired by PPL Electric. PPL Electric does not require any additional ROW to construct the PPL Electric portion of the Project on PPL Electric-owned property or right-of-way.

35. Although the new structures will slightly increase in height, impacts will be minimal because the Project will be built on PPL Electric owned property or right-of-way and in close proximity to the existing structures. Further, no new poles will be placed on any property that currently does not have an existing pole.

36. Land use impacts are anticipated to be minimal due to the fact that the Project will be constructed entirely within the existing right-of-way. Where practical, PPL Electric will use

previously established access roads for construction to further reduce interference with existing land uses.

37. 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 Initial Clearing and Control of Vegetation On or Adjacent to Electric Line Right-of-Way Through Use of Herbicides, Mechanical and Hand Clearing Techniques" to mitigate any impacts.

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

39. 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 similar height of the new facilities and the existing facilities.

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

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

42. The Project will not affect any recreational areas or natural landmarks.

43. The Project area was reviewed with the Pennsylvania Historical and Museum Commission ("PHMC"). The PHMC has concluded that the Project will have minimal impacts to cultural and archaeological resources, and that no further archaeological work is necessary for the Project.

44. Although wetlands and streams are located on the site selected for the Lauschtown 500-230-138/69 kV Substation, none of these natural features will be impacted as a

result of the construction of the 230 kV connecting lines. PPL Electric will avoid impacts to streams and wetlands located in the Project area to the maximum extent practical.

45. PPL Electric will obtain all necessary permits from the Pennsylvania Department of Environmental Protection and the United States Army Corps of Engineers and will comply with all of the terms and conditions placed on those permits.

46. PPL Electric will acquire any required soil erosion and sedimentation control permits and will comply with any conditions placed on those permits.

47. PPL Electric has consulted with state and federal agencies to obtain information regarding endangered and threatened species in close proximity to the Project. PPL Electric has reviewed the Pennsylvania Natural Diversity Inventory records under the jurisdiction of the Pennsylvania Department of Conservation and Natural Resources, the Pennsylvania Fish and Boat Commission, and the Pennsylvania Game Commission. Based on this review, these agencies have reported that the Project will not impact any threatened and endangered species and/or special concern species and resources located within the Project area.

48. The Project is located in Lancaster County, which is within the known range of the federally threatened bog turtle (*Clemmys muhlenbergii*). Therefore, the U.S. Fish and Wildlife Service indicated that further review is required for the presence of the federally threatened bog turtle. PPL Electric retained a qualified bog turtle surveyor to conduct Phase I bog turtle surveys. Based on these Phase I bog turtle surveys, none of the delineated wetlands were found to contain potential bog turtle habitat. The U.S. Fish and Wildlife Service concurred with these findings, and provided a clearance letter dated July 28, 2014.

**V. NOTICE**

49. PPL Electric has provided information regarding the Project to representatives of Brecknock Township and Lancaster County. These entities have not objected to the proposed Project.

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

51. 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**

52. 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).

53. The proposed Project qualifies for use of a Letter of Notification because the proposed the new 230 kV transmission lines needed to interconnect the Lauschtown 500-230-138/69 kV Substation with the 230 kV system will be less than two miles, *i.e.*, together the four new 230 kV transmission lines will be approximately 0.75 miles.

54. 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 that the Pennsylvania Public Utility Commission approve the to construct four new 230 kV transmission lines needed to interconnect the proposed new Laushtown 500-230-138/69 kV Substation with the existing 230 kV transmission system in Brecknock Township, Lancaster County, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,

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Date: October 24, 2014

Attorneys for PPL Electric Utilities Corporation

# ATTACHMENT 1

**ATTACHMENT 1  
LAUSCHTOWN 500 kV AND 230 kV CONNECTING LINES  
NECESSITY STATEMENT**

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**ATTACHMENT 1  
LAUSCHTOWN 500 kV AND 230 kV CONNECTING LINES  
NECESSITY STATEMENT**

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**A. INTRODUCTION**

PPL Electric Utilities (“PPL Electric”) is requesting Pennsylvania Public Utility Commission (“PUC” or the “Commission”) approval to site and construct 230 kV transmission lines needed to interconnect the proposed new Lauschtown 500-230-138/69 kV Substation located in Brecknock Township, Lancaster County, Pennsylvania with the existing 230 kV transmission system (the “Lauschtown Project”). As part of this Project, Metropolitan Edison Company (“Met-Ed”), a FirstEnergy Company, will also be requesting PUC approval, through a separate filing, to site and construction 500 kV transmission lines needed to interconnect the Lauschtown 500-230-138/69 kV Substation with the existing 500 kV system. As explained below, the Lauschtown Project is needed to resolve multiple North American Electric Reliability (“NERC”) and PJM Interconnection, LLC (“PJM”) violations, and to reinforce the 230 kV systems in Lancaster, Berks, and Chester Counties.

As part of the Lauschtown Project, PPL Electric herein requests Commission approval to interconnect two existing 230 kV lines with the Lauschtown Substation: the South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line. This part of the Project will involve the construction of four new single-circuit 230 kV transmission lines (two for each interconnected circuit). The total length of the new 230 kV transmission lines to be constructed is approximately 3,885 feet, or approximately 0.75 miles.

The estimated cost to site, design, and construct the 230 kV transmission line interconnections with the Lauschtown Substation is approximately \$3.2 million.<sup>1</sup> Subject to the Commission’s approval, construction is scheduled to begin in the second quarter of 2015 to support an in-service date of May 2017.

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

Maps showing the location and operational voltage of the existing and proposed transmission facilities within the Project area are included at the end of this Attachment as Figures 1-1 and 1-2, respectively. One line diagrams of the existing and proposed facilities are included as Figures 1-3 and 1-4, respectively. This filing addresses only the existing and proposed transmission 230 kV system in this portion of Lancaster, Berks, and Chester Counties.

**B. SYSTEM PLANNING PROCESS AND GUIDELINES**

**1. Transmission Reliability Standards**

The nation's interconnected 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 interconnected transmission system (transmission grid) be planned and designed to be highly reliable so that reliable electric service can be provided under peak and all loading conditions and when certain elements of the system are out of service (system contingencies) due to planned or unplanned outages.

On February 3, 2006, FERC certified the NERC as the organization required to establish and enforce reliability standards for the bulk electric system. Pursuant to this certification, NERC develops and enforces reliability standards, which define the reliability requirements for planning and operating certain transmission systems in North America. The NERC Reliability Standards apply to all users, owners, and operators of the critical transmission systems on the nation's interconnected transmission grid, including PPL Electric. The NERC Reliability Standards are monitored and enforced by NERC and the regional reliability organizations that function under its auspices. NERC achieves compliance through monitoring, audits and investigations, the imposition of financial penalties, and other enforcement actions for non-compliance. These FERC-approved NERC Reliability Standards are mandatory and failure to comply can result in penalties of up to \$1 million per day per violation.

## 2. System Planning

System Planning is the process which assures that the transmission system can supply electricity to all customer loads in a manner that is reliable and economic. This System Planning process assures that both the Bulk Electric System (“BES”)<sup>2</sup> and non-Bulk Electric System<sup>3</sup> (“non-BES”) 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 needs 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 NERC, PJM, and PPL Electric’s transmission planning reliability principles, practices and standards (RP&P) for all normal and emergency operating conditions.

The fundamental purpose of the NERC, PJM and RP&P criteria is to provide a set of principles upon which to build a reliable transmission system.

The transmission planning process begins with the development of a computer model of the future system. A specific study year is chosen, and the future system model is developed using the existing system plus any planned modifications to the transmission system scheduled to be completed prior to the study year. Load levels used in the system model are based on the latest forecast prepared annually by PJM. Once the system model is complete, comprehensive power flow simulations are performed to determine the ability of the system to comply with the planning criteria. Compliance is determined by simulating particular contingency conditions. All conditions where the system is not in conformance with the reliability criteria are identified, then system reinforcements are added to the model to bring the system into compliance.

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<sup>2</sup> Bulk Electric System (BES) - Includes transmission facilities operated at voltages of 100 kV or higher.

<sup>3</sup> Non-Bulk Electrical System (non-BES) - Includes transmission facilities operated at voltages less than 100 kV.

### **3. PJM Planning Process**

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 kV and above), and coordinating the movement of electricity in all or parts of thirteen 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”)<sup>4</sup> to identify system reinforcements that are required to, among other things, meet the NERC Reliability Standards, PJM reliability planning criteria, and transmission owner reliability criteria. The RTEP is a FERC-approved transmission planning process that undertakes a comprehensive analysis to identify existing and forecasted violations of the NERC Reliability Standards on the transmission systems within PJM’s service territory.

*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. The NERC reliability standards, transmission owner criteria, and PJM reliability planning criteria are used by PJM to analyze the system and to determine the specific transmission upgrade projects, as part of the overall reliability solution, that are needed to ensure long-term reliable electric service to customers and competitive power markets. Based upon this analysis, PJM determines the transmission upgrades that are needed to meet NERC reliability standards.*

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. When the studies show an inability of the transmission system to meet a specific reliability standard under these conditions, solutions such as construction of one or more new transmission lines or one or more upgrades to existing transmission facilities may be necessary.

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<sup>4</sup> 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 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.

NERC reliability standards require PJM to identify the “critical system conditions” against which the system must be evaluated to ensure that it meets the performance criteria specified in the standards. Specifically, the NERC reliability standards require PJM to test events which fall into the following categories:

- NERC Category A criteria require that, for all facilities in service, equipment thermal ratings and system voltage levels are within applicable limits and that the system is stable, referred to as “N minus zero” or N-0.
- NERC Category B criteria impose similar requirements with one facility removed from service. This is referred to as the “n minus 1” or “N-1” criteria. These criteria ensure that the system continues to remain within applicable limits and stable upon the outage of a transmission element.
- NERC Category C criteria require the system to be stable and within applicable equipment thermal ratings and system voltage limits for less probable contingency events. Such events include multiple facility outages such as bus, tower line, or circuit breaker failures. Also included are second contingencies involving the loss of one system element followed by manual system readjustments, and then the loss of a second system element. These second contingencies are referred to as the “N minus 1 minus 1” or “N-1-1” criteria.

PJM has developed the PJM Reliability Planning Criteria as set forth in the PJM Manual 14B. The PJM Reliability Planning Criteria consist of multiple standards and applicable planning principles that include PJM planning procedures, NERC Planning Standards, NERC Regional Council planning criteria, Reliability First Corporation (“RFC”) Standards, and Transmission Owner-defined reliability criteria (in this case, the PPL Electric RP&P). PJM applies all applicable planning criteria when identifying reliability problems and determining the need for transmission system upgrades the PJM service territory. As a transmission owner in the PJM service territory, PPL Electric is required to follow the PJM Reliability Planning Criteria.

When a potential reliability violation is identified, PJM and the affected transmission owner develop specific solutions to resolve the identified violation.<sup>5</sup> PJM presents the results of the analyses to its Transmission Expansion Advisory Committee (“TEAC”) to solicit comments on the violations and recommendations to resolve the identified reliability violations. The TEAC is open to participation by: (i) all transmission customers; (ii) all PJM members; (iii) state commissions and consumer advocates; (iv) any other entity proposing to build Merchant transmission facilities to be integrated into the PJM region; and (v) any other interested entities or persons. The TEAC reviews potential solutions to the identified reliability violations, including transmission line solutions.

#### **4. The PPL Electric System Planning Process<sup>6</sup>**

PPL Electric undertakes an independent analysis of both its BES transmission facilities, which include transmission facilities operated at voltages of 100 kV or higher and are under the functional control of PJM, and its non-BES transmission facilities. Therefore, PPL Electric, as a transmission owner and member of PJM, undertakes system planning for all of its transmission facilities in concert with the PJM RTEP. In this way, PPL Electric actively participates in the PJM RTEP process, and through this participation PPL Electric provides the results of its independent studies of its reliability plans to PJM for consideration and inclusion in the PJM RTEP. The PPL Electric planning criteria are outlined in its RP&P document, which was developed to ensure adequate and appropriate levels of electric service to its customers consistent with good utility practice. The PPL Electric RP&P for the BES is consistent with NERC and PJM reliability criteria.

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<sup>5</sup> The PJM Planning process outlined in this filing explains the process at the time the Lauschtown Project was identified. With the new FERC Order 1000, effective January 1, 2014, NERC and PJM reliability violations may be open for stakeholder proposals to undertake projects to resolve the identified violations. PJM will make the determination of whether a stakeholder proposal window should be opened for all stakeholders to respond with proposed solutions to resolve the identified violation. PJM will then select the optimal solution to resolve that criteria violation. In this case, PPL Electric was given construction responsibility for the Lauschtown Project by PJM prior to FERC Order 1000 becoming effective.

<sup>6</sup> The PPL Electric System Planning Process identified in this filing explains the process at the time the Lauschtown Substation was identified. With the new FERC Order 1000, effective January 1, 2014, violations of the PPL Electric RP&P are to be reported to PJM. PJM will then make the determination of whether a stakeholder proposal window should be opened for all stakeholders to respond with proposed solutions to resolve the identified violation. PJM will then select the optimal solution to resolve that criteria violation.

The PPL Electric planning process begins by developing a computer model of the future transmission system. A specific study year is chosen to define expected facility loadings. The future transmission system model is prepared using the existing transmission system plus any planned modifications to the transmission system that are scheduled to occur prior to the study year. Load levels used in the transmission system model are based on the latest forecast prepared by PJM Load Forecasting. Once PPL Electric's system model is complete, comprehensive power flow simulations are performed to determine the ability of the system to comply with the NERC criteria, PJM reliability criteria, and RP&P. This is accomplished by simulating an outage of each single circuit line, double circuit line, transformer, bus, generator, or circuit breaker as outlined above. All conditions where the future system does not meet the NERC criteria, PJM reliability criteria, and RP&P are identified.

Alternatives that can mitigate the reliability criteria violation are then 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. Computer simulations of the system, considering the identified reinforcement alternatives, are completed to identify the best overall reinforcement plan that will meet the future needs of the region in a reliable and economic manner.

As explained below, studies conducted for PPL Electric's transmission system, in conjunction with the PJM RTEP process described above, concluded that the proposed Lauschtown Substation Project is necessary to resolve reliability criteria violations of PJM's and NERC planning criteria. The local transmission operator, in this case PPL Electric, is responsible for confirming the reliability violations and correcting any violations to the aforementioned transmission planning criteria on the BES system. Projects that are necessary to resolve NERC criteria, PJM reliability criteria, or the transmission owners' own local transmission planning criteria are included as baseline projects in PJM's RTEP.

## **C. DEFINITION OF THE PROBLEM**

### **1. Existing System**

Presently, customers in Lancaster, Berks and Chester Counties receive their bulk electric power supply from multiple 230 kV lines. These 230 kV transmission lines provide power to regional transmission substations. Each of these regional substations supply several 69 kV or 138 kV transmission lines, which in turn supply various 69-12 kV and 138-12 kV distribution substations in Lancaster, Berks and Chester Counties. The 230 kV system in Lancaster, Berks and Chester Counties serves approximately 223,000 customers.

Currently, the 230 kV system in Lancaster, Berks and Chester Counties is not interconnected with a 500 kV source of supply. The Three Mile Island – Hosensack 500 kV Transmission Line traverses the area in close proximity to the existing 230 kV system; however, it has no connections to the 230 kV system.

The existing 230 kV and 500 kV transmission systems in the Lancaster, Berks and Chester Counties are shown in Figures 1-1 and 1-3.

### **2. Reliability Violations**

The Portland (Unit 1 & 2), Shawville (Unit 1, 2, 3 & 4), Titus (Unit 1, 2 & 3), and Glen Gardner (CT 1-8) generating facilities are scheduled to be deactivated in 2015. Studies conducted for PPL Electric's transmission system, in conjunction with the PJM RTEP process described above, revealed several transmission line thermal overload and voltage violations to the BES in the Lancaster area by summer 2015 after these generating facilities are retired.

Specifically, the 2013 RTEP identified that multiple violations of the NERC and PJM reliability standards are likely to occur on PPL Electric's 230 kV electric system in Lancaster, Berks and Chester Counties under N-1-1 conditions in 2015 after the declared generator deactivations. The major violations identified in the 2013 RTEP are summarized below.

- By the summer of 2015, an outage of the South Akron – Millwood 230 kV Transmission Line followed by the outage of the South Lebanon – Berks 230 kV Transmission Line would cause the following overloads: the Brunner Island – South Manheim 230 kV

Transmission Line would exceed its summer emergency rating by 6% and the South Akron – South Manheim 230 kV Transmission Line would exceed its summer emergency rating by 9%.

- By the summer of 2015, an outage of the South Manheim – Brunner Island 230 kV Transmission Line followed by an outage of the South Lebanon - Berks 230 kV Transmission Line would overload the Millwood – South Akron 230 kV Transmission Line, causing it to exceed its summer emergency rating by 20%.
- By the summer of 2015, an outage of the South Akron - Millwood 230 kV Transmission Line followed by subsequent outage of the Brunner Island – South Manheim 230 kV Transmission Line would cause a voltage drop of 8% on the 230 kV bus at the South Akron 230-138-69 kV Substation. This voltage drop would exceed the maximum allowable voltage deviation threshold of 5% for buses that remain networked post contingency as set forth in both the PPL Electric RP&P and the PJM Planning Criteria.

The electric reliability violations identified in the 230 kV system supplying Lancaster, Berks and Chester Counties are the result of “overloaded” transmission facilities and voltage drop violations. Transmission lines have a maximum rated thermal capacity, which is the maximum electrical current they can safely carry. When a transmission line overloads, the conductor, the hardware securing the conductor, and the line terminal equipment begin to overheat. Overheating the conductor may cause the line to sag. Under these conditions, the metal in the conductor may become brittle, rendering it likely to fail. In addition, the line may break and fall to the ground causing a potentially dangerous situation for those near the line, as well as the crews required to respond to the event. Overloading transmission lines may cause sustained damage to transmission infrastructure and catastrophic long duration power outages. Voltage drop violations will affect the voltage and power quality provided to customers served from the affected transmission lines.

#### **D. PROPOSED SOLUTION**

To resolve the violations of the NERC and PJM reliability standards discussed above, PPL Electric proposes to construct the new Lauschtown 500-230-138/69 kV Substation in Brecknock Township, Lancaster County, Pennsylvania, east of Reading Route (State Route 625). The new Lauschtown Substation will provide a new 500 kV backbone source to the area and will alleviate the overload conditions on the 230 kV system under the contingency conditions described in Section E above.

The proposed Lauschtown Substation will be interconnected with the existing Hosensack – Three Mile Island 500 kV Transmission Line. This part of the Lauschtown Project will be completed by Met-Ed and will involve the construction of two single-circuit 500 kV transmission lines that will extend approximately 0.2 miles from the 500 kV yard at the proposed Lauschtown Substation to the existing Hosensack – Three Mile Island 500 kV Transmission Line. The new 500 kV circuits will be referred to as the Three Mile Island – Lauschtown 500 kV and the Lauschtown – Hosensack 500 kV Transmission Lines. The single-circuit 500 kV lines will supply one 500-230 kV 750 MVA transformer within the Lauschtown Substation, which in turn will provide power supply to the 230 kV yard at the Lauschtown Substation. Met-Ed will seek PUC approval to site and construct the 500 kV portion under a separate filing. The 500 kV portion of the project is explained in greater detail in the Met-Ed separate filing.

To interconnect the 230 kV yard at the Lauschtown Substation with the 230 kV system, PPL Electric requests Commission approval to interconnect two existing 230 kV lines with the Lauschtown Substation: the South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line. This part of the Project will involve the construction of four new single-circuit 230 kV transmission lines (two for each interconnected circuit). The total length of new 230 kV transmission lines to be constructed is approximately 3,885 feet, or approximately 0.75 miles. The new 230 kV circuits will be referred to as the Lauschtown – South Reading 230 kV, the Lauschtown – South Akron #3 230 kV, the Lauschtown – South Akron #4 230 kV, and the Lauschtown – Berks 230 kV line. A detailed description of the new 230 kV transmission lines is provided in Attachment 2.

The proposed 230 kV transmission systems in the Lancaster, Berks and Chester Counties are shown in Figures 1-2 and 1-4.

The proposed Lauschtown Substation has sufficient capacity and room to accommodate a new 138/69 kV switchyard. The new 138/69 kV switchyard will be constructed as part of a separate project filed with the Commission at Docket Number A-2014-2430565 for the siting and construction of the North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Lines.<sup>7</sup>

The Lauschtown Project resolves all the overloads and the voltage drop violations identified in the 2013 RTEP through the 2015 Generator Deactivation Study. The proposed Lauschtown Project will provide the region with the required electric power supply reinforcement and will meet all NERC, PJM, and PPL Electric reliability criteria. The Lauschtown Project also will provide additional capacity for future electric system load growth in Lancaster, Berks and Chester Counties.

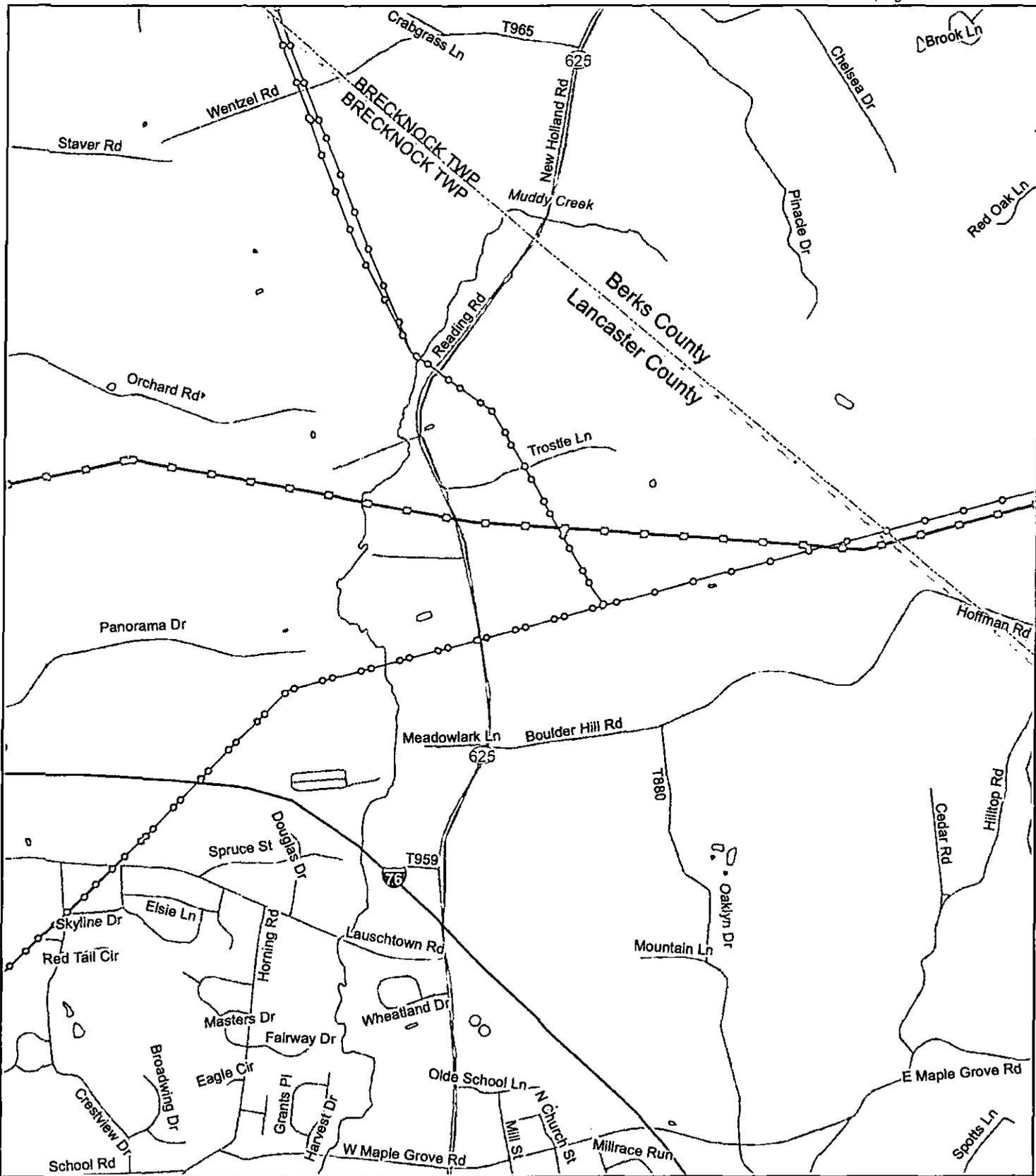
PPL Electric submitted the proposed Lauschtown Project to PJM on March 23, 2012, for review and inclusion in the RTEP. The Project was presented before stakeholders at the TEAC meeting on April 27, 2012, and approved by the PJM Board. The Lauschtown Project was included in the 2013 RTEP Report as a baseline project b2006.1.

The total estimated cost to site, design, and construct the proposed Lauschtown Substation and the 230 kV connecting lines is approximately \$82.7 million, which includes approximately \$79.5 million for the substation work and \$3.2 million for the 230 kV transmission line work. Subject to the Commission's approval, construction is scheduled to begin in second quarter of 2015 to support an in-service date of May 2017.

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<sup>7</sup> As explained therein, the North Lancaster-Honeybrook #1 & #2 138/69 kV Transmission Lines are required to address load growth, improve reliability of service, provide an alternate source of supply to the area, and resolve violations of PPL Electric's RP&P criteria. The need for the North Lancaster-Honeybrook #1 & #2 138/69 kV Transmission Lines is unrelated to the need for the Lauschtown Project proposed herein. However, use of the Lauschtown Substation as the source of supply for the North Lancaster-Honeybrook #1 & #2 138/69 kV Transmission Lines proposed at Docket No. A-2014-2430565 avoids the need to locate and construct a separate new substation.

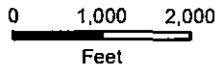
**Figure 1-1. Map of Existing Facilities**



Lauschtown 230 kV  
 Connecting Lines Project  
 Figure 1-1. Map of Existing Facilities

**Legend**

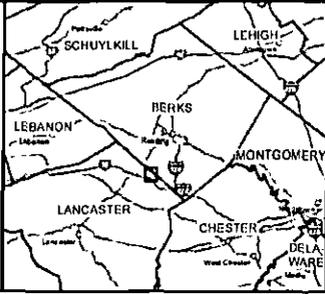
- Existing Transmission — Stream
- 500kV — Waterbody
- 230kV



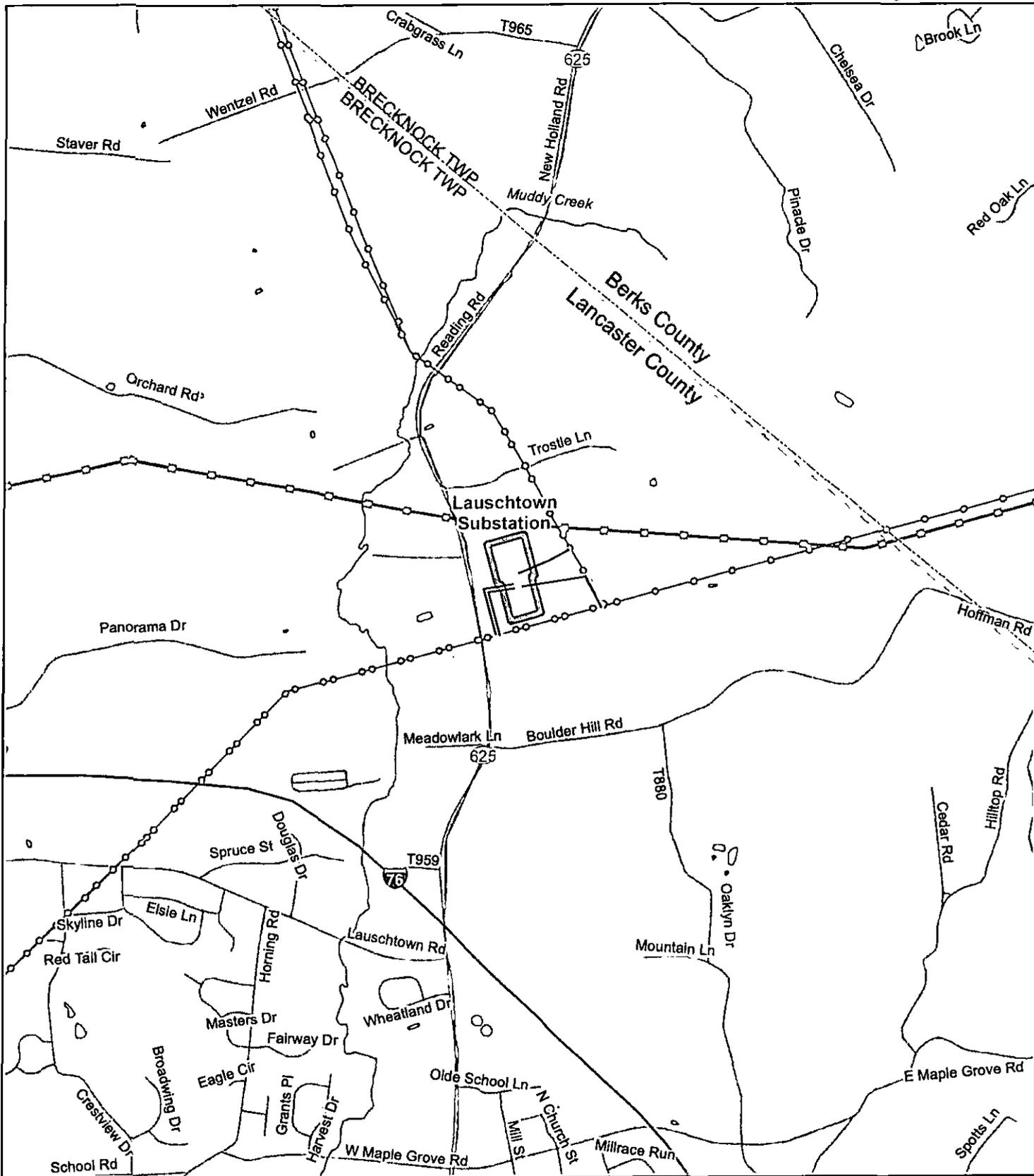
Sources: Pennsylvania Spatial Data Access (PASDA),  
 Environmental Systems Research Institute (ESRI),  
 United States Geological Survey (USGS)



Projected Coordinate System: PA State Plane, South,  
 Datum: North American Datum of 1983 (NAD83),  
 Projection: Lambert Conformal Conic,  
 Linear Unit: Feet,  
 Ellipsoid: Geodetic Reference System 80



**Figure 1-2. Map of Proposed Facilities**



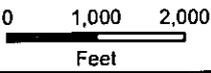
Lauschtown 230 kV  
 Connecting Lines Project  
 Figure 1-2. Map of Proposed Facilities

**Legend**

- Proposed 230 kV Lines
- Stream
- ▭ Proposed Fenceline
- ▭ Waterbody

**Existing Transmission**

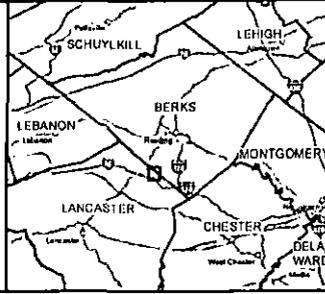
- ▣ 500kV
- 230kV

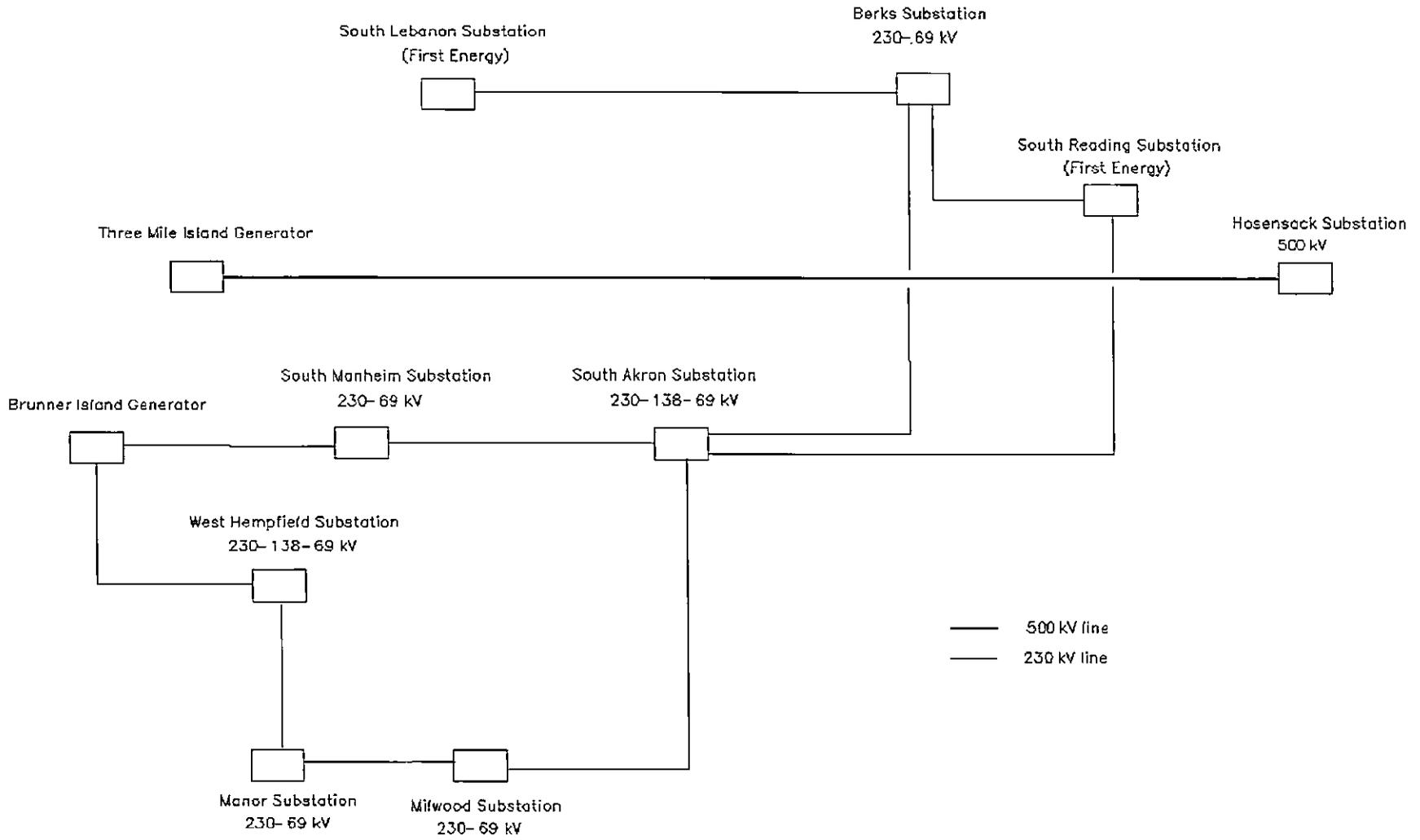


Sources: Pennsylvania Spatial Data Access (PASDA),  
 Environmental Systems Research Institute (ESRI),  
 United States Geological Survey (USGS)

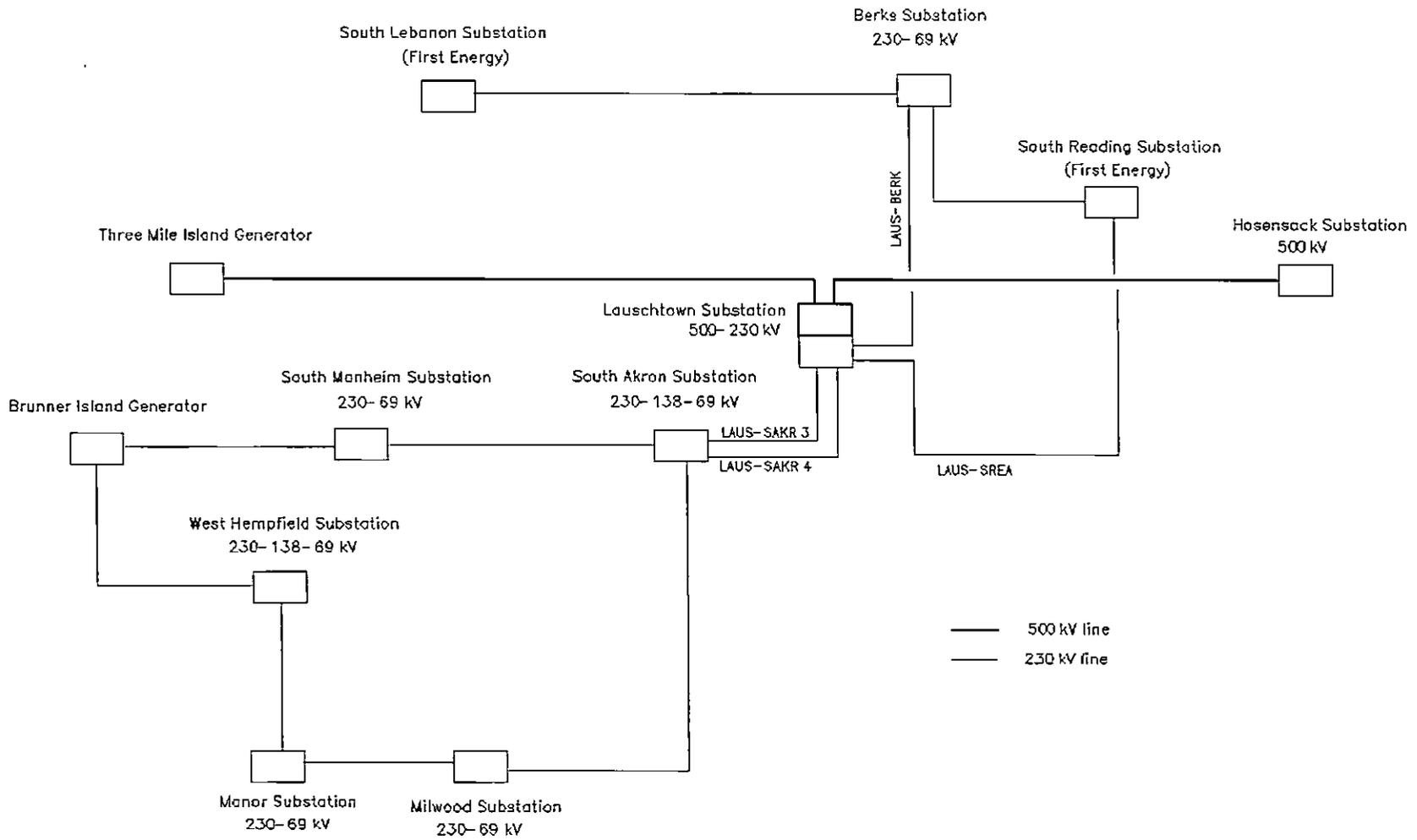


Projected Coordinate System: PA State Plane, South,  
 Datum: North American Datum of 1983 (NAD83)  
 Projection: Lambert Conformal Conic,  
 Linear Unit: Feet,  
 Ellipsoid: Geodetic Reference System 80





**Figure 1-3. Existing Transmission System Configuration**



**Figure 1-4. Proposed Transmission System Configuration**

# ATTACHMENT 2

**ATTACHMENT 2  
LAUSCHTOWN 230 KV CONNECTING LINES PROJECT  
ENGINEERING DESCRIPTION**

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**ATTACHMENT 2**  
**LAUSCHTOWN 230 KV CONNECTING LINES PROJECT**  
**ENGINEERING DESCRIPTION**

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**A. INTRODUCTION**

PPL Electric Utilities Corporation (“PPL Electric”) proposes to construct a new 500-230-138/69 kV Substation (the “Lauschtown Substation”) near the intersection of two existing 230 kV transmission lines and one existing 500 kV transmission line in Brecknock Township, Lancaster County, Pennsylvania. All three existing transmission lines will be tied into and interconnected with the Lauschtown Substation. To accomplish this, PPL Electric herein seeks approval from the Pennsylvania Public Utility Commission (“PUC” or the “Commission”) to site and construct four single-circuit 230 kV transmission lines needed to interconnect the Lauschtown Substation with the existing South Akron – Berks 230 kV line and the South Akron – South Reading 230 kV line (the “Project”). As discussed in Attachment 1, Metropolitan Edison Company (“Met-Ed”), a FirstEnergy Company, also will be requesting, through a separate filing, PUC approval to site and construct 500 kV transmission lines needed to re-terminate the existing Hosensack – Three Mile Island 500 kV line into the new substation.

An aerial exhibit showing the location of the proposed facilities is provided as Figure 3-1 to Attachment 3.

**B. DESCRIPTION OF PROPOSED LINE**

To interconnect the 230 kV yard at the Lauschtown Substation with the 230 kV system, PPL Electric requests Commission approval to interconnect two existing 230 kV lines with the Lauschtown Substation: the South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line. This part of the Project will involve the construction of four new single-circuit 230 kV transmission lines (two for each interconnected circuit). The total length of new 230 kV transmission lines to be constructed is approximately 3,885 feet, or approximately 0.75 miles. Each new 230 kV transmission line will be less than 0.25 miles. The new 230 kV transmission lines will be referred to as:

Lauschtown – South Reading 230 kV Transmission Line;  
Lauschtown – South Akron #3 230 kV Transmission Line;  
Lauschtown – South Akron #4 230 kV Transmission Line; and,  
Lauschtown – Berks 230 kV Transmission Line.

Each of the new 230 kV transmission lines to be constructed as part of this Project will utilize three power conductors. The single-circuit power conductors will each be 1,590 thousand circular mills (“kcmil”)<sup>1</sup>, 45/7 stranding, aluminum conductor steel reinforced (“ACSR”). The new single-circuit 230 kV transmission lines also will use either one 1/2 inch overhead ground wire (“OHGW”), or one 0.752” optical ground wire (“OPGW”).<sup>2</sup>

The construction of the new 230 kV transmission lines requires the removal of five existing steel structures and the installation of nine new steel monopole structures. The new steel monopoles will have an average height of approximately 120 to 135 feet. All new poles for the proposed Project will be self-supporting structures on drilled shaft, reinforced concrete foundations. A typical 230 kV monopole is shown in Figure 2-1.

The double-circuit South Akron – Berks 230 kV Transmission Line traverses southwest through PPL Electric-owned site for the Lauschtown Substation before intersecting the South Akron – South Reading 230 kV Transmission Line and heading west. One of the two circuits on the South Akron – Berks 230 kV Transmission Line is presently abandoned in-place. As part of this Project, a portion of the abandoned circuit will be removed. However, the rest of the abandoned line will remain in-place. Therefore, as part of this Project PPL Electric will construct a new steel monopole deadend structure on the Lauschtown Substation property in order to terminate the abandoned circuit.

The proposed line will be designed to comply with National Electrical Safety Code (“NESC”) standards. The minimum conductor-to-ground clearance will be 32 feet, which occurs at a

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<sup>1</sup> A 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 (0.001) of an inch.

<sup>2</sup> One of the four connecting lines will utilize a single OHGW, the remaining three will utilize a single OPGW.

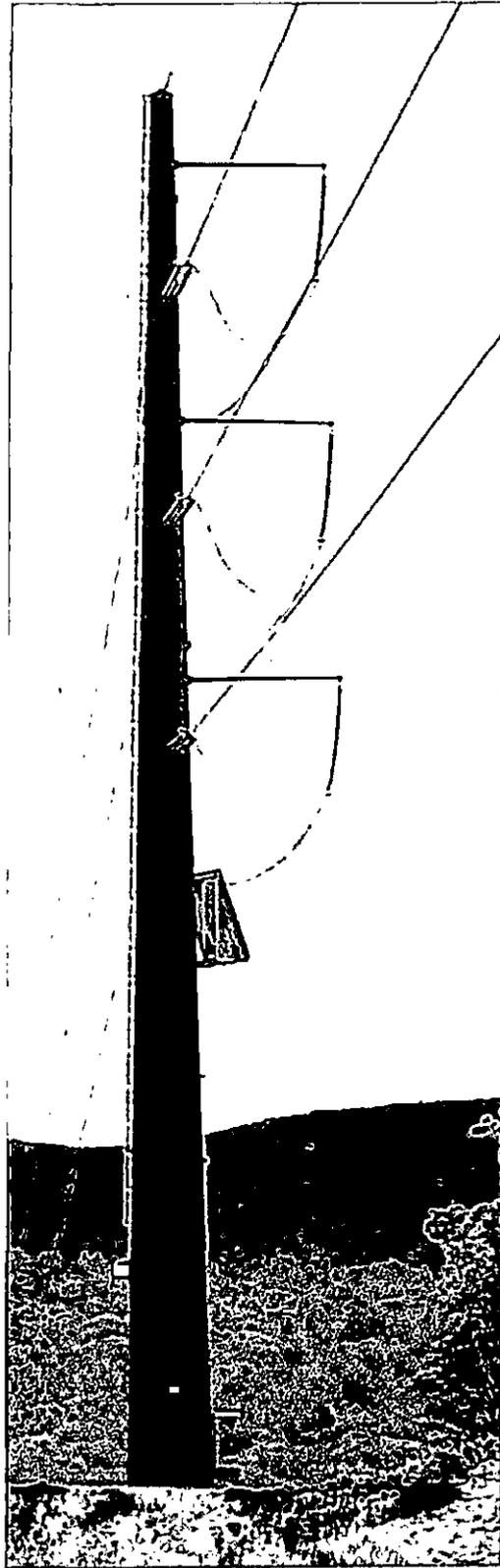
maximum conductor temperature of 140° C. Design specifications and safety rules practiced by PPL Electric are included in Attachment 4.

**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 program generally prescribes the use of a line design that provides five feet higher ground clearance than NESC standards and reverse phasing of new double-circuit lines where it is feasible to do so at low or no cost.

Each proposed transmission line needed to interconnect the existing 230 kV system with the Laushtown Substation will be a single circuit. Reverse phasing requires a double circuit line. Therefore, reverse phasing will not be possible for these proposed transmission lines. However, pursuant to PPL Electric's Magnetic Field Management Program, PPL Electric will utilize ground clearances that are five feet higher than NESC standards to further mitigate the potential for exposure to magnetic fields.

**FIGURE 2-1 - TYPICAL 230 kV MONOPOLE**



# ATTACHMENT 3

**ATTACHMENT 3  
LAUSCHTOWN 230 KV CONNECTING LINES PROJECT  
DESCRIPTION OF THE RIGHT-OF-WAY**

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FIGURE 3-2	PHMC CLEARANCE LETTER.....	END OF ATTACHMENT

**ATTACHMENT 3**  
**LAUSCHTOWN 230 KV CONNECTING LINES PROJECT**  
**DESCRIPTION OF THE RIGHT-OF-WAY**

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**A. INTRODUCTION**

PPL Electric Utilities Corporation (“PPL Electric”) proposes to site and construct 230 kV transmission lines to interconnect the proposed Lauschtown 500-230-138/69 kV Substation located in Brecknock Township, Lancaster County, Pennsylvania with the existing 230 kV transmission system (the “Project”). The proposed 230 kV lines are located entirely within PPL Electric-owned property or rights-of-way (“ROW”). Figures 1-1 and 1-2 to Attachment 1 depicts the general Project location and Figure 3-1 to this Attachment is an aerial map of the Project that identifies property owners crossed by the Project.

As part of this Project, PPL Electric proposes to interconnect two existing 230 kV transmission lines into the Lauschtown Substation: the South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line. This part of the Project will involve the construction of four single-circuit 230 kV transmission lines (two for each interconnected circuit). The total length of new 230 kV transmission lines to be constructed will be approximately 3,885 feet, or approximately 0.75 miles. The new 230 kV circuits will be referred to as the Lauschtown – South Reading 230 kV, the Lauschtown – South Akron #3 230 kV, the Lauschtown – South Akron #4 230 kV, and the Lauschtown – Berks 230 kV line.

The Project is located east of Reading Road (State Route 625) in Brecknock Township, Lancaster County, Pennsylvania. PPL Electric has discussed the proposed Project with representatives from Lancaster County and Brecknock Township, none of which had any objection to the Project.

**B. RIGHT OF WAY DESCRIPTION**

As discussed in Attachment 1, the purpose of the Project is to resolve multiple North American Electric Reliability (“NERC”) and PJM Interconnection, LLC (“PJM”) violations, and to reinforce the 230 kV systems in Lancaster, Berks, and Chester Counties. To resolve these

reliability issues, PJM and PPL have determined that the existing system requires a new source of supply.

The proposed Lauschtown Substation site is located at the intersection of an existing 500 kV transmission line, which will supply the Substation, and two existing 230 kV transmission lines, which will be interconnected with and supplied by the Substation. The site for the Lauschtown Substation is an ideal location for a substation given the proximity to the existing 500 kV and 230 kV transmission lines, as well as the fact that the property is largely undeveloped, cleared of trees, not bordered by dense residential development, and easily accessible from State Route 625.

The PPL Electric portion of the Project will be constructed within the Lauschtown Substation site owned by PPL Electric, within the ROW for the existing South Akron – Berks 230 kV Transmission Line and the South Akron – South Reading 230 kV Transmission Line, and within new ROW previously acquired by PPL Electric. PPL Electric does not require any additional ROW to construct the PPL Electric portion of the Project.

As explained in Attachment 2, nine steel monopole structures will be constructed as part of this Project. In addition, one new steel deadend structure will be constructed in order to terminate the remaining portion of the abandoned South Akron – Berks 230 kV circuit. The new steel monopoles will have an average height of approximately 120 to 135 feet. Impacts are expected to be minimal because the Project will be constructed within existing PPL Electric-owned property or ROW, and within close proximity to the existing transmission structures. Further, no new poles will be placed on any non-PPL Electric-owned property that currently does not have an existing tower structure. The new 230 kV circuits primarily cross land that was previously used for agricultural purposes, is largely undeveloped, cleared of trees, and not bordered by dense residential development.

### **C. ENVIRONMENTAL ASSESSMENT**

Land use impacts are anticipated to be minimal because construction will occur within or just outside of the proposed Lauschtown Substation property, which is in close proximity to the

existing 500 kV and 230 kV transmission lines, largely undeveloped, cleared of trees, and not bordered by dense residential development. As shown in Figure 3-1, all proposed access roads will traverse PPL Electric-owned property that is undeveloped and currently cleared of trees.

An unoccupied house is located on a PPL Electric-owned property identified on Figure 3-1 as parcel number 5. This building will be removed prior to construction.

The Living Hope Christian Church is located south of the proposed substation site and is crossed by the existing South Akron – South Reading 230 kV line. Two of the proposed 230 kV connecting lines will tap into the South Akron – South Reading 230 kV line located on the north border of the church property. These connecting lines will be located within the existing transmission ROW for the South Akron – South Reading 230 kV line.

No nearby communication towers, pipelines, or other utilities will be affected by the proposed Project. The closest airport, the Morgantown Airport, is located approximately 4 miles south of the Project. The Morgantown Airport is classified as a general service airport by the Pennsylvania Department of Transportation (“PennDOT”) Bureau of Aviation. PPL Electric does not anticipate any interference with airport operations because the Project is located in an area where there are existing electrical facilities and because the new facilities will be a similar height as the existing facilities. However, PPL Electric will file any required documentation with both the Federal Aviation Administration and the Pennsylvania Department of Transportation Bureau of Aviation.

The Project was reviewed by the Pennsylvania Historical and Museum Commission (“PHMC”) and their response is documented in correspondence dated April 25, 2014. The PHMC has determined that the Project will not affect any archaeological sites or historic buildings, structures, districts, or objects. A copy of the PHMC clearance letter is provided as Figure 3-2.

No unique geological, scenic or designated natural areas were identified within 1 mile of the Project. The Project will not affect any recreational areas or natural landmarks.

PPL Electric has retained a consultant to identify and delineate all wetlands and watercourses within the Project area. Although there are seven wetlands and four streams located at or near the site selected for the proposed Lausehtown Substation, none of these natural features will be impacted by the construction of the 230 kV connecting lines. PPL Electric will obtain all permits required by the U.S. Army Corps of Engineers (“USACE”) and the Pennsylvania Department of Environmental Protection (“PADEP”) and will fully comply with any conditions on those permits. Further, prior to construction of the Project, PPL Electric will acquire any required wetland/stream and soil erosion and sedimentation control permits and will comply with any required conditions placed on those permits.

PPL Electric conducted an online Pennsylvania Natural Diversity Inventory (“PNDI”) review on February 6, 2014<sup>1</sup>. Lancaster County is located within the known range of the bog turtle (*Clemmys muhlenbergii*). Therefore, PPL Electric retained a U.S. Fish and Wildlife Service (“USFWS”)-qualified bog turtle surveyor to conduct Phase I bog turtle surveys. None of the delineated wetlands were found to contain potential bog turtle habitat. The USFWS concurred with these findings, and provided a clearance letter dated July 28, 2014<sup>2</sup>. The Pennsylvania Fish and Boat Commission (“PFBC”), the Pennsylvania Department of Conservation and Natural Resources (“DCNR”), and the Pennsylvania Game Commission (“PGC”) reported that the Project is not expected to impact any threatened and endangered species or special concern species and resources located within the Project area.

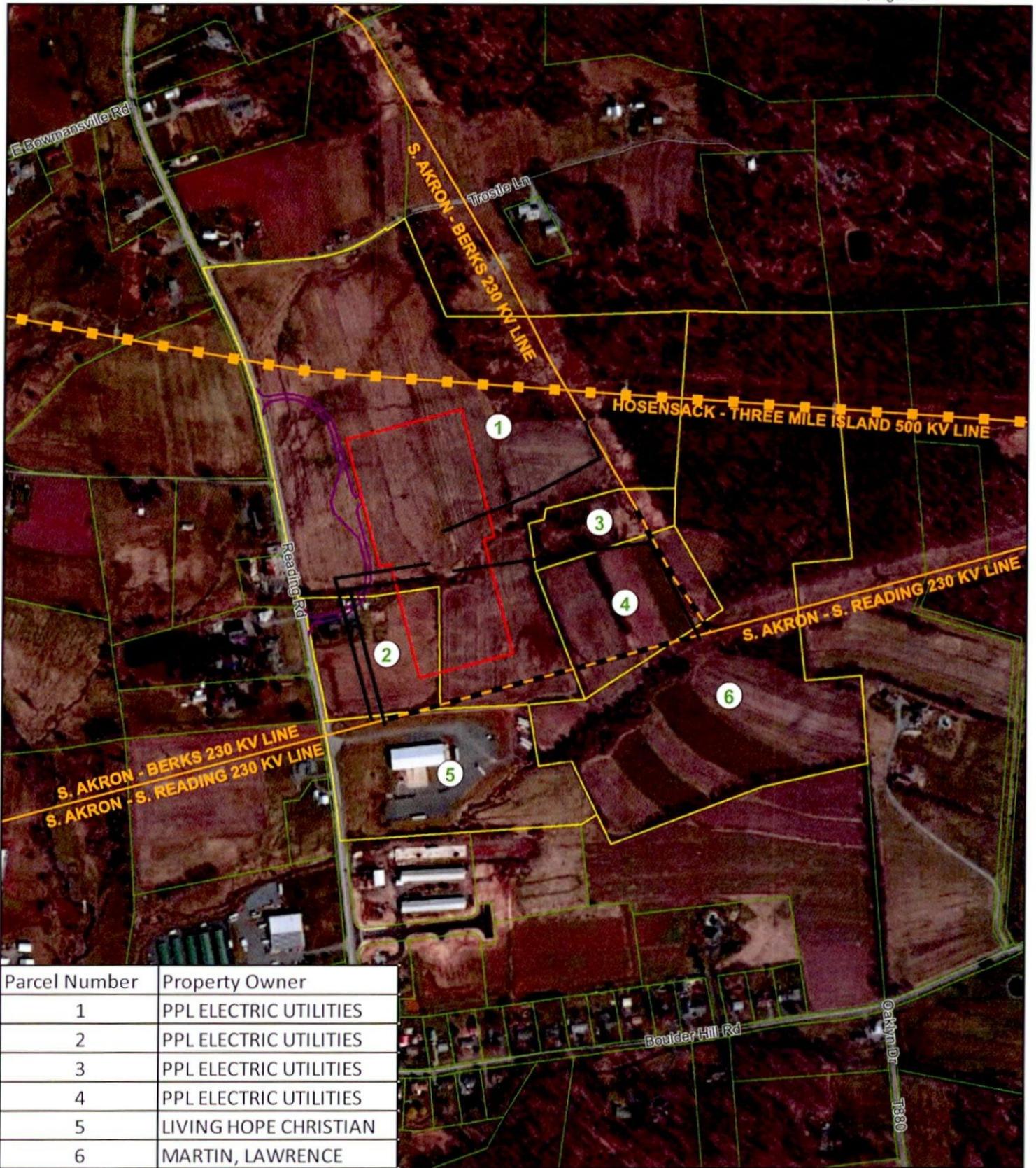
#### **D. VEGETATION MANAGEMENT**

The Project is being completed in an area that previously has been cleared of vegetation. Minimal vegetation clearing may be necessary to construct the 230 kV connecting lines. In areas where vegetation management is required to construct and maintain the Project, PPL Electric will apply its “Specifications for Initial Clearing and Control of Vegetation On or Adjacent to Electric Line Right-of-Way Through Use of Herbicides, Mechanical and Hand Clearing Techniques” to minimize any potential impacts.

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<sup>1</sup> PNDI Receipt No. 20121025377775

<sup>2</sup> USFWS Project No. 2014-0854



Parcel Number	Property Owner
1	PPL ELECTRIC UTILITIES
2	PPL ELECTRIC UTILITIES
3	PPL ELECTRIC UTILITIES
4	PPL ELECTRIC UTILITIES
5	LIVING HOPE CHRISTIAN
6	MARTIN, LAWRENCE

**Legend**

- Proposed 230 kV Lines
- Conductor Removal
- Proposed Fenceline
- Proposed Access Roads

**Existing Transmission**

- 500 kV
- 230 kV
- Parcels within Project Area
- Parcel Boundary

**Lauschtown 230 kV  
Connecting Lines Project  
Figure 3-1. Aerial Map**

0      500      1,000  
Feet

Sources: Pennsylvania Spatial Data Access (PASDA),  
Environmental Systems Research Institute (ESRI),  
United States Geological Survey (USGS)

Projected Coordinate System: PA State Plane, South  
Datum: North American Datum of 1983 (NAD83)  
Projection: Lambert Conformal Conic  
Linear Unit: Feet  
Ellipsoid: Geodetic Reference System 80





Commonwealth of Pennsylvania  
Pennsylvania Historical and Museum Commission **Attachment 3, Figure 3-2**  
Bureau for Historic Preservation  
Commonwealth Keystone Building, 2nd Floor  
400 North Street  
Harrisburg, PA 17120-0093  
www.phmc.state.pa.us

April 25, 2014

John H. Finkeldie, PE  
Burns & McDonnell  
100 Eagle Rock Avenue, Suite 303  
East Hanover, NJ 07936-3149

NO EXPENSES INCURRED  
BHP REFERENCE 10/1/08

Re: File No. ER 2014-1087-071-A  
COE Joint Permit Application: PPL  
Electric Utilities Corp., Lauschtown  
500/230 kV 230/69 kV Substation  
Construction, Brecknock Twp.  
Lancaster Co.

Dear Mr. Finkeldie:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

### **Historic Structures**

Your request does not include sufficient information. We are unable to proceed with our review for historic structures until the information on the attached form is provided.

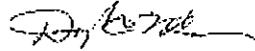
### **Archaeology**

In our opinion no archaeological resources will be affected by this project.

Page 2  
April 25, 2014  
John H. Finkeldie, PE

If you need further information in this matter please consult Cheryl Nagle at (717) 772-4519.

Sincerely,



Douglas C. McLearn, Chief  
Division of Archaeology &  
Protection

cc: PPL Electric Utilities Corp., Two North Ninth Street (GENN3),  
Allentown, PA 18101-1179  
COE, Baltimore District  
DEP, Southcentral Regional Office

Attachment  
DCM/tmw

PENNSYLVANIA HISTORICAL AND MUSEUM COMMISSION  
BUREAU FOR HISTORIC PRESERVATION

[www.phmc.state.pa.us/bhp](http://www.phmc.state.pa.us/bhp)

ADDITIONAL INFORMATION REQUEST SHEET

(Revised March 2012)

Please submit checked items for PHMC-BHP to proceed with project review.

A. FUNDING/PERMITTING/LICENSING/APPROVAL PROGRAM

1. Identify the Federal/State Agency and funding program or permit/license

B. PROJECT DESCRIPTION

1. Narrative description of the project and related actions resulting from the project
2. Proposed boundary of the project's Area of Potential Effect (APE). Provide Justification of APE. Remember to consider visual impacts
3. Architectural plans of existing conditions (as-built or as-found)
4. Preliminary architectural drawings or plans (floor plans, elevations, specifications)
5. Work write-ups
6. Site plans of existing conditions
7. Site plans of proposed development
8. For linear project: highlight any portion of the alignment that is located outside of current road/railroad or buried utility Right-of-Way (ROW)

C. PROJECT LOCATION

1. U.S.G.S 7.5 min. series quadrangle with the PROJECT LOCATION(S) AND LIMITS CLEARLY MARKED using a colored pen. Please include the name of the quadrangle. Map must include nearest place name.
2. Street map (for properties in densely populated areas)
3. Street map showing location and historic district boundaries (if appropriate)
4. Street address of property
5. Municipality in which project is located (not mailing address location)

D. PROJECT SIZE (supply as appropriate for project)

1. Acreage of project area
2. Miles/feet of project area and Right-of-Way (ROW) width
3. Extent and nature of ground disturbing activities (i.e. grading, trenching, foundation excavation)

E. PHOTOGRAPHS (No photocopies. Clear, color, high resolution digital images preferred)

1. Exterior of all building(s)/structures in project area
2. Interior of building(s) in project area
3. Interior of building(s) illustrating the proposed work areas/features
4. Buildings, streetscape, setting of features in Area of Potential Effect (APE)
5. Views of project area

F. CULTURAL RESOURCE IDENTIFICATION

1. Pennsylvania Historic Resource Survey Form(s) for all properties 50 years or older within the Area of Potential Effect (APE) (see our website at: [www.phmc.state.pa.us/bhp](http://www.phmc.state.pa.us/bhp), Select "Forms and Guidance")
2. Historical background, context report, information for historic resources identified  
Apply this context, available on our website: \_\_\_\_\_

G. EFFECTS

1. How will the project affect building(s) over 50 years old?
2. National Register listed/eligible property(s) exist in project area. How will the project affect this historic property(ies)?



Commonwealth of Pennsylvania  
Pennsylvania Historical and Museum Commission  
**Bureau for Historic Preservation**  
Commonwealth Keystone Building, 2<sup>nd</sup> Floor  
400 North Street  
Harrisburg, PA 17120-0093  
[www.phmc.state.pa.us](http://www.phmc.state.pa.us)

Attachment 3, Figure 3-2

July 9, 2014

John H. Finkeldie  
Burns & McDonnell  
100 Eagle Rock Avenue, Suite 303  
East Hanover, NJ 07936-3149

RE: BHP ER 2014-1087-071-B COE Joint Permit Application: PPL Electric Utilities Corp., Lauschtown  
500/230 kV 230/69 kV Substation Construction, Brecknock Twp. Lancaster Co. Receipt of HRSF

Dear Mr. Finkeldie:

Thank you for submitting information concerning the above referenced project. The Bureau for Historic Preservation (the State Historic Preservation Office) reviews projects in accordance with state and federal laws. Section 106 of the National Historic Preservation Act of 1966, and the implementing regulations (36 CFR Part 800) of the Advisory Council on Historic Preservation, is the primary federal legislation. The Environmental Rights amendment, Article 1, Section 27 of the Pennsylvania Constitution and the Pennsylvania History Code, 37 Pa. Cons. Stat. Section 500 et seq. (1988) is the primary state legislation. These laws include consideration of the project's potential effects on both historic and archaeological resources.

It is the opinion of the State Historic Preservation Officer that the following property is not eligible for listing in the National Register of Historic Places:

*David A. King Property, Tax Parcel 040-87066-0-0000*

Therefore, based on the available information, there are no National Register eligible or listed historic buildings, structures, districts, and/or objects in the area of this proposed project.

If you have any questions, please contact Cheryl L. Nagle at 717-772-4519 or [chnagle@pa.gov](mailto:chnagle@pa.gov).

Sincerely,

Andrea L. MacDonald  
Chief, Division of Preservation Services

ALM/cln

cc: PPL Electric Utilities Corp. Two North Ninth Street (GENN3) Allentown, PA 18101-1179  
COE, Baltimore District  
DEP, Southcentral Regional Office

# ATTACHMENT 4

**ATTACHMENT 4**  
**LAUSCHTOWN 500 kV AND 230 kV CONNECTING LINES**  
**NECESSITY STATEMENT**

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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 Corp. (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 crossarm 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 is 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.	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	21 Ft.	30 Ft.
Spaces accessible to pedestrians only	17 Ft.	30 Ft.
Railroad tracks	31 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.	32 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	23 Ft.	32 Ft.
Spaces accessible to pedestrians only	19 Ft.	32 Ft.
Railroad tracks	31 Ft.	36 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	28 Ft.	53 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	28 Ft.	53 Ft.
Spaces accessible to pedestrians only	24 Ft.	53 Ft.
Railroad tracks	38 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 safety rules that demonstrate the Company's concern for employee safety:

- Work procedures have been developed to allow work to be performed on energized 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 are 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 workers 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.

**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: 10/23/14

Stephanie Raymond

**CERTIFICATE OF SERVICE**

RECEIVED  
2014 OCT 24 PM 3:28  
PA DEPT OF  
SECRETARY'S BUREAU

I hereby certify that a true and correct copy of the foregoing 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, 2<sup>nd</sup> Floor  
Harrisburg, PA 17120-0053  
Attn: Mr. Douglas C. McLearen, Chief

Pennsylvania Department of Transportation  
Honorable Barry Schoch, P.E., Secretary  
c/o Office of Chief Counsel  
Commonwealth Keystone Building  
400 North Street, 9<sup>th</sup> Floor  
Harrisburg, PA 17120  
Attn: William J. Cressler

Pennsylvania Department  
of Environmental Protection  
P.O. Box 2063  
Market Street State Office Building  
Harrisburg, PA 17105-2063  
Attn: Office of Field Operations

Office of Consumer Advocate  
555 Walnut Street  
Forum Place, 5th Floor  
Harrisburg, PA 17101-1923

Bureau of Investigation & Enforcement  
Commonwealth Keystone Building  
400 North Street, 2nd Floor West  
PO Box 3265  
Harrisburg, PA 17105-3265

Office of Small Business Advocate  
Commerce Building  
300 North Second Street, Suite 202  
Harrisburg, PA 17101

Lancaster County Board of Commissioners  
Lancaster County Government Center  
150 North Queen Street  
7th Floor, Suite 715  
Lancaster, PA 17603  
Attn: Dennis P. Stuckey, Chairman

Lancaster County Planning Commission  
150 North Queen Street, Suite 320  
Lancaster, PA 17603  
Attn: Leo S. Lutz, Chairperson

Brecknock Township Board of Supervisors  
1026 Dry Tavern Rd. (Rt. 897)  
Denver, PA 17517  
Attn: D. Garth Wise, Chairman

Brecknock Township Planning Commission  
1026 Dry Tavern Rd. (Rt. 897)  
Denver, PA 17517  
Attn: Harry Lehman, Chairman

Lawrence Martin  
1490 Reading Road  
Mohnton, PA 19540

Living Hope Christian Fellowship Church  
103 Springhead Road  
Gap, PA 17527

Date: October 24, 2014

  
\_\_\_\_\_  
Christopher T. Wright