



17 North Second Street  
12th Floor  
Harrisburg, PA 17101-1601  
717-731-1970 Main  
717-731-1985 Main Fax  
www.postschell.com

Christopher T. Wright

cwright@postschell.com  
717-612-6013 Direct  
717-731-1985 Direct Fax  
File #: 166593

January 6, 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 Rebuild Approximately 10.6 miles of the Blooming Grove - Honesdale 138/69 kV Line in Pike and Wayne Counties, Pennsylvania - Docket No. A-2016-**

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 May 2018.

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  
January 6, 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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**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-2016-\_\_\_\_\_  
for Approval to Rebuild Approximately :  
10.6 miles of the Blooming Grove – :  
Honesdale 138/69 kV Line in Pike and :  
Wayne Counties, Pennsylvania :

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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 rebuild approximately 10.6 miles of the existing Blooming Grove – Honesdale 138/69 kV Line (the “Project”). As explained below, the existing Blooming Grove – Honesdale 138/69 kV Line has exceeded its useful life and must be rebuilt in order to continue to provide reliable service into the future. The entire Project is located within the existing rights-of-way. The proposed Project is located in the City of Blooming Grove, Blooming Grove Township, and Palmyra Township in Pike County, and Palmyra Township in Wayne County. 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 April 2017 to support the in-service date of May 2018. 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](mailto:kklock@pplweb.com)

David B. MacGregor (I.D. # 28804)  
Christopher T. Wright (I.D. # 203412)  
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](mailto:dmacgregor@postschell.com)  
E-mail: [cwright@postschell.com](mailto:cwright@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 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 417 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's 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. EXISTING SYSTEM**

8. The existing Blooming Grove – Honesdale Line extends approximately 10.6 miles from the Blooming Grove Substation located in in the City of Blooming Grove, Pike County, Pennsylvania to the Paupack-Honesdale Line located in Wayne County, Pennsylvania.

9. From the Blooming Grove Substation, the Blooming Grove – Honesdale Line extends approximately 6.4 miles to the Wallenpaupack Tap. This segment of the line currently is operated as a double-circuit 69 kV line.

10. From the Wallenpaupack Tap, the Blooming Grove – Honesdale Line extends approximately 2.7 miles to the Hawley Tap. This segment of the line currently is operated as a single-circuit 69 kV line.

11. From the Hawley Tap, the Blooming Grove – Honesdale Line extends approximately 1.5 miles to the start of the Paupack – Honesdale Line. This segment of the line is currently operated as a single-circuit 69 kV line.

12. The existing Blooming Grove – Honesdale Line consists of 181 outdated guyed and un-guyed wood and steel poles with an average height of 80 feet.

13. The existing Blooming Grove – Honesdale Line currently uses 556 kcmil<sup>1</sup> 24/7 aluminum-conductor steel-reinforced (“ACSR”) conductors.

14. These lines are described in Attachment 1 to this Letter of Notification. A map and one-line diagram of the existing system are provided in the Necessity Statement included as Attachment 1 to this Letter of Notification.

**B. NEED FOR THE PROJECT**

15. The Blooming Grove – Honesdale Line has been in service since 1973. The existing conductors and wood monopole structures do not meet current design or height standards.

16. PPL Electric has analyzed the Blooming Grove – Honesdale Line. Based on this analysis, PPL Electric concluded that the conductors, hardware, splices, and tower structures of the existing Blooming Grove – Honesdale Line have reached the end of their useful lives and should be rehabilitated or replaced in order to continue to provide safe and reliable service to the approximately 9,200 customers served from the Hawley and Honesdale Substations.

17. The need for this Project is further explained in Attachment 1 to this Letter of Notification.

**C. THE PROPOSED PROJECT**

18. PPL Electric determined that the total cost to rehabilitate the Blooming Grove – Honesdale Line would be greater than the cost to rebuild the line in place. Therefore, rebuilding

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<sup>1</sup> A kcmil is a thousand circular mils. A circular mil is the cross-sectional area of a wire one mil in diameter, where 1 kcmil = 0.5067 mm<sup>2</sup>.

the existing Blooming Grove – Honesdale Line was identified as the most prudent and effective option.

19. PPL Electric proposes to rebuild 6.4 miles of the Blooming Grove – Honesdale Line from the Blooming Grove Substation to the Wallenpaupack Tap as a double-circuit 138/69 kV line, and the remaining 4.2 miles is proposed to be rebuilt as a single-circuit 138/69 kV line. The rebuilt Blooming Grove – Honesdale Line will initially operate as a 69 kV line until the load growth in the area makes it appropriate to increase the operating voltage.

20. The entire Project will be located within the existing right-of-way for the Blooming Grove – Honesdale Line, which is adjacent and parallel to the right-of-way corridor for the existing Susquehanna-Roseland 500 kV Transmission Line. A map and of the Blooming Grove – Honesdale Line right-of-way is provided in Figure 1-1 to Attachment 1 and Figure 3-1 to Attachment 3.

21. The existing Blooming Grove – Honesdale Line currently has a total of 181 structures. These structures will be removed and replaced with 126 new structures. The new structures will be located generally within the same vicinity as the existing tower structures. However, certain structures will be relocated in order to avoid constructability issues and environmental constraints, such as rocky outcrops, streams and wetlands. The new structure locations will provide greater flexibility to optimize span lengths and reduce the total number of structures. No new poles will be placed on any property that currently does not have an existing pole.

22. The existing, outdated structures range in height from 55 to 110 feet, with an average height of 80 feet. The existing transmission structures will be replaced with self-weathering steel monopoles that will range between 60 and 115 feet in height, with an average

height of approximately 90 feet. All new poles will be self-supported, either direct embedded or on concrete caisson foundations.

23. Depictions of the type of monopoles used for this Project are provided in Attachment 2 to this Letter of Notification.

24. The rebuilt 138/69 kV design will utilize three power conductors per circuit and two overhead ground wires. The power conductors will be 556.5 kcmil<sup>2</sup> 24/7 stranding ACSR<sup>3</sup> conductors. The overhead ground wires will be 0.567-inch diameter optical ground wires. A detailed engineering description is provided in Attachment 2 to this Letter of Notification.

25. The proposed rebuild of the Blooming Grove – Honesdale Line will bring the line into compliance with current design standards. The rebuild of the transmission line will also increase the lightning protection of the line and reduce the frequency of momentary outages experienced by customers.

26. The total estimated cost of the proposed Project is \$18.5 million.<sup>4</sup>

27. Upon Commission approval, the Project has a scheduled construction start date of April 2017 to support the in-service date of May 2018.

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

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

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<sup>2</sup> The term “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 (0.001) of an inch.

<sup>3</sup> “ACSR” stands for aluminum conductor steel reinforced.

<sup>4</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 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.

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

30. The closest airport is the Cherry Ridge Airport, which is located approximately 2.4 miles north of the Project area. 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. However, PPL Electric will file all required documentation with the Federal Aviation Administration and the Pennsylvania Department of Transportation, Bureau of Aviation.

31. As explained in Attachment 2 to this Letter of Notification, PPL Electric’s Magnetic Field Management Program has been developed to reduce magnetic fields on new and rebuilt transmission lines when it can be done at low or no cost and consistent with functional requirements. The rebuilt Blooming Grove – Honesdale Line will be designed with clearances that are five feet higher than NESC standards and will be reverse phased. These measures will reduce the potential for exposure to magnetic fields.

**IV. DESCRIPTION OF RIGHT-OF-WAY**

32. As explained above, PPL Electric proposes to rebuild approximately 10.6 miles of the existing Blooming Grove – Honesdale Line in order to ensure it continue to provide reliable service into the future.

33. The entire Project will be rebuilt within the existing right-of-way, which is adjacent to and parallels the right-of-way corridor for the existing Susquehanna-Roseland 500 kV Transmission Line.

34. As explained in Attachment 3, the existing right-of-way generally varies from 100 to 200 feet in width. PPL Electric has designed the rebuilt Blooming Grove – Honesdale Line to fit within the existing rights-of-way and to meet NESC standards.

35. The existing rights-of-way are sufficient to accommodate the construction, operation, and maintenance of the rebuilt Blooming Grove – Honesdale Line. Therefore, no additional rights-of-way are required for the construction and operation of these new transmission lines.

36. As explained above, new structures will be located generally within the same vicinity as the existing tower structures. However, certain structures will be relocated in order to avoid constructability issues and environmental constraints, optimize span lengths, and reduce the total number of structures. In areas where pole locations will be shifted significantly from the present location, PPL Electric met with and advised the affected landowners of the change in pole location. No new poles will be placed on any property that currently does not have an existing pole.

37. An aerial plot plan, including the location of the existing and proposed structures, is provided in Figure 3-1 of Attachment 3 to this Letter of Notification.

38. Land use impacts are anticipated to be minimal due to the fact that the Project will be constructed entirely within the existing rights-of-way and in close proximity to existing transmission facilities. Where practical, PPL Electric will use previously established access roads for construction to further reduce interference with existing land uses.

39. 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.

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

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

42. The Project will traverse approximately 1.6 miles of State Game Lands. However, the Project is not anticipated to have any adverse effect on the land use, or recreational usage of the State Game Lands due to location of the Project within the existing right-of-way.

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

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

45. The Project is located within one mile of four listed and five eligible cultural and archaeological resources. PPL Electric will coordinate with the Pennsylvania Historical and Museum Commission ("PHMC") to ensure that the Project will have no adverse impacts to cultural and archaeological resources.

46. The proposed Project will span ten streams. The rebuilt transmission lines will span these streams, which will minimize any impacts.

47. The Project will span forty-seven wetland sites. It is anticipated the Project will have no impacts on streams or wetlands because the entire Project will be built within the existing right-of-way, and because the new tower structures will be located to avoid impacts to wetland and streams. PPL Electric will obtain all necessary permits from the United States Army Corps of Engineers ("USACE") or the Pennsylvania Department of Environmental

Protection ("PADEP"), and will comply with all of the terms and conditions placed on any permits required.

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

49. PPL Electric completed a Pennsylvania Natural Diversity Inventory records review. Based on this review, the Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Fish and Boat Commission, and the U.S. Fish and Wildlife Service reported that the Project will not impact any threatened and endangered species, or special concern species and resources located within the Project area as explained in Attachment 3.

50. The Pennsylvania Game Commission identified the potential for ospreys, a threatened species. Although no osprey nests were observed during the wetland delineation, PPL Electric will coordinate with the Pennsylvania Game Commission to mitigate potential impacts on this identified species.

51. PPL Electric will obtain all necessary permits from these state and federal agencies, and will comply with all of the terms and conditions placed on any permits required.

## **V. NOTICE**

52. PPL Electric has provided information regarding the Project to representatives of City of Blooming Grove, Blooming Grove Township, Palmyra Township, Pike County, and Wayne County. These entities have not objected to the proposed Project.

53. 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).

54. 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**

55. 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) (v).

56. As explained above, PPL Electric herein seeks Commission approval to rebuild approximately 10.6 miles of the existing Blooming Grove – Honesdale Line entirely within the existing right-of-way. PPL Electric submits that this proposed Project qualifies for use of a Letter of Notification because the project will not substantially alter the right-of-way.

57. 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.*

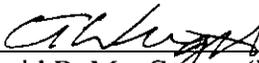
**VII. CONCLUSION**

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that the Pennsylvania Public Utility Commission approve the rebuild of approximately 10.6 miles of the existing Blooming Grove – Honesdale Line in Pike and Wayne Counties, Pennsylvania, as explained above and in the Attachments hereto.

Respectfully submitted,

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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](mailto:kklock@pplweb.com)



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David B. MacGregor (I.D. # 28804)  
Christopher T. Wright (I.D. # 203412)  
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](mailto:dmacgregor@postschell.com)  
E-mail: [cwright@postschell.com](mailto:cwright@postschell.com)

Date: January 6, 2017

Attorneys for PPL Electric Utilities Corporation

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**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: 1/3/17

Stephanie Raymond

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Before the  
Pennsylvania Public Utility Commission

**BLOOMING GROVE – HONESDALE  
138/69 kV TAP LINE  
REBUILD PROJECT**

ATTACHMENTS IN SUPPORT OF THE  
**Letter of Notification**

Application Docket No. \_\_\_\_\_

Submitted by: PPL Electric Utilities Corporation



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**ATTACHMENT 1**  
**BLOOMING GROVE - HONESDALE 138/69 KV LINE**  
**REBUILD PROJECT**  
**NECESSITY STATEMENT**

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PA PUBLIC UTILITY COMMISSION  
SECRETARY'S BUREAU

**A. INTRODUCTION**

PPL Electric Utilities Corporation ("PPL Electric") is requesting Pennsylvania Public Utility Commission ("PUC" or the "Commission") approval to rebuild approximately 10.6 miles of the Blooming Grove - Honesdale Line in order to improve electric reliability in the region (the "Project"). As explained below, the existing Blooming Grove - Honesdale Line has reached an age and condition that the facilities must be replaced in order to provide safe and reliable service into the future. The Project is part of PPL Electric's Asset Optimization Strategy, and involves rebuilding the lines to meet all current design and lightning protection standards. The modernization of the line will help ensure reasonably continuous and reliable service to customers in the area.

The rebuilt Blooming Grove - Honesdale Line will be located in Wayne and Pike Counties, Pennsylvania. The estimated cost to design and construct the Project is approximately \$18.5 million. Subject to the Commission's approval, the Project has a scheduled construction start date of April 2017 to meet an in-service date of May 2018.

**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 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")<sup>1</sup> and non-Bulk Electric System ("non-BES")<sup>2</sup> 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")<sup>3</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.

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<sup>1</sup> BES - Includes transmission facilities operated at voltages of 100 kV or higher.

<sup>2</sup> Non-BES - Includes transmission facilities operated at voltages less than 100 kV.

<sup>3</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.

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 14B<sup>4</sup> 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 1000<sup>5</sup> to identify the optimal solution to resolve the criteria violation.

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 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

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<sup>4</sup> PJM Manual 14B is available at <http://www.pjm.com/~media/documents/manuals/m14b.ashx>.

<sup>5</sup> <http://www.ferc.gov/industries/electric/indus-act/trans-plan.asp>

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.

PPL Electric's Transmission Owner criteria addresses thermal, voltage, short circuit, and stability limits specific to the PPL Electric zone and also ensures compliance with NERC and PJM reliability criteria. These criteria ensure adequate and appropriate levels of electric service to PPL Electric customers in accordance with good utility practices. In addition to these criteria, PPL Electric plans the system according to its own Transmission System Development Standards.

In addition to NERC, PJM, and Transmission Owner criteria-based projects, PPL Electric also initiates projects based on the Transmission System Development Standards. These projects address local load growth, provide load restoration flexibility, and replace poor performing transmission assets in order to provide an advanced level of reliability on the local system.

PPL Electric has developed an Asset Optimization Strategy that is incorporated into the Transmission System Development Standards. A significant portion of the system infrastructure is either approaching the end of or has exceeded its expected or useful life. The Asset Optimization Strategy was developed to systematically identify and modernize these aging facilities. The measures used to identify and prioritize the equipment and lines that qualify for this work include, but are not limited to, age, condition, operational issues, maintainability of the equipment, criticality of the equipment or line, line loading, and circuit performance. Once equipment has been identified and assessed under the above measures, it will be put into the Capital Budget for replacement under the Asset Optimization Strategy.

Projects created to support PPL Electric's Transmission System Development Standards are presented to PJM stakeholders at either a Transmission Expansion Advisory Committee ("TEAC") or Sub-Regional RTEP meeting and are assigned a Supplemental project number in the RTEP. PJM incorporates these projects into the

power flow model, which they use to perform various reliability analyses for the RTEP.

As explained below, the proposed Project is necessary to address the asset health according to PPL Electric Transmission System Development Standards. The proposed Project has been presented at a PJM Mid-Atlantic Sub-Regional RTEP stakeholder meeting and has been approved as supplemental project s0957.2 in PJM's RTEP.

**C. EXISTING SYSTEM**

The existing Blooming Grove - Honesdale Line extends approximately 10.6 miles from the Blooming Grove Substation located in in the City of Blooming Grove, Pike County, Pennsylvania to the Paupack - Honesdale Line located in Wayne County, Pennsylvania. The Blooming Grove - Honesdale Line serves the Hawley Substation, which currently supplies approximately 7,150 customers, and the Honesdale Substation, which currently supplies approximately 2,099 customers.

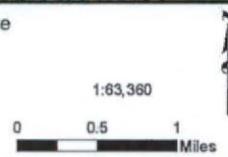
From the Blooming Grove Substation, the Blooming Grove - Honesdale Line extends approximately 6.4 miles to the Wallenpaupack Tap. This segment of the line currently is operated as a double-circuit 69 kV line occupied by the Blooming Grove - Honesdale and Blooming Grove - West Damascus 69 kV circuits. From the Wallenpaupack Tap, the Blooming Grove - Honesdale Line extends approximately 2.7 miles to the Hawley Tap. This segment of the line is currently operated as a single-circuit 69 kV line occupied by the Blooming Grove - Honesdale 69-kV circuit. From the Hawley Tap, the Blooming Grove - Honesdale Line extends approximately 1.5 miles to the Paupack - Honesdale Line. This segment of the line is currently operated as a single-circuit 69 kV line occupied by the Blooming Grove - Honesdale 69-kV circuit.

The existing Blooming Grove - Honesdale Line parallels the Susquehanna - Roseland 500-kV Transmission Line from the Blooming Grove Substation to the Honesdale.

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



- Blooming Grove D1 Route
- Proposed Structures



**Figure 1-1**  
**PPL Blooming Grove D1 Project**  
**- Topographic Map**

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**E. PROPOSED SOLUTION**

PPL Electric evaluated the cost to rehabilitate the Blooming Grove - Honesdale Line, and concluded that the total cost to rehabilitate the line would be greater than the cost to rebuild the line. Therefore, rebuilding the existing 10.6-mile Blooming Grove - Honesdale Line was identified as the most prudent option.

As explained above, the Blooming Grove - Honesdale Line extends approximately 6.4 miles from the Blooming Grove Substation to the Wallenpaupack Tap as a double-circuit 69 kV line. From the Wallenpaupack Tap, the Blooming Grove - Honesdale Line extends approximately 2.7 miles to the Hawley Tap as a single-circuit 69 kV line. From the Hawley Tap, the Blooming Grove - Honesdale Line extends approximately 1.5 miles to the Paupack - Honesdale Line as a single-circuit 69 kV line. PPL Electric proposes to rebuild 6.4 miles of the Blooming Grove - Honesdale Line from the Blooming Grove Substation to the Wallenpaupack Tap as a double-circuit 138/69 kV line, and the remaining 4.2 miles is proposed to be rebuilt as a single-circuit 138/69 kV line. The rebuilt Blooming Grove - Honesdale Line will initially operate as a single-circuit and double-circuit 69 kV line until the load growth in the area makes it appropriate to install a second circuit on the single-circuit portion of the line or increase the operating voltage.

The proposed rebuild of the Blooming Grove - Honesdale Line will bring the line into compliance with current design standards. This would include an increased vertical ground clearance, increased phase spacing for galloping loop consideration, and installation of steel monopole structures for optimal structure longevity. The rebuild of the transmission line will also increase the lightning protection of the line and reduce the frequency of momentary outages experienced by customers through an increased Critical Impulse Flash Over ("CIFO") level,<sup>7</sup> installation of dual optical ground wire ("OPGW") shielding cables, and decreased footing impedances.

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<sup>7</sup> CIFO is a measure of the insulation level of a line as it relates to the protection level of an insulator to the impulse voltage across an insulator during a lightning strike.

The configuration of the rebuilt Blooming Grove – Honesdale Line will use higher ampacity conductors. After completion of this "Project," the customers served from these lines will experience improved service reliability. The higher line capacity will allow for increased transfer capabilities, contributing to the higher level of reliability for the customers served from these lines.

For all of the foregoing reasons, this Project is necessary to enable PPL Electric to continue to provide reliable service now and into the future and, therefore, PPL Electric requests approval of the Commission to complete this "Project."

**ATTACHMENT 2**  
**BLOOMING GROVE -HONESDALE 138/69 kV LINE REBUILD PROJECT**  
**ENGINEERING DESCRIPTION**

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**A. INTRODUCTION**

As explained in Attachment 1, PPL Electric Utilities Corporation ("PPL Electric") proposes to rebuild approximately 10.6 miles of the existing the Blooming Grove - HonesdaleHonesdale Line in order to improve electric reliability in the region (the "Project"). The existing the Blooming Grove - Honesdale Line has reached an age and condition that the facilities must be replaced in order to provide safe and reliable service into the future. The Project will help ensure reasonably continuous and reliable service to customers in the area.

**B. DESCRIPTION OF THE PROPOSED LINES**

As explained in Attachment 1, the Blooming Grove - Honesdale Line extends approximately 6.4 miles from the Blooming Grove Substation to the Wallenpaupack Tap as a double-circuit 69 kilovolt ("kV") line. From the Wallenpaupack Tap, the Blooming Grove - Honesdale Line extends approximately 2.7 miles to the Hawley Tap as a single-circuit 69 kV line. From the Hawley Tap, the Blooming Grove - Honesdale Line extends approximately 1.5 miles to the Paupack - Honesdale Line as a single-circuit 69 kV line. PPL Electric proposes to rebuild 6.4 miles of the Blooming Grove - Honesdale Line from the Blooming Grove Substation to the Wallenpaupack Tap as a double-circuit 138/69 kV line, and the remaining 4.2 miles is proposed to be rebuilt as a single-circuit 138/69 kV line. The rebuilt Blooming Grove - Honesdale Line will initially operate as a single-circuit and double-circuit 69 kV line until the load growth in the area makes it appropriate to install a second circuit on the single-circuit portion of the line or increase the operating voltage.

PPL Electric proposes to rebuild the Blooming Grove - Honesdale Line within the existing right-of-way, which varies in width from 100 to 200 feet. The rebuilt Blooming Grove - Honesdale line will be constructed with new steel monopoles, high capacity conductors, and two optical ground wires.

The existing Blooming Grove - Honesdale Line consists of 181 outdated guyed and un-guyed wood and steel poles with an average height of 80 feet. The existing

structures will be removed and replaced with 126 new self-weathering steel monopoles equipped with steel arms and glass insulator assemblies. The new monopole structures will range in height from 60 to 115 feet in height, with an average height of approximately 90 feet. All new monopoles will be self-supported and either direct embedded or on concrete caisson foundations. Figures 2-1 to 2-8 depict typical structures to be used for the Project.

The new monopole structures will be located generally within the same vicinity as the existing tower structures. No new structures will be placed on property that currently does not have an existing structure. Figure 3-1 of Attachment 3 depicts the locations of existing structures and proposed new structures.

The reconstructed double-circuit Blooming Grove - Honesdale Line will utilize six power conductors and two overhead ground wires. The power conductors will be 556.5-kcmil,<sup>1</sup> 24/7 stranding, aluminum conductor steel reinforced ("ACSR") conductors. The overhead ground wires will be two 0.567-inch-diameter Optical Ground Wires.

Following completion of the Project, the Blooming Grove - Honesdale lines will meet and/or exceed all current PPL Electric and National Electrical Safety Code ("NESC") standards. Design specifications and safety rules practiced by PPL Electric are included in Attachment 4.

The minimum conductor-to-ground clearance will be 30 feet, which occurs at a maximum thermal conductor temperature of 125° Celsius ("°C"). The design minimum conductor clearances and conductor thermal ratings for the reconducted and reconstructed lines are shown in Tables 2-1 and 2-2.

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<sup>1</sup> A kcmil is a thousand circular mils. A circular mil is the cross-sectional area of a wire 1 mil in diameter, where 1 kcmil = 0.5067 square millimeters.



7-008-001  
138kV Double Circuit Steel Pole  
0° to 1° Suspension Structure

Revision: 0  
Effective Date: 3/18/2016  
Sheet 1 of 1

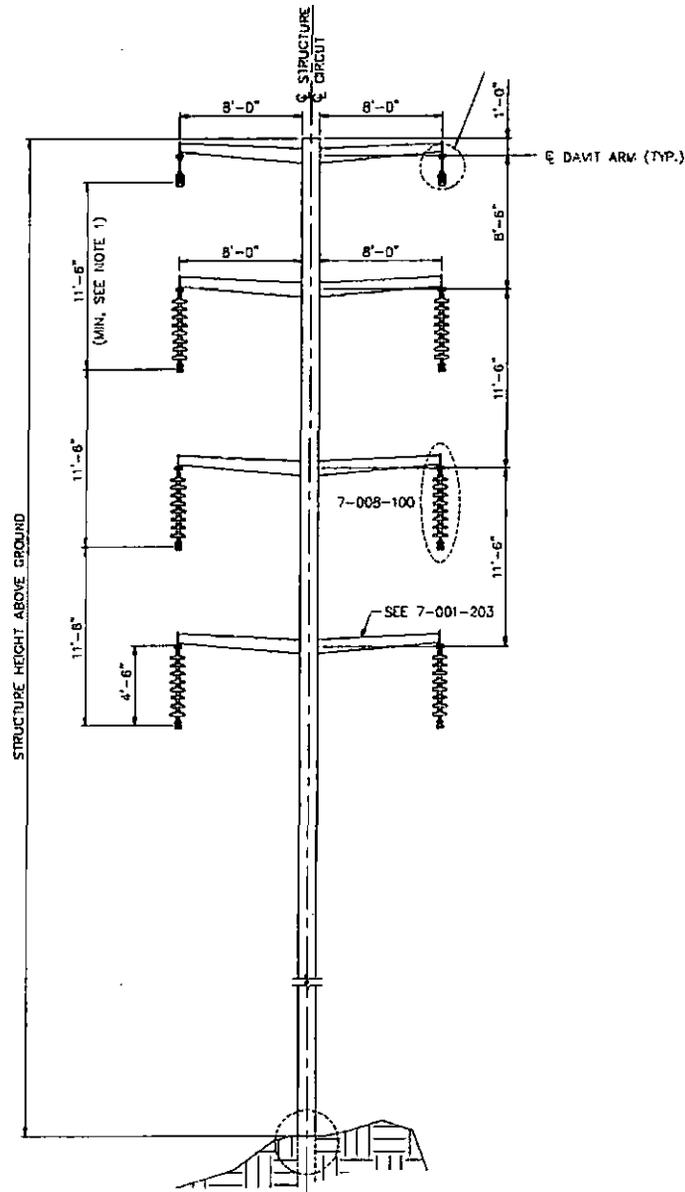


Figure 2-1 - 138 kV Double Circuit Steel Pole 0° to 1° Suspension Structure Diagram



7-008-002  
138kV Double Circuit Steel Pole  
1° to 10° Angle Suspension Structure

Revision: 0  
Effective Date: 3/18/2016  
Sheet 1 of 1

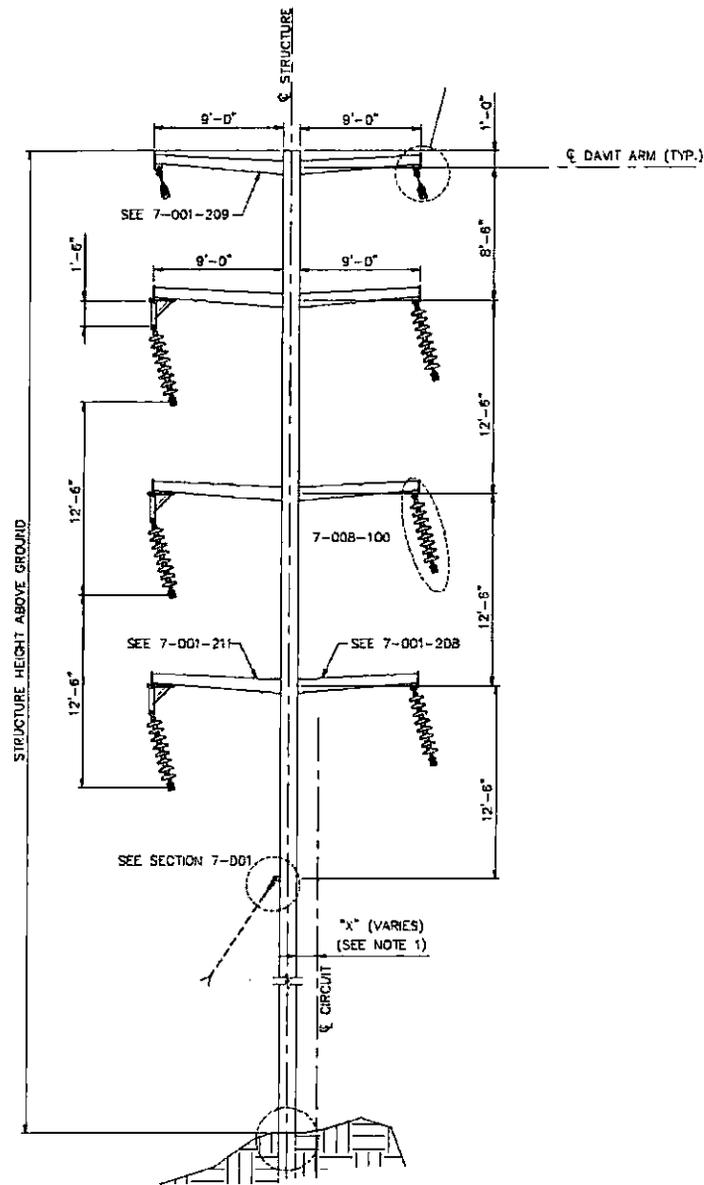


Figure 2-2 - 138 kV Double Circuit Steel Pole 1° to 10° Angle Suspension Structure Diagram

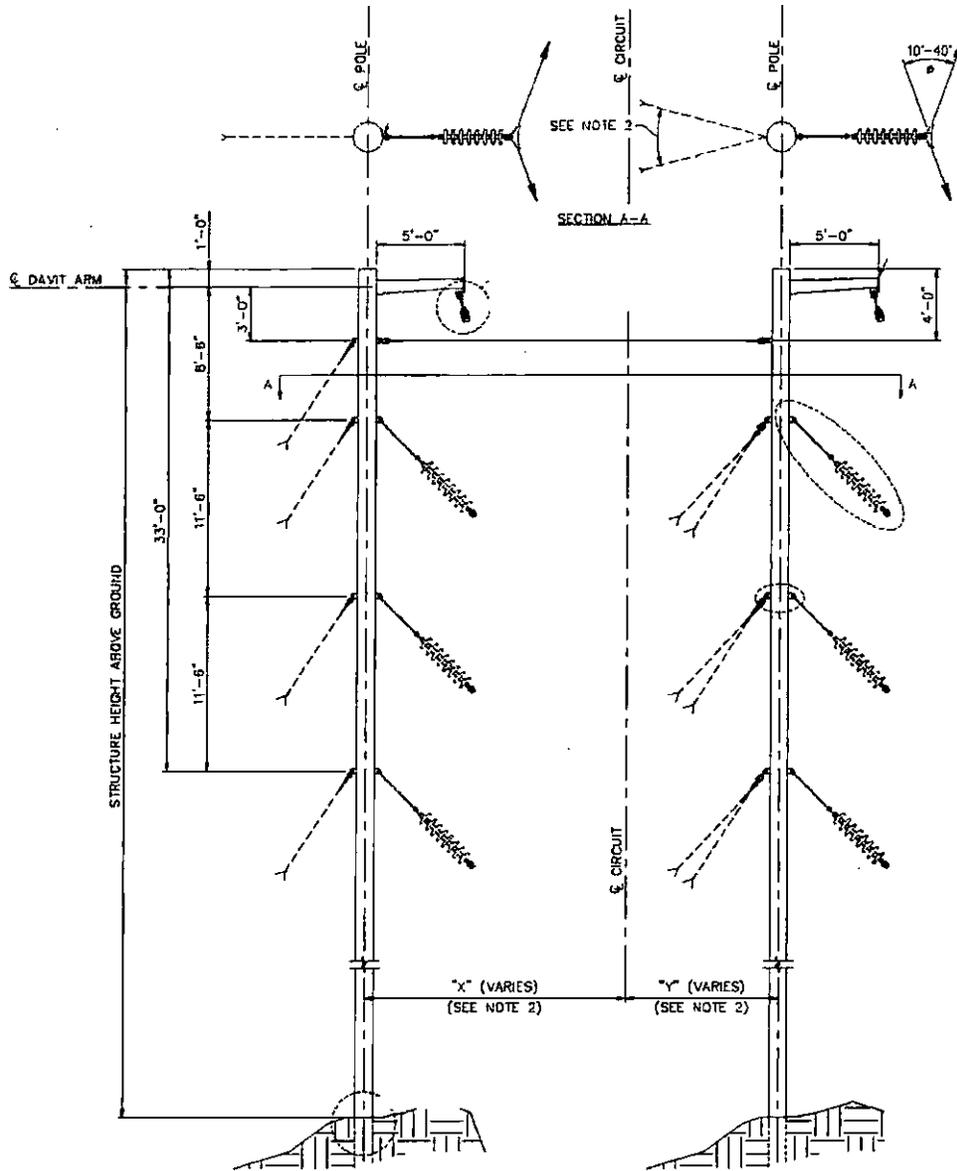


Figure 2-3 – 138 kV Double Circuit Steel Pole 10° to 40° Angle Suspension Structure Diagram

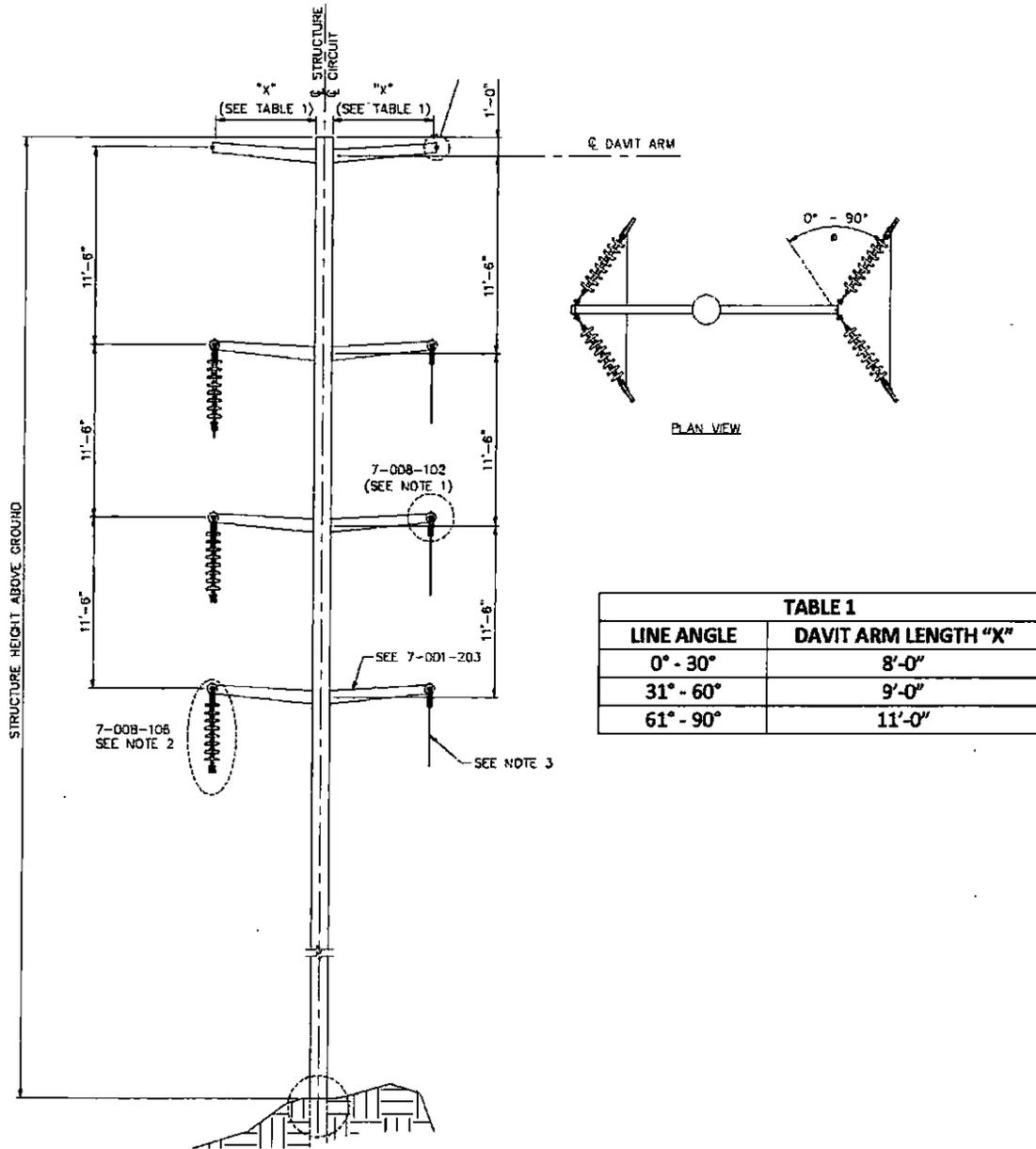


Figure 2-4 – 138 kV Double Circuit Steel Pole 0° to 90° Angle Tension on Arm Structure Diagram

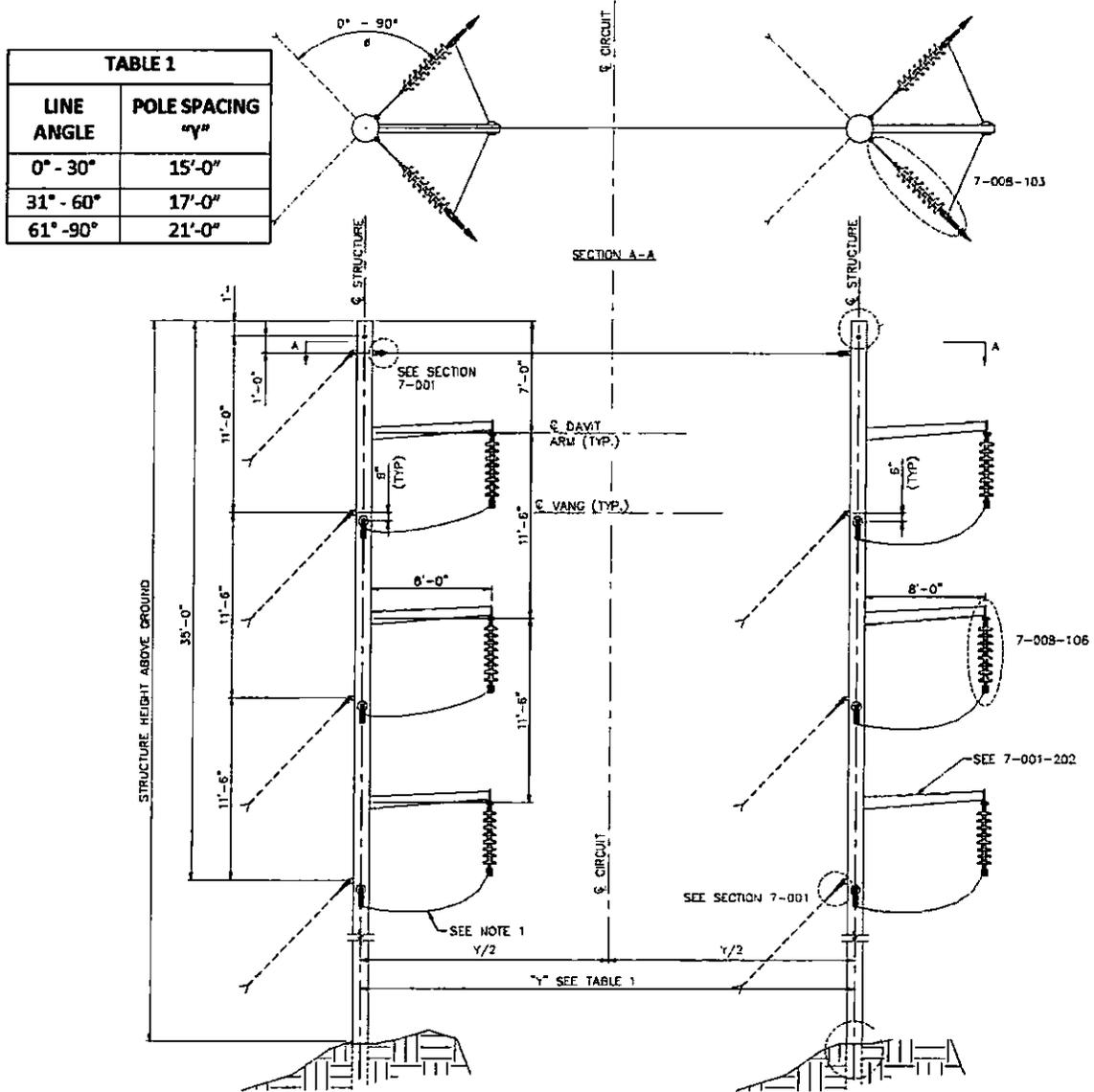


Figure 2-5 - 138 kV Double Circuit Steel Pole 0° to 90° Angle Tension on Pole Structure Diagram



7-008-061  
138kV Long Span Double Circuit Steel Pole  
0° to 1° Suspension Structure

Revision: 0  
Effective Date: 3/18/2016  
Sheet 1 of 1

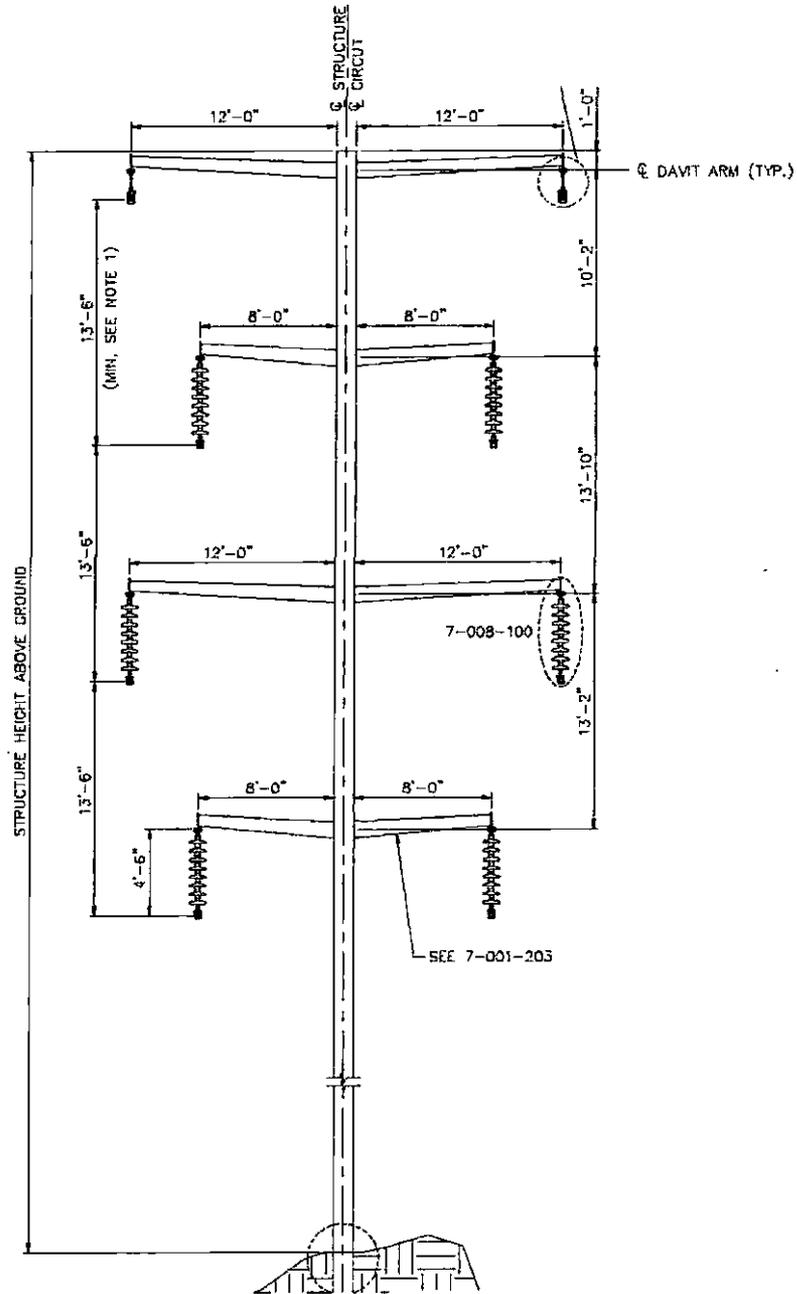


Figure 2-6 - 138 kV Long Span Double Circuit Steel Pole 0° to 1° Suspension Structure Diagram

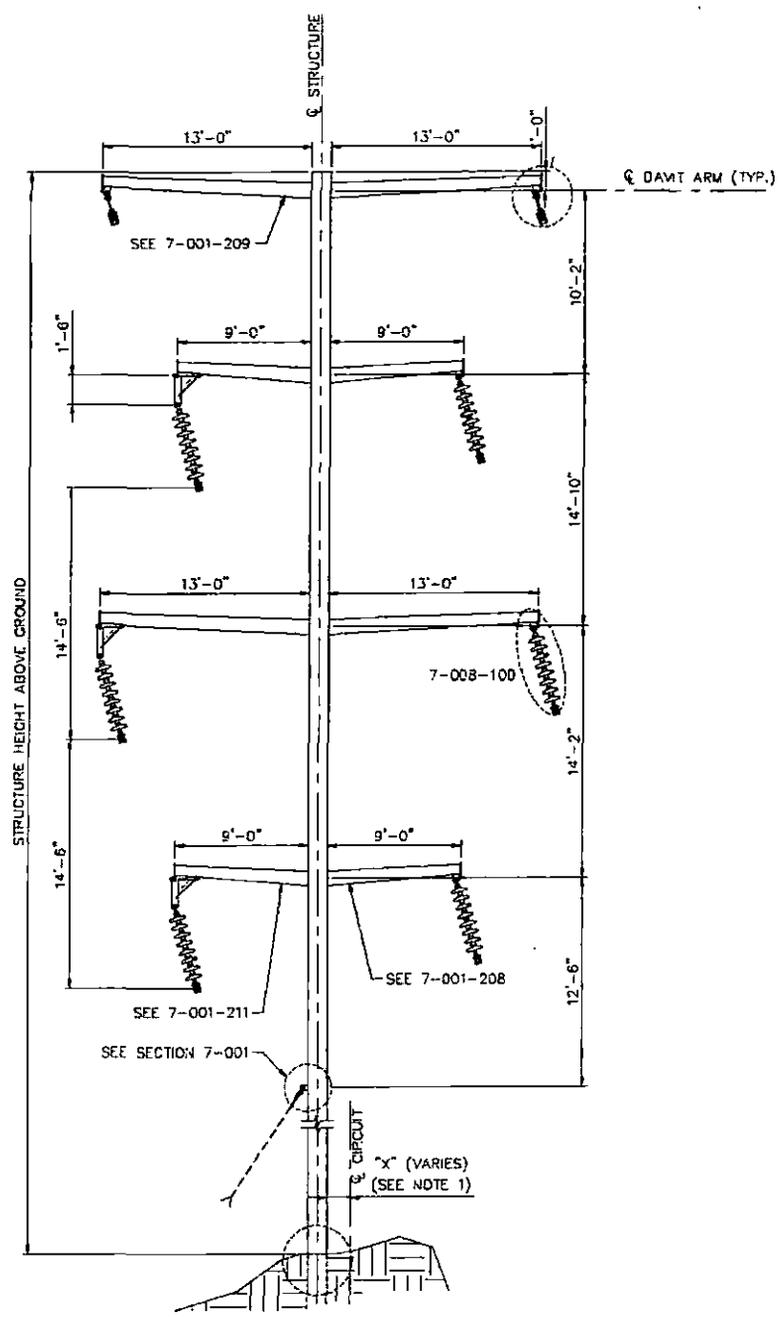


Figure 2-7 - 138 kV Long Span Double Circuit Steel Pole 1° to 10° Angle Suspension Structure Diagram



**7-008-064**  
**138kV Long Span Double Circuit Steel Pole**  
**0° to 90° Angle Tension on Arm Structure**

Revision: 0  
 Effective Date: 3/18/2016  
 Sheet 1 of 1

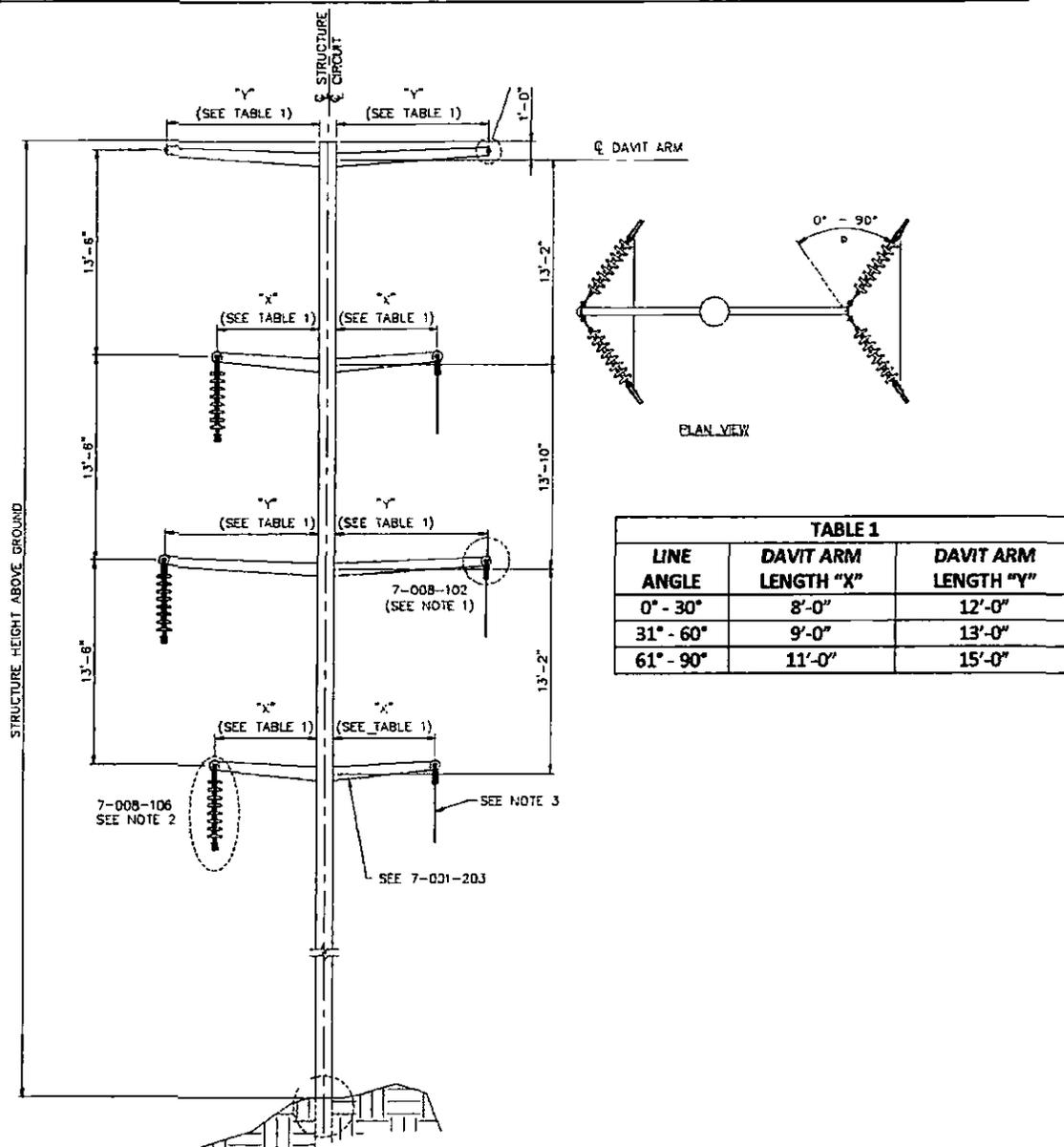


Figure 2-8 – 138 kV Long Span Double Circuit Steel Pole 0° to 90° Angle Tension on Arm Structure Diagram

Table 2-1 - Design for Minimum Conductor Clearances for 556.5-kcmil 24/7 Stranding ACSR <sup>2</sup>	
Conductor	Transmission Double-Circuit Design Clearance-to-Ground
Heavy Ice (1-inch Ice at 0°C ambient temperature)	31 feet
Predicted extreme thermal load (125°C conductor temperature)	31 feet
Predicted blowout (6 pounds, 16°C, ambient temperature)	31 feet

Table 2-2 - Conductor Thermal Rating 556.5-kcmil 24/7 Stranding ACSR 125°C Maximum Conductor			
Condition	Ambient Temperature (°C)	Wind Speed (feet/second)	Ampacity (amps)
Summer Normal	35	0	806/866
Winter Normal	10	0	929/982
Summer Emergency	35	2.5	1054/1101
Winter Emergency	10	2.5	1187/1229

The estimated cost to design and construct the Project is approximately \$18.5 million. Subject to the Pennsylvania Public Utility Commission's ("PUC" or "Commission") approval, the Project has a scheduled construction start date of April 2017 to meet an in-service date of May 2018.

**C. 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

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<sup>2</sup> 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.

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 with ground clearance that is 5 feet higher than NESC standards and reverses phasing of new double-circuit lines where it is feasible to do so at low or no cost. The rebuilt Blooming Grove - Honesdale Line will be designed to comply with PPL Electric's Magnetic Field Management Program.

**ATTACHMENT 3**  
**BLOOMING GROVE – HONESDALE 138/69 kV LINE REBUILD PROJECT**  
**DESCRIPTION OF THE RIGHT-OF-WAY**

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**A. INTRODUCTION**

As explained in Attachment 1, PPL Electric Utilities Corporation ("PPL Electric") proposes to rebuild approximately 10.6 miles of the existing Blooming Grove - Honesdale Line in order to improve electric reliability in the region (the "Project"). The Project is located in the City of Blooming Grove, Blooming Grove Township and Palmyra Township in Pike County, as well as Palmyra Township in Wayne County, Pennsylvania. The Project will help ensure reasonably continuous and reliable service as further described in Attachment 1.

**B. DESCRIPTION OF THE RIGHT-OF-WAY**

As explained in Attachment 2, PPL Electric proposes to rebuild the Blooming Grove - Honesdale Line 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 Susquehanna - Roseland 500 kilovolt ("kV") transmission line. Figure 3-1 is an aerial map of the Project that identifies the location and properties crossed by the Project.

There is existing residential development in the areas to the south and west of the Blooming Grove Substation. Mature vegetation surrounds the substation, providing screening of the station and electric transmission line facilities. This Project does not propose to clear the existing vegetation surrounding the substation. The rebuild will primarily be located to the north and east of the substation away from the existing residential development.

The existing right-of-way extends north from the Blooming Grove Substation for approximately 3.5 miles through state game lands and private lands with thick mature vegetation. There are no residential or commercial areas adjacent to the right-of-way along this segment of the right-of-way corridor.

Approximately 3.6 miles north of the Blooming Grove Substation, the existing right-of-way crosses U.S. Route 6 ("U.S. 6"). In the vicinity of the crossing, there are four

commercial and one residential structures near the existing right-of-way. In this area, there is mature vegetation screening the right-of-way from the residential structure. The Project will not remove the existing screening, and thus there should be no visual impact on the residence. Visual impacts are also not expected to the commercial buildings because the Project proposes fewer new transmission structures, and the placement of the new structures will be further away from the commercial buildings than the existing transmission structures. The placement of the new facilities will mitigate visual impacts to the commercial buildings.

The existing right-of-way continues north from the crossing with U.S. 6 for approximately 2.5 miles through heavily wooded areas. There are no residential or commercial structures adjacent to the corridor in this segment of the right-of-way.

The right-of-way pivots to the west for approximately 2.7 miles where it once again crosses U.S. 6. At the second crossing of U.S. 6, there are three commercial buildings located adjacent to the existing right-of-way. Within this area, PPL Electric is proposing to place the new transmission structures in the same place as the existing transmission structures to minimize any potential impacts from the new structures.

From the second crossing of U.S. 6, the existing right-of-way continues west for approximately 1.6 miles to the Paupack - Honesdale Line. This section of the right-of-way corridor is surrounded by heavy vegetation. There are no residential or commercial buildings adjacent to the existing right-of-way in this area.

As explained above, the existing Blooming Grove - Honesdale Line right-of-way is located primarily in wooded areas with little development in close proximity of the Project. The existing right-of-way is currently maintained in accordance with PPL Electric's Vegetation Management Program. In some areas, PPL Electric also has additional tree clearing/tree trimming rights and/or building restrictions in place to

prevent encroachments and minimize the potential impacts of danger trees. To the extent additional vegetation management is required for the rebuild of the Blooming Grove - Honesdale Line, PPL Electric will apply its "*Specifications for Transmission Vegetation Management LA-79827*" to minimize potential impacts.

The existing Blooming Grove - Honesdale Line consists of 181 structures. These structures will be removed and replaced with a total of 126 new structures, which will reduce the overall impact of the Blooming Grove - Honesdale Line. Additionally, the new structures will be located generally within the same vicinity as the existing tower structures. In areas where pole locations will be shifted significantly from the present location, PPL Electric met with and advised the affected landowners of the change in pole location. No new structures will be placed on any property that currently does not have an existing structure. The locations of existing and proposed transmission structures are depicted in Figure 3-1.

### C. CULTURAL RESOURCES

PPL Electric's contractor, Environmental Resources Management ("ERM"), conducted a review of the online Pennsylvania Historical and Museum Commission ("PHMC") Bureau for Historic Preservation ("BHP") Cultural Resources Geographic Information System ("CRGIS") database to determine if National Register of Historic Places ("NRHP")-listed or eligible historic properties are located in the Project vicinity. Based on this review, four NRHP-listed and five NRHP-eligible historic or archaeological resources are located within 1 mile of the proposed Project.

As explained above, the Project will be located entirely within the existing right-of-way. Further, there will be a reduction in the total number of structures, and the new structures will be placed within close proximity of the existing structures. Therefore, impacts to historic or cultural resources are expected to be minimal.

Although the new structures are taller than the existing structures, impacts to the viewshed from cultural resources are expected to be minimal because the proposed Project will occupy and parallel the same right-of-way corridor as the existing

Susquehanna to Roseland 500-kV Transmission line. Therefore, the rebuilt transmission line is unlikely to have any additional adverse impacts to historic or cultural resources.

There may be temporary indirect impacts to historic or cultural resources due to visibility of and noise from construction activities. PPL Electric will work with the PHMC to mitigate temporary impacts from construction.

**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 no additional property will be required to complete the proposed Project. PPL Electric will use and update previously established access roads for construction to the extent practicable to further reduce interference with existing land uses.

PPL Electric identified wetlands and waterbodies within the area of the proposed Project. The proposed Project will cross 67.4 acres of wetlands (47 wetland sites) and 10 waterbodies. However, it is anticipated that the Project will have minimal impacts to these streams and wetlands because the entire Project will be built within the existing right-of-way, and the new structures have been sited to avoid wetlands where practicable.

PPL Electric will avoid temporary and permanent 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. Further, 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 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 March 21, 2016.<sup>1</sup> Based on this review, the Pennsylvania Game Commission ("PGC") and the Pennsylvania Department of Conservation and Natural Resources ("DCNR") reported that the proposed Project may have potential impacts to threatened and endangered species, or special concern species and resources located within the Project area.

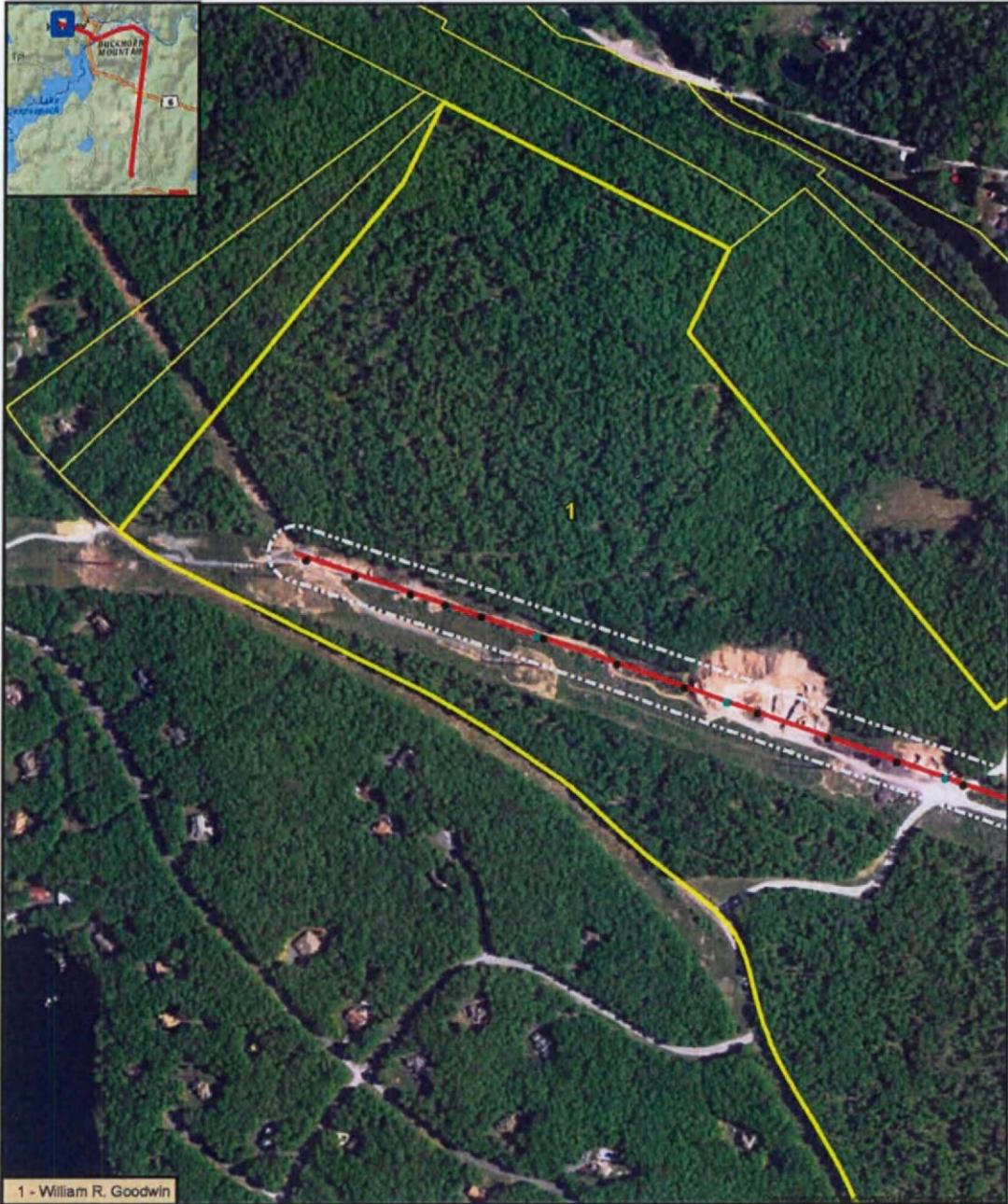
The PNDI search results identified a potential impact to two DCNR special concern species, the Dion skipper and the mulberry wing. However, correspondence with the DCNR has indicated that these two species are not protected in Pennsylvania and no further surveys for habitat or host plants for these species was requested.

The PNDI search also identified potential impacts to one PGC threatened species, the osprey. No osprey nests were observed during PPL Electric's wetland delineation. PPL Electric will continue to collaborate with the PGC to mitigate potential impacts to this identified species.

The PNDI review also included a review by the U.S. Fish and Wildlife Service ("USFWS") and the Pennsylvania Fish and Boat Commission. The USFWS review indicated that there were no anticipated impacts to federally listed or proposed species from the Project. Similarly, the Pennsylvania Fish and Boat Commission also indicated that there were no anticipated impacts to Pennsylvania threatened and endangered species.

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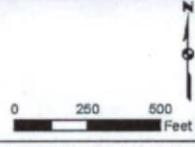
<sup>1</sup> PNDI Project Search ID: 20160321554408



1 - William R. Goodwin



- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
- ROW
- Parcel Boundary



**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
 Page 1 of 15



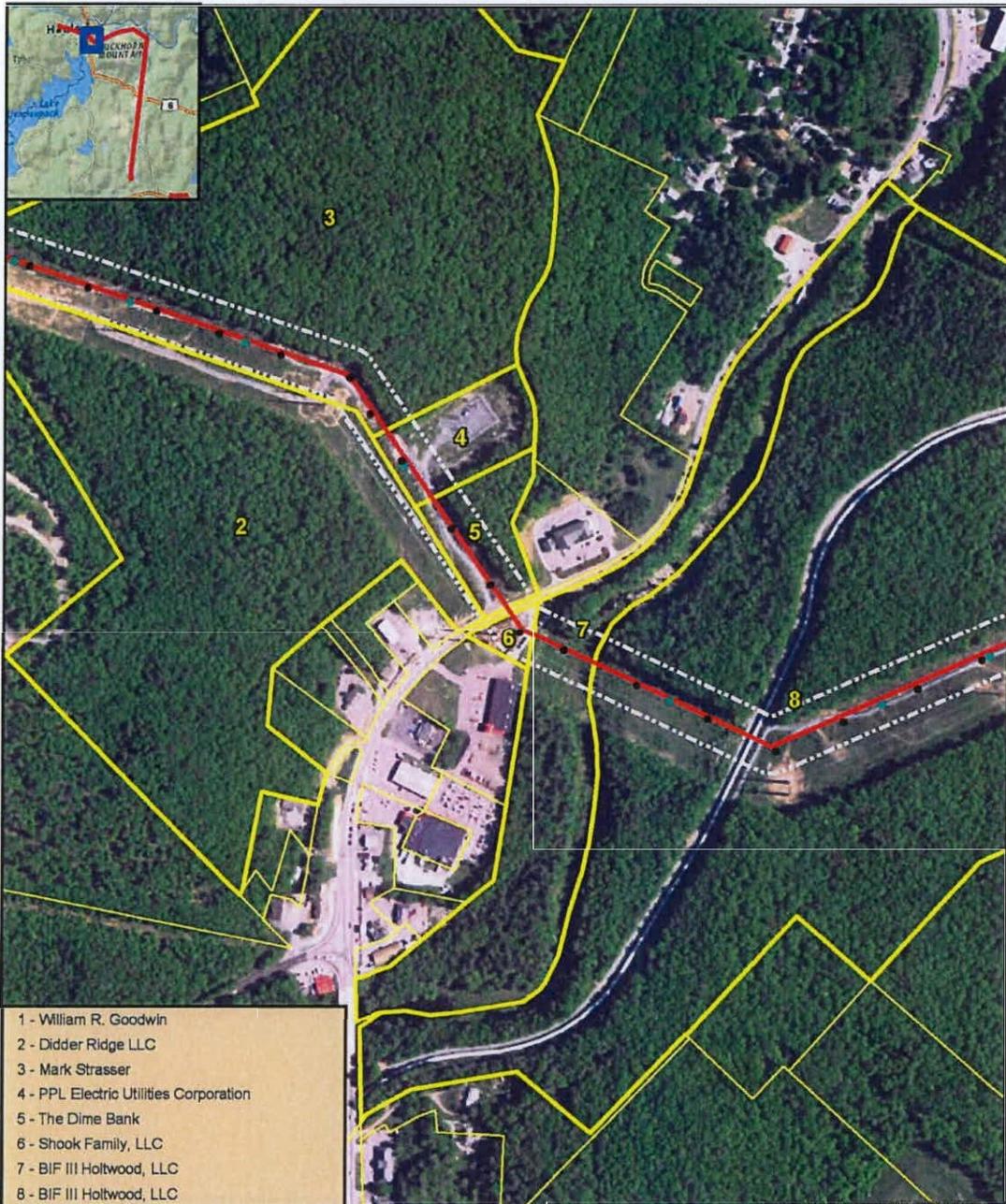



- 1 - William R. Goodwin
- 2 - Dider Ridge LLC
- 3 - Mark Strasser

	Existing Structure	
	Proposed Structure	
	Blooming Grove D1 Route	
	Parcel Boundary	

**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
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- 1 - William R. Goodwin
- 2 - Diddy Ridge LLC
- 3 - Mark Strasser
- 4 - PPL Electric Utilities Corporation
- 5 - The Dime Bank
- 6 - Shook Family, LLC
- 7 - BIF III Holtwood, LLC
- 8 - BIF III Holtwood, LLC



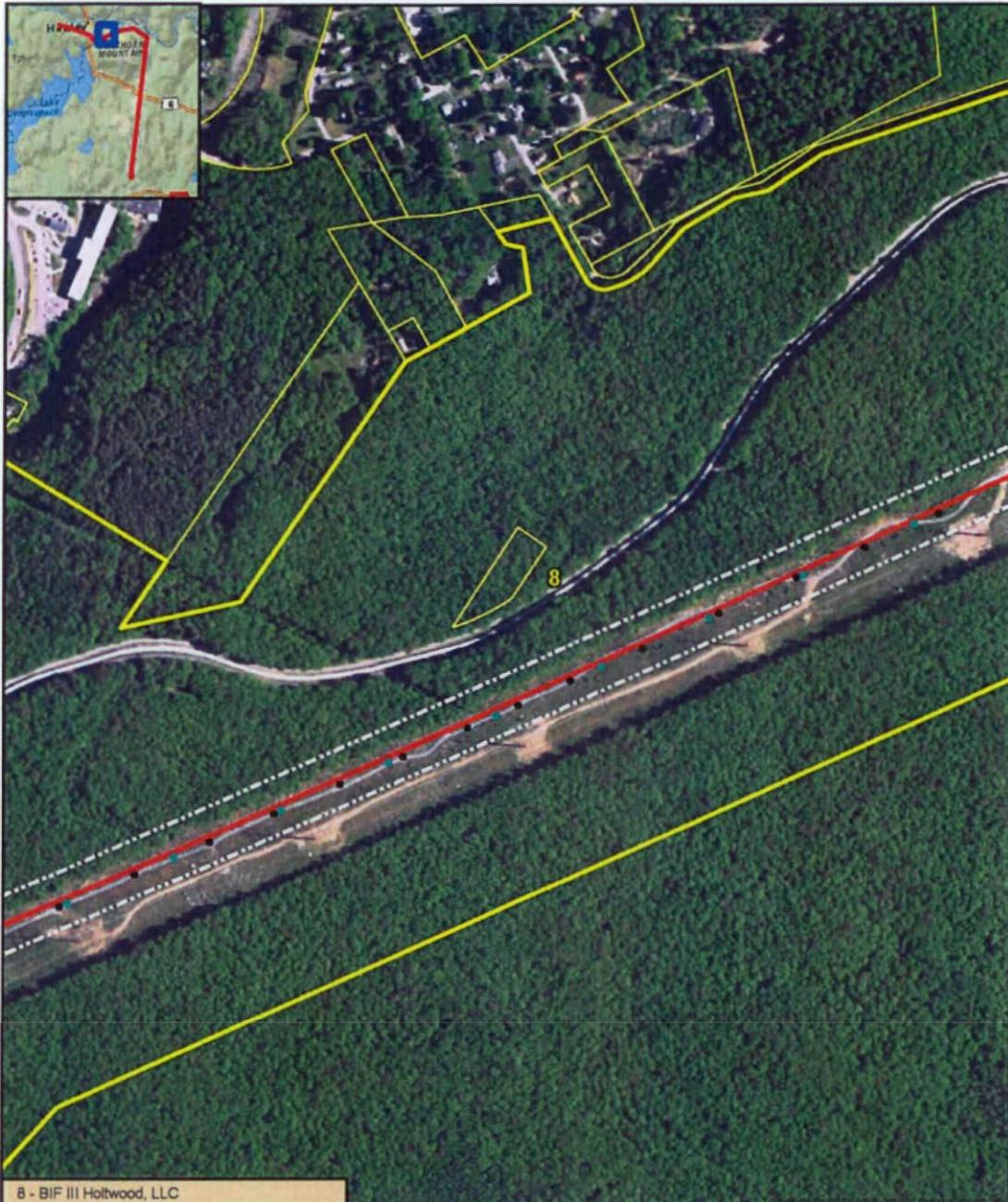
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- Proposed Structure
- Blooming Grove D1 Route
- ROW
- Parcel Boundary

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**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
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8 - BIF III Holtwood, LLC

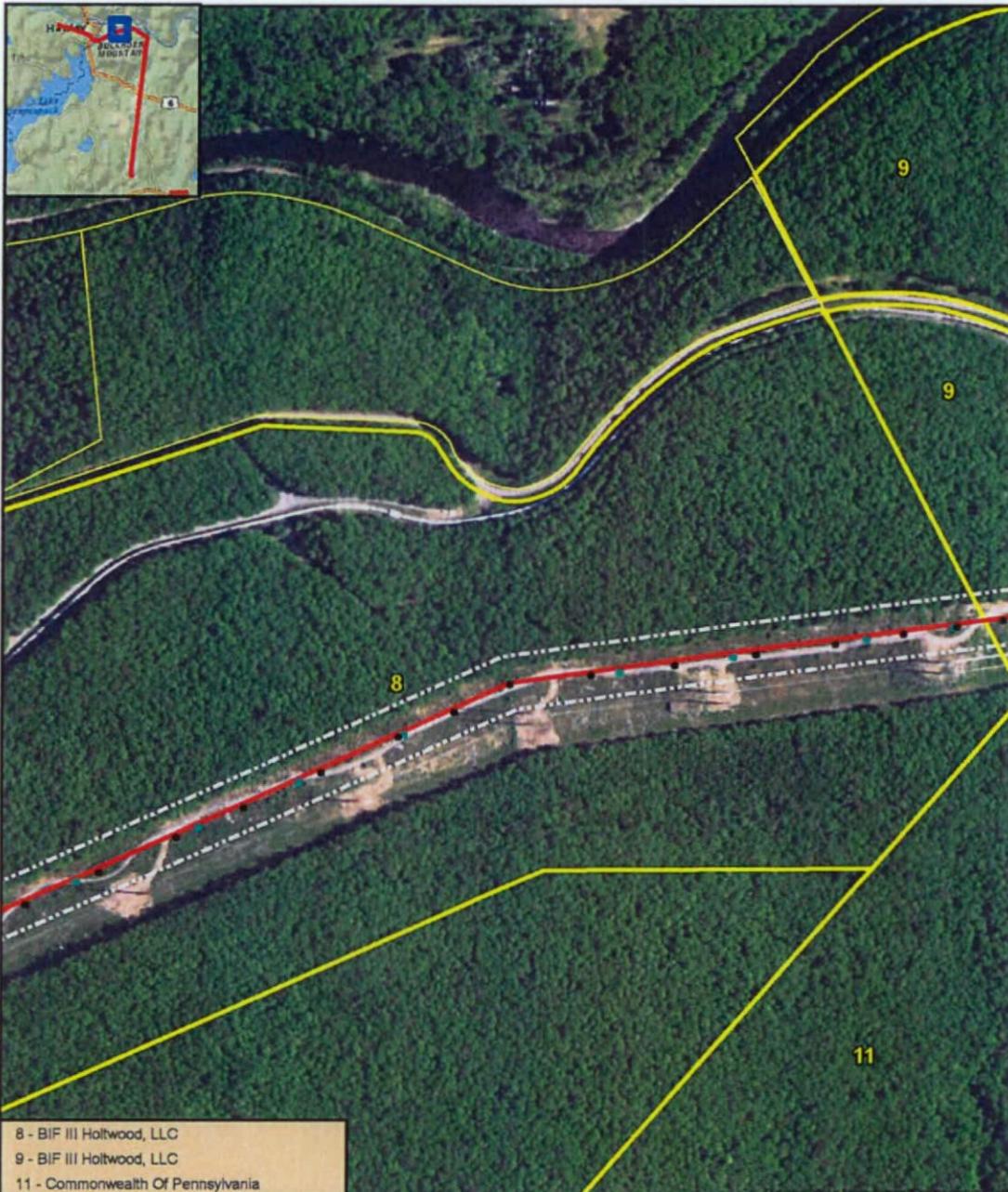


- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
- - - ROW
- ▭ Parcel Boundary



**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
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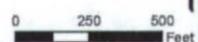


8 - BIF III Holtwood, LLC  
 9 - BIF III Holtwood, LLC  
 11 - Commonwealth Of Pennsylvania



- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
- ROW
- ▭ Parcel Boundary



**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
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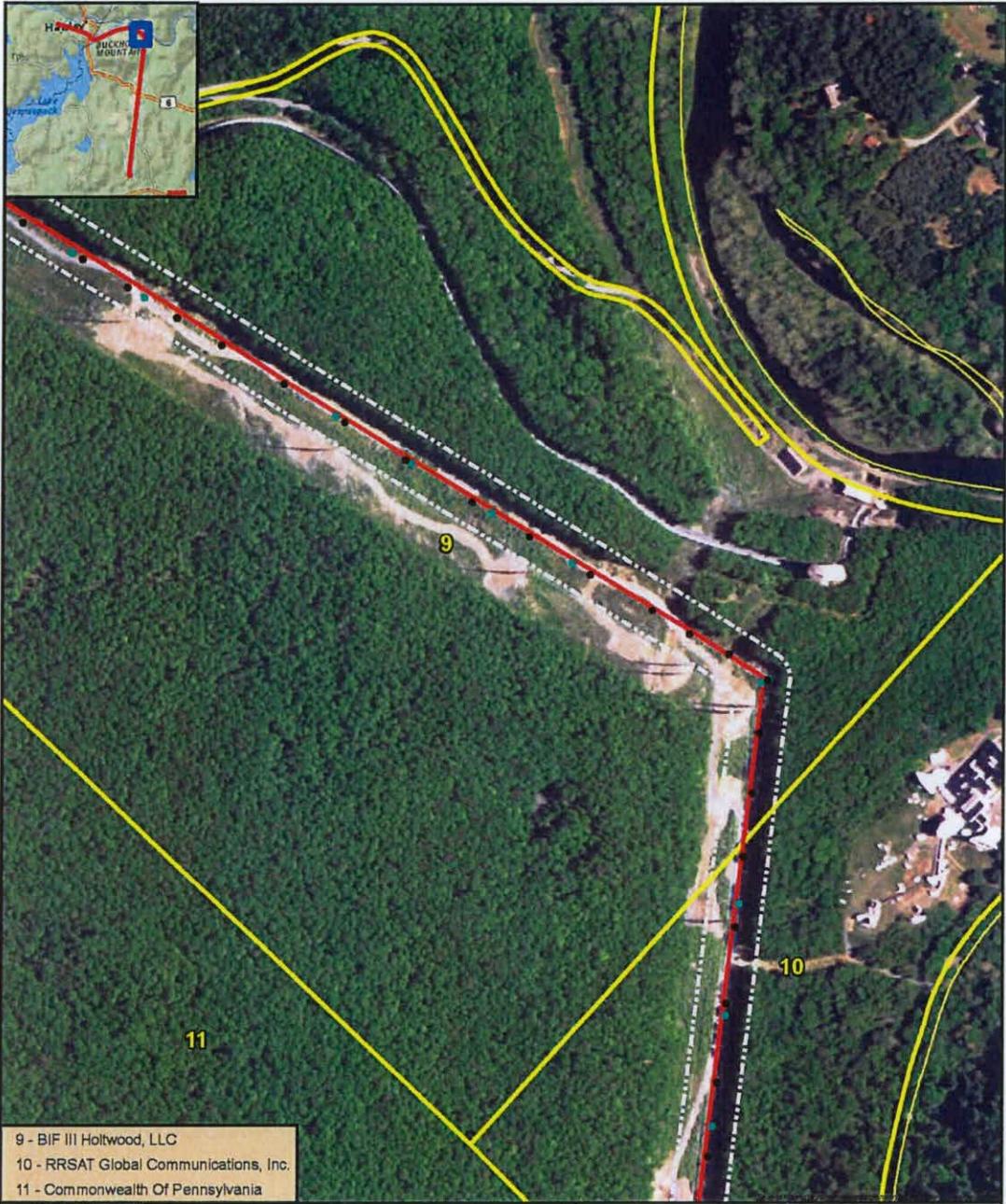


8 - BIF III Holtwood, LLC  
9 - BIF III Holtwood, LLC  
11 - Commonwealth Of Pennsylvania

● Existing Structure  
● Proposed Structure  
Blooming Grove D1 Route  
--- ROW  
Parcel Boundary

**PPL Blooming Grove D1 Project**  
Aerial Map Set  
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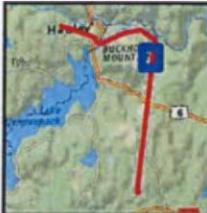
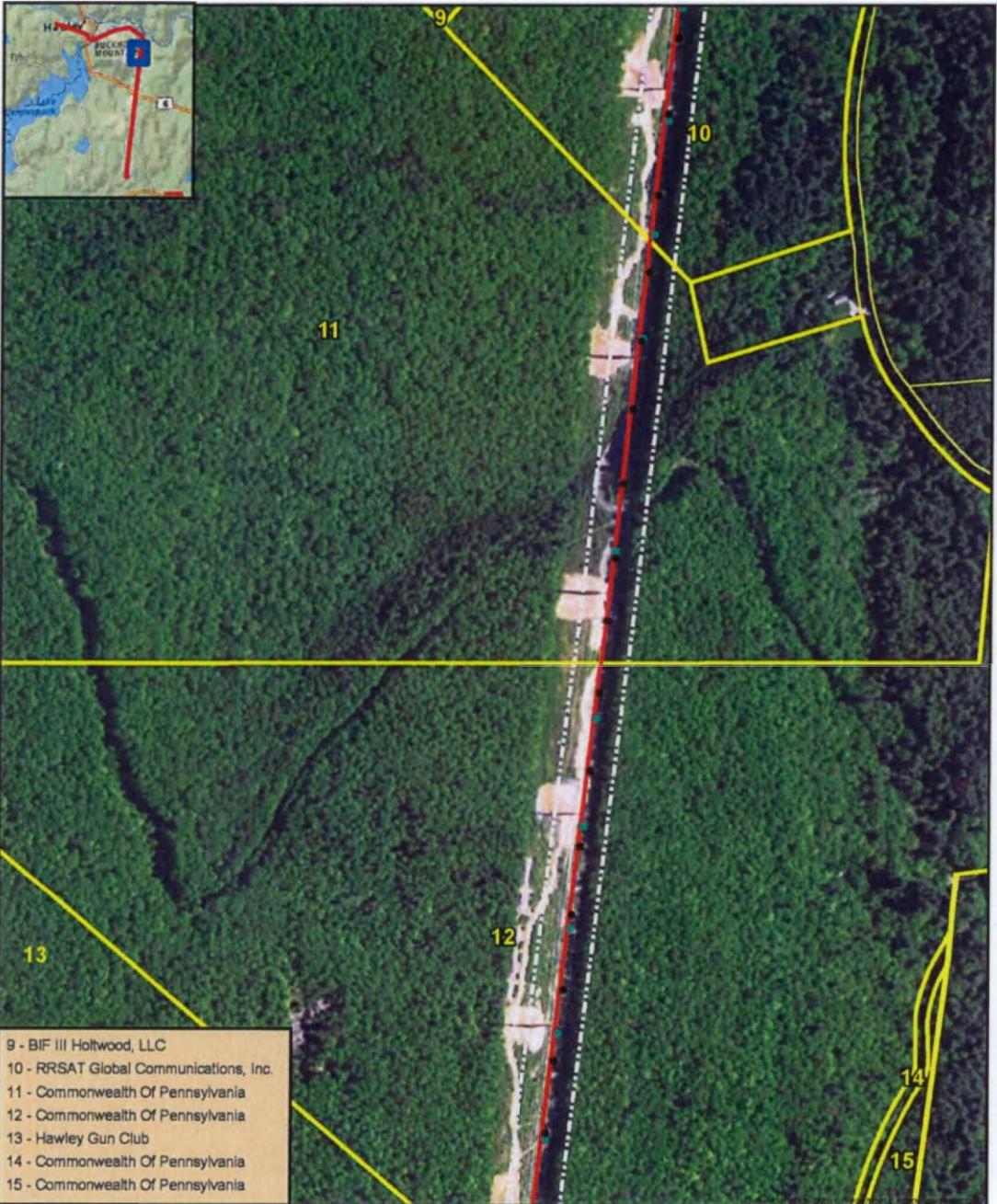
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9 - BIF III Holtwood, LLC  
 10 - RRSAT Global Communications, Inc.  
 11 - Commonwealth Of Pennsylvania

	Existing Structure
	Proposed Structure
	Blooming Grove D1 Route
	ROW
	Parcel Boundary

**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
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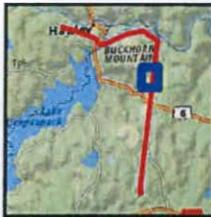


- 9 - BIF III Holtwood, LLC
- 10 - RRSAT Global Communications, Inc.
- 11 - Commonwealth Of Pennsylvania
- 12 - Commonwealth Of Pennsylvania
- 13 - Hawley Gun Club
- 14 - Commonwealth Of Pennsylvania
- 15 - Commonwealth Of Pennsylvania



- Existing Structure
- Proposed Structure
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**PPL Blooming Grove D1 Project**  
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- 12 - Commonwealth Of Pennsylvania
- 13 - Hawley Gun Club
- 14 - Commonwealth Of Pennsylvania
- 15 - Commonwealth Of Pennsylvania



- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
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**PPL Blooming Grove D1 Project**  
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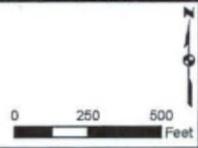




- 15 - Commonwealth Of Pennsylvania
- 16 - Melody and Alfred Conklin
- 17 - Baudin Canka
- 18 - Joshua and Jennyrose Johnson
- 19 - George and Joan Sampson
- 20 - Joel Duplessis
- 21 - Dion H. Keene
- 22 - Atlantic Oil & Heating Company
- 23 - Peter Fox & Melissa Shemanski
- 24 - Commonwealth Of Pennsylvania



- Existing Structure
- Proposed Structure
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**PPL Blooming Grove D1 Project**  
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 Page 10 of 15




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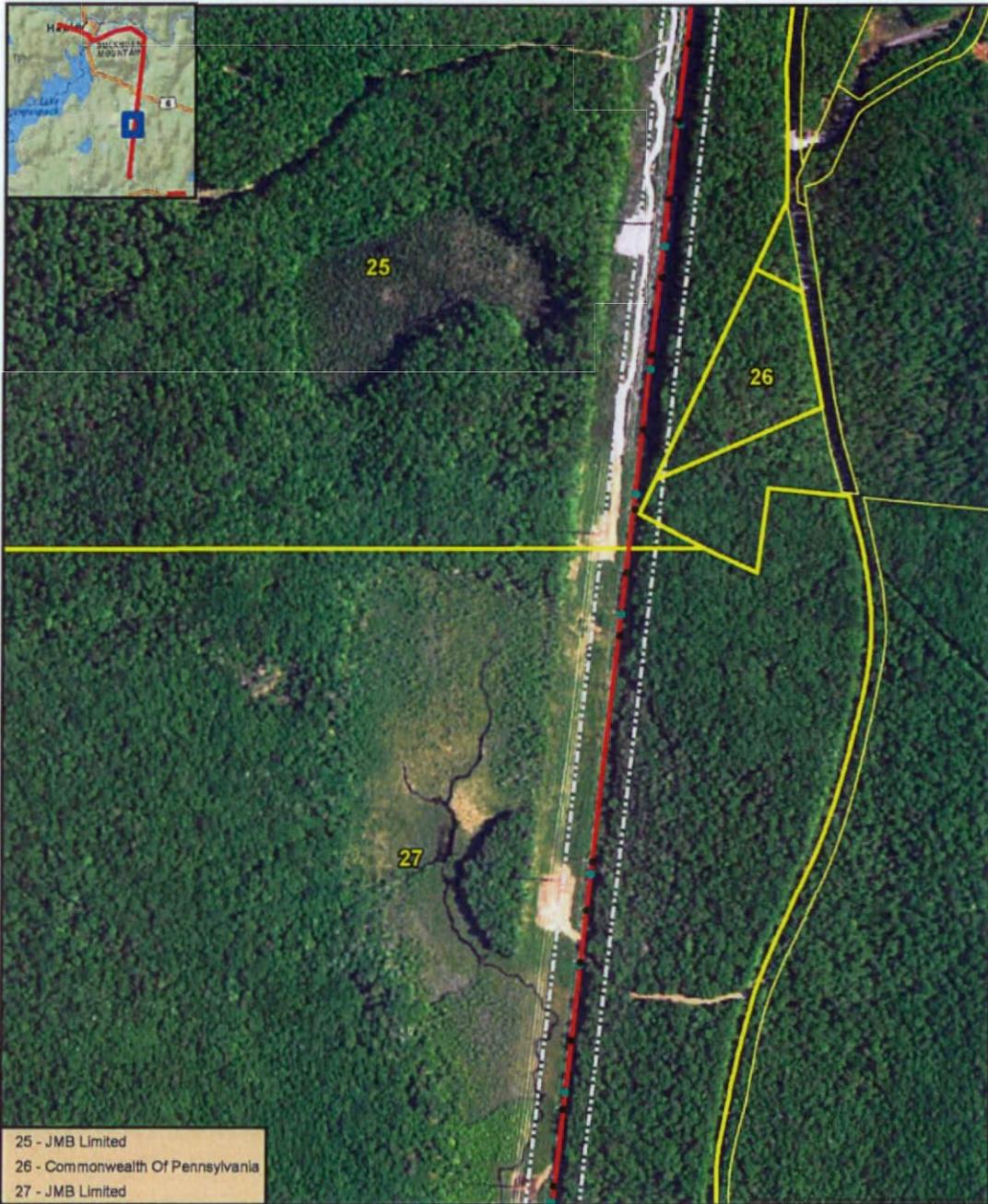


24 - Commonwealth Of Pennsylvania  
 25 - JMB Limited

- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
- - - ROW
- Parcel Boundary

**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
 Page 11 of 15

ERM



25 - JMB Limited  
 26 - Commonwealth Of Pennsylvania  
 27 - JMB Limited

**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
 Page 12 of 15

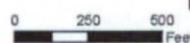




27 - JMB Limited

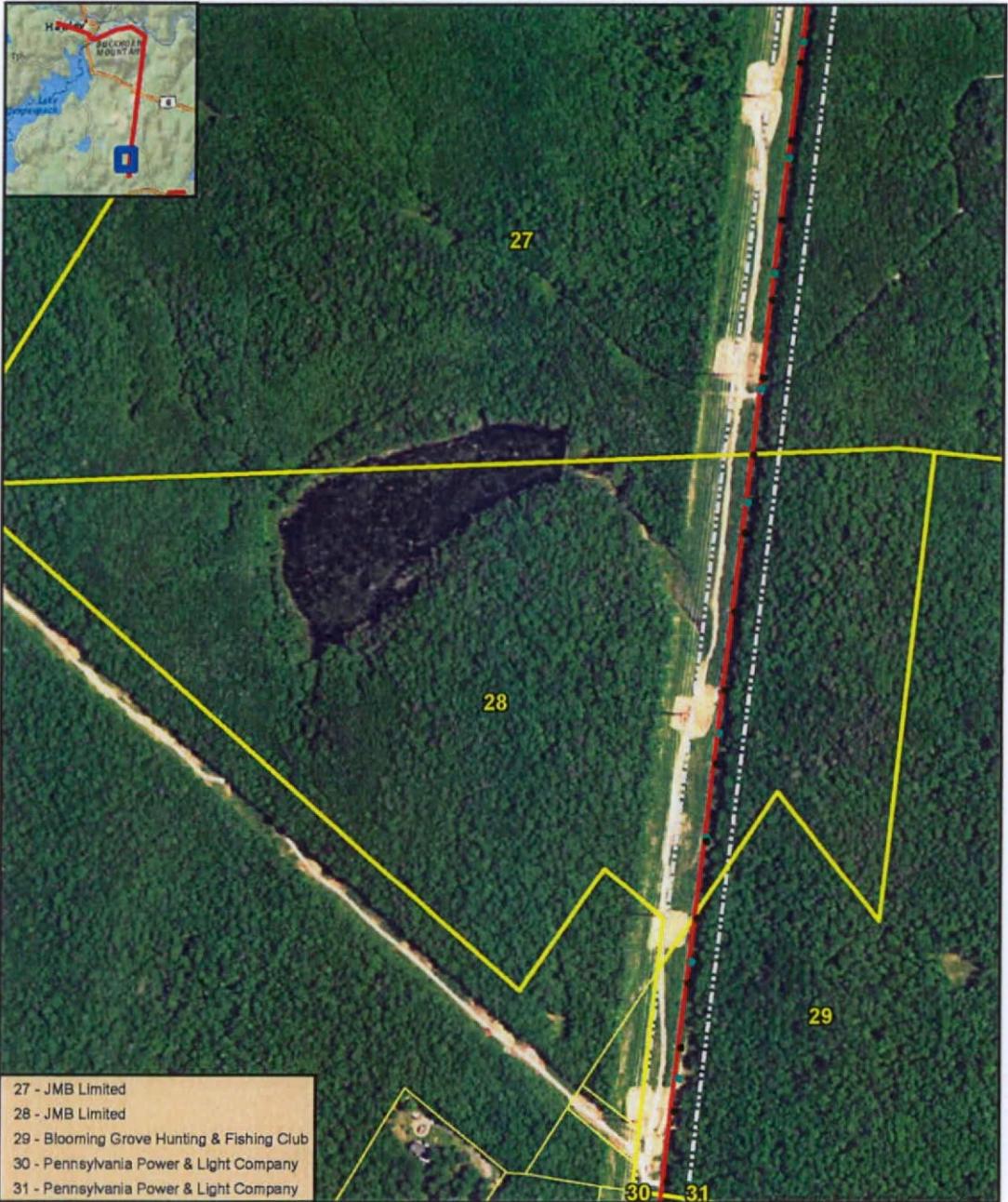


- Existing Structure
- Proposed Structure
- Blooming Grove D1 Route
- ROW
- Parcel Boundary



PPL Blooming Grove D1 Project  
Aerial Map Set  
Page 13 of 15





- 27 - JMB Limited
- 28 - JMB Limited
- 29 - Blooming Grove Hunting & Fishing Club
- 30 - Pennsylvania Power & Light Company
- 31 - Pennsylvania Power & Light Company

● Existing Structure  
 ■ Proposed Structure  
 — Blooming Grove D1 Route  
 - - - ROW  
 — Parcel Boundary

0 250 500 Feet

**PPL Blooming Grove D1 Project**  
**Aerial Map Set**  
 Page 14 of 15

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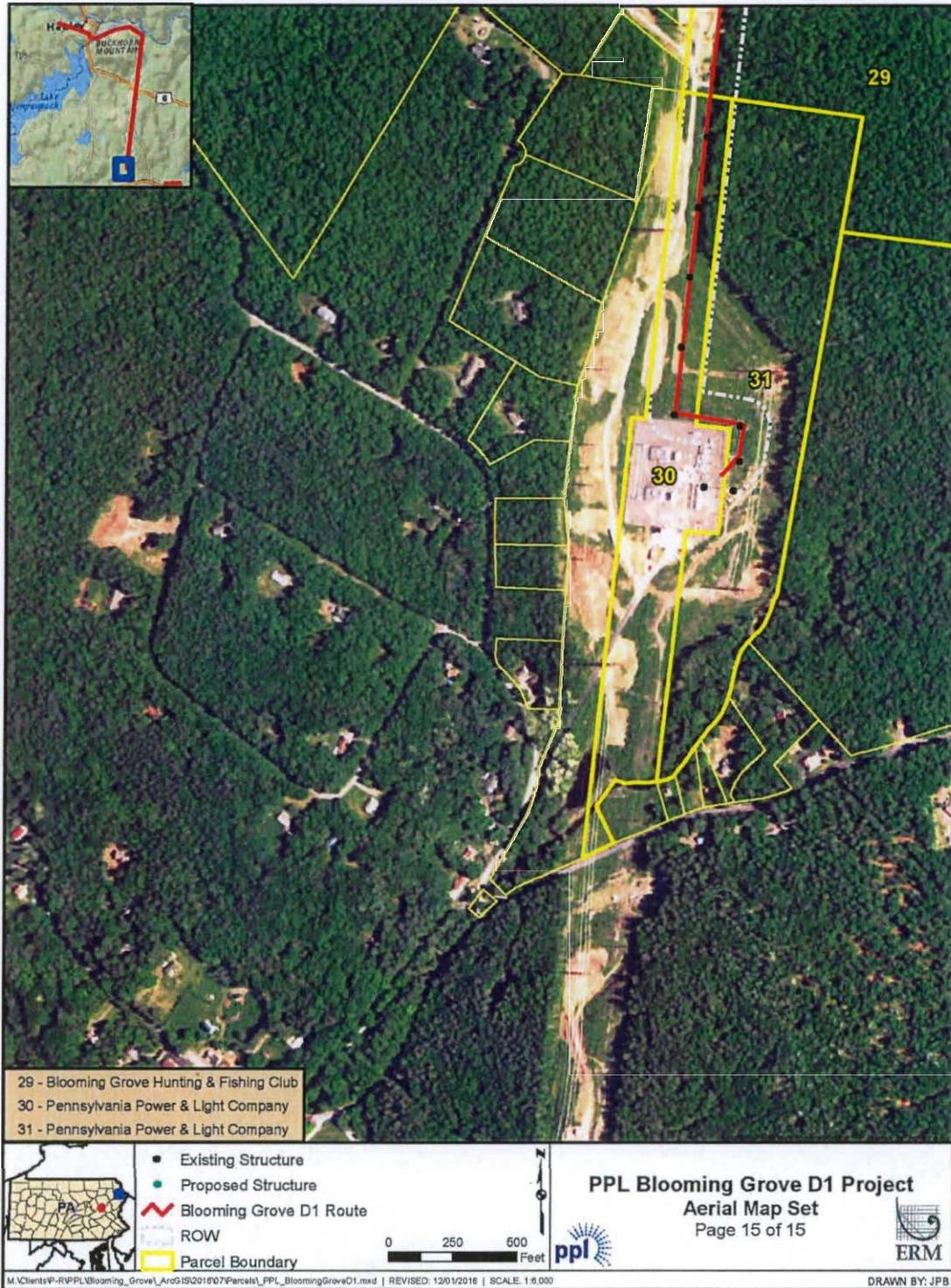


Figure 3-1 – Aerial Maps of Project

ATTACHMENT 4

BLOOMING GROVE – HONESDALE 138/69 kV LINE REBUILD PROJECT  
PPL ELECTRIC DESIGN CRITERIA AND SAFETY PRACTICES

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A. **INTRODUCTION**

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 that meet or surpass all requirements specified by the NESC.

B. **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 Electric 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, with 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 Electric 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 4 pounds per square foot horizontal wind pressure (equivalent to 40 miles 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 Electric transmission lines are at least 0.5-inch ice combined with 8 pounds per square foot horizontal wind pressure (equivalent to 57 miles per hour wind velocity). This means that PPL Electric lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL Electric transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL Electric and NESC ground clearances for lines of various voltages.

**69 kilovolt (kV)**

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Electric Design</u>
Roads, streets, alleys	20 Feet ("Ft.")	30 Ft.
Other land traversed by vehicles (such as cultivated field, forest, etc.)	20 Ft.	30 Ft.
Spaces accessible to pedestrians	16 Ft.	30 Ft.
Railroad tracks	28 Ft.	31.5 Ft.

### 138 kV

<u>Surface Underneath Conductors</u>	<u>Vertical Clearance to Ground</u>	
	<u>NESC Standard</u>	<u>PPL Electric 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	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 Electric 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	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 Electric 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	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.

C. **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 3 to 5 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.

D. **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-energize 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 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 feet (')-7 inches (")
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 4 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.

**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**

Craig E. Rickard, Planning Director  
Wayne County  
Wayne County Department of Planning  
925 Court Street  
Honesdale, PA 18431

Jo-Ann M. Rose, Administrator  
Palmyra Township (Pike County)  
115 Buehler Lane  
Paupack, PA 18451

Jo-Anna Donahue, Secretary to the Planning  
Commission  
Blooming Grove Township  
488 Route 739,  
Lords Valley, PA 18428

Michael Mrozinski, Planning Director  
Pike County, Pennsylvania  
837 Route 6, Unit 3  
Shohola, PA 18458

Pete Steffen, Supervisor Chairman  
Palmyra Township (Wayne County)  
219 Oak Street  
Hawley, PA 18428

Tammy Gillette, Supervisor  
Blooming Grove Township  
488 Route 739,  
Lords Valley, PA 18428

Thomas A. Simons, Chairman  
Palmyra Township (Pike County)  
115 Buehler Lane  
Paupack, PA 18451

Pike County Conservation District  
556 PA-402  
Hawley, PA 18428

Wayne County Conservation District  
648 W Park Street  
Honesdale, PA 18431

Department of Conservation  
and Natural Resources  
Rachel Carson State Office Building  
P.O. Box 8767  
400 Market Street  
Harrisburg, PA 17105-8767  
Attn: Jason Ryndock

Pennsylvania Department  
of Environmental Protection  
Northeast Regional Office  
2 Public Square  
Wilkes-Barre, PA 18711-0790

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

Pennsylvania Department of Transportation  
Engineering District 4  
55 Keystone Industrial Park  
Dunmore, PA 18512

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

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

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

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

U.S. Fish and Wildlife Service  
110 Radnor Road, Suite 101  
State College, PA 16801-7987

Atlantic Oil and Heating Company  
PO Box 159  
Macungie, PA 18062

BIF III Holtwood LLC  
75 State Street, Suite 2701  
Boston, MS 02109

Blooming Grove Hunting and Fishing Club  
123 Old Field Road  
Hawley, PA 18428

Didder Ridge LLC  
198 O'Connell Road  
Waymart, PA 18472

George and Joan Sampson  
28 Southwick Street  
Milford, NJ 08848

Hawley Gun Club  
791 Grubbs Mill Road  
Berwyn, PA 19312

Joel Duplessis  
541 Richfield Avenue  
Kenilworth, NJ 07033

Joshua and Jennyrose Johnson  
124 Decker Creek Drive  
Hawley, PA 18428

Mark Strasser  
PO Box 16  
Hawley, PA 18428

Melody and Alfred Conklin Jr.  
13 Degroat Road  
Hawley, PA 18428

Peter Fox and Melissa Shemanski  
Route 50X, Box 162  
Tafton, PA 18464

RRSAT Global Communications Inc.  
Waverly Oaks, Unit 331  
Waltham, MA 02452

Shook Family LLC  
102 High Blue Avenue  
Hawley, PA 18428

The Dime Bank  
820-822 Church Street  
Honesdale, PA 18431

William R. Goodwin  
1186 Owego TPKE  
Honesdale, PA 18431

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

Pike County Public Library  
100 Bond Court  
Milford, PA 18337

Wayne County Public Library  
1406 Main Street  
Honesdale, PA 18431

Secretary of the Department of  
Transportation  
Room 1200 Transportation and Safety  
Building  
Harrisburg, PA 17120

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

E.R. Linde Construction Corp.  
9 Collam Park  
Honesdale, PA 18431

Robert McGinnis  
PO Box 249  
Hawley, PA 18428

Commonwealth PL Properties  
(PA Game Commission)  
3917 Memorial Highway  
Dallas, PA 18612

Baudin & Josephine Canka  
7 Apple Blossom Lane  
Manalapan, NJ 07726

Department of Conservation and  
Natural Resources  
Delaware Forest  
2174A Route 611  
Swiftwater, PA 18370

JMB Limited  
10 Gilberton Road  
Gilberton, PA 17934  
Attn: Robert B. Hoppe

Dion H. & Julissa Keene  
737 Quincy Avenue  
Bronx, NY 10465

Date: January 6, 2017

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

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## First Class Mail

**POST &  
SCHELL**<sup>PC</sup>  
ATTORNEYS AT LAW

Post & Schell, P.C.  
17 North Second Street  
12th Floor  
Harrisburg, PA 17101-1601

166593

---

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

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