Before the
Pennsylvania Public Utility Commission

BLOOMING GROVE-JACKSON
&
PECKVILLE-JACKSON
138/69 kV LINE

ATTACHMENTS IN SUPPORT OF THE
Full Siting Application

Application Docket No._____

Submitted by: PPL Electric Utilities Corporation

EXECUTIVE SUMMARY

This filing is submitted by PPL Electric Utilities Corporation (PPL Electric) pursuant to the Pennsylvania Public Utility Commission's (PUC or the Commission) regulations at 52 Pa. Code §§57.71 through 57.77 for PUC approval to site and construct a new 3.8 mile long double-circuit transmission line located in Jackson and Pocono Townships, Monroe County. The new line will be constructed parallel to the existing double-circuit Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Line, which will be renamed the Jackson – Wagners #1 and #2 138/69 kV Line. The newly constructed line will then be named the Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Line.

The existing Lake Naomi 138/69 kV Tap is currently served by the Blooming Grove – Jackson 138/69 kV Transmission Line. This project proposes to construct a new double-circuit 138/69 kV line from the Jackson Substation that will extend north to the Lake Naomi Tap pole, a distance of approximately 3.8 miles. As a result of this new line, the existing Lake Naomi Tap (to be renamed the Jackson – Wagners 138/69 kV Line) will have its own power source, and will no longer be supplied by the Blooming Grove – Jackson 138/69 kV circuit. The new line will be designed and constructed for future 138 kV operation, but will initially operate at 69 kV until load growth in the area makes it appropriate to increase the operating voltage.

The new double-circuit line section will replace the existing Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Line. The existing Blooming Grove – Jackson and Peckville-Jackson Line section between the Jackson Substation and the Lake Naomi Tap will remain in place and be renamed the Jackson – Wagners #1 and #2 138/69 kV Line (see Figures 1 and 2 in Attachment 2). This project was previously communicated to the public, government agencies, and elected officials as the Jackson - Lake Naomi Project.

The proposed new transmission line will create a separate power source to the Lake Naomi Tap and its associated substations, Lake Naomi and Wagners. The independent power source to this

tap will be created by removing the existing Lake Naomi Tap from the Blooming Grove – Jackson 138/69 kV circuit, re-terminating both the Blooming Grove – Jackson and Peckville – Jackson circuits at the Jackson Substation into alternate line bays, and constructing approximately 3.8 miles of new double-circuit 138/69 kV transmission line from the Lake Naomi Tap pole to the Jackson Substation.

The proposed new facility will reduce the electrical load on the existing Blooming Grove – Jackson 138/69 kV circuit and provide operating flexibility and improved reliability for customers in Jackson, Pocono, and Tobyhanna Townships in Monroe County.

This project is required to:

(i) avoid exceeding the winter normal thermal loading limit on the Blooming Grove-Jackson 138/69 kV circuit under peak winter conditions;

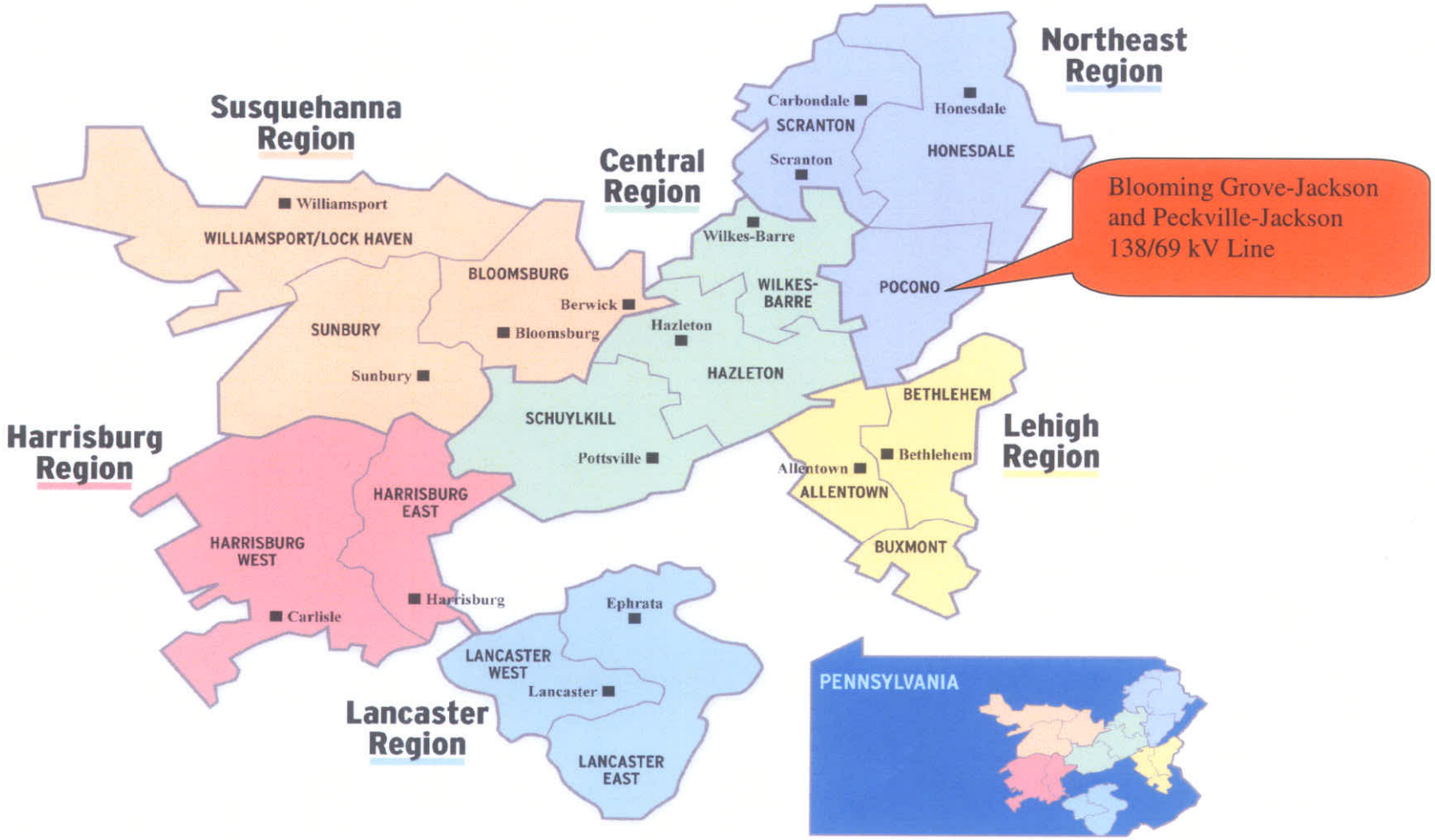
(ii) reduce the electrical loading on the Blooming Grove-Jackson 138/69 kV single-circuit line below the 60 MW line loading limit, in order to comply with PPL Electric's Reliability Principles and Practices (RP&P); and

(iii) prevent interrupting an amount of load that exceeds PPL Electric's RP&P guidelines if the Blooming Grove-Jackson 138/69 kV line at Jackson Substation were interrupted.

The total estimated cost to site, design, and construct this project is approximately $6.12 million. This cost includes the proposed overhead transmission line and substation modifications at Jackson Substation. The overhead transmission portion is estimated to cost approximately $5.21 million and the modifications to the Jackson Substation are estimated to cost approximately $905,000.

In order to meet a required in service date of November 2013, construction on this Project must commence by January 2013.

PPL ELECTRIC UTILITIES SERVICE TERRITORY



Attachment 1

ATTACHMENT 1
BLOOMING GROVE-JACKSON AND PECKVILLE-JACKSON 138/69 kV LINE
PUC REGULATION CROSS-REFERENCE MATRIX

Pennsylvania Code Section*	PUC Regulation Requirement	Location in Application	Associated Tables/Figures
57.72 (c)	Application shall contain		
57.72 (c)(1)	The name of the applicant and the address of its principal business office	• Certification Application	
57.72 (c)(2)	The name, title and business address of the attorney of the applicant and the person authorized to receive notice and communications with respect to the application if other than the attorney of the applicant.	• Certification Application	
57.72 (c)(3)	A general description – not a legal or metes and bounds description – of the proposed route of the HV line, to include the number of route miles, the rights-of-way width and the location of the proposed HV line within each city, borough, town, and township traversed.	• Attachment 4	• Figures 4-4, 4-5, and 4-6
57.72 (c)(4)	A names and addresses of known persons, corporations, and other entities of record owning property within the proposed rights-of-way, together with an indication of HV line rights-of-way acquired by the applicant.	• Attachment 4 • Attachment 8.1	• Map Pocket
57.72 (c)(5)	A general statement of the need of the proposed HV line in meeting identified present & future demands for service, how the proposed line will meet that need, and engineering justifications	• Attachment 2 • Attachment 5	• Figure 2-1 • Figure 2-2
57.72 (c)(6)	A statement of the safety considerations that will be incorporated into the design, construction, and maintenance of the proposed HV line.	• Attachment 5 • Attachment 10 • Attachment 11	
57.72 (c)(7)	A description of the studies which had been made as to the projected environmental impact of the HV line as proposed and of the efforts which have been and will be made to minimize the impact of the HV line upon the environment and upon scenic and historic areas, including but not limited to impacts, where applicable, upon land use, soil and sedimentation, plant and wildlife habitats, terrain, hydrology and landscape.	• Attachment 3 • Attachment 4	• Tables 3-1, 4-3, 4-4 • Figures 3-3 through 3-12 • Figures 4-1 through 4-6
57.72 (c)(8)	A description of the efforts of the applicant to locate and identify archeological, geologic, historic, scenic, or wilderness areas within 2 miles of the proposed right-of-way and the location and identity of the areas discovered by the applicant.	• Attachment 3 • Attachment 4	• Tables 4-3, 4-4 • Figures 3-3 through 3-12 • Figure 4-6
57.72 (c)(9)	The location and identity of airports within 2 miles of the nearest limit of the right-of-way of the proposed HV line.	• Attachment 3 • Attachment 4	• Figure 4-6

Pennsylvania Code Section*	PUC Regulation Requirement	Location in Application	Associated Tables/Figures
57.72 (c)(10)	A general description of reasonable alternative routes to the proposed HV line, including a description of the corridor planning methodology, a comparison of the merits and detriments of each route, and a statement of the reasons for selecting the proposed HV line route.	• Attachment 4	• Tables 4-1 through 4-4 • Figure 4-4
57.72 (c)(11)	A list of the local, State, and Federal governmental agencies which have requirements that shall be met in connection with the construction or maintenance of the proposed HV line and a list of documents which have been or are required to be filed with those agencies in connection with the siting and construction of the proposed HV line.	• Attachment 14	
57.72 (c)(12)	The estimated cost of construction of the proposed HV line and the projected date for completion.	• Attachment 2 • Attachment 4 • Attachment 5	• Table 4-3
57.72 (c)(13)(i)	A depiction of the proposed route on aerial photographs and topographic maps of suitable detail.	• Attachment 4	• Figures 4-4 and 4-5
57.72 (c)(13)(ii)	A description of the proposed HV line, including the length of the line, the design voltage, the size, number, and materials of conductors, the design of the supporting structures and their height, configuration and materials of construction, the average distance between supporting structures, the number of supporting structures, the line to structure clearances and the minimum conductor to ground clearance at mid-span under normal load and average weather conditions and under predicted extreme load and weather conditions.	• Attachment 5 • Attachment 10	• Tables 5-1 and 5-2 • Figures 5-1, 5-2, and 5-3
57.72 (c)(13)(iii)	A simple drawing of a cross section of the proposed rights-of-way of the HV line and any adjoining rights-of-way showing the placement of the supporting structures at typical locations, with the height and width of the structures, the width of the right-of-way and the lateral distance between the conductors and the edge of the right-of-way indicated.	• Attachment 5	• Figure 5-3
57.72 (c)(13)(iv)	A system map which shows in suitable detail the location and voltage of existing transmission lines and substations of the applicant and the location and voltage of the proposed HV line and associated substations	• Attachment 2	• Attachment 2 Map pocket
57.72 (c)(14)	A statement identifying litigation concluded or in progress which concerns property or matter relating to the proposed HV line, right-of-way route, or environmental matters.	• Certification Application	•

Pennsylvania Code Section*	PUC Regulation Requirement	Location in Application	Associated Tables/Figures
Chapter 69	Interim guidelines require		
69.3102 (a)(1)	A Code of Conduct/Internal Practices governing the manner in which public utility employees or their agents interact with landowners along proposed rights of way.	• Attachment 13	
69.3102 (a)(2)	Copies of information provided to landowners by the public utility of any publicly disseminated notices advising landowners to contact the Commission or OCA in the event of improper land agent practices.	• Attachment 13	
69.3102 (a)(3)	Copies of all notices sent pursuant to §57.91 (relating to disclosure of eminent domain power of electric utilities).	• Attachment 13	
69.3102 (b)	Applicants for transmission siting authority should serve a copy of the Code of Conduct on all landowners along the proposed route whose property is to be purchased, subject to easement rights or borders the transmission corridor. The Code of Conduct should also be available on the applicant's website.	• Attachment 13	
69.3102 (c)	Applicants for transmission siting authority should provide prior notice to the Commission's Office of Communications of informational presentations to community groups by the public utility scheduled after the filing of the transmission siting application so that the Commission, OCA and other interested parties can attend meetings or obtain copies of information being disseminated at the presentations.	• N/A	
69.3103	**Eminent domain filing requirements**	• Condemnation Application	
69.3104	**Exemption from municipal zoning standards**	• Attachment 4	
69.3105 (1)	Transmission applicants should utilize a combination of transmission route evaluation procedures including high-level GIS data, traditional mapping (including US Geological Survey data and compilation), aerial maps and analysis of physical site-specific constraints raised by affected landowners.	• Attachment 3 • Attachment 4	• Tables 4-1 to 4-4 • Figures 3-1 through 3-12 • Figures 4-1 through 4-6
69.3105 (2)	Transmission applicants should summarize the status of property acquisitions (including fee simple acquisitions and rights of way/easements) as part of the application. The applicant should provide the current status and continuing updates on property acquisition litigation or settlements during the course of the siting proceeding.	• Attachment 4	

Pennsylvania Code Section*	PUC Regulation Requirement	Location in Application	Associated Tables/Figures
69.3105 (3)(i)	In providing information regarding the reasonable alternative routes the utility actively considered in its final phase of the route selection process, and the relative merits of each, in accordance with §57.72(c)(10), the applicant should include the following information: The environmental, historical, cultural and aesthetic considerations of each route.	• Attachment 4	
69.3105 (3)(ii)	The proximity of these alternative routes to residential and non-residential structures.	• Attachment 4	
69.3105 (3)(iii)	The applicant's consideration of relevant existing rights of way.	• Attachment 4	
69.3105 (3)(iv)	The comparative construction costs associated with each route.	• Attachment 4	• Tables 4-3, 4-4
69.3105 (4)	With reference to the proposed route, applicants should provide a summary of efforts made to contact and solicit assistance from local governments and non-governmental organizations regarding areas encompassed within the requirement of §57.72(c)(8).	• Attachment 7 • Attachment 12	
69.3106 (1)	A matrix or list showing all expected federal, state and local government regulatory permitting or licensing approvals that may be required for the project at the time the application is filed, the issuing agency, approximate timeline for approval and current status. The applicant should provide an update on the status of the regulatory permitting/licensing approvals as the case progresses.	• Attachment 14	
69.3107(a)(1)	Applicants for transmission line siting authority should provide a detailed vegetation management plan that includes the following components: A general description of the utility's vegetation management plan.	• Attachment 6	
69.3107(a)(2)	Factors that dictate when each method, including aerial spraying, is utilized.	• Attachment 6	
69.3107(a)(3)	Vegetation management practices near aquatic and other sensitive locations.	• Attachment 6	
69.3107(a)(4)	Notice procedures to affected landowners regarding vegetation management practices.	• Attachment 6	
69.3107(a)(5)	Provision of a copy of a landowner maintenance agreement that describes the duties and responsibilities of landowners and the utility for vegetation management to the extent utilized.	• Attachment 6	

Pennsylvania Code Section*	PUC Regulation Requirement	Location in Application	Associated Tables/Figures
69.3107(b)(1)	Transmission siting applications should include the following: A description of the EMF mitigation procedures that the utility proposes to utilize along the transmission line route. This description should include a statement of policy approach for evaluating design and siting alternatives and a description of the proposed measures for mitigating EMF impacts.	• Attachment 11	

*Pennsylvania Code 57.71 – 57.75 relates to "Commission Review of Siting and Construction of Electric Transmission Lines". Pennsylvania Code 69.3101 – 69.3107 relates to "General Orders, Policy Statements, and Guidelines on Fixed Utilities". Sections described within Attachment 1 pertain specifically to those items required to be included for an application filing.

Attachment 2

ATTACHMENT 2
BLOOMING GROVE-JACKSON AND PECKVILLE-JACKSON 138/69 kV LINE NECESSITY STATEMENT

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FIGURES

1.0 INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) proposes to install a new double-circuit 138/69 kilovolt (kV) transmission line between the existing Jackson 138/69 kV Substation and the existing Lake Naomi 138/69 kV Tap pole. The new line will be designed and constructed for future 138 kV operation, but will initially operate at 69 kV until load growth in the area makes it appropriate to increase the operating voltage.

The existing Lake Naomi 138/69 kV Tap is currently served by the Blooming Grove – Jackson 138/69 kV Transmission Line. As a result of the proposed new transmission line, the existing Blooming Grove – Jackson and Peckville – Jackson Line will create an independent power source for the Lake Naomi and Wagners substations, which will be normally supplied by the Lake Naomi Tap (to be renamed the Jackson – Wagners #1 and #2 Line). The independent power source to these substations will be created by:

- removing the connection on the existing Lake Naomi Tap from the Blooming Grove – Jackson 138/69 kV circuit, and re-terminating both the Blooming Grove – Jackson and Peckville – Jackson circuits at Jackson Substation into alternate line bays,
- constructing 3.8 miles of new double-circuit 138/69 kV transmission line from the Lake Naomi Tap pole to the Jackson Substation, and
- terminating the new line into two other separate line bays at the Jackson Substation.

The proposed new facility will reduce the electrical loading on the existing Blooming Grove – Jackson 138/69 kV circuit, which is most important during peak winter conditions, and provide operating flexibility and improved reliability for customers in Jackson, Pocono, and Tobyhanna Townships in Monroe County.

This project is required to:

(i) avoid exceeding the winter normal thermal loading limit on the existing Blooming Grove – Jackson 138/69 kV circuit under peak winter conditions;

(ii) reduce the electrical loading on the existing Blooming Grove – Jackson 138/69 kV single-circuit line below the 60 MW line loading limit, in order to comply with the guidelines established in PPL Electric's Reliability Principles and Practices (RP&P); and

(iii) prevent interrupting an amount of load that would exceed PPL Electric's RP&P guidelines if the existing Blooming Grove – Jackson 138/69 kV line at Jackson Substation is interrupted.

The estimated cost to site, design, and construct the proposed overhead transmission line is approximately $5.21 million. This cost does not include the required modifications to Jackson Substation. The required in-service date, which is defined as the date that the proposed facility must be placed in service to prevent overloads that could potentially damage equipment and result in service interruptions to customers, is November 2013. In order to meet that in-service date, construction is scheduled to commence in January 2013.

A PPL Electric system map showing existing transmission facilities with a design voltage of 35 kV or greater is included in the **Attachment 2** map pocket. This filing addresses only the existing and proposed transmission system in this portion of Monroe County.

2.0 SYSTEM PLANNING PROCESS

System Planning is the process which assures that PPL Electric's non-bulk electric transmission system can supply electricity to all customer loads in a manner that is

reliable and economic. This process assures that PPL Electric's non bulk electric system (non-BES) transmission system is planned and constructed so that:

- It can sustain probable contingencies and disturbances with minimal customer service interruptions;
- It can adequately serve each customer's needs with regard to capacity, voltage and reliability for all load levels throughout the daily load cycle; and
- It is in conformance with PPL Electric's RP&P.

The reliable and economical operation of PPL Electric's 138/69 kV transmission system requires planning guidelines for system expansion and reinforcement. The principles upon which these planning guidelines are based recognize that:

- The system expansion should be coordinated to achieve the most economical balance of construction and operating expenditures;
- It should maintain a proper balance between the degree of risk, amount and type of load interrupted, and the cost of providing the needed expansion; and
- System reliability should be maintained to prevent large scale, long term, or frequent service interruptions to avoid adverse effects and hazards to the public.

In accordance with these guidelines and PPL Electric's Reliability Criteria, PPL Electric's non-BES transmission system is planned so that:

1. Normal operation of the system will not load any electric facility beyond its normal continuous rating.
2. The loss of any single transmission line, generating unit connected to the non-BES transmission system, power transformer, substation bus, circuit breaker, or double-circuit line due to the outage of a single tower or pole, does not result in any system electric facility being operated beyond its applicable emergency rating.

3. No customer load should remain interrupted for routine maintenance of non-BES transmission facilities.
4. The loss of any single facility should not result in a voltage drop of more than 5% on the 138/69 kV transmission system.
5. Stability of the electric system should be maintained from a permanent three-phase transmission line fault cleared by normal primary relay action. In addition to this, system stability should also be maintained for a permanent single phase to ground line fault and the failure of the protective devices to operate properly resulting in a failed circuit breaker.
6. No large-scale, long-term or frequent interruption may cause excessive load loss due to their adverse effects on, and hazard to, the public.
7. Excessive load is not interrupted for the loss of a single-circuit 69 kV line or double-circuit 69 kV line.

These principles are incorporated in the PPL Electric Utilities Transmission Planning RP&P document.

The 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 PPL Electric, based on recent summer and winter peak load forecasts which take into account ambient temperatures and humidity indices.

Once the system model is complete, comprehensive power flow simulations are performed to determine the ability of the system to comply with the PPL Electric transmission planning reliability criteria. This is accomplished by simulating an outage of each non-BES transmission and bulk electric facility. All conditions where the system is not in conformance with the reliability criteria are identified and system reinforcements are added to bring the system into conformance. Also identified are estimated costs and

lead-times to implement the required reinforcements. Computer simulations of the system with the identified reinforcement alternatives are completed to identify the best overall reinforcement that will meet the needs of the region in a reliable and economic manner.

3.0 EXISTING SYSTEM

From Jackson Substation to the Lake Naomi Tap pole, the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV circuits are built on double-circuit 138/69 kV structures – that is, both circuits are installed on common structures. The circuits are constructed for future 138 kV operation, but are currently operated at 69 kV. Currently, the existing Lake Naomi 138/69 kV Tap is sourced by the Blooming Grove-Jackson 138/69 kV circuit. The Lake Naomi Tap is built for future double-circuit 138/69 kV operation, but is currently operated as a single-circuit 69 kV system. **Figure 1** shows the functional arrangement of the existing transmission facilities in the area.

4.0 DEFINITION OF THE PROBLEM

Due to increasing load growth in the area, transmission planning studies project, for 2013 and beyond, the existing Blooming Grove-Jackson 138/69 kV circuit will be loaded to 115 Mega Volt Amperes (MVA) during peak winter conditions. The Blooming Grove-Jackson 138/69 kV circuit has a normal winter rating of 111 MVA, and loading the circuit to 115 MVA would be a violation of PPL Electric's RP&P guidelines. Operating the circuit in an overloaded condition, above its normal rating, would initially damage the conductor and ultimately cause a failure resulting in customer outages. This would result in approximately 16,300 customers interrupted. This violation can be attributed to recent additional commercial/industrial loading which greatly exceeded the normal projected load growth for this area. The RP&P guidelines also recommend that loading on a single-circuit should not exceed 60 Mega Watts (MW), so that for the loss of one circuit, the load from the out of service circuit can be transferred to the remaining in-service circuit which can still operate within its emergency ampacity rating.

By winter 2013, the loss of the Blooming Grove – Jackson 138/69 kV line would interrupt 115 MVA of load. Transferring load from Jackson to Blooming Grove Substations would be limited due to the resulting low voltage at the end of the Blooming Grove – Jackson circuit. In such an outage, the Power Dispatcher would be required to interrupt customer load served by distribution substations at Wagners and Lake Naomi, and the customer-owned Sanofi substation, to restore 69 kV voltages along the line to within the acceptable lower limit. The RP&P guideline for maximum allowable load loss is 30 MW for a single-circuit line outage. If an outage were to occur on the Blooming Grove – Jackson circuit in its current configuration, approximately 68 MW would remain interrupted for extended periods of time until the outage could be located and switching moves could be made to re-sectionalize the line. This outage would exceed the RP&P guideline for maximum allowable load loss for a single-circuit line outage.

5.0 PROPOSED SOLUTION

To resolve the issues described above, PPL Electric, with approval from the PUC, plans to construct the following:

- A new double-circuit 138/69 kV line from the Jackson Substation, north to the Lake Naomi Tap pole, a distance of approximately 3.8 miles. PPL Electric will design the new line to current 138 kV standards, but will operate the line at 69 kV initially.
- At Jackson Substation in the 69 kV Yard, PPL Electric will install a new line terminal, breaker bay, and circuit breaker.

The existing Peckville – Jackson and Blooming Grove – Jackson 138/69 kV Line, heading north from the Jackson Substation, will become the new Jackson-Wagners #1 & #2 138/69 kV circuits, respectively. The Lake Naomi 138/69 kV Tap will become part of the circuit designated as the Jackson – Wagners #1 Line. The Jackson-Wagners #2 Line will have no load applied to it until the second 138/69 kV circuit is added to the Lake

Naomi Tap in 2014. That project will be submitted to the PUC for review and approval at an appropriate time in the future. The proposed line will be named the Blooming Grove – Jackson and Peckville – Jackson 138/69 kV line. The existing Camelback 69 kV Tap will be removed from its current tap location and re-attached to the new circuit designated as the Peckville - Jackson 138/69 kV circuit. This will be done to eliminate the need for transmission lines to physically cross over/underneath of each other. In addition, attaching the Camelback 69 kV Tap to the Peckville – Jackson 138/69 kV circuit allows the Camelback Substation loads to remain served from their same basic configuration.

PPL Electric determined that this configuration will resolve two of the RP&P transmission violations in the area because the new double-circuit line provides additional transmission capacity and load transfer capability. This new line will reduce loading on the current Blooming Grove – Jackson 138/69 kV circuit, by providing another double-circuit line that ties directly into the Jackson Substation. The load on the existing Lake Naomi Tap will be transferred to the Jackson-Wagners #1 circuit and terminated separately into Jackson substation. After completion of the project, the Blooming Grove-Jackson 69 kV single-circuit line will be loaded to 59 MW during peak winter conditions, which is within RP&P guidelines.

After completion of the project, an outage on the Blooming Grove-Jackson 69 kV line near the Jackson Substation would interrupt 59 MW. Transferring load between Blooming Grove and Jackson Substations is limited because of the low voltage levels that result at the end of the abnormally sectionalized Blooming Grove-Jackson 69 kV line. For an outage near the Jackson Substation on the single-circuit Blooming Grove-Jackson 69 kV line, approximately 32 MW would remain interrupted for an extended period of time. This situation still violates the RP&P guideline for maximum allowable load loss for a single-circuit line outage (30 MW), however the amount of load remaining interrupted will be greatly reduced. The remaining violation will be resolved with another project that will be filed with the Commission in the future.

Figure 2 shows the functional arrangement of the proposed transmission facilities in the area. The total estimated cost for the proposed work is approximately $6.12 million which includes transmission line and substation work. The transmission line work is expected to cost approximately $5.21 million.

6.0 FUNCTIONAL ALTERNATIVES

No other reasonably economical functional alternatives were identified that would resolve the problem as outlined above.

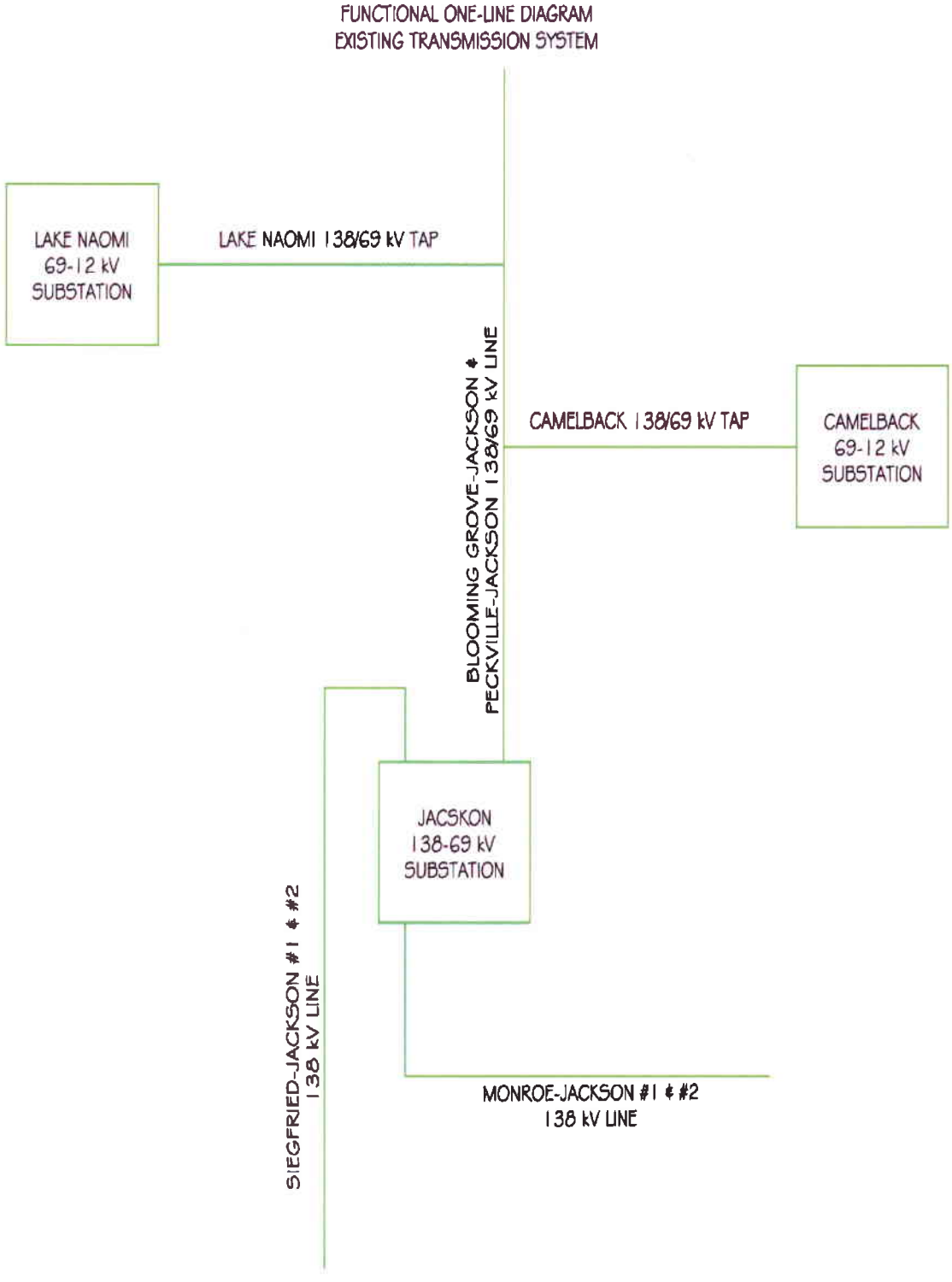


FIGURE 2-1 – ONE LINE DIAGRAM EXISTING TRANSMISSION FACILITIES

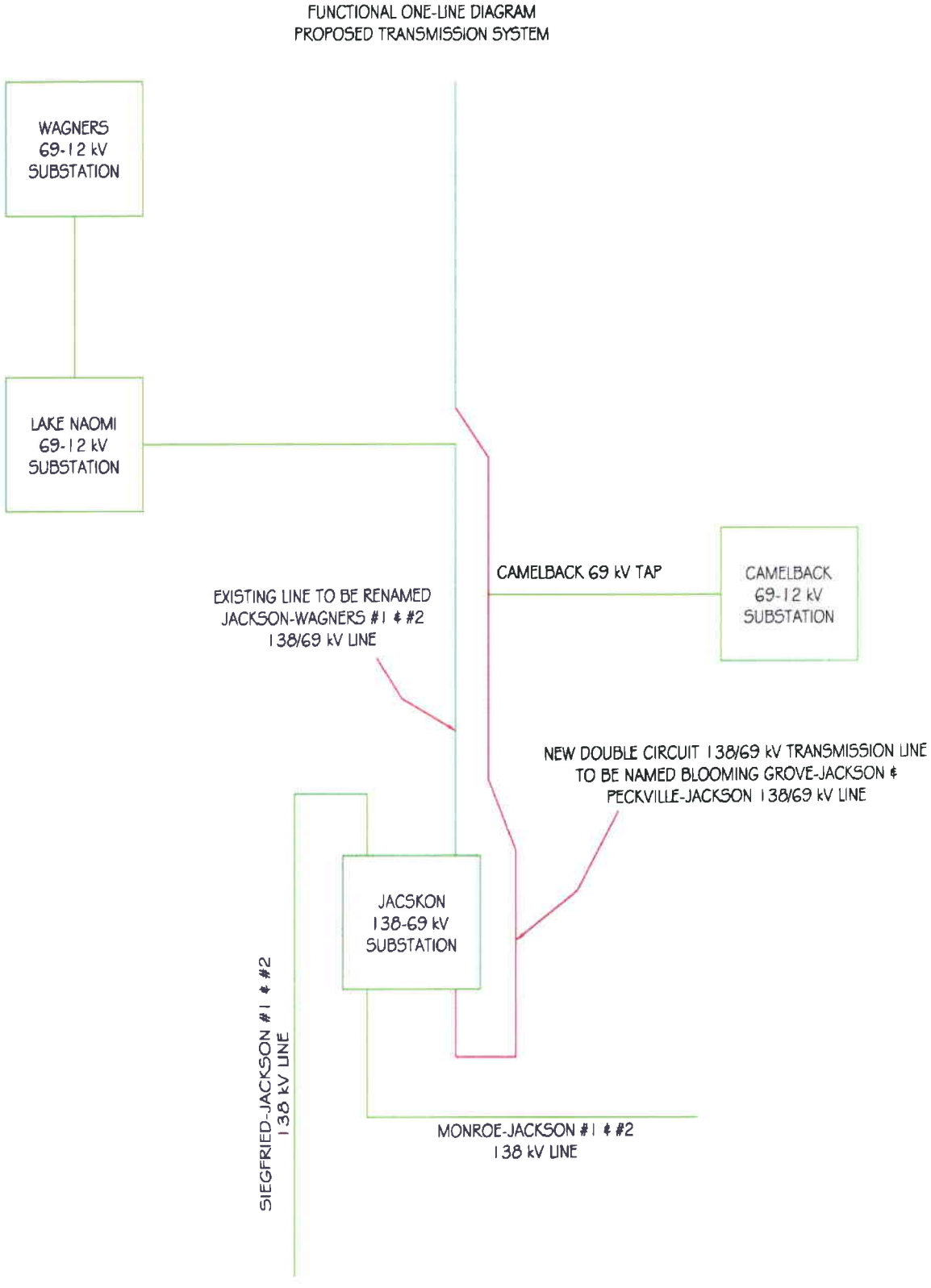


FIGURE 2-2 – ONE LINE DIAGRAM PROPOSED TRANSMISSION FACILITIES

Attach. 2

Figures

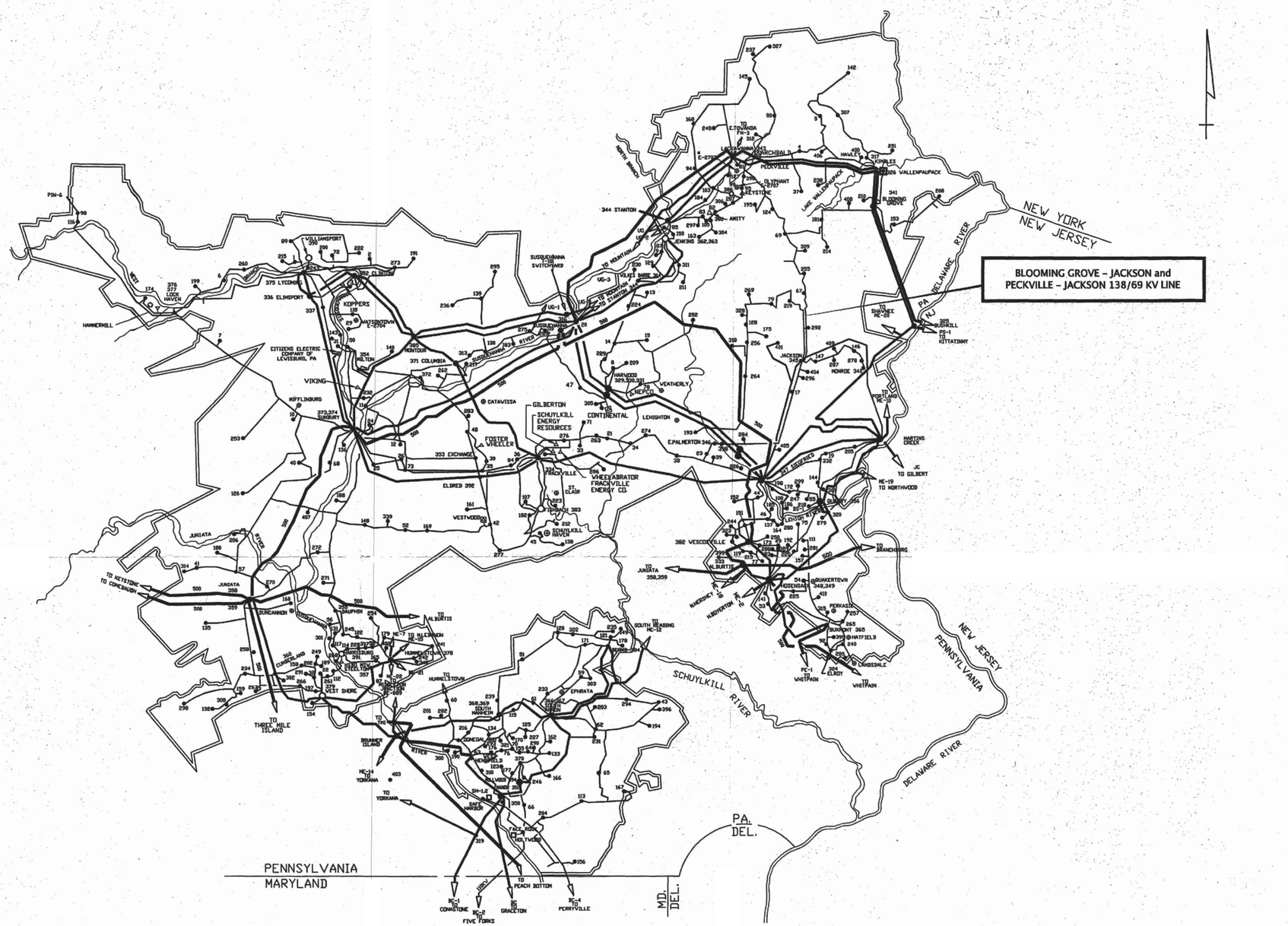
THIS DRAWING IS THE CONFIDENTIAL AND PROPRIETARY PROPERTY OF PPL ELECTRIC UTILITIES. IT CONTAINS PROPRIETARY AND CONFIDENTIAL INFORMATION WHICH MUST NOT BE REPRODUCED OR DISCLOSED TO ANY THIRD PARTY WITHOUT WRITTEN AUTHORIZATION FROM PPL ELECTRIC UTILITIES.

SUBSTATION LISTING

1. WEST WILLIAMSPORT
2. FAIRFIELD
3. MONTGOMERY
4. VARDEN
5. HONESDALE
6. JERSEY SHORE
7. LOGANTON
8. VALMONT
9. RIVER
10. LIMESTONE
11. NORTHUMBERLAND
12. REED
13. WRIGHT
14. ST. JOHNS
15. FRIELAND
16. *
17. GILBERT
18. *
19. CHERRY HILL
20. SUSQUEHANNA 230kV
21. TAMAMEND
22. WHITE HILL
23. PALMERTON
24. HAMILTON
25. HUNTER
26. FAIRVIEW
27. *
28. *
29. MONTOUR PUMP
30. MT. CARMEL
31. KELLY
32. SPORTING HILL
33. MAHANOY CITY
34. GREENWOOD
35. MOWERY
36. ALTAMOUNT
37. HAMLIN
38. ASHFIELD
39. SOUTH SLATINGTON
40. SOUTH MIDDLEBURG
41. WALKER
42. FRAILEY
43. MORGANTOWN
44. EGYPT
45. CRESSONA
46. SOUTH WHITEHALL
47. EAST TOMHICKEN
48. BEAR GAP
49. SALISBURY
50. SOUTH MILTON
51. HEIDELBERG
52. LYKENS
53. UPPER HANOVER
54. RICHLAND
55. MACADA
56. ROCKVILLE
57. THOMPSONTOWN
58. PAXTON
59. COCALICO
60. EAST ELIZABETHTOWN
61. WARWICK
62. EARL
63. HEMPFIELD
64. EAST LANCASTER
65. KINZER
66. MT. NEBO
67. MT. POCONO
68. PENNS
69. GOULDSBORO
70. DILLERVILLE
71. GIRARD MANOR
72. KENMAR
73. GOWEN CITY
74. *
75. ELLIOT HEIGHTS
76. ROHRERSTOWN
77. MACUNGIE
78. EAST HAZLETON
79. WAGNERS
80. EAST CARBONDALE
81. EYNON
82. MINOOKA
83. OLD FORGE
84. FOUNTAIN SPRINGS
85. SULLIVAN TRAIL
86. *
87. SWATARA
88. *
89. HEPBURN
90. *
91. *
92. FRANCONIA
93. EMMAUS
94. MORGAN
95. THROOP
96. *
97. *
98. CHAPMAN
99. SUBURBAN
100. *
101. *
102. *
103. PROVIDENCE
104. *
105. AVOCA
106. *
107. CASS
108. CATASAQUA
109. *
110. SUSQUEHANNA 500kV
111. SEIDERSVILLE
112. ROSEMONT
113. QUARRYVILLE
114. LAWNTON
115. LITITZ
116. RENOVO
117. WALNUT
118. WATSON
119. TREXLERTOWN
120. LAVINO
121. SPRING
122. COLONIAL PARK
123. WEST LANCASTER
124. MADISONVILLE
125. NEFFSVILLE
126. BEAVERTOWN
127. BELMONT
128. LAKE HARMONY
129. GEORGETOWN
130. SCOTT
131. NORTH HARRISBURG
132. MOUNT ROCK
133. GREENLAND
134. LANDISVILLE
135. GREEN PARK
136. SELINSGROVE
137. SUMNER
138. AUBURN
139. ROHRSBURG
140. DERRY
141. EAST GREENVILLE
142. WEST DAMASCUS
143. NEW COLUMBIA
144. FARMERSVILLE
145. GREENVILLE
146. NORTH STROUDSBURG
147. TANNERSVILLE
148. ELIZABETHVILLE
149. WYOMISSING
150. EXETER
151. CRACKERSPORT
152. SCHNECKSVILLE
153. HEMLOCK
154. MT. ALLEN
155. PRINCE
156. WAKEFIELD
157. COOPERSBURG
158. WERTZVILLE
159. WEST CARLISLE
160. BENVENUE
161. HEGINS
162. LEOLA
163. YATESVILLE
164. CENTRAL ALLENTOWN
165. OBERLIN
166. STRASBURG
167. ATGLEN
168. BROOKSIDE
169. WILLIAMSTOWN
170. EAST PETERSBURG
171. WERNERSVILLE
172. NORTH BETHLEHEM
173. WEST ALLENTOWN
174. FLEMINGTON
175. MECKESVILLE
176. DONERVILLE
177. MILLERSVILLE
178. SHILLINGTON
179. DUKE
180. MCALISTERVILLE
181. NEWFOUNDLAND
182. MARLIN
183. WEST BERWICK
184. KEYSER AVENUE
185. MICKLEYS
186. EAST ALLENTOWN
187. PINE RIDGE
188. DALMATIA
189. PENNSBORO
190. NORTH COLUMBIA
191. HUGHSVILLE
192. SOUTH ALLENTOWN
193. WEISSPORT
194. HONEYBROOK
195. MOSCOW
196. *
197. ROSSMOYNE
198. NORTHAMPTON
199. WOOLRICH
200. PAXON
201. ELIZABETHTOWN
202. ENOLA
203. TERRE HILL
204. BUCK
205. MT. BETHEL
206. RICHFIELD
207. SCRANTON
208. TWIN LAKES
209. HARLEIGH
210. TAFTON
211. BEAR CREEK
212. ORWIGSBURG
213. EAST TEXAS
214. CANDENSIS
215. LINDEN
216. MT. JOY
217. WEST BLOOMSBURG
218. MINSI TRAIL
219. LAKE NAOMI
220. LANARK
221. *
222. MONTOURSVILLE
223. POINT CARBON
224. BLYTHEBURN
225. MILFORD
226. TREICHLERS
227. ROSEVILLE
228. RUTHERFORD
229. HARTLAND
230. PARRISH
231. WEST NEW HOLLAND
232. POINT
233. LINCOLN
234. MIDDLETON
235. STATE HILL
236. MILLVILLE
237. TINKER
238. LAKEVILLE
239. NORTH MANHEIM
240. HATFIELD
241. HERSHEY
242. SOUTH HERSHEY
243. SOUTH WILLIAMSPORT
244. FOGELSVILLE
245. WINDSOR
246. WEST WILLOW
247. WESTGATE
248. EDELA
249. SUMMERDALE
250. DORNEYVILLE
251. BOHEMIA
252. WHITE HAVEN
253. LAURELTON
254. LINGLESTOWN
255. POCONO FARMS
256. HICKORY RUN
257. BLOOMING GLEN
258. SHERMANDSDALE
259. *
260. LARRYS CREEK
261. SPANGLER MILLS
262. EAST DANVILLE
263. DELANO
264. CARBON
265. SELLERSVILLE
266. MECHANICSBURG
267. CARLISLE
268. CEDAR
269. ARROWHEAD
270. NEWPORT
271. HALIFAX
272. MILLERSBURG
273. MUNCY
274. HAUTO
275. BERWICK
276. SHENANDOAH
277. PINE GROVE
278. STROUDSBURG
279. FREEMANSBURG
280. ALLENTOWN
281. BINGEN
282. RHEEMS
283. CLEVELAND
284. LITTLE GAP
285. ORVILLA
286. TUSCARORA
287. BARTONSVILLE
288. ALTON PARK
289. SALEM
290. NORTH BRIDGEPORT
291. HAMPDEN
292. CAMELBACK
293. SILVER SPRING
294. BRECKNOCK
295. BENTON
296. McMICHAELS
297. HUGHESTOWN
298. NEWVILLE
299. POINTE NORTH
300. MARIETTA
301. CENTER CITY
302. NEW KINGSTOWN
303. REAMSTOWN
304. DUPONT
305. HUMBOLT
306. CEDAR AVE.
307. INDIAN ORCHARD
308. NOTTINGHAM
309. NORTH COOLBAUGH
310. LETORT
311. EAST MOUNTAIN
312. JERMYN
313. BLOOMSBURG
314. MIFFLINTOWN
315. RIDGE ROAD
316. SUSQUEHANNA T-10 SW. YARD
317. KIMBLES
318. CHRISTMANS
319. OTTER CREEK
320. STEEL CITY
321. McGOVERNVILLE
322. ROBESONIA
323. SOUTH FOGELSVILLE
324. ELROY
325. BUSHKILL
326. WALLENPAUPACK
327. ELK MOUNTAIN
328. JACK FROST
329. HARWOOD 230/69kV
330. HARWOOD CTG
331. HARWOOD 69/12kV
332. NAZARETH
333. ALBURTIS
334. FRACKVILLE
335. *
336. ELIMSPORT
337. ALLENWOOD
338. *
339. GRATZ
340. HOCKERSVILLE
341. BLOOMING GROVE
342. MONROE
343. LACKAWANNA ##
344. STANTON
345. JACKSON
346. EAST PALMERTON
347. SIEGFRIED
348. HOSENSACK 230/69
349. HOSENSACK 500kV
350. CONESTOGA
351. MANOR
352. CLINTON
353. EXCHANGE
354. MILTON
355. DAUPHIN
356. QUARRY SUB.
357. STEELTON
358. JUNIATA 500/230kV
359. JUNIATA 230/69kV
360. CUMBERLAND
361. DONEGAL
362. JENKINS 230/69kV
363. JENKINS CTG
364. WILKES-BARRE
365. BUXMONT
366. SOUTH AKRON 230/138/69kV
367. SOUTH AKRON 69/12kV
368. SOUTH MANHEIM 69/12kV
369. SOUTH MANHEIM 230/69kV
370. ENGLESIDE
371. COLUMBIA
372. DANVILLE
373. SUNBURY
374. HUMMELS WHARF
375. LYCOMING
376. LOCK HAVEN CTG
377. LOCK HAVEN 69/12kV
378. HUMMELSTOWN
379. WEST SHORE
380. MONTAGE
381. SOUTH FARMERSVILLE
382. WESCOSVILLE
383. FISHBACH
384. BERKS
385. MONTOUR
386. SUBURBAN YARD
387. *
388. *
389. MACK
390. WILLIAMSPORT
391. HARRISBURG
392. ELDRED
393. *
394. MILLWOOD
395. TELFORD
396. TWIN VALLEY
397. DEVONSHIRE
398. BELTZVILLE
399. SCHOENECK
400. HAWLEY
401. EFFORT MOUNTAIN
402. COPPERSTONE
403. RED FRONT
404. APPENZELL
405. BLUE MOUNTAIN
406. DAPPERS 69/12kV
407. MEISERVILLE
408. LEDGEDALE
409. EAST TANNERSVILLE
410. TRUMBAUERSVILLE

* - SUBSTATIONS THAT HAVE BEEN RETIRED.

\#\# - SITE OF THE EXISTING 230kV SUBSTATION AND PROPOSED 500kV SYBSTATION.



INTERCONNECTIONS

PS PUBLIC SERVICE ELECTRIC AND GAS CO. OF N.J.
ME METROPOLITAN EDISON CO. (FIRST ENERGY)
PE PHILADELPHIA ELECTRIC CO. (PECO ENERGY)
BC BALTIMORE GAS AND ELECTRIC CO.
SH SAFE HARBOR WATER POWER CORPORATION
UP THE UNITED GAS IMPROVEMENT CO. - LUZERNE ELECTRIC DIVISION
PN PENNSYLVANIA ELECTRIC CO. (FIRST ENERGY)
JC JERSEY CENTRAL POWER AND LIGHT CO. (FIRST ENERGY)

COMBUSTION TURBINE
HYDRO ELECTRIC
COMBINATION
FIRM SALES
SUBSTATION /SWITCHING STATION
STEAM ELECTRIC
NON-UTILITY GENERATION
INDEPENDENT POWER PRODUCERS

500KV OPERATION
230KV OPERATION
138KV OPERATION
69KV OPERATION

NO.	DATE	ACCT.		BY	REVIEWED	APPROVED
96	10/25/11	169003	ADDED BLOOMING GROVE - JACKSON & PECKVILLE - JACKSON 138/69 KV LINE	MG		JDW
95	9/9/11	169017	ADDED TRUMBAUERSVILLE #1 & #2 138/69 KV TAP LINE	mg		KBK
94	6/15/11	161723	ADDED EAST PETERSBURG #1 & #2 138KV TAP & PARK CITY #1 & #2 138KV TAP	mg		JBW
93	7/22/11	10014283	DEPICT LOCATION OF MARTINS CREEK - SIEGFRIED #2 230KV LINE REBUILD	mg		DJG

REFERENCE TITLE | NUMBER | REFERENCE TITLE | NUMBER

#6000

PPL ELECTRIC UTILITIES

ACCT- 805201
SCALE- NONE
BY- CDW
REVIEWED

ELECTRICAL SYSTEM MAP
BLOOMING GROVE - JACKSON & PECKVILLE - JACKSON
138/69 KV LINE

APPROVED G. HAKUN III
DATE 7/17/85

PPL ELECTRIC UTILITIES

PPL DRAWING NO. D191830
SHEET NO. 1
REV. 96

D191830 5001.DWG

PPL EU FORM 4877 07/90
PC CAD

Attachment 3

ATTACHMENT 3
BLOOMING GROVE-JACKSON AND PECKVILLE-JACKSON 138/69 kV LINE ENVIRONMENTAL SETTING

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LIST OF ACRONYMS

Acronym	Definition
ACE	Agricultural Conservation Easement
ASA	Agricultural Security Area
CWF	Cold Water Fishery
CRGIS	Cultural Resources Geographic Information System
EV	Exceptional Value
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
HQ	High Quality
I	Interstate
IBA	Important Bird Area
kV	Kilovolt
MF	Migratory Fishery
MCPC	Monroe County Planning Commission
NAI	Natural Areas Inventory
NPL	National Priority List
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
NWPS	National Wilderness Preservation System
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PFBC	Pennsylvania Fish and Boat Commission
PFO	Palustrine Forested
PGC	Pennsylvania Game Commission
PHMC	Pennsylvania Historical and Museum Commission
PNDI	Pennsylvania Natural Diversity Inventory
PNHP	Pennsylvania Natural Heritage Program
PPL Electric	PPL Electric Utilities Corporation
PSS	Palustrine Scrub/Shrub
RCRA	Resource Conservation and Recovery Act
RTE	Rare, Threatened, or Endangered

Acronym	Definition
SR	State Route
TNC	The Nature Conservancy
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground Storage Tank

1.0 INTRODUCTION

This Attachment provides background information regarding the environmental setting of the General Area of Study for siting a new PPL Electric Utilities Corporation (PPL Electric) transmission line in Monroe County, Pennsylvania. The purpose of the information presented in this Attachment is to provide context and information used for the detailed siting study described in **Attachment 4**, which involves the development of a refined Project Study Area, Macro Corridors, Alternative Routes, and the determination of a Selected Route. The boundaries of the General Area of Study were derived from the Project's Purpose and Need (**Attachment 2** – Necessity Statement), which defines the beginning location as the Jackson Substation and the optimal ending area along a 3.5-mile segment of existing transmission line located southeast of the Lake Naomi Substation. This 3.5-mile segment includes portions of the existing Lake Naomi 138/69 kV Tap line and the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission lines. The approximately 30-square mile General Area of Study is defined to the south by the Jackson Substation, beyond which a new route extending north to the desired tap location would not be reasonable. Landscape features define the remaining boundaries and include dense residential areas to the west and north, and compacted residential and commercial districts along Interstate (I)-80 and State Route (SR) 611 to the east.

Information contained in this Attachment was gathered from numerous sources, including federal, state, and local geographic information systems (GIS) databases, published reports and maps, and field reconnaissance surveys.

The General Area of Study is in Monroe County, which is located in northeastern Pennsylvania (**Figure 3-1**). Portions of the following municipalities are included in the General Area of Study:

- Jackson Township
- Pocono Township
- Tobyhanna Township
- Tunkhannock Township

2.0 NATURAL ENVIRONMENT OF THE GENERAL AREA OF STUDY

Features of the natural environment are an important consideration in the siting process as they help define the opportunity and constraint areas that must be considered when developing transmission line routes. This section provides a description of the environmental setting of the General Area of Study including the physiography, geology, soils, surface waters, vegetation and wildlife habitat, and special use areas.

2.1 Physiographic Provinces and Terrain

Monroe County extends across two physiographic provinces (**Figure 3-2**): the Appalachian Plateau Province in the north, which includes a Glaciated Low Plateau Section and a Glaciated Pocono Plateau Section, and the Ridge and Valley Province in the south, which includes the Appalachian Mountain Section (Sevon 2000). The underlying bedrock geology, as well as glacial and stream erosion and deposition, shape surface topography.

The General Area of Study is located at the confluence of these two physiographic provinces, but is primarily within the Glaciated Low Plateau and Glaciated Pocono Plateau Sections of the Appalachian Plateau Province. The southernmost portion of the General Area of Study, which includes the Jackson Substation, is a narrow segment of the Appalachian Mountain Section of the Ridge and Valley Province. This narrow segment is located at the southern base of the Pocono Plateau Escarpment, a prominent topographic feature that separates the Ridge and Valley Province from the Appalachian Plateau Province. The Appalachian Mountain Section in this area is characterized by low linear ridges and shallow valleys that extend north to the Pocono Plateau Escarpment (Sevon 2000). Local variation in elevation between the mountaintops and valley floors is about 700 feet. Areas of steep slopes (> 30% slope) in the General Area of Study are illustrated on **Figure 3-3**.

Most of the General Area of Study is located north of the Appalachian Mountain Section and is evenly divided between the Glaciated Pocono Plateau Section to the west and Glaciated Low Plateau Section to the east. According to the Pennsylvania Bureau of Topographic and Geologic Survey,

> *"…the Glaciated Pocono Plateau is a broad upland surrounded on all but its western side by steep to moderately steep slopes. This area is underlain mainly by tough, erosion resistant sandstones that are relatively flat lying. Relief on the upland is generally less than 200 feet, but can be as much as 600 feet where small hills rise above the general level of the upland. Elevations on the upland range from 1,200 to 2,320 feet. The upland is drained by several small streams that flow from the upland interior to and away from the margins. Swamps and peat bogs have developed in small un-drained depressions created by glacial scour and deposition."* (Pennsylvania Department of Conservation and Natural Resources [PADCNR] 2010a)

Furthermore, according to the Pennsylvania Bureau of Topographic and Geologic Survey,

> *"…the Glaciated Low Plateau Section includes an area of diversified topography in northeastern Pennsylvania. The topography consists of rounded hills and broad to narrow valleys all of which have been modified by glacial erosion and deposition. The Section reflects the interplay between bedrock of various types, mainly sandstones and siltstones, and glacial erosion and deposition. Glacial deposits, mainly glacial till or sand and gravel, may occur anywhere, but are found mainly in the valley bottoms and margins."* (PADCNR 2010a)

2.2 Geologic Areas

The geology of the General Area of Study can be described in terms of underlying consolidated rocks (bedrock geology) and unconsolidated deposits atop bedrock (surficial geology). The following is a summary of information from Berg (1975), Berg *et al.* (1977), Carswell and Lloyd (1979), and Sevon *et al.* (1975).

The bedrock geology of the General Area of Study is shown in **Figure 3-4**. Rock units that underlie the unconsolidated material are from the Late Devonian period, which ranges in age from about 360 million years to about 385 million years. The following rock units and associated map symbol (i.e., Dcpg) are listed from youngest to oldest:

- Poplar Gap Member (Catskill Formation) (Dcpg)
- Packerton Member (Catskill Formation) (Dcp)
- Long Run Member (Catskill Formation) (Dclr)

Most of the General Area of Study is underlain with the Long Run Member, which is characterized by alternating sequences of gray sandstone with red siltstone and shale. Along its western edge, the General Area of Study is underlain by the Packerton and Poplar Gap Members, which also consist of sandstone, siltstone, and conglomerates.

The highest point in the General Area of Study is the 2,133-foot Pocono Knob located on top of Camelback Mountain. Camelback Mountain is a component of the Pocono Plateau Escarpment, which is a significant west to east protrusion of the Poplar Gap Member into the Long Run Member bedrock component that typifies the General Area of Study. Situated within Big Pocono State Park, Pocono Knob is considered an outstanding scenic geologic formation in Pennsylvania due to the exceptional vistas available from this location (Geyer and Boles 1979).

Unconsolidated geologic units overlying the General Area of Study bedrock are glacial, alluvial, and colluvial, as defined below. This area is known to have undergone several glaciations over the last 150,000 years. It is believed glaciers advanced into this area generally from the northeast with the Pocono Plateau Escarpment influencing the main direction of flow. Most of the General Area of Study is covered with material carried by and deposited directly from the ice sheets, called glacial till and outwash. Sediments transported and deposited by present-day and ancestral streams are called alluvium. Alluvial deposits primarily occur within stream banks and in floodplains, most of which are post-glacial floodplains. Loose rock debris that has accumulated at the base of a gently sloping cliffs or slopes through the action of weather or gravity is called colluvium. Due to the variable topography, colluvial deposits may be located at various elevations throughout the General Area of Study, as well as along the edge of stream banks and floodplains.

2.3 Soil Characteristics

The general characteristics of soils that have developed in the General Area of Study correspond closely to physiography and geology (Lipscomb 1981). The following discussion of soils is based on information provided by the U.S. Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS 2010). Soils in the Ridge and Valley Province are well to moderately well drained, may be shallow or deep, and are derived from till, colluvium, or bedrock. Deep, excessively drained to well drained soils form as alluvium on terraces and floodplains.

Soils in the Glaciated Pocono Plateau Section of the Appalachian Plateau Province are somewhat excessively well drained to somewhat poorly drained, typically deep, and are derived from sandstone and siltstone. Many of these soils are characterized as being very stony and having high water tables.

Soils in the Glaciated Low Plateau Section of the Appalachian Plateau Province are somewhat excessively drained to well drained, moderately deep, and are derived from sandstone and siltstone. These soils are characterized as less stony and having deeper water tables. Glacial till and outwash areas are prevalent throughout the area.

Figure 3-5 illustrates the soil-mapping units within the General Area of Study that are labeled as prime farmland soils, hydric soils, or soils with hydric inclusions.

- Prime farmland soils, particularly significant in agricultural areas, have the best combination of physical and chemical characteristics for producing food and feed. These soil properties are used to determine if farms are eligible to be incorporated into the County Agricultural Conservation Easement (ACE) program (see **Section 3.1.1**).
- Hydric soils are formed under wet conditions (saturation, flooding, or ponding) sufficient to develop anaerobic conditions during the growing season in the upper regions of the soil layer and support the growth of hydrophytic vegetation.
- Hydric inclusions are small areas of hydric soils located within a larger soil type that is not typically identified as hydric. **Table 3-1** provides a list of the hydric soils and soils with hydric inclusions located within the General Area of Study.

Erosion potential associated with the project will be related to clearing the vegetation and constructing the transmission poles and access roads, all of which are expected to be minimal given the limited extent of the project. Following existing access roads and co-locating the new transmission line within portions of existing ROW will reduce the

potential for erosion and the resulting sedimentation. Erosion and sedimentation control plans will also be developed that will address the construction and post-construction stormwater concerns. These plans will be reviewed and approved by the Monroe County Conservation District prior to the issuance of other necessary permits.

TABLE 3-1: Soils with Hydric Characteristics within the General Area of Study

SOIL SYMBOL	SOIL NAME
Hydric Soils	
CmA	Chippewa and Norwich Silt Loams, 0 to 5 percent slopes
CnB	Chippewa and Norwich Extremely Stony Soils, 0 to 8 percent slopes
Hy	Holly Silt Loam
Mp	Mucky Peat, Deep
Ms	Mucky Peat, Shallow
ReA	Rexford Gravelly Silt Loam, 0 to 3 percent slopes
SmA	Shelmadine Silt Loam, 0 to 3 percent slopes
SpB	Shelmadine Very Stony Silt Loam 0 to 8 percent slopes
Wb	Wayland Silty Clay Loam
Soils with Hydric Inclusions	
As	Alluvial Land
AvB	Alvira Gravelly Silt Loam, 3 to 8 percent slopes
AwB	Alvira and Watson Very Stony Loams, 0 to 12 percent slopes
BrA	Braceville Gravelly Loam, 0 to 3 percent slopes
BrB*	Braceville Gravelly Loam, 3 to 8 percent slopes
BuB*	Buchanan Loam, 3 to 8 percent slopes
BxC	Buchanan Extremely Stony Loam, 8 to 25 percent slopes
ExB	Empeyville Extremely Stony Sandy Loam 0 to 8 percent slopes
MbC	Mardin Very Stony Silt Loam, 8 to 25 percent slopes
MgB	Morris Channery Silt Loam, 2 to 10 percent slopes
MoB	Morris Extremely Stony Silt Loam, 0 to 8 percent slopes
MoC	Morris Extremely Stony Silt Loam, 8 to 20 percent slopes
Ph*	Philo Silt Loam
Po*	Pope Silt Loam
Pp	Pope Silt Loam, High Bottom
VaC	Very Stony Land and Rock Outcrops, Sloping
VxB	Volusia Extremely Stony Silt Loam, 0 to 8 percent slopes
WmB*	Wellsboro Channery Loam, 3 to 8 percent slopes
WmC	Wellsboro Channery Loam, 8 to 15 percent slopes
WpB	Wellsboro Extremely Stony Loam, 0 to 8 percent slopes
WpC	Wellsboro Extremely Stony Loam, 8 to 25 percent slopes
WxB	Wurtsboro Extremely Stony Loam, 0 to 8 percent slopes
WxC	Wurtsboro Extremely Stony Loam, 8 to 25 percent slopes

Source: USDA/NRCS * Indicates prime farmland soils

2.4 Hydrology

The General Area of Study lies primarily within the Pocono Creek portion of the McMichael's Creek watershed, which is in the Delaware River Basin.[1] A small portion is also located within the Brodhead Creek watershed of the Delaware River Basin. Another small portion to the west is within the Tobyhanna Creek sub-watershed of the Lehigh River watershed.[2] Major streams and lakes found on U.S. Geological Survey (USGS) topographic maps, as well as watershed boundaries, are illustrated in **Figure 3-6** and discussed further below (USGS 1998 and 2001).

2.4.1 Streams

The Pennsylvania Code, Title 25, Chapter 93 (Pennsylvania Department of Environmental Protection [PADEP] 2010) establishes narrative and numeric water quality criteria necessary to support a variety of protected water uses. All surface waters must be protected for aquatic life (warm water fishes), water supply (potable, industrial, livestock, wildlife, and irrigation), and recreation (boating, fishing, water contact sports, and aesthetics). PADEP assigns all streams in the Commonwealth a *Designated Use*, which is the water use goal for a particular stream segment, whether or not it is currently being attained. In contrast, a stream's *Existing Use* is the use actually attained by existing water quality. PADEP's antidegradation policy requires existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. As such, the water quality of a stream segment with an existing use that exceeds its designated use may not be degraded below the water quality levels protective of that existing use.

Stream segments within the General Area of Study have either Chapter 93 designated use classifications of Cold Water Fishery (CWF), indicating their suitability as a cold-water fishery for the maintenance or propagation of fish indigenous to a cold-water habitat, or are designated for special protection as High Quality (HQ) and Exceptional Value (EV) waters (**Figure 3-7**). All streams are also designated as Migratory Fisheries (MF), indicating their suitability for the passage, maintenance, and propagation of migratory

[1] Drainage List C of Pennsylvania Code. Title 25. Chapter 93. Water Quality Standards ("Chapter 93")
[2] Drainage List D of Pennsylvania Code. Title 25. Chapter 93. Water Quality Standards ("Chapter 93")

fish. Of note is that Swiftwater Creek and its tributaries from their source to SR 611, have a designated use classification of HQ-CWF, but an existing use classification of EV.

Streams in the General Area of Study, and their designated use classifications, include:

- Fall Creek – EV, MF
- Tunkhannock Creek – HQ-CWF, MF
- Wolf Swamp Run – EV, MF
- Sand Spring Run – EV, MF
- Dry Sawmill Run – HQ-CWF, MF
- Transue Run – HQ-CWF, MF
- Pocono Creek – HQ-CWF, MF
- Scot Run – HQ-CWF, MF
- Swiftwater Creek – HQ-CWF, MF (existing use is EV)

Additionally, within the General Area of Study, the Pennsylvania Fish and Boat Commission (PFBC) has indicated that Pocono Creek is an approved trout stocking stream. Wolf Swamp Run is also listed by the PFBC as a Class A wild trout stream and is part of the Wild Brook Trout Enhancement Program. Sand Spring Run and Wolf Swamp Run are also classified by PFBC as Wilderness Trout streams (PFBC 2010).

2.4.2 100-year Floodplains

The areas adjacent to streams subject to inundation by a flood elevation with a 1-percent-annual-chance of being equaled or exceeded each year are known as the 100-year floodplains. The Federal Emergency Management Agency (FEMA) delineates the extent of some 100-year floodplains on Flood Insurance Rate Maps, but is not comprehensive. As such, **Figure 3-7** shows the 100-year floodplain boundaries from the Monroe County Planning Commission (MCPC) digital database.

2.4.3 Lakes

Numerous open water bodies are located within the General Area of Study. Major lakes include Deep Lake, Crescent Lake, Sand Spring Lake, Pine Tree Lake, and Emerald Lake (**Figure 3-6**).

2.4.4 Wetlands

U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) wetland maps indicate that wetlands in the General Area of Study are palustrine (i.e., nontidal, freshwater) wetlands dominated by trees, shrubs, persistent emergent vegetation, and emergent mosses or lichens. NWI wetlands are classified in accordance with the Cowardin system (Cowardin et al. 1979), which also includes open waters (e.g., streams, ponds, lakes) as wetlands. Large concentrations of NWI wetlands, primarily palustrine forested (PFO) or shrub/scrub (PSS) communities, are noted in association with the Long Pond Macrosite and the Sand Spring Run/Wolf Swamp Run Natural Areas, located in the western portion of the General Area of Study, and around Emerald Lake Estates, located in the northwestern portion (**Figure 3-6**) (USFWS 2011).

The wetlands depicted in the NWI database are not identified or delineated in accordance with methodologies used by regulatory agencies to establish boundaries of wetlands under their jurisdiction. The NWI maps were created based on the analysis of aerial photographs from the 1980s with limited ground verification, and should not be considered an alternative to delineating wetlands using regulatory requirements. An official delineation of the wetlands within the Selected Route will be required prior to issuance of the environmental permits necessary for construction of the transmission line.

2.5 Plant and Wildlife Habitats

The General Area of Study contains unique areas of natural environment composed of native plant and wildlife habitats. Many of these natural areas are preserved for their ecological benefit, as well as being a social recreational resource.

2.5.1 Vegetation

Vegetation within the General Area of Study includes both natural undeveloped areas dominated by upland or wetland forests as well as human-influenced plant communities such as landscaped areas, successional meadows, and a few agricultural fields.

The General Area of Study lies within the Central Appalachian Broadleaf Forest-Coniferous Forest-Meadow Forest ecosystem province (Bailey 1998). This province is temperate, with distinct summer and winter seasons and some of the highest precipitation levels in the eastern United States. Within this ecosystem province, vegetation

communities have been further refined into regional classifications such as those established by the PADCNR (Fike 1999) and The Nature Conservancy (TNC) (TNC Natural Areas Inventory [NAI] 1991; TNC 1999).

The vegetative community in the extreme southern portion of the General Area of Study is classified as Mixed Oak Forest (TNC 1991). The forests within this region are characterized by species such as red oak (*Quercus rubra*), white oak (*Q. alba*), black oak (*Q. velutina*), sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), tulip tree (*Liriodendron tulipifera*), and hickories (*Carya* spp). Shrub species typical of these forests include blueberry (*Vaccinium corymbosum*), spicebush (*Lindera benzoin*), and witch hazel (*Hamamelis virginiana*).

Most of the General Area of Study is located in a vegetative community classified as the Northern Hardwoods Forest, which lies north of the Mixed Oak Forest (TNC 1991). The Northern Hardwoods Forests are different from the Mixed Oak Forest in that the oaks are a minor component relative to the dominance of red maple (*Acer rubrum*), sugar maple, beech, white ash, yellow birch (*Betula alleghaniensis*), and hemlock (*Tsuga canadensis*). In wetter environments, such as the boreal conifer swamps created by glacial activities, coniferous species are more abundant and include larch (*Larix laricina*), black spruce (*Picea mariana*), and balsam fir (*Abies balsamea*).

2.5.2 Wildlife

Typical wildlife species found within the General Area of Study include those found in wetlands, forested habitats, and scrub-shrub habitats. Wetlands in the area harbor species such as green frog (*Rana clamitans*), bullfrog (*R. catesbeiana*), northern water snake (*Nerodia sipedon*), red-wing blackbird (*Agelaius phoenicus*), common yellowthroat (*Geothlypis trichas*), and raccoon (*Procyon lotor*). Forests and scrub-shrub habitats are home to species such as white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), wild turkey (*Melagris gallopavo*), box turtle (*Terrapene carolina*), striped skunk (*Mephitus mephitus*), opossum (*Didelphis marsupialis*), and a variety of small mammals and songbirds (TNC 1991, Fergus and Hansen 2000).

The Audubon Society has identified the Long Pond Macrosite and adjacent State Game Land #38 as an Important Bird Area (IBA #64) **(Figure 3-8)**. Species identified in the

Long Pond Macrosite include scarlet tanagers (*Piranga olivacea*), bobolinks (*Dolichonyx oryzivorus*), wood ducks (*Aix sponsa*), and various warblers. This unique ecosystem also provides habitat for several threatened bird species including the American bittern (*Botaurus lentiginosus*), osprey (*Pandion haliaetus*), and the northern harrier (*Circus cyaneus*) (Audubon 2010).

2.5.3 Rare, Threatened, and Endangered Species

Based on a search of the Pennsylvania Natural Diversity Inventory (PNDI) database, administered by the Pennsylvania Natural Heritage Program (PNHP) (PNHP 2010), and follow-up consultations with the USFWS, PFBC, Pennsylvania Game Commission (PGC), and PADCNR, the following federal and/or state rare, threatened, or endangered (RTE) species could potentially occur within the General Area of Study:

- Bog turtle (*Glyptemys muhlenbergii*) – State endangered, Federal threatened reptile (USFWS)
- Indiana bat (*Myotis sodalist*) State endangered, Federal endangered reptile (USFWS)
- Timber Rattlesnake (*Crotalus horridus*) – State candidate reptile (PFBC)
- Variable Sedge (*Carex polymorpha*) – State endangered plant (PADCNR)
- Pitch Pine-Heath Woodland [Ridgetop dwarf-tree forest (*Quercus ilicifolia-Kalmia latifolia*)] – Special Concern Resource (PADCNR)

Habitat assessments for these RTE species may be required by the jurisdictional agencies as part of the environmental permitting and approval process for the Selected Route.

2.6 Special Use Areas

Special use areas are places recognized by regulatory agencies or local governments as providing unique habitat characteristics or wildlife management opportunities that indicate a need for preservation. Examples include scenic areas, wilderness areas, wild and scenic rivers, state game lands, and priority natural areas.

2.6.1 Scenic Areas

The only designated scenic area in the General Area of Study is the Big Pocono Overlook, located within Big Pocono State Park, which is designated as scenic by the PADCNR. The PADCNR provides designations for vistas and overlooks, waterfalls,

scenic hikes, or other special areas **(Figure 3-8)** (PADCNR 2010b). There are no Heritage Geology Sites designated by the PNHP in the General Area of Study (PADCNR 2010d).

2.6.2 Wilderness Areas

No part of the General Area of Study is located within the National Wilderness Preservation System (NWPS 2010).

2.6.3 Wild and Scenic Rivers

No wild or scenic rivers, as designated pursuant to the federal Wild and Scenic Rivers Act or by the Pennsylvania Scenic Rivers Act, are located within the General Area of Study (PADCNR 2010c).

2.6.4 State Game Lands

Approximately 3,150-acres of the 5,500-acre State Game Land #38 lies within the boundaries of the General Area of Study **(Figure 3-8)**. State Game Land #318 is located to the northwest, outside of the General Area of Study (PGC 2010).

2.6.5 Priority Natural Areas

The NAI for Monroe County, conducted by TNC, indicates that three Priority Natural Areas are partially or wholly located within the General Area of Study **(Figure 3-8)** (TNC 1991, 1999). These sites include the Long Pond Macrosite, Camelback Mountain, and Sand Spring Run/Wolf Swamp Run. According to the 1991 Monroe County NAI,

> *"The Long Pond Macrosite Preserve encompasses excellent examples of Acidic Shrub Swamp and Ridgetop Dwarf-tree Forest natural communities that typify the Pocono Plateau. It is one of the most unique ecosystems in the Northeast and an extremely important site for preservation. Numerous plant and animal species of special concern inhabit these communities."*

Due to its biodiversity and high concentration of rare species, the NAI ranks Long Pond Macrosite as 1 out of 5 for priority of preservation (1 is highest ranking). This 15,000-acre preserve is a complex mosaic of barrens, hardwoods, conifer forests, and wetlands that provides habitat for at least 30 regionally and 10 globally rare plant species.

Camelback Mountain, which reaches an elevation of 2,133 feet, provides exceptional vistas and is considered an outstanding scenic geologic feature; (this classification is different from the Heritage Geology Sites designated by the PNHP). Although the northern slope has been heavily disturbed by the Camelback Mountain Ski Resort, the southern face is composed of a relatively undisturbed oak/hardwood forest and the upper slopes support a high-quality Ridgetop Dwarf-tree Forest natural community. The NAI ranks the Camelback Mountain area as having a priority status of 3. The NAI ranks the Sand Spring Run and Wolf Swamp Run as having a priority status of 5; additionally, these areas are PADEP EV-designated streams that are considered priority sites due to their High Gradient Clearwater Creek natural community characteristics.

3.0 HUMAN ENVIRONMENT OF THE GENERAL AREA OF STUDY

Human influences on the natural environment within the General Area of Study are represented by many development types and patterns. These are discussed below using the Monroe County land use codes as a framework (described in **Section 3.1**) and other land use/land cover categories noted in **Section 3.2** through **Section 3.5**.

3.1 Land Use

Land use codes designated by the Monroe County Planning Department were used to characterize the General Area of Study (MCPC 2010). These land use codes are discussed below and displayed in **Figure 3-9.**

3.1.1 Agriculture

Relatively few sections of the General Area of Study are used for agricultural purposes and these are located primarily in the extreme southern portion. All of these lands are privately owned. The primary agricultural use involves row crops such as hay, corn, and soybeans. Other agricultural uses include horse pastures and dairy farms, but these are limited compared to row crops.

Monroe County has several mechanisms for protecting farmland, including:

- Agricultural Security Area (ASA)
- Agricultural Conservation Easement (ACE)
- Act 319 ("Clean and Green Act")

The Farmland Preservation Board administers the creation of an ASA and the purchase of an ACE. An ASA is an area of 500 or more semi-contiguous acres that is used for agricultural production. Farmers voluntarily form and/or join an ASA as a means of receiving special consideration with regard to regulations, nuisance complaints, and conflicting land uses.

The ACE purchase program allows counties to use specific state-issued farmland preservation funds to purchase development rights. Qualifying farms must be part of an existing ASA and are rated on the basis of soil quality, proximity to other farms, and other criteria. Once a farm is in easement, agricultural production must continue every year thereafter, with no new structures permitted except farm accessory buildings. Act

319 provides a means by which landowners whose property meets one of three qualifying uses (farming, forest, or water supply/open space) to have their property assessed, for tax purposes, on the basis of its use rather than on the basis of its fair market value.

Based on review of Monroe County parcel data, one ASA and an associated ACE are located in the extreme southern portion of the General Area of Study (MCPC 2010). There are numerous Act 319 properties located throughout the General Area of Study. These agricultural preservation lands are illustrated on **Figure 3-10**.

3.1.2 Communication/Transportation/Utilities

Monroe County includes only railroads and airports under transportation land use, and not roadways, which are reviewed in **Section 3.2.1**. There are no active railroads or airports present within the General Area of Study. An abandoned railroad alignment traverses around the eastern shoulder of Big Pocono State Park, along the base of the northern slope, and then northwest toward Lake Naomi. The closest airport is Pocono Mountain Municipal Airport, which is located approximately 2.15 miles north of the General Area of Study. A significant portion of the southwestern corner of the General Area of Study is identified by Monroe County as having a utility land use, but is actually part of a large (~9,000 acre) forest tract owned by the Bethlehem Water Authority for the protection of its water sources in the area. Similarly, a 20-acre parcel near the intersection of I-80 and I-380 is identified as having a services land use, but is actually a series of four communication towers.

3.1.3 Private/Public Parks and Recreation Facilities

There are no federal or county parks within the General Area of Study. The 1,300-acre Big Pocono State Park is located along the southeastern edge of the General Area of Study, and the 81-acre Mountain View Park (maintained by Pocono Township) is located south of I-80 near the community of Scotrun. The 4,000-acre State Game Land #38, which is managed by the PGC, is located in the south-central portion of the General Area of Study. Camelback Mountain Ski Resort, located on the north side of Big Pocono State Park, maintains over 160 acres of groomed terrain for recreational skiing and tubing. Other areas of public open space include a 43-acre parcel located to the west of Crescent

Lake and maintained by Pocono Heritage Land Trust, and a 360-acre parcel located at the western edge of the General Area of Study that is maintained by TNC (see **Figure 3-8**).

3.1.4 Educational Services

Two public schools, Pocono Elementary School and Pocono Mountain West High School, are located in the southeastern and northwestern sections of the General Area of Study, respectively. Northampton County Area Community College has an active facility along SR 611 in Tannersville and a planned campus area located along SR 715 to the west of Tannersville; both areas are located in the southeastern corner of the General Area of Study. Two independent educational facilities (Growing Concern and Acorns to Oaks Day Care) are also located in the General Area of Study. Growing Concern is located north of SR 715 near the village of Reeders, and Acorns to Oaks Day Care is located west of SR 611 near the community of Scotrun.

3.1.5 Forest

Forested land cover consists of large uninterrupted areas of wooded land identified as a land use/cover type, or forested areas incorporated into other land use types, such as residential, recreational, or utilities. As noted in **Section 3.1.2**, the Bethlehem Water Authority manages a large forest tract in the southwestern corner of the General Area of Study that is identified as having a utility land use. Similarly, the 4,000-acre State Game Land #38 and the 1,300-acre Big Pocono State Park are identified as recreational areas. Fragmented forest cover also borders some residential developments and often indicates the presence of steep slopes, rocky soils, or wet areas that could not be developed. The largest swaths of forest cover identified on Monroe County land use maps, located primarily north of Sullivan Road, are owned by mining companies and show only historic signs of mining activities.

3.1.6 Government Services

Government services within the General Area of Study are located near the communities of Swiftwater and Lake Naomi. These services include the Swiftwater State Police Station, located on SR 611, and a PADCNR office for the Delaware State Forest, located along Long Pond Road.

3.1.7 Industrial

According to the Monroe County land use classifications, there are no industrial land uses within the General Area of Study. However, there are several large tracts of land located north of Sullivan Trail Road that are owned by mining companies. Only limited evidence of historic mining or quarrying activity has been noted during field studies. These lands are presently classified as forest (see **Section 3.1.5**).

3.1.8 Residential

Residential land use is a primary land use cover type in the General Area of Study and is composed primarily of single-family residences and vacation rental homes or condominium complexes. Much of the residential development has occurred within the past 30 years. These residential areas range from widespread 200-home development complexes, such as Emerald Estates, to modest 20-30 home developments, such as Crescent Lake, Old Orchard Farms, Cobble Creek Estates, and Stones Row. A growing number of vacation condominium complexes, such as Northridge Station, are being developed near the Camelback Mountain Ski Resort.

3.1.9 Retail Trade

Commercial land use occurs primarily as retail development along SR 611 in the communities of Swiftwater, Scotrun, and Tannersville, and along Sullivan Trail Road near Camelback Mountain. Most of the commercial sites are densely situated along SR 611 and include restaurants, hotels, automotive service stations, and a variety of specialty shops. The Crossings Premium Outlets center, which consists of over 100 stores, is located along SR 611 in Tannersville, on the eastern edge of the General Area of Study. Retail areas along Sullivan Trail Road include ski shops and restaurants.

3.1.10 Resorts and Group Camps

Several four-season resorts, including the Inn at Pocono Manor, Camelback Mountain, and Caesars Brookdale Resort, are located within the General Area of Study. Two group camps, Mt. Gilead Camp and Conference Center and Streamside Camp, are located in the southeastern portion of the General Area of Study. Other areas identified as resorts include the Four Seasons Campground on Babbling Brook Road near Scotrun and the Summit Resort (currently closed) located on SR 715 near Tannersville.

3.1.11 Services

Service related land uses identified within the General Area of Study include banks, real estate offices, churches, and cemeteries. Most of the banks and real estate offices are concentrated along SR 611 in the communities of Swiftwater, Scotrun, and Tannersville. St. John's Lutheran Church and its cemetery are located in the community of Scotrun. Grace Church is located along SR 611 in Tannersville, and the Pocono Evangelical Free Church is located north of SR 715 near Reeders. These two churches are in the southeastern corner of the General Area of Study.

3.1.12 Vacant

Vacant lands are scattered across the General Area of Study and are associated with a wide variety of land cover types and parcel sizes. For example, numerous small parcels (1 to 2 acres) within the residential developments are noted as vacant if they are undeveloped. Similarly sized parcels within the commercialized areas along SR 611 are also noted as vacant if unoccupied. Larger parcels of forested or meadowland, ranging from 30 to 70 acres, are also identified as vacant.

3.2 Other Linear Features

Linear features present in the General Area of Study include roadways, historic railroads, and existing transmission corridors, as illustrated in **Figure 3-11**.

3.2.1 Roadways

As noted in **Section 3.1.2** (Communication/Transportation/Utilities), the Monroe County transportation code does not include roads. The primary roadway systems within the General Area of Study are I-80 (east to west) and I-380 (north to south). I-380 branches off I-80 near the center of the General Area of Study. Remaining road networks are comprised of several multiple-lane state routes (SRs 715 and 611), numerous local roads, residential streets, and unpaved forest roads.

Located in the extreme southern portion of the General Area of Study, SR 715 is an east-west arterial road that intersects with I-80 in Tannersville and connects rural sections of Monroe Country with this major commercial center. SR 715 consists primarily of two undivided traffic lanes bordered by sporadic commercial development. Located along the

extreme eastern portion of the General Area of Study, SR 611 is a north-south arterial highway that parallels I-80 from Stroudsburg to Tannersville and then proceeds north through the communities of Scotrun and Swiftwater. SR 611 varies between a two-lane undivided and four-lane divided highway. Numerous commercial developments border this roadway.

3.2.2 Historic Railroads

As noted in **Section 3.1.2** (Communication/Transportation/Utilities), an abandoned railroad alignment traverses around the eastern shoulder of Big Pocono State Park, along the base of the northern slope, and then northwest under I-80 and I-380 toward Lake Naomi. This historic alignment is part of a walking path in the Big Pocono State Park area. Most of the alignment, however, is abandoned and overgrown with natural vegetation.

3.2.3 Transmission Line Corridors

The principal transmission line in the General Area of Study is the Blooming Grove-Jackson and Peckville-Jackson 69 kV alignment, which bisects the central portion of the area from north to south. Two tap extensions diverge from this line; the Camelback 69 kV Tap and the Lake Naomi 69 kV Tap. The Jackson-Tannersville 138 kV transmission line proceeds from the Jackson Substation in a westerly direction along the southern edge of the General Area of Study.

3.2.4 Pipelines

There are currently no major natural gas, petroleum, or water pipelines within the General Area of Study. A Williams' natural gas pipeline will be routed through the area in the near future. This alignment is currently in the design phase.

3.3 Historic, Cultural, and Archeological Resources

A review of the cultural resources within the General Area of Study is required by various state agencies to ensure their preservation. These reviews assess the existing historic architecture, as well as the potential for archeological locations.

3.3.1 Historic Architecture

A desktop and windshield survey was conducted of the historic architectural resources within the General Area of Study. The desktop survey consisted of accessing the Pennsylvania Historical and Museum Commission's (PHMC) Bureau of Historic Preservation's Cultural Resources Geographic Information System (CRGIS) to review available information on previously recorded historic architectural sites within the General Area of Study. A windshield survey was also conducted in October 2010 that provided information about the built environment and the types of historic architectural resources in the General Area of Study. Areas of potential concern were identified during the windshield survey and used in defining constraints during the analysis used to determine the Selected Route for the project (**Attachment 4).**

No National Register of Historic Places (NRHP)-listed or -eligible historic structures or districts were identified in the General Area of Study. One undetermined above ground resource, identified by MCPC as the Transue School (PHMC Key No. 039537), is an 1870's building located within the General Area of Study. This building is located on Sullivan Trail Road, north of I-80, in Pocono Township. Its undetermined status means that although this resource has been brought to the attention of PHMC, no determination of eligibility has been made.

3.3.2 Archaeology

The desktop survey noted above also included a CRGIS search for previously identified archaeological sites within the General Area of Study. No sites have been documented in the General Area of Study, and only a few archaeological surveys have been conducted in this region. Nonetheless, the General Area of Study, overall, possesses at least a moderate potential for pre-contact (Native American) archaeological resources. This is due to the dissected nature of the terrain, with numerous upland flats between drainages, such as between Pocono and Swiftwater Creeks. These types of settings frequently yield evidence of short-term occupation, known as lithic scatters, most likely left by small groups. Historic archaeological sites tend to occur along roadways or at the end of farm lanes extending back from a public thoroughfare. In many cases, historic architectural resources also contain an archaeological component.

PHMC Coordination

Information regarding the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project (formerly Jackson-Lake Naomi 138/69 kV Taps Project) was provided to PHMC in June 2011. On July 12, 2011, PHMC issued a response letter stating that based on their review there are no NRHP- eligible or -listed historic or archaeological properties in the area of the proposed project. A copy of this coordination letter is provided as **Attachment 12**.

3.4 Local Zoning and Comprehensive Plans

Local zoning ordinances have been adopted in all the townships located within the General Area of Study (**Figure 3-12**). Generally, these ordinances are used to guide future land use in the townships by encouraging development of desirable residential, commercial, agricultural, and industrial areas with appropriate groupings of compatible and related land uses. In regards to transmission line development, the public utility is exempt from these requirements and the township ordinances typically defer to the Pennsylvania Public Utility Commission (PUC) to decide that the utility in question is reasonably necessary for the convenience or welfare of the public. For example, Jackson Township ordinances note that public utility uses are permitted in any zoning district with a special exception permit, which is issued after the Zoning Hearing Board determines that specific location and design criteria have been met.

Based on a review of the Monroe County Comprehensive Plan (MCPC 1999), the region has been experiencing one of the highest growth rates in Pennsylvania. Much of this growth is attributed to the development of vacation homes. Concerns raised and addressed by the Comprehensive Plan focus primarily on providing adequate supplies of public water for these new homes and managing the increased stormwater responsibility created by these homes. A key goal expressed throughout the Comprehensive Plan is to reduce the impact of this development on the high quality nature of the surrounding stream network through the use of erosion and sedimentation control techniques. Township comprehensive plans (Jackson Township 2006, Pocono Township 2005, Tobyhanna and Tunkhannock Townships 2005) mirrored the concerns raised by the

Monroe County Comprehensive Plan. No strategy to address the growing need for electricity for the region is noted in any of these documents.

Another concern raised by these comprehensive plans is maintenance of the scenic characteristics of the region. Most of the focus in the plans is on the excessive roadside signage used by local merchants located in the commercial areas of the region, particularly along SR 611. Other aspects focused on the preservation of open space to maintain the area's rural and agricultural personality, as well as to increase publicly available recreational opportunities. A key goal identified by these comprehensive plans is to implement strategies, such as ACEs or joint township-county open space preservation incentives, to provide existing undeveloped lands with a conservation-oriented level of protection. These ideals and associated plans are also mirrored in the Monroe County Open Space Plan, issued by the Monroe County Open Space Advisory Board (MCOSAB 2001), as well as the relevant township-based open space plans (Jackson and Pocono Townships 2003, Tobyhanna and Tunkhannock Townships 2000). Issues related to electric transmission corridors are not addressed in any of these documents. The only reference to these corridors is an acknowledgement of their potential use by hikers or bike riders as greenways that provide connectivity to other sections of the region.

3.5 Proposed Developments

The U.S. Census Bureau reports a nearly 20 percent increase in Monroe County's population from 2000 to 2008, and about a 70 percent increase from 1990 to 2008 (U.S. Census 2000). Townships located within the General Area of Study have seen a 20 to 40 percent growth in population between 2000 and 2010 and some townships are expected to double in population by 2020. Based on this growth pattern, proposed development within the General Area of Study is anticipated to increase.

There are several specific areas of proposed development within the General Area of Study. One large grouping is located adjacent to the Camelback Mountain Ski Resort. Review of the Monroe County parcel dataset (MCPC 2010) indicates the addition of dozens of new condominium-style structures situated along a ridge-top area. Additionally, there are three areas of proposed development on the north side of I-80,

each for single-family style structures. One area is a 12-15 parcel subdivision near Crescent Lake, located in the central portion of the General Area of Study. In the western section of the General Area of Study, there is a proposed 10-12 parcel subdivision south of Sullivan Trail Road and a series of proposed subdivision roads on the north side of Sullivan Trail Road.

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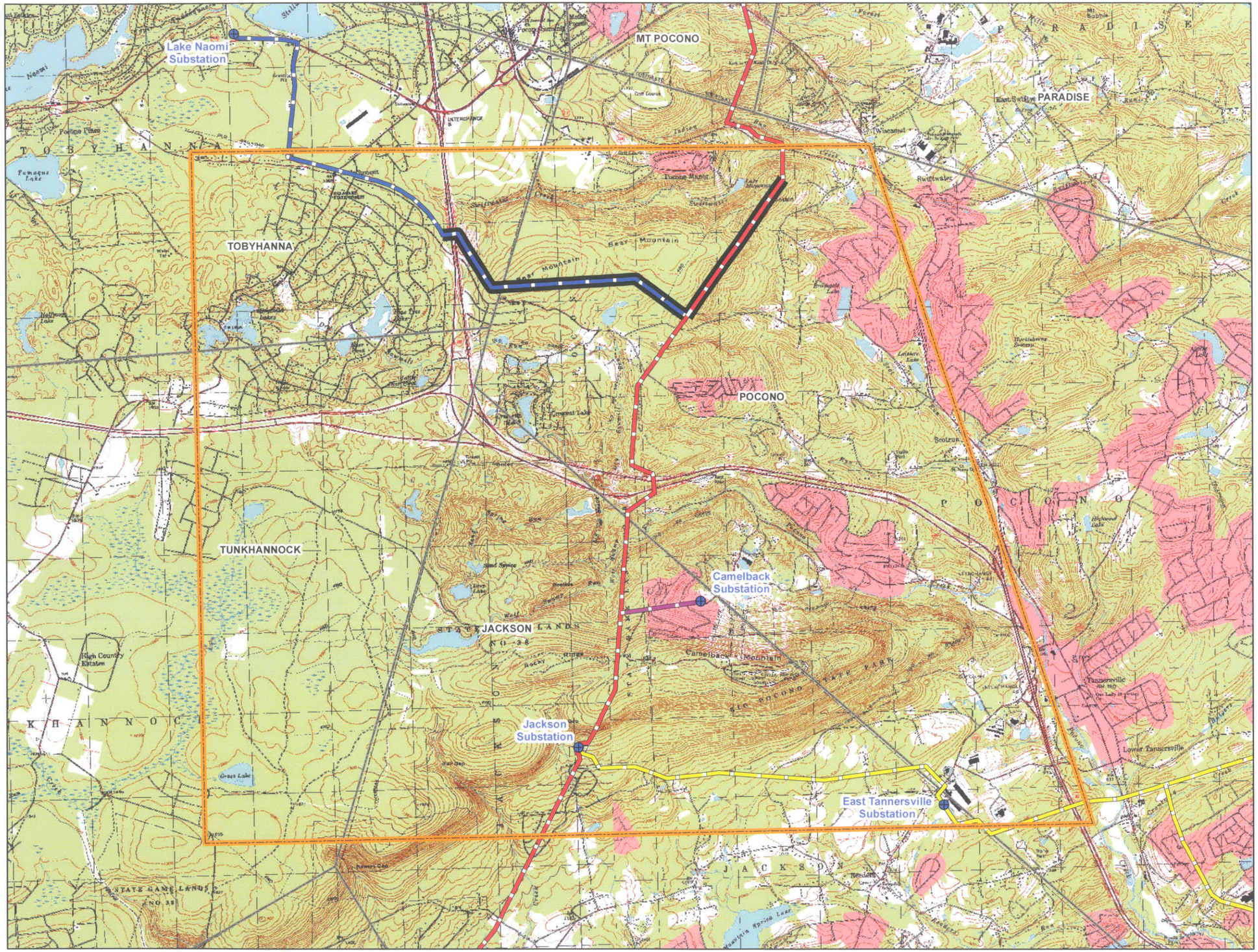
Attach. 3

Figures

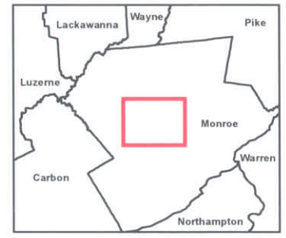


Legend

- Substations

Existing Transmission Lines

- Jackson - Peckville 69 kV Line
- Lake Naomi 69 kV Tap
- Camelback 69 kV Tap
- Jackson - Tannersville 138 kV Line
- 3.5 Mile Proposed Connection Segment
- General Area of Study
- PA Municipalities



Key Map Not to Scale

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NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

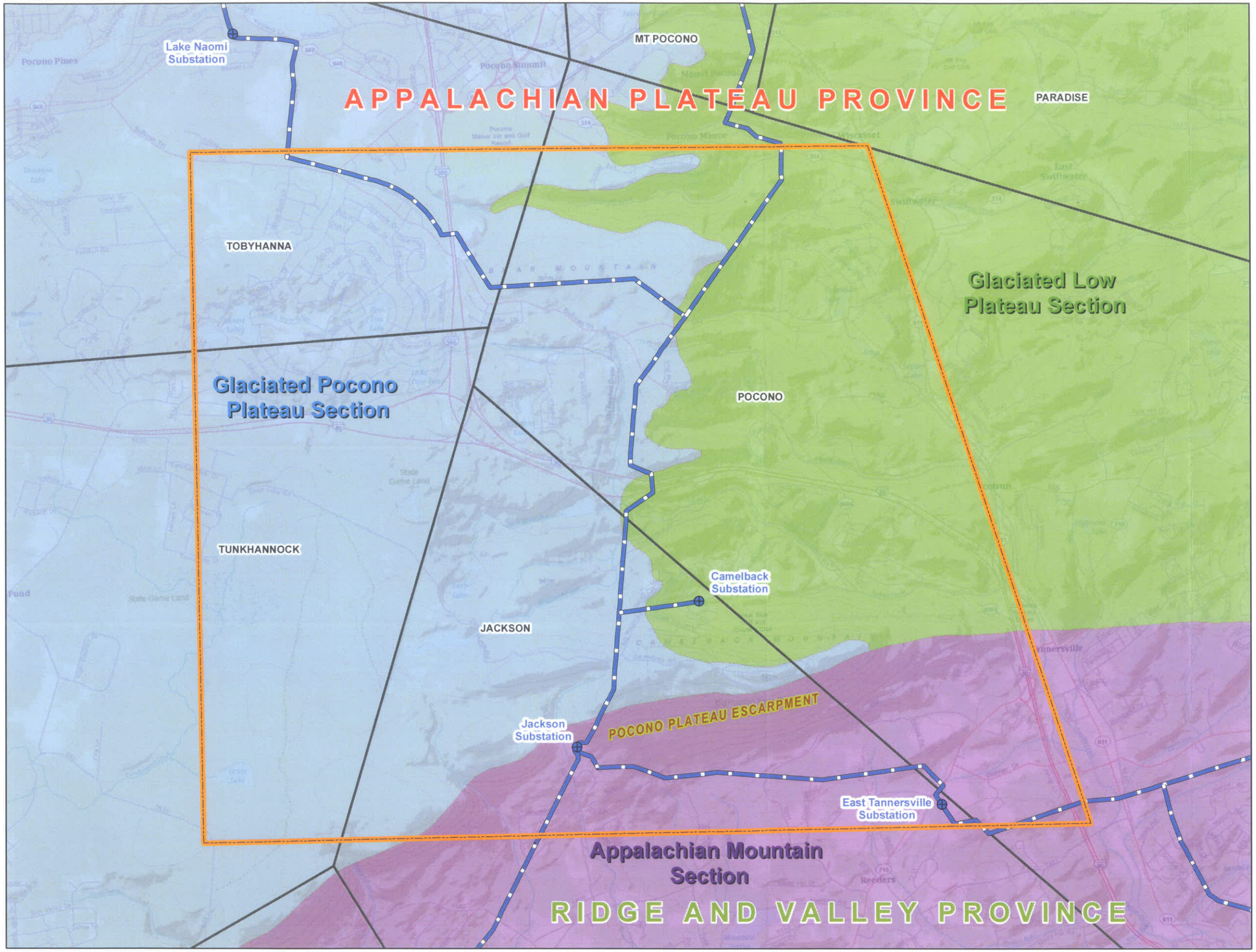
ppl PPL Electric Utilities

URS

Figure 3-1
General Area of Study

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-1 - Area of Study.mxd

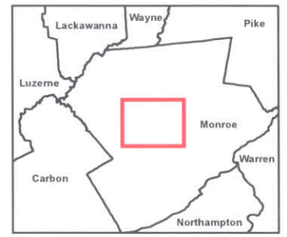


Legend

- Substations
- Existing Transmission Lines

Physiographic Sections

- Appalachian Mountain Section
- Glaciated Low Plateau Section
- Glaciated Pocono Plateau Section
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 StatePlane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Physiographic Province Data provided by the Bureau of Topographic and Geologic Survey, Pennsylvania Department of Conservation and Natural Resources.

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

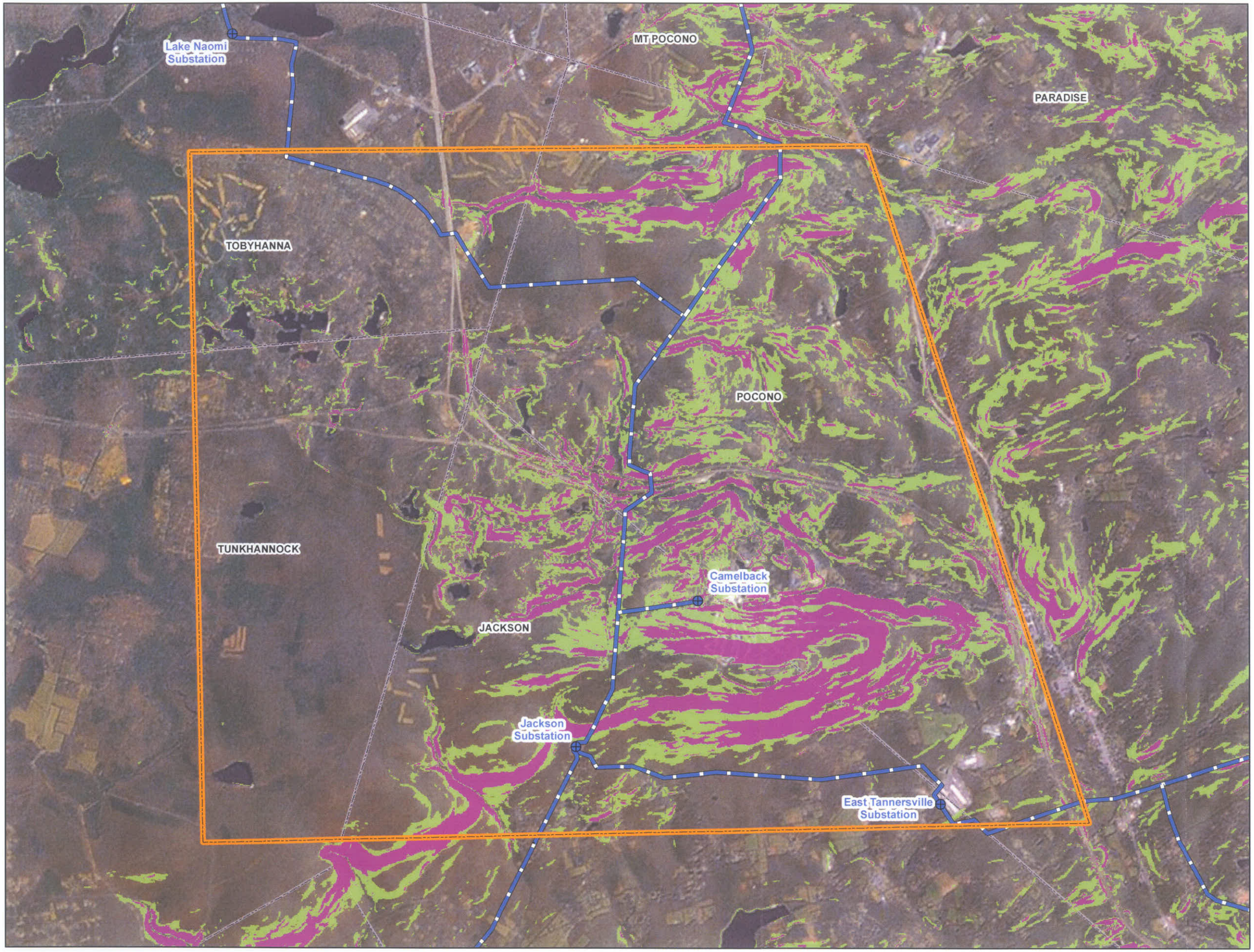
ppl PPL Electric Utilities

URS

Figure 3-2
Physiographic Provinces

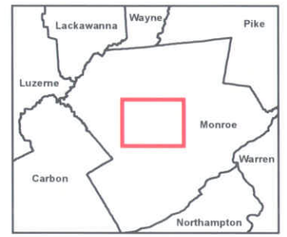
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-2 - Physiographic Provinces.mxd



Legend

- Substations
- Existing Transmission Lines
- Steep Slopes (15-25%)
- Steep Slopes (>25%)
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Slope data generated from 10M
Digital Elevation Model courtesy of the USGS

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

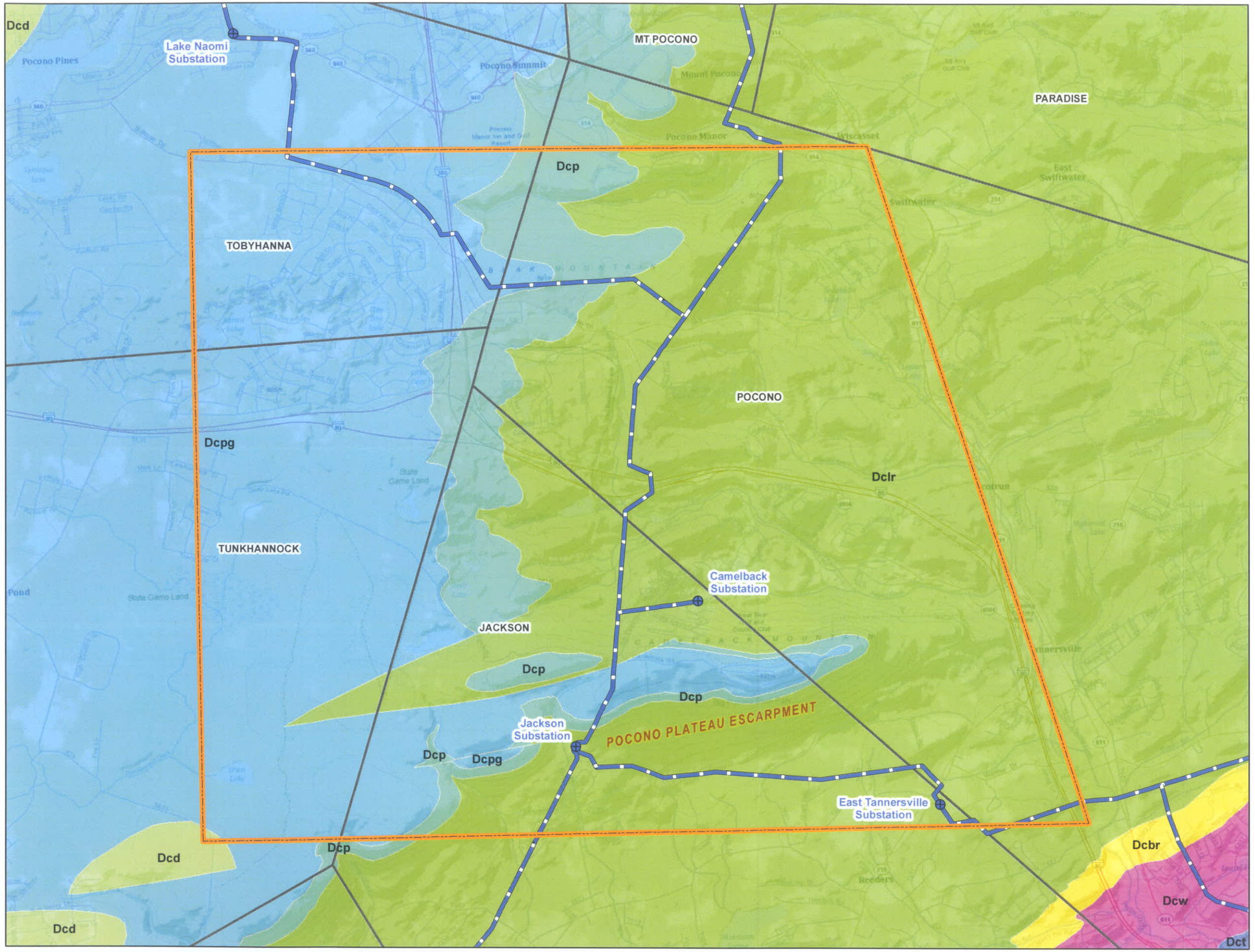
ppl PPL Electric Utilities

URS

Figure 3-3
Steep Slopes

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-3 - Steep Slopes.mxd



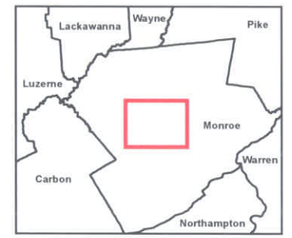
Legend

- Substations
- Existing Transmission Lines

Bedrock Geology

(All Members of Catskill Formation)

- Dcbr - Beaverdam Run Member
- Dcd - Duncannon Member
- Dclr - Long Run Member
- Dcp - Packerton Member
- Dcpg - Poplar Gap Member
- Dct - Towamensing Member
- Dcw - Walcksville Member
- General Area of Study
- PA Municipalities



Key Map Not to Scale

NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

N

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Bedrock Geology provided by the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Conservation and Natural Resources

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

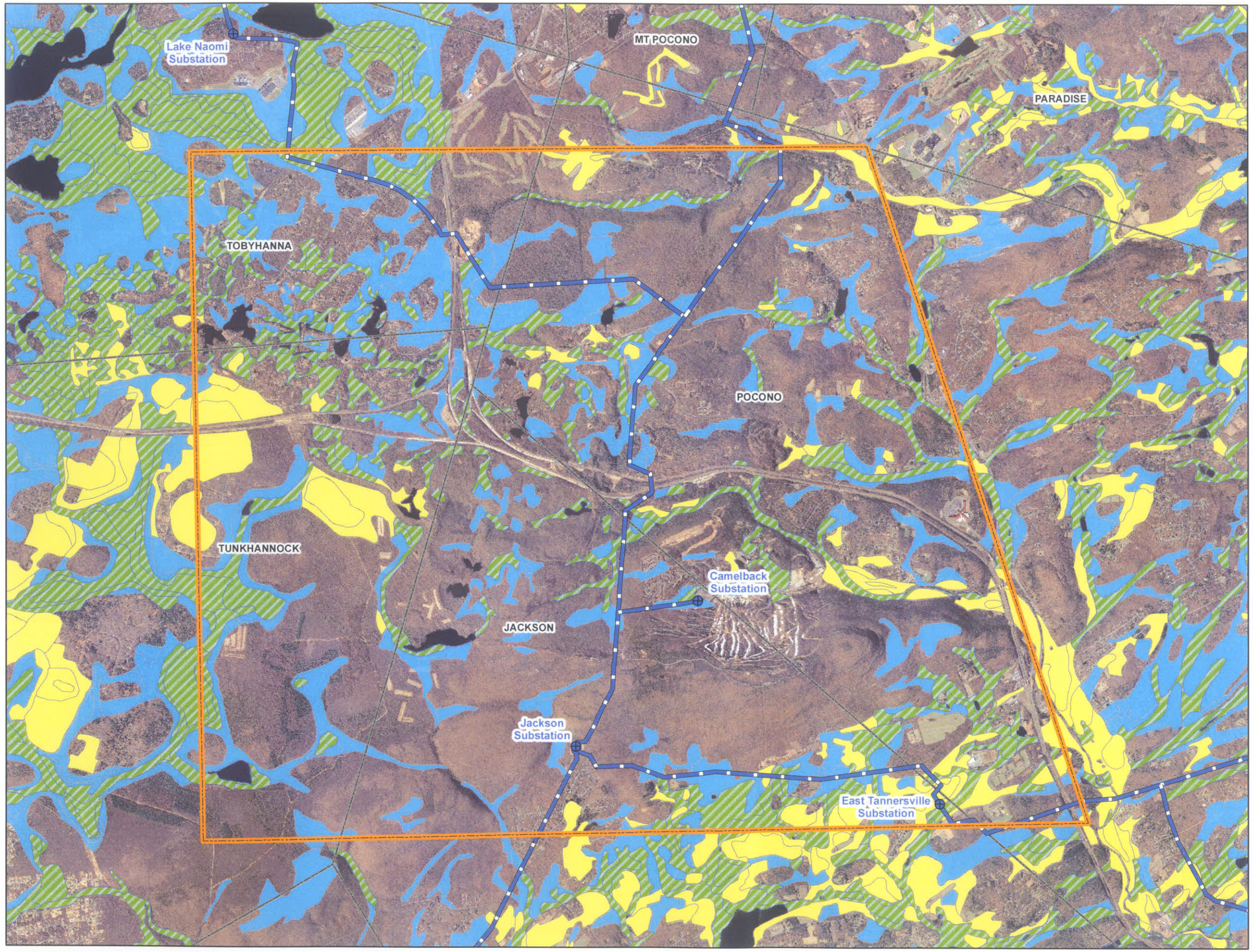
ppl PPL Electric Utilities

URS

Figure 3-4
Geologic Areas

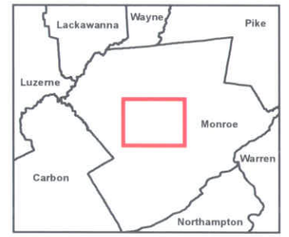
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-4 - Geologic Areas.mxd



Legend

- Substations
- Existing Transmission Lines
- Prime Farmland Soils
- Hydric Soils
- Hydric Inclusions
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 StatePlane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Data 2010
USDA/NRCS Soils Data 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

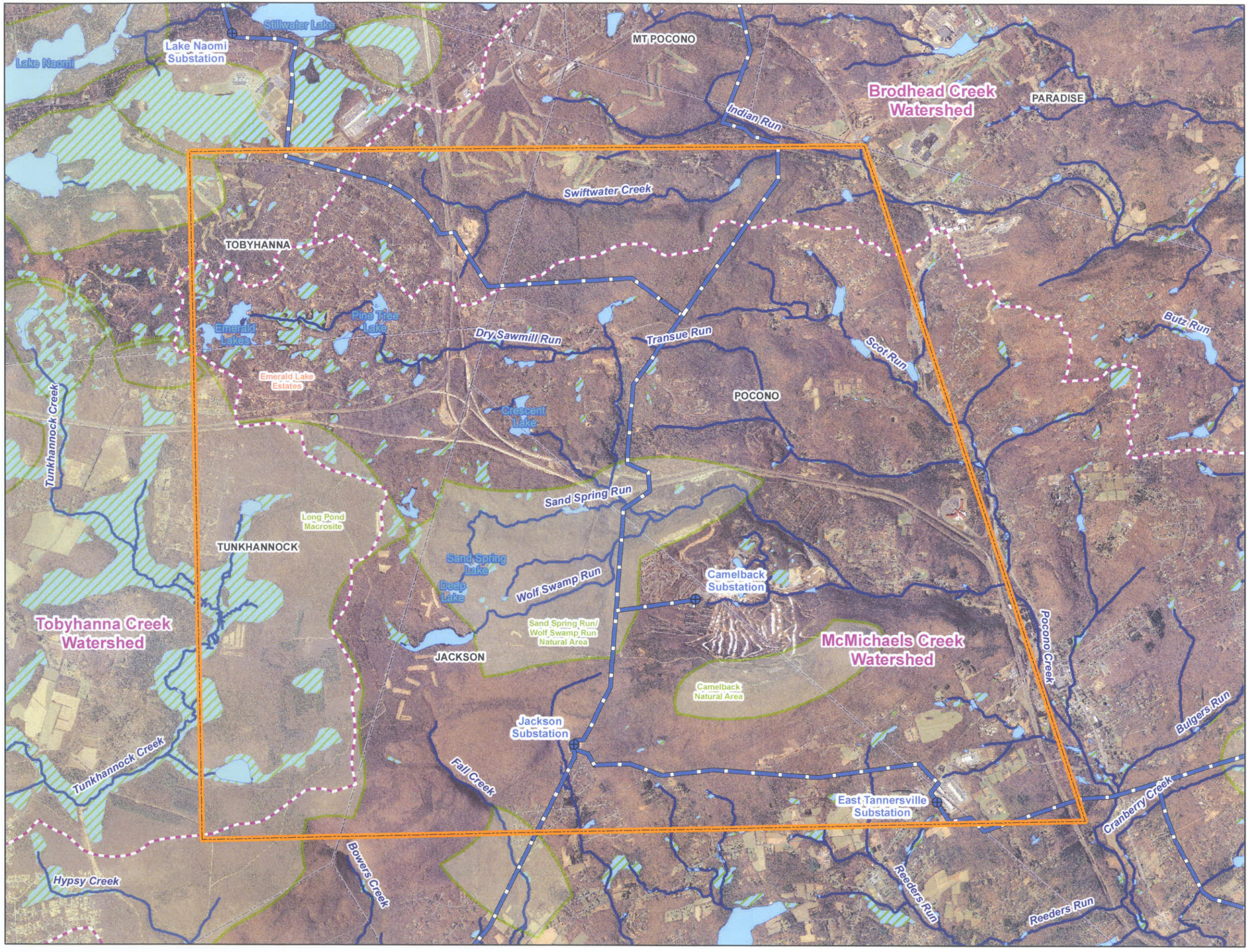
ppl PPL Electric Utilities

URS

Figure 3-5
Soil Characteristics

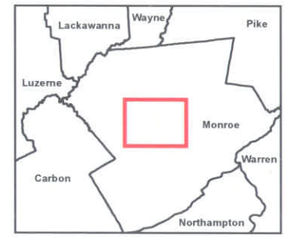
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPLUCKSNLKNM\Projects\PPL JLN Figure 3-5 - Soil Characteristics.mxd



Legend

- Substations
- Existing Transmission Lines
- Streams & Rivers
- National Wetlands Inventory (NWI)
- Lakes & Ponds
- Watershed Boundaries
- Natural Areas
- General Area of Study
- PA Municipalities



Key Map Not to Scale

NAD 1983 StatePlane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Data 2010
USFWS NWI 2010

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

PPL Electric Utilities

URS

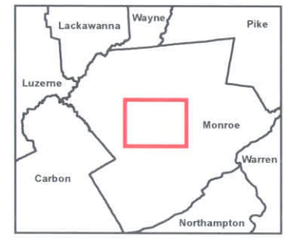
Figure 3-6
Watersheds and Surface Hydrology

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-6 - Hydrology.mxd

Legend

- Substations
- Existing Transmission Lines
- Exceptional Value Streams
- High-Quality - Cold Water Fishes Streams
- 100-yr Floodplain
- Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 StatePlane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Data 2010
USFWS NWI 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

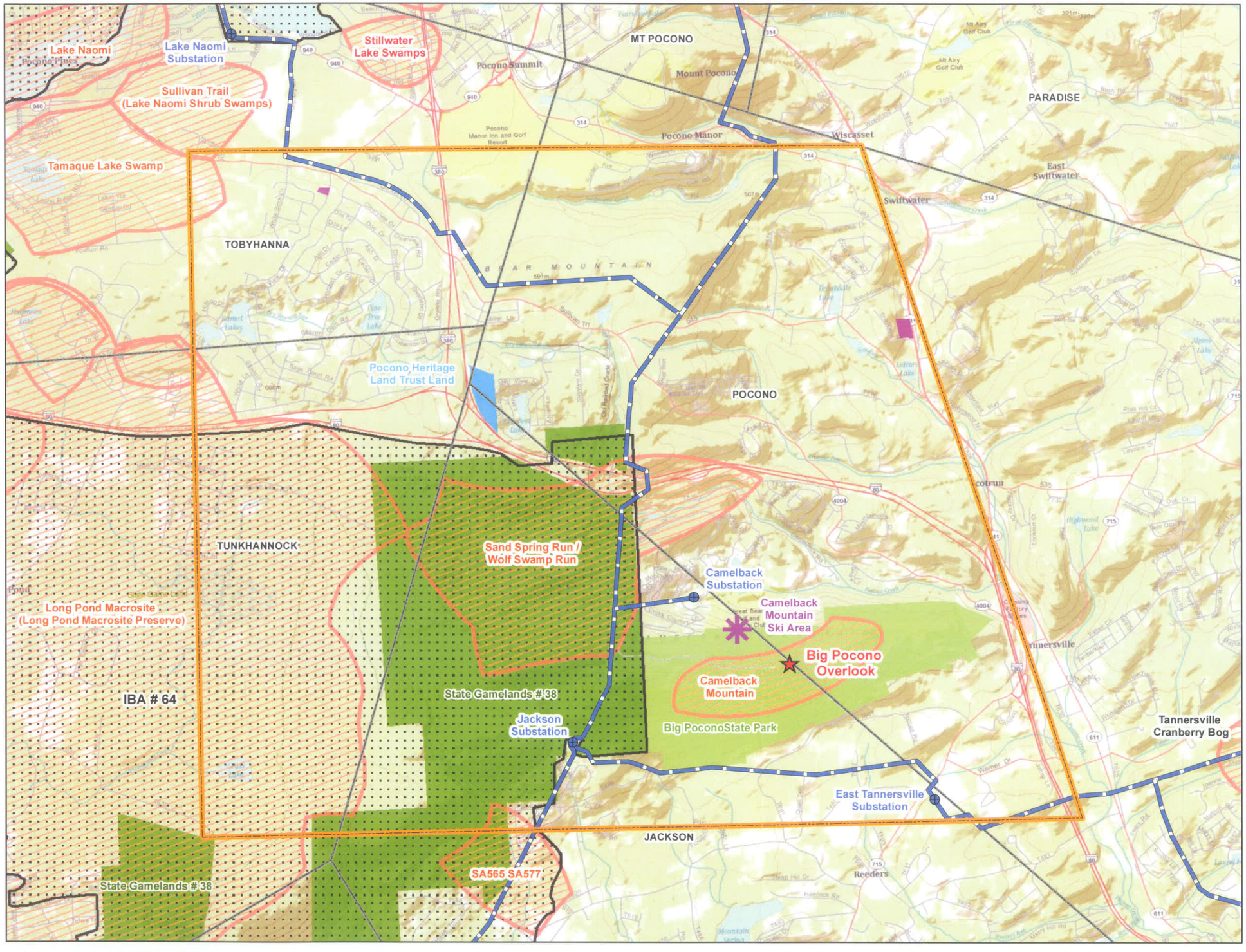
PPL Electric Utilities

URS

Figure 3-7
Streams Designated Uses and Floodplains

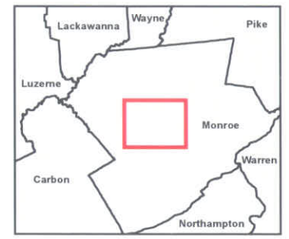
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\UCKSNLKNM\Projects\PPL JLN Figure 3-7 - Designated Use Streams.mxd



Legend

- Substations
- Existing Transmission Lines
- Monroe County Priority Natural Areas
- State Gameland
- State Park
- Pocono Heritage Land Trust
- State Forest Land
- Important Birding Area
- General Area of Study
- PA Municipalities



Key Map Not to Scale

NAD 1983 State Plane Pennsylvania North FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Planning Commission - Monroe County GIS Data 2010:
Parcel Boundaries & Natural Areas
DCNR - State Forest Land Data
Audubon Society - Important Bird Areas

N

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

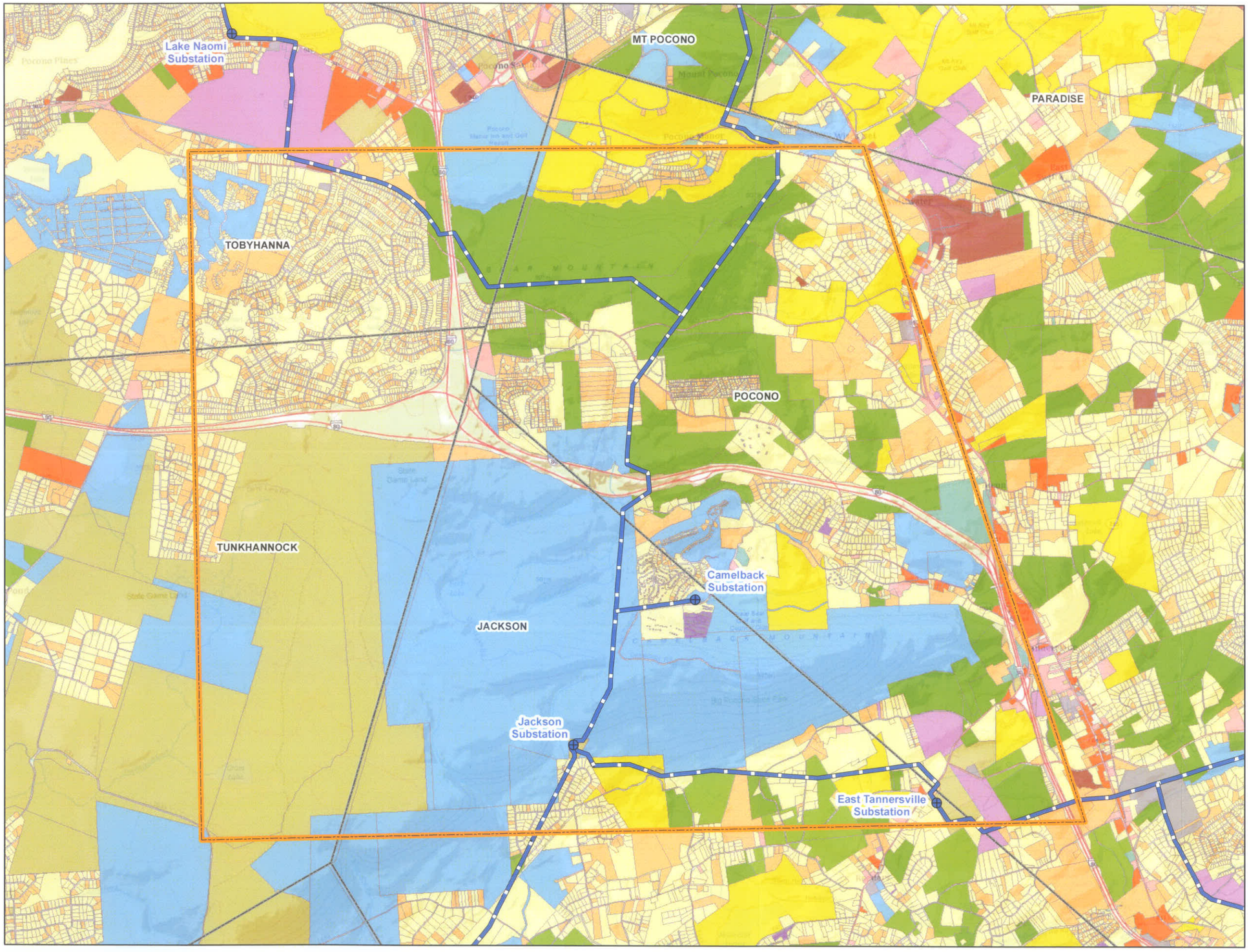
ppl PPL Electric Utilities

URS

Figure 3-8
Natural Areas

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\UCKSNLKNM\Projects\PPL JLN Figure 3-8 - Natural Areas.mxd

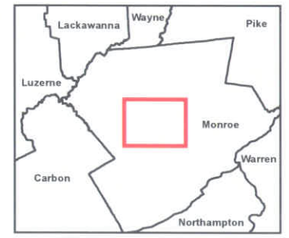


Legend

- Substations
- Existing Transmission Lines
- General Area of Study
- PA Municipalities

Monroe County Generalized Land Use

- Agriculture
- Communication/ Transportation/Utilities
- Cultural, Public/Private Parks & Recreation
- Developed
- Educational Services
- Forest
- Government Services
- Hotels
- Industrial
- N.E.C.
- Orchard
- Residential
- Resorts & Group Camps
- Retail Trade
- Services & F.I.R.E.
- Vacant



Key Map Not to Scale

N

NAD 1983 StatePlane Pennsylvania North FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Parcel Data 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

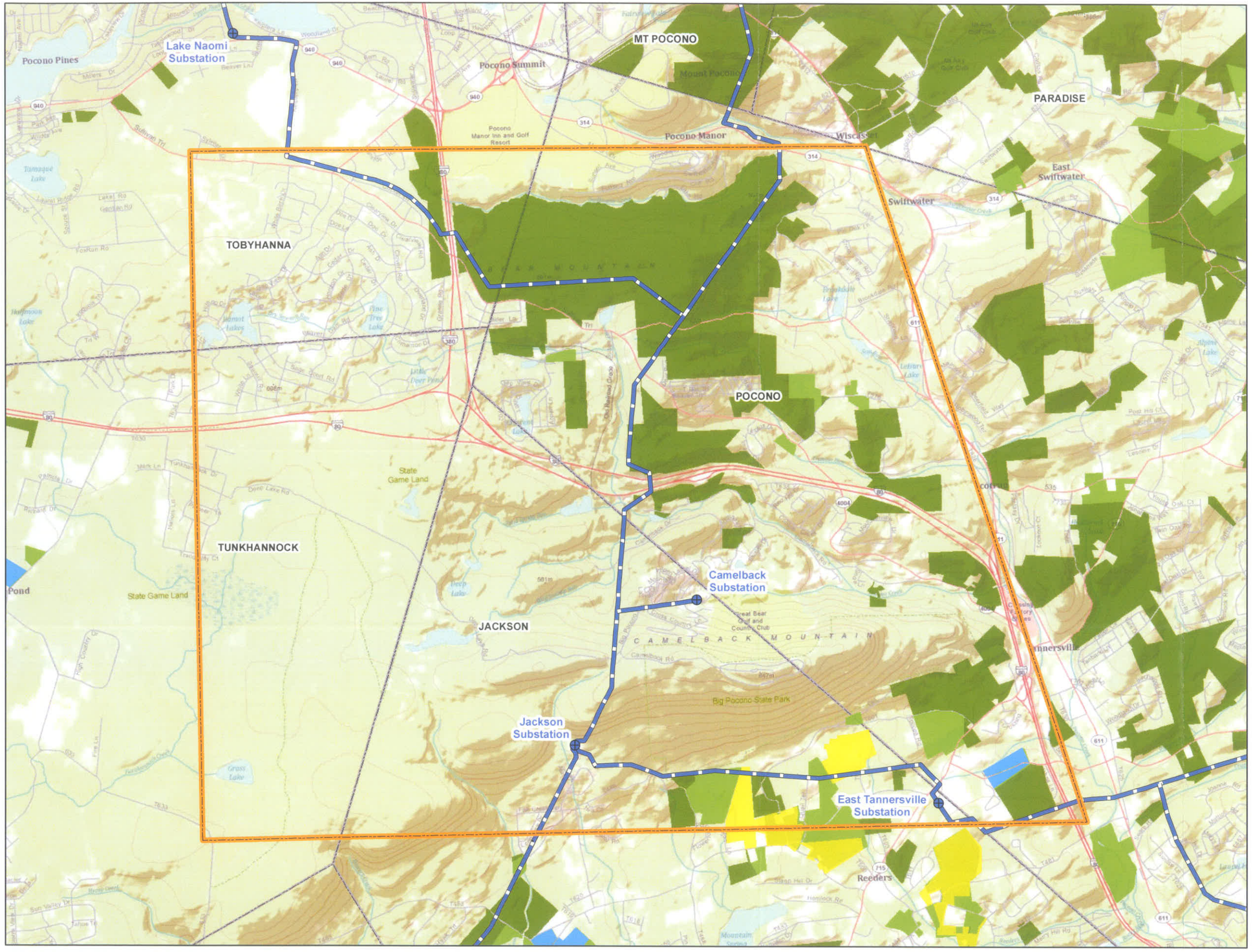
PPL Electric Utilities

URS

Figure 3-9
Existing Land Use

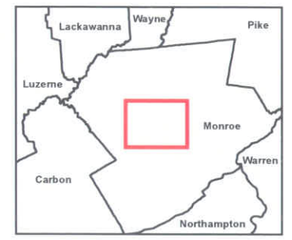
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\UCKSNLKNM\Projects\PPL JLN Figure 3-9 - Existing Land Use.mxd



Legend

- Substations
- Existing Transmission Lines
- Agricultural Security Areas
- Clean & Green Act 319 Agriculture Land
- Clean & Green Act 319 Forest Land
- Agricultural Conservation Easements
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

ESRI Topographic Basemap 2010
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Planning Commission -
Monroe County GIS Data 2010:
Parcel Boundaries, Agricultural Data

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

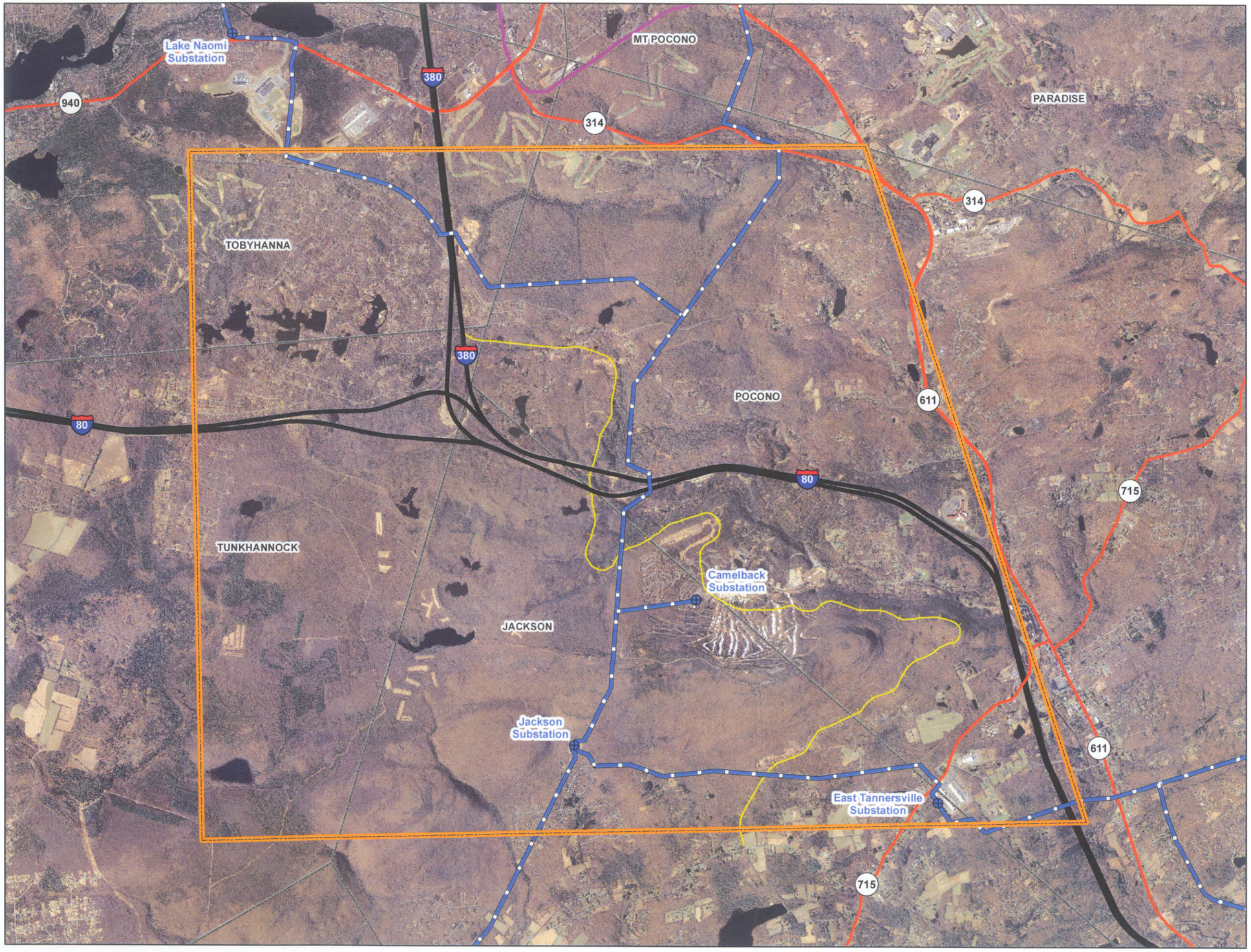
PPL Electric Utilities

URS

Figure 3-10
Agricultural Preservation

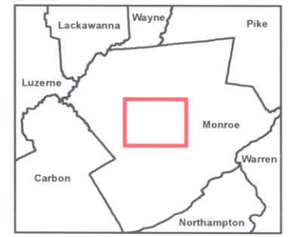
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-10 - Ag Preservation.mxd



Legend

- Substations
- Existing Transmission Lines
- Interstate Highway
- PA State Roads
- Railroad
- Historic Railroad
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 StatePlane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
PennDOT - Pennsylvania State Roads 201101
POWERmap Transmission Data - 2010
Environmental Resources
Research Institute - Active Railroads
Monroe County Data 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

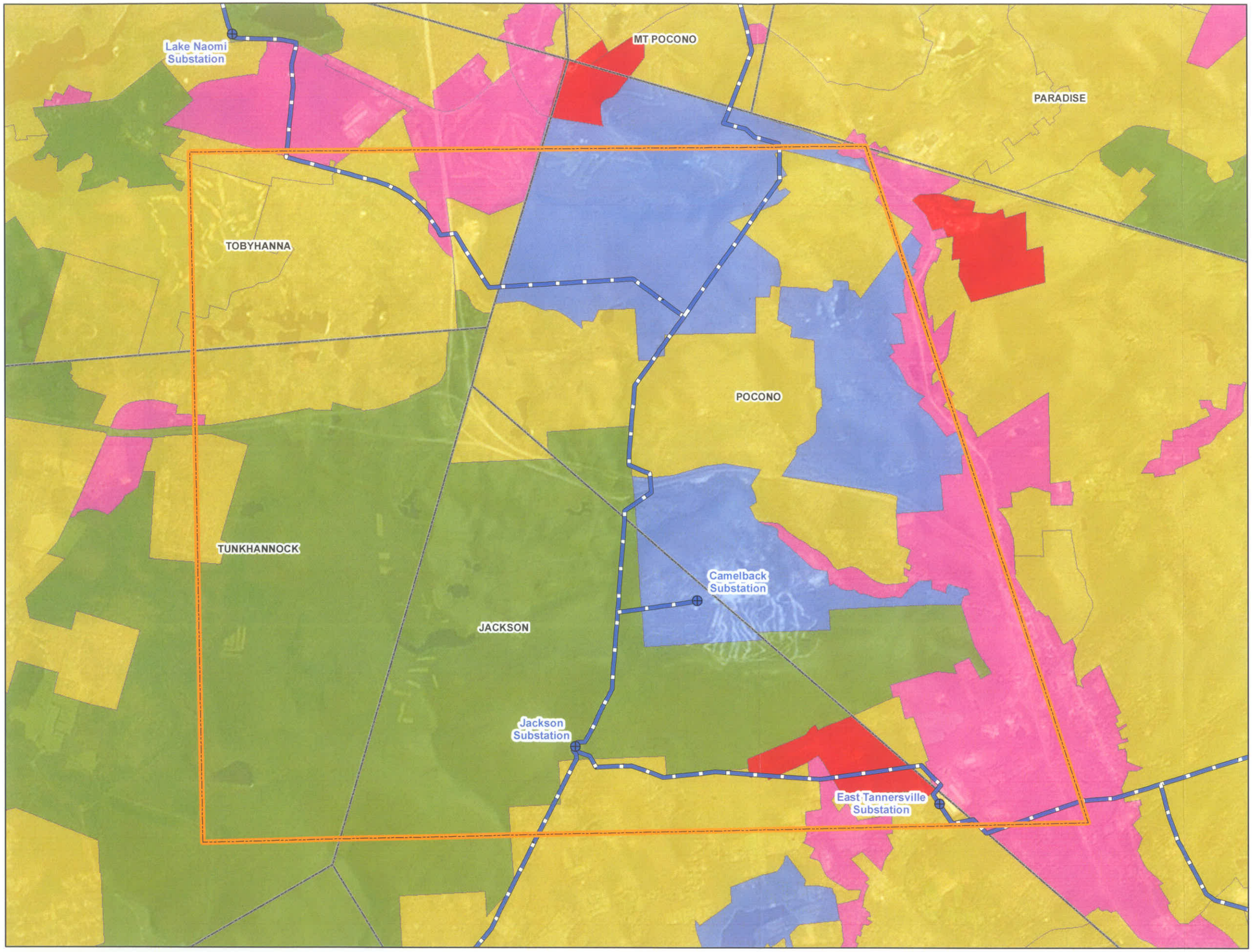
PPL Electric Utilities

URS

Figure 3-11
Linear Features

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-11 - Linear Features.mxd

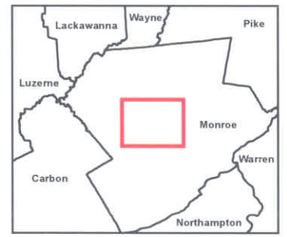


Legend

- Substations
- Existing Transmission Lines

Zoning

- Conservation
- Recreation
- Residential
- Commercial
- Industrial
- General Area of Study
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Planning Commission -
Monroe County GIS Data 2010: Zoning

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

PPL Electric Utilities

URS

Figure 3-12
Zoning

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 3-12 - Zoning.mxd

Attachment 4

ATTACHMENT 4
BLOOMING GROVE-JACKSON AND PECKVILLE-JACKSON 138/69 kV LINE ALTERNATIVES AND SITIG ANALYSIS

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

Acronym	Definition
CWF	Cold Water Fishery
DEM	Digital Elevation Model
EPRI	Electric Power Research Institute
EV	Exceptional Value
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GTC	Georgia Transmission Corporation
HQ	High Quality
I	Interstate
kV	Kilovolt
MF	Migratory Fishery
NAI	Natural Area Inventory
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
PADCNR	Pennsylvania Department of Conservation and Natural Resources
PADEP	Pennsylvania Department of Environmental Protection
PADOT	Pennsylvania Department of Transportation
PEM	Palustrine Emergent
PFBC	Pennsylvania Fish and Boat Commission
PFO	Palustrine Forested
PNHP	Pennsylvania Natural Heritage Program
PPL Electric	PPL Electric Utilities Corporation
PSS	Palustrine Scrub/Shrub
ROW	Right-of-Way
RTE	Rare, Threatened, and Endangered
TNC	The Nature Conservancy
URS	URS Corporation
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 OVERVIEW OF SITING ANALYSIS

This Attachment describes the methodology used by PPL Electric and URS Corporation (URS) to define alternative transmission routes (Alternative Routes) and to select the proposed transmission line route (Selected Route) for this project. The data used in this siting study fall into three broad categories: 1) ecological, 2) land use/cultural and 3) technical/engineering. Data were drawn from a wide variety of sources including state and local Geographic Information System (GIS) databases, field reconnaissance surveys, information supplied by public agencies, published documents, and publicly available electronic information.

As described in this Attachment, the siting study was conducted in several steps, the first of which identified major opportunities and constraints within the General Area of Study. The first step included extensive background research regarding the overall environmental setting of the General Area of Study, the results of which are described in **Attachment 3**. The second step of the process involved a quantitative evaluation to develop, score, and rank the Alternative Routes according to certain selected criteria (described in **Section 2.0**). Lastly, a qualitative evaluation that incorporated the professional judgment of the Siting Team was conducted to assess the Alternative Routes and determine the Selected Route. It is important to note that not all criteria can be counted and scored, making the qualitative evaluation an essential step in the selection process.

The ultimate goal of the Blooming Grove-Jackson and Peckville-Jackson 138/69 kilovolt (kV) Project siting study is to identify an overhead electric transmission line alignment with the least amount of impact to the natural, cultural, and social environments to the maximum extent practical, while still maintaining the economic viability and technical feasibility of the project.

1.1 Overview of Quantitative and Qualitative Siting Methodology

The framework used for this siting study is based on the process developed by the Electric Power Research Institute (EPRI) and Georgia Transmission Corporation (GTC),

which incorporates GIS technology, statistical evaluation, and professional judgment into the decision-making process. The approach formalizes many of the methods and principles used in the industry and by consultants, including URS, over the last several years. It was developed with collaboration and feedback from utility companies; federal, state and local government agencies; and other key stakeholders, such as private landowners. The process was tested and calibrated against existing transmission line siting projects that had been successfully completed. A review of the methodology used for this siting study is included in this section. A full discussion of the EPRI-GTC Siting Methodology can be found in the report entitled *EPRI-GTC Overhead Electric Transmission Line Siting Methodology* (EPRI-GTC 2006).

The siting methodology used for determining the Selected Route for this project was adapted from the EPRI-GTC protocol. The siting method consisted of four fundamental phases:

1) **Generate Macro Corridors.** Macro Corridors were developed to define the outer edges of the Project Study Area from within the larger General Area of Study. The General Area of Study is described in **Attachment 3**.

2) **Generate Alternative Corridors.** Alternative Corridors most suitable for transmission line development within the Project Study Area were generated from three primary perspectives: 1) protection of the natural environment, 2) protection of the built environment, and 3) engineering considerations.

3) **Generate Alternative Routes.** Alternative Routes most suitable for transmission line alignment within the Project Study Area were generated from within the Alternative Corridors.

4) **Determine Selected Route.** A Selected Route was determined based on the quantitative and qualitative assessment of the Alternative Routes by the Siting Team.

The following sections provide a general discussion of the four phases of the EPRI-GTC protocol.

1.2 Overview of Phase I – Macro Corridor Generation

Macro Corridor analysis begins after the start and end points of the new transmission line are established. The first step in the Macro Corridor development process was to develop

a land use/land cover GIS database to identify some of the key opportunity and constraint areas traditionally reviewed as part of a siting study. Typical opportunity areas include paralleling or rebuilding existing utility corridors, paralleling primary or secondary roads, or crossing open and undeveloped areas. The next step addresses Avoidance Areas, which are excluded from the database analysis and effectively prohibit the proposed Macro Corridors from crossing these sensitive locations. Examples of these areas include federal- or state-listed historic structures or districts, wildlife refuges, mines and quarries, national or state parks, church or cemetery parcels, residential dwellings, airports, and military facilities. While it is typical to try to avoid these features, project specific circumstances may require that locations including these features be included in the analysis.

A GIS map of the General Area of Study was created using commercially available land use and land cover data and other feature data including road networks, terrain, and existing transmission line alignments. A Composite Suitability Surface Map was then created composed of a grid of cells that are assigned a value indicating whether an area in a cell is suitable for a transmission line, *i.e.*, is an opportunity, or is less suitable, *i.e.*, a constraint. This process is repeated several times with cells of decreasing size and progressively more detailed and precise data.

The quantitative analysis performed by PPL Electric uses a series of grid cells across the General Area of Study. Values are assigned to each cell depending upon its primary use. A value is assigned representing, for example, an opportunity area such as open land or a constraint area such as a residential neighborhood. A "least impact" corridor or path can be determined by the mathematical addition of the value numbers from the value assigned to each cell between the start and end points. Opportunity areas are assigned low numbers, and constraint areas are assigned a high number. Therefore, the corridor or path with the lowest value or "least impact" is the corridor or path with the least adverse impacts.

The features of each cell (e.g., commercial land use, transmission line right-of-ways, agriculture, wetlands, steep slopes) were ranked from one (1), being the most suitable, to

nine (9), which is the least suitable. A feature was considered suitable if a transmission corridor through it is possible with little adverse impact. An open pasture is an example of a feature that would be considered suitable. A feature was considered less suitable if a transmission line going through it could have adverse consequences. A wetland area is an example of a feature that would be considered less suitable

Based on the numeric values assigned to each feature, a composite suitability surface was created. This composite suitability surface was used to produce a series of potential broad corridor areas for the following three scenarios:

- Opportunities for rebuilding or paralleling existing transmission lines and other linear features
- Opportunities to parallel existing road right-of-way
- Opportunities to cross undeveloped land

These corridors represent preferred opportunity areas for developing a new transmission line. This process determined the corridor across the suitability surface that minimizes the sum of the values within that corridor. Corridors with the lowest sums have the highest overall suitability. Corridors with a larger suitability sum were considered less optimal.

The lowest sum areas, i.e., the preferred transmission line development areas, were identified as scenario-specific Macro Corridors. After the most suitable scenario-specific Macro Corridor was identified for each of the three scenarios, the three corridors were merged together into a final combined Macro Corridor area. The outer boundary of the Macro Corridor area defined the boundaries for the Project Study Area. The Project Study Area (defined by the Macro-Corridor analysis) is a subset of the larger General Area of Study discussed in **Attachment 3.** This Project Study Area provides a refined and focused area in which to acquire more detailed datasets for analysis. The process achieves this by using a GIS based siting method to reduce the appearance of an arbitrary definition of the project boundary. This focused Project Study Area represents the most practicable area in which to site the new transmission line.

1.3 Overview of Phase II – Alternative Corridor Generation

In Phase II, Alternative Corridors were generated through GIS analysis from within the Project Study Area based on the following three distinct perspectives:

1) *Built Environment Perspective* – protecting human and cultural resource areas by reducing potential Project conflicts with existing residential neighborhoods and other community-valued features.

2) *Natural Environment Perspective* – protecting plants, animals and aquatic resources by minimizing the Project impact to ecological resources and natural habitat.

3) *Engineering Considerations Perspective* – maximizing co-location and minimizing cost and schedule challenges for the Project by seeking the shortest path or using existing right-of-way, while avoiding areas that pose significant construction obstacles, such as steep slopes or those used for unique agricultural practices.

An assessment based on each of these three primary perspectives was conducted using GIS-based datasets, which are collections of similar information developed for organization and analysis. The same datasets used for the Macro Corridors were used to establish each of the perspective-specific Alternative Corridors, but a higher weighting was applied to data aligned with each unique perspective. For example, the built environment assessment applied a higher weighting to features related to building proximity and building density, whereas the natural environment evaluation applied a higher weighting to floodplain and wildlife habitat features. Similarly, the engineering considerations assessment was based on linear infrastructure and slope features. This approach allowed a comparison of the social, environmental, and financial costs and benefits of the different Alternative Corridors.

1.4 Overview of Phase III – Alternative Route Generation and Evaluation

The next step in the process, determining the Alternative Routes within the Alternative Corridors, was accomplished by using GIS analysis to identify preferred paths or alignments within each of the Alternative Corridors. A summary of the process used to generate the Alternative Routes is presented below; **Section 2.3** of this Attachment provides project-specific detailed information on this process.

Generation of the Alternative Routes for the transmission line used similar data to that used in developing the Alternative Corridors, but the effort was focused on identifying a single alignment rather than a broader corridor area.

To assess the advantages and disadvantages of the GIS-generated Alternative Routes, feature metrics—or specific parameters measured for a particular feature (such as the number of residences or number of stream crossings per route)—were considered for each Alternative Route. These quantitative feature metrics were normalized, assigned relative weights, and organized within the three perspectives. The metrics were normalized to provide a means to compare the data. Using a normalized 0 – 100 scale allowed the different data values to be mathematically combined and compared without being distorted by differences in measurement scale. Establishing these quantitative values allowed overall scoring for each Alternative Route. Lower scores are preferred as they indicate potentially less impact along that route. The numerical score provides an objective reference for comparing each of the Alternative Routes.

1.5 Overview of Phase IV – Selected Route Determination

The final step in the evaluation process was to apply expert judgment to rank the top Alternative Routes. During this phase, Siting Team members qualitatively ranked the Alternative Routes with the lowest overall quantitative scores from the previous step. The routes were ranked based on several important considerations, such as visual concerns, community concerns, schedule delay risk, special permit issues and construction, maintenance, and accessibility issues. Additional considerations were added if deemed relevant to a given project. This process encouraged thorough discussion by Siting Team members as they evaluated and selected the final Selected Route in an objective, consistent and comprehensive manner.

2.0 ALTERNATIVE ROUTE SELECTION PROCESS AND RESULTS

The goal of this siting analysis was to determine the most suitable transmission line route to connect the Jackson Substation and a new tap location along a specific 3.5-mile-long portion of the existing Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission line and the Lake Naomi 138/69 kV Tap (as shown in **Figure 3-1**). Connecting these locations was identified as a way to resolve the reliability concerns that make this project necessary, as described in **Attachment 2**. The following sections describe the methodology used to generate the Macro Corridors and define the Project Study Area (**Section 2.1**), the methodology used to generate Alternative Corridors (**Section 2.2**), the methodology used to generate Alternative Routes (**Section 2.3**), the Alternative Routes (**Section 2.4**), public outreach efforts (**Section 2.5**), and the evaluation and assessment of the Alternative Routes used to determine the Selected Route (**Section 2.6**).

2.1 Generating Macro Corridors and Defining the Project Study Area

The Project Study Area was defined within the General Area of Study (refer to **Attachment 3**) using the progressive process described in **Section 1.1** of this Attachment. Specific avoidance areas for this Project included the Big Pocono State Park, non-spannable water bodies (Crescent Lake, Sand Spring), the Butz Landfill Superfund site, and several small historic quarries. Other potential avoidance area categories, such as airports, military facilities, National Register of Historic Places (NRHP) –listed historic structures or districts, federally designated wildlife refuges, and federally or state designated wild and scenic rivers are not present within the General Area of Study.

The following datasets were used to create a composite suitability surface with each grid cell classified by its underlying land use.

- *Pennsylvania Land Use/Land Cover dataset* (PSU 2005) – This dataset describes the land use (residential, commercial, agriculture) and land cover (forest,

wetlands, and streams) based on the Anderson Land Use/Land Cover system (Anderson et al., 1976).[1]

- *U.S. Geological Survey* (USGS) *Digital Elevation Model* (DEM) *data* (USGS 2001) – describes the topography in the General Area of Study. This data was used to process and derive slope information. Slopes were classified into two types: slopes greater than or less than 30 degrees

- *Pennsylvania Department of Transportation* (PADOT 2011) – describes the roadways in the General Area of Study. This data was used to identify Interstate (I), primary, and secondary roads

- *Existing Transmission Corridors dataset from PPL Electric Utilities* (PPL Electric) – describes the existing transmission corridors

- *Gas Pipelines* (Platts POWERmap 2011) – describes the location of existing gas pipelines

Suitability surfaces were then developed and used to create three **Macro Corridors** based on three potential scenarios:

- Rebuilding or paralleling existing transmission lines

- Paralleling existing transportation and other utility right-of-way

- Crossing undeveloped land

Figure 4-1 shows each of the three Macro Corridor areas (Existing Transmission Line Macro Corridor, Transportation and Other Utilities Macro Corridor, and Undeveloped Land Macro Corridor). The outer extents of the three individual least-impact Macro Corridors were then combined to define the outer extent of the **Project Study Area**. The resulting Project Study Area, shown in **Figure 4-2**, forms the basis for the collection and analysis of more detailed datasets that are used in the Alternative Corridor analysis.

The process used in this study provides a quantifiable method for determining the Project Study Area. Traditional methods of defining study areas are sometimes criticized for the apparently arbitrary selection of features, such as nearby roads or rivers, to define the boundaries. The GIS siting tools used for this project, however, works by effectively

[1] This dataset is based on aerial photographs collected between 2003 and 2007. A windshield survey was conducted in December 2010 to "ground truth" the accuracy of the remote data and the data was updated as necessary.

reviewing each individual composite surface to determine the areas that can be crossed with the least impact to the identified resources.

2.2 Generating and Reviewing Alternative Corridors in the Project Study Area

Alternative Corridors were generated using the same method as the Macro Corridors, but rely on more detailed datasets from within the defined Project Study Area. Datasets added to the evaluation process included:

- U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) wetlands (USFWS 2011) are used to identify the location and type of potential wetlands.
- Federal Emergency Management Agency (FEMA) 100-year floodplain boundaries are used to define the width of floodplain areas adjacent to major streams.
- Pennsylvania Department of Environmental Protection (PADEP) Chapter 93 stream classifications are used to illustrate classification status and associated levels of protection.
- Tax parcel boundaries (Monroe County Planning Commission [MCPC] 2010) are used to define property edges to minimize bisecting a property.
- Public land classifications (e.g., conservation easements, open space lands, agricultural easements) are used to identify the location and type of land preservation features.

Detailed data within the Project Study Area were used to generate three types of Alternative Corridors. These corridors were identified as being the most suitable for transmission line development from three distinct perspectives:

- Built environment
- Natural environment
- Engineering considerations

Opportunity/constraint values are assigned to the different siting criteria within each perspective as shown in **Table 4-1**. Although many of the rankings and weights noted in **Table 4-1** are from the original EPRI report, some values were refined with respect to specific layers. These refinements, described below in **Section 2.2.1**, were made by PPL Electric and URS technical experts in environmental, engineering, and public outreach disciplines to better represent conditions within Pennsylvania, such as the inclusion of

stream classifications to offer enhanced protection of this key resource within the natural environment perspective. The datasets were then reviewed to define the Alternative Corridors (**Section 2.2.2**).

TABLE 4-1: Opportunity/Constraint Values for Alternative Corridor Generation by Criteria Type

Built Environment		Engineering		Natural Environment	
Proximity to Buildings	**14%**	**Linear Infrastructure**	**75%**	**Floodplain**	**6%**
Background	1	Rebuild Existing Transmission Lines	1	Background	1
900-1200	2	Parallel Existing Transmission Lines	2	100-Year Floodplain	9
600-900	3	Parallel Interstate ROW	3	**Streams/Wetlands**	**21%**
300-600	4	Background	5	Background	1
0-300	9	Parallel Roads ROW	7	PEM/PSS wetlands + 100' buffer	6
Building Density	**45%**	Road ROW	8	Streams classified as CWF/MF + 100' buffer	6
0-0.05 Buildings/Acre	1	**Slope**	**25%**	PFO Wetlands + 100' buffer	7
0.05-0.25 Buildings/Acre	3	Slope 0-15%	1	HQ Streams + 150' buffer	8
0.25-1 Buildings/Acre	5	Slope 15-30%	6	Class A, Wilderness, or EV Streams + 150' Buffer	8
1-4 Buildings/Acre	7	Slope >30%	9	**Public Lands**	**16%**
4-25 Buildings/Acre	9			Background	1
Land Divisions	**11%**			Conservation Lands - Open Space, Conservation Easements	5
Edge of Field	1			State-Owned Lands - Game Lands	5
Land Lots	8			**Land Cover**	**21%**
Background	9			Open Land, Pastures, Scrub/Shrub	1
Spannable Lakes and Ponds	**5%**			Row Crops and Horticulture	2
Background	1			Managed Timber Lands	2
Spannable Lakes and Ponds	9			Developed Land	6
Land Use	**25%**			Hardwood/Natural Coniferous Forests	9
Undeveloped	1			**Wildlife Habitat**	**36.%**
Nonresidential	2			Background	1
Residential	9			Important Birding Areas	2
				Priority Natural Areas	5

Legend:

Perspective Categories
Layers
Layer Influence Percentages
Value
Features

NOTE: The Opportunity/Constraint Value system is based on a 1-9 scale, with a rank of 1 being most desirable and a rank of 9 being least desirable.

2.2.1 Dataset Refinements

Refinements of the environmental datasets within the Project Study Area were made to stream and wetland classifications and to protective buffer definitions. Additionally, potential bog turtle habitat, important bird areas, and The Nature Conservancy (TNC) identified Priority Natural Areas were added, as described below.

Streams

All streams in the Project Study Area were classified in accordance with Pennsylvania Code Title 25, Chapter 93: Water Quality Standards, which is produced by the PADEP (PADEP 2010a). Streams with the following classifications occur in the Project Study Area:

Aquatic Life Designations

- *Cold Water Fishery (CWF)* – Maintenance and propagation, or both, of fish species including the family Salmonidae and additional flora and fauna that are indigenous to a cold-water habitat.
- *Migratory Fishery (MF)* – Passage, maintenance, and propagation of anadromous and catadromous fishes and other fishes that move to and from flowing waters to complete their life cycles in other waters.

Special Protection Designations

- *High Quality Waters (HQ)* – Surface waters having quality that exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in or on the water by satisfying 25 PA Code § 93.4b(a).
- *Exceptional Value Waters (EV)* – Surface waters having quality that exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in or on the water by satisfying 25 PA Code § 93.4b(b).

Additionally, the Pennsylvania Fish and Boat Commission (PFBC) has devised several trout water classifications designed to provide additional recognition to the ecological value of specific streams. Trout water classification types identified within the Project Study Area includes:

- *Class A Wild Trout Streams* – streams that support a population of naturally produced trout of sufficient size and abundance to support a long-term and rewarding sport fishery (PFBC 2010a).

- *Wilderness Trout Streams* – streams identified based upon the provision of a wild trout fishing experience in a remote, natural and unspoiled environment where man's disruptive activities are minimized. This option was designed to protect and promote native (brook trout) fisheries, the ecological requirements necessary for natural reproduction of trout and wilderness aesthetics. The superior quality of these watersheds is considered an important part of the overall angling experience on wilderness trout streams (PFBC 2010b).

Furthermore, Pennsylvania Code Title 25, Chapter 102 states:

> *Erosion and Sediment Control, riparian buffers bordering streams have been acknowledged as a mechanism for maintaining the water quality of the resource by removing sediments and other pollutants that may result from earth disturbance or other adjacent land use activities.*

Based on the Chapter 102 regulations, the minimum effective buffer width is 100-feet from the edge of most streams (i.e., those with CWF designations). 150-foot-wide stream buffers are recommended for special protection waters (i.e., those with HQ and EV designations) (PADEP 2010b).

For this study, each of the stream classifications and associated buffer widths was assigned a specific weighting factor, with the most protected waters weighted most heavily.

Wetlands

Wetlands within the Project Study Area are classified based on the Cowardin system (Cowardin et al., 1979). These classifications include:

- *Palustrine Emergent (PEM)* – these wetlands are characterized by erect, rooted, herbaceous hydrophytes not including mosses and lichens. These wetlands are typically dominated by perennial plants that are present for the majority of the growing season.

- *Palustrine Forested (PFO)* – these wetlands are characterized by woody vegetation that is over 20-feet tall and normally include an overstory of trees, an understory of young trees or shrubs, and an herbaceous layer.

- *Palustrine Shrub-Scrub (PSS)* – these wetlands are generally dominated by woody vegetation under 20-feet tall. These wetlands may represent a successional stage leading to a forested wetland and include shrubs, young trees, and trees or shrubs stunted due to environmental conditions.

Similar to the protection provided to streams, riparian buffers bordering wetlands reduce the potential degradation of water quality caused by the influx of pollutants and sedimentation. Unlike streams, wetlands are typically characterized by their physical composition (i.e., such as PEM or PFO), not by their water quality.

For this study, all wetlands were assigned 100-foot buffers, the minimum effective buffer width according to the PADEP Chapter 102: Erosion and Sediment Control regulations.

Development of transmission lines through wetlands designated as PEM or PSS is not expected to significantly impact them since the lines span these wetland types. However, development through wetlands designated as PFO would result in substantially more impacts due to tree removal required in order to develop the right-of-way development. To minimize the impacts to this wetland type, a higher level of protection was provided to PFO wetlands.

Potential Bog Turtle Habitat

Bog turtles (*Clemmys muhlenbergii*) are a federally threatened species of concern that is monitored by the USFWS. Preferred habitat for these reptiles is spring-fed wetlands that are composed of soft mud and emergent hydrophytic plants, such as rushes, tussock sedge (*Carex stricta*), and jewelweed (*Impatiens capensis*). It is important for their habitat to have an open canopy, because bog turtles spend a considerable amount of time basking in the sunlight. Although the exact locations of bog turtle populations are not known within the Project Study Area, their preference for PEM wetland habitats was acknowledged, and these wetlands were provided a higher protective weighting.

Important Bird Areas

As described in **Attachment 3, Section 2.7**, the Audubon Society has identified the Long Pond Macrosite and adjacent State Game Land #38, which is located in the southwestern

quadrant of the Project Study Area, as an Important Bird Area (IBA #64). IBA #64 was assigned a protective weighting factor.

Priority Natural Areas

A Natural Area Inventory (NAI) has been conducted for the Monroe County Planning Commission (MCPC) by TNC to document the location and importance of these natural environments and the associated plants and animals (TNC 1991, 1999). Many of these habitats are recognized by the Pennsylvania Natural Heritage Program (PNHP) as rare, and some of the plants and animals within these areas have been identified as species of special concern (rare, threatened, or endangered). Specific Priority Natural Areas within the Project Study Area were reviewed in **Attachment 3, Section 2.6.5**. These environmentally sensitive areas were assigned a protective weighting factor.

2.2.2 Review of Alternative Corridors

The datasets for each of the three perspectives, including the identified weighting factors, were evaluated using GIS analysis to identify the Alternative Corridors (**Figure 4-3**). These Alternative Corridors then formed the optimal areas within which to identify Alternative Route alignments for consideration.

2.3 Generation and Evaluation of Alternative Routes in the Project Study Area

The third phase of the siting analysis was to generate several **Alternative Routes** (**Figure 4-4**). The Alternative Routes were generated by optimizing each of the different perspectives using standard GIS analysis tools. To complete this task, more refined data were developed and existing data were supplemented to reflect a greater amount of detail. For example, to avoid routing close to residences, a 300-foot protective buffer was created adjacent to residential areas. Refinements made to ensure engineering feasibility are described in **Section 2.3.2**.

2.3.1 Selection of Alternative Route Alignments

Six Alternative Routes were generated within the Alternative Corridors. Data were weighted in accordance with their importance or sensitivity, as described in **Section 2.2.1**. The six Alternative Routes were developed from individual siting models that assessed the region between the Jackson Substation and the 3.5-mile segment of the existing Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission line or the Lake Naomi 138/69 kV Tap identified as the preferred tap location. While all of the Alternative Routes take into consideration each of the three perspectives (built environment, engineering considerations, or natural environment), each alternative specifically optimizes one of the perspectives (**Section 2.4**).

2.3.2 Engineering Adjustments to Alternative Route Alignments

Based on field observations and assessment of aerial maps, the initial six Alternative Routes were modified to reflect more practical alignments. Changes included:

- Straightening the proposed alignments in areas where the generated alignment was irregular (e.g., zigzagged through open areas).
- Setting possible pole sites to minimize potential impact to environmental and sensitive land use features. A 1,000-foot distance was used as the longest possible distance for a span between transmission line poles.
- Setting possible pole sites in positions to effectively span some features (roadway intersections) or to make turns that avoid other features (dense development). These modifications were primarily implemented to avoid commercial and private structures.
- Placing proposed alignments along the edge of open fields or undeveloped lots. These modifications were implemented to decrease the potential impact to commercial and private activities.

2.4 Description of the Six Alternative Routes

The resulting alignments are described below and illustrated in **Figure 4-4**.

2.4.1 Alternative Route A

Alternative Route A is based on optimizing the built environment perspective and is 3.81 miles (20,100 feet) in length. Optimizing the built environment perspective means the route was selected by giving priority to reducing impacts to the built environment.

- Starting at the Jackson Substation, Alternative Route A travels northwest for 2.26 miles (11,900 feet) through State Game Land #38 and crosses to the north side of I-80. Alternative Route A crosses Sand Spring Run and Wolf Swamp Run, two EV streams associated with a TNC-identified Natural Area.

- Alternative Route A then turns to the northeast for 0.21 miles (1,100 feet) over Dry Sawmill Run, a HQ stream, and through another section of State Game Land #38.

- Turning to the north, Alternative Route A proceeds for 0.51 miles (2,700 feet) along the eastern edge of the Crescent Lake residential development.

- Alternative Route A then turns to the west for 0.19 miles (1,000 feet), crossing over Crescent Lake Road and through a proposed residential development area.

- Turning to the northwest, Alternative Route A travels another 0.19 miles (1,000 feet), crossing Dry Sawmill Run, a HQ stream, and an associated wetland complex.

- Alternative Route A then turns north and proceeds for 0.45 miles (2,400 feet), passing along the eastern edge of a residential community and crossing Sullivan Trail Road.

- After crossing Sullivan Trail Road, Alternative Route A intersects with the existing Lake Naomi 138/69 kV Tap line at the western edge of the Project Study Area and closest to the Lake Naomi Substation.

2.4.2 Alternative Route B

Alternative Route B is based on optimizing the built environment perspective and is 3.68 miles (19,400 feet) in length.

- Starting at the Jackson Substation, Alternative Route B travels northwest for 2.26 miles (11,900 feet) mirroring Alternative Route A to the north side of I-80. Alternative Route B crosses Sand Spring Run and Wolf Swamp Run, two EV streams associated with a TNC-identified Natural Area.

- After crossing I-80, Alternative Route B turns sharply to the northeast and proceeds for 0.23 miles (1,200 feet) over Dry Sawmill Run, a HQ stream, and through another portion of State Game Land #38.

- Alternative Route B then turns north and travels 0.51 miles (2,700 feet) along open forest land bordering a wetland complex.

- Turning to the northeast, Alternative Route B proceeds 0.19 miles (1,000 feet) and crosses Dry Sawmill Run, a HQ stream, and an associated wetland complex.

- Alternative Route B then turns north and travels 0.49 miles (2,600 feet) and crosses Crescent Lake Road, Sullivan Trail Road, and sections of open forest before intersecting the existing Lake Naomi 138/69 kV Tap line east of Alternative Route A.

2.4.3 Alternative Route C

Alternative Route C is based on optimizing the engineering perspective and is 3.65 miles (19,300 feet) in length. Optimizing the engineering considerations perspective means the route was selected by giving priority to reducing engineering impediments for constructing the transmission line.

- Starting at the Jackson Substation, Alternative Route C travels north for 2.14 miles (11,300 feet), traveling through State Game Land #38 and crossing over two EV streams (Sand Spring Run and Wolf Swamp Run) that are associated with a TNC-identified Natural Area. Alternative Route C also crosses over Dry Sawmill Run, a HQ stream, which flows between the east- and west-bound lanes of I-80.

- After crossing to the north side of I-80, Alternative Route C turns to the northeast and travels 0.32 miles (1,700 feet) across another section of State Game Land #38.

- Alternative Route C then turns north for 0.72 miles (3,800 feet), passing along the back edges of existing and proposed residential lots and then crossing over Dry Sawmill Run, a HQ stream.

- Turning to the northeast, Alternative Route C travels 0.47 miles (2,500 feet), crossing over Sullivan Trail Road and over open forest land before intersecting with the existing Lake Naomi 138/69 kV Tap line in the center of the Project Study Area.

2.4.4 Alternative Route D

Alternative Route D is based on optimizing the engineering perspective and is 3.76 miles (19,850 feet) in length.

- Starting at the Jackson Substation, Alternative Route D travels northeast for 0.53 mile (2,800 feet), crossing through State Game Land #38 and paralleling the eastern edge of the existing transmission line.

- After cresting the top of Camelback Mountain, Alternative Route D turns to the north for 1.37 miles (7,250 feet) through State Game Land #38 to a point just south of I-80. The proposed line crosses Wolf Swamp Run, an EV stream, which is associated with a TNC-identified Natural Area.

- Just south of I-80, Alternative Route D shifts to the west of the existing transmission line right-of-way to avoid a cluster of residential properties. To accomplish this shift, the existing line would be transferred to new poles constructed in a new right-of-way

on the western side of the existing right-of-way. The new line would then be transferred to the existing poles in the existing right-of-way.

- From the base of the south side of I-80, Alternative Route D turns to the east for 0.27 miles (1,400 feet), crossing Dry Sawmill Run, a HQ stream associated with the TNC-identified Natural Area.

- Alternative Route D then turns sharply north for 0.15 miles (800 feet) and crosses to the north side of I-80.

- Turning to the northwest, Alternative Route D then proceeds 0.19 miles (1,000 feet) over open forest to a point just within the borders on another section of State Game Land #38.

- Alternative Route D then turns to the north for 0.61 miles (3,200 feet) through open forest and parallel with a private dirt road that provides access to several homes and other potential residential lots located along the existing transmission line right-of-way.

- At a point prior to reaching the homes, Alternative Route D shifts back to the east side of the existing transmission line right-of-way. This shift would be accomplished by moving the proposed transmission line to the new poles in the new right-of-way created on the east side of the existing right-of-way. The existing transmission lines would then be transferred back to the existing poles in the existing right-of-way.

- Paralleling the eastern edge of the existing transmission line right-of-way, Alternative Route D then turns to the northeast for 0.64 mile (3,400 feet) and crosses over Sullivan Trail Road, Transue Run (a HQ stream), and traverses through open forest before intersecting with the existing Lake Naomi 138/69 kV Tap line right-of-way in the eastern end of the Project Study Area.

2.4.5 Alternative Route D-1

Alternative Route D-1 is based on the engineering perspective and is 3.75 miles (19,800 feet) in length.

- Starting at the Jackson Substation, Alternative Route D-1 mirrors the Alternative Route D description for 2.51 miles (13,250 feet) by paralleling the eastern edge of the existing transmission line through State Game Land #38. Alternative Route D-1 crosses Wolf Swamp Run (EV stream) and Dry Sawmill Run Creek (HQ stream), which are part of the TNC-identified Sand Spring Run/Wolf Swamp Run Natural Area, and switches from one side of the existing transmission line right-of-way to the other side prior to and after crossing I-80.

- After switching to the east side of the existing transmission line right-of-way on the north of I-80, Alternative Route D-1 departs from the existing right-of-way and proceeds northeast for 0.17 miles (900 feet) and then turns north for 0.33 miles (1,750

feet). In this section, Alternative Route D-1 traverses an area of open forest that bypasses several residential properties, but through an area identified as a proposed residential development.

- Upon intersecting with the existing transmission line right-of-way, Alternative Route D-1 then turns to the northeast and travels 0.57 miles (3,000 feet), crossing over Sullivan Trail Road, over Transue Run (a HQ stream), and through open forest before intersecting with the existing Lake Naomi 138/69 kV Tap line right-of-way in the eastern end of the Project Study Area.

2.4.6 Alternative Route E

Alternative Route E is based on optimizing the natural environment perspective and is 4.1 miles (21,650 feet) in length. Optimizing the natural environment perspective means the route was selected by giving priority to avoiding and reducing impacts to the natural environment.

- Starting at the Jackson Substation, Alternative Route E travels northeast for 1.12 miles (5,900 feet), crossing through State Game Land #38. Alternative Route E parallels the eastern edge of the existing transmission line to the crest of Camelback Mountain, at which point it crosses the access road for Big Pocono State Park and parallels the eastern edge of the road down to the northern base of the mountain.

- Alternative Route E then turns to the east for 0.34 miles (1,800 feet) paralleling the south side of the access road.

- Near PPL Electric's existing Camelback Substation, Alternative Route E turns to the northeast for 0.44 miles (2,300 feet) and immediately crosses the access road and the existing Camelback Tap 69 kV transmission line. Alternative Route E then traverses an open parking lot and a wooded area bordering the northwestern edge of the Camelback Ski Resort.

- Alternative Route E then turns north for 0.56 miles (2,950 feet), crossing Camelback Drive and open forest land adjacent to areas of proposed condominium development associated with the ski resort.

- Turning to the northwest, Alternative Route E travels 0.85 miles (4,500 feet), crossing Pocono Creek, a HQ stream and part of the TNC-identified Sand Spring Run/Wolf Swamp Run Natural Area. Alternative Route E then crosses I-80, an unnamed tributary to Transue Run (a HQ stream) and traverses areas of open forest that are a proposed residential development site.

- At this point, Alternative Route E turns north for 0.51 miles (2,700 feet) passing to the west of a residential development. It crosses Sullivan Trail Road, sections of open forest, and then crosses Transue Run, a HQ stream.

- Alternative Route E then intersects with the existing transmission line right-of-way and turns to the northeast for 0.28 miles (1,500 feet) paralleling the eastern edge of the right-of-way, before intersecting with the existing Lake Naomi 138/69 kV Tap line right-of-way in the eastern portion of the Project Study Area.

2.5 Public Outreach Overview

PPL Electric announced its intent to build the new, approximately 4-mile, Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Line in early May 2011. Since then, PPL Electric has undertaken activities to provide information on the project to the public and government officials and to collect input from those audiences.

2.5.1 Summary of Outreach Activities

- Calls and e-mails to Government Officials – PPL Electric representatives made phone calls and sent e-mails to local government officials to brief them on the project and invite them to the planned open house.

- Letters – PPL Electric sent notification letters to all property owners within a 1,000-foot corridor of the transmission line.

- Fact Sheet – A fact sheet was developed to provide an overview of the project. This document included information on the planned open house. The fact sheet was distributed to property owners in the 1,000-foot corridor, as well as at the open house.

- News Advertisements – PPL Electric announced the open house in an advertisement that ran in the local newspaper, the Pocono Record, on May 4, 2011.

- Open House – PPL Electric held a public open house on Monday, May 16, 2011 at the Northampton Community College Monroe Campus in Tannersville, Monroe County. The intent of the open house was to provide information and seek community input on the project. The open house provided detailed information about the project and gave attendees the opportunity to ask questions and provide input and information to representatives of PPL Electric.

An exhibition-style format was employed at the public workshop using a variety of displays to explain various aspects of the project. Displays were staffed by representatives of PPL Electric and other experts who explained the project to attendees, received feedback and other input from attendees, and answered questions and/or recorded questions for subsequent follow-up. The displays and the literature covered

various subjects, such as the electrical need for the line, engineering and construction requirements, right-of-way acquisition procedures, and route-selection procedures.

Seven people attended this event, most of whom were affected property owners along the transmission line right of way.

A review of the three comment cards left by attendees as well as feedback from the team members revealed some overall concerns related to this project. They include:

- Perceived loss in property value due to proximity of expanded right-of-way to residents and business owners
- General right-of-way concerns.
- Pole height, color and placement.
- Tree trimming, vegetation management, and federal regulation concerns.
- Increase in electrical current along the lines.

2.6 Evaluation of Alternative Routes

The Alternative Routes were compared and evaluated against each other to determine the **Selected Route**. Evaluation of the Alternative Routes included a combination of *quantitative analysis* based on weighted metrics, as well as a *qualitative review* by the Siting Team. This section describes the evaluation metrics, weighting procedures, and Siting Team analyses used to evaluate the Alternative Routes and to determine the Selected Route. The quantitative analysis included using weighted metrics to assess viability and preference in accordance with the three perspectives (built environment, natural environment, and engineering considerations). The qualitative analysis performed by the Siting Team included an assessment of visual concerns; community concerns; risk of schedule delay; special permit requirements; and construction, maintenance, and accessibility issues specific to each Alternative Route.

Evaluation Metrics

As described in the **Section 1.0** overview, the process for identifying the Selected Route involved quantitatively evaluating the advantages and disadvantages of the Alternative Routes. Initial steps in this process required defining the metrics, or constraint data, to be

used and then assigning values for each Alternative Route for each metric. These data were summarized in tabular form organized by evaluation metrics for each of the Alternative Routes, and by the three perspectives.

Evaluation metrics were used to factor detailed information on relative lengths, acres of easement, and particular circumstances into the selection process. For example, specific evaluation metrics included the number of homes within 300 feet of the route, acres of wetland crossings, and miles paralleling existing utility right-of-way. The metrics used for this evaluation process are shown in **Table 4-2**. The constraint data use a variety of scales/units, including acres, miles, and number of units. For instance, one Alternative Route may cross 100 linear feet of wetland, while another might cross 10 feet of wetland and be in close proximity to 100 houses.

The resulting constraint data was then normalized. Data normalization is required to allow meaningful comparison of the Alternative Routes using the quantitative values. Normalizing the data allows the underlying characteristic of the datasets to be compared by removing the units (miles, acres) associated with the various measurements. Data normalization was achieved by first comparing a single constraint value for a given Alternative Route against the same constraint values for the other Alternative Routes. For example, the Alternative Route with the lowest and highest potential wetland impacts was determined by comparing the range of wetland constraint values between the Alternative Routes. As an example, the number of wetland acres ranges from 9.57 acres for **Alternative Route A** to 13.07 acres for **Alternative Route C**. A normalization calculation was used to assign each Alternative Route a value based on a scale of 0 – 100. The Alternative Route with the lowest potential impact was assigned a value of 0 and the Alternative Route with the highest potential impact was assigned a value of 100; other Alternative Routes were assigned a value in between 0 – 100 based on their relative potential impact when compared to the lowest and highest scoring routes. This same process was used to assign a value on the 0 – 100 scale for all the metrics evaluated. **Table 4-3** provides a tabular summary of the raw metrics and corresponding normalized values for the six Alternative Routes identified for the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project siting study.

TABLE 4-2: Metric Definitions of Quantitative Criteria

Built Environment
NRHP-Listed/Eligible Structures/Districts (within 1,500 feet): Identifies the number of historic structures or districts located within 1,500 feet of the Alternative Route.
Residences (within 300 feet): Residences located in close proximity to the Alternative Route.
Proposed Housing Developments (within 300 feet): Areas that have physical indications of new residential development located in proximity to the Alternative Route.
Commercial Buildings (within 300 feet): Structures in close proximity to the Alternative Route, including retail stores, restaurants, and service garages.
Industrial Buildings (within 300 feet): Structures in close proximity to the Alternative Route, including steel mills, power plants, or quarries.
School, Day Care, Church, Cemetery, or Park Parcels (within 1,000 feet): Identifies the number of areas where the Alternative Route would be within 1,000 feet of any of these sensitive land uses.
Within Homes Curtilage: Identifies properties that contain residences that lie within 100-meters (328 feet) of or have their curtilage crossed by the proposed Alternative Route.
Natural Environment
Natural Forests: Acres of forest crossed by the proposed Alternative Route.
Stream/River Crossing: Number of streams that would be crossed by the proposed Alternative Route. Values based on GIS stream data. Smaller tributaries are often not identified in the GIS database, thus the actual number of crossings may be higher than indicated.
NWI Wetlands and Areas of Hydric Soils: Acres of potential wetlands that would be crossed by the proposed Alternative Route. USFWS NWI Wetlands and Monroe County hydric soils were used as the basis of the analysis.
Floodplain Areas: Acres of floodplains that would be crossed by the proposed Alternative Route. Values based on GIS-mapped FEMA floodplains, as available in state databases.
Engineering Considerations
Length: Length of transmission line as calculated by GIS analysis.
Miles of Co-location with Existing Linear Utilities: Length of the proposed Alternative Route to be built parallel to the right-of-way of an existing transmission line or other linear utility (i.e., water, gas, petroleum). These areas have fewer impacts compared to developing completely new right-of-way, but require additional coordination and may involve more engineering analysis to ensure safe co-location with the other utility.
Miles Parallel with Roads and Railroads: Length of the proposed Alternative Route adjacent to (within 100 feet) of roadways or railroads. These areas have easier access for construction and maintenance. Conversely, lines routed distant from these features have higher engineering constraints.
Number of Road and Railroad Crossings: Number of times the proposed Alternative Route crosses a public road or railroad alignment. These areas have engineering constraints due to height requirements.
Areas of Steep Slopes (>30%): Acres of steep slopes crossed by the proposed Alternative Route. These areas have engineering constraints resulting from access road development, pole placement, and long-term maintenance.
Number of Landowners: Number of different landowners associated with the proposed transmission line
Estimated Total Project Costs: Values were estimated based on typical project-specific cost per mile and associated cost of new right-of-way property acquisition, if relevant. Estimates do not include licensing and permitting and other miscellaneous costs.

TABLE 4-3: Tabular Summary of Alternative Routes

Criteria	Corridor	ROUTE A	ROUTE B	ROUTE C	ROUTE D	ROUTE D-1	ROUTE E
BUILT ENVIRONMENT	NHRP-Listed/Eligible Structures/Districts (1,500 feet from edge of right-of-way)	0	0	0	0	0	0
	Normalized						
	Residences (within 300 feet of transmission center line)	10	6	2	4	2	36
	Normalized	23.53	11.76	0.00	5.88	0.00	100.00
	Proposed Housing Developments (within 300 feet of transmission center line)	1	0	0	0	1	1
	Normalized	100.00	0.00	0.00	0.00	100.00	100.00
	Commercial Buildings (within 300 feet of transmission center line)	0	0	0	0	0	3
	Normalized	0.00	0.00	0.00	0.00	0.00	100.00
	Industrial Buildings (within 300 feet of transmission center line)	0	0	0	0	0	0
	Normalized						
	School, Day Care, Church, Cemetery, Park/Recreation Center Parcels (#) (within 1,000 feet of transmission center line)	0	0	0	0	0	1
	Normalized	0.00	0.00	0.00	0.00	0.00	100.00
	Within Homes Curtilage	0	0	0	4	0	0
	Normalized	0.00	0.00	0.00	100.00	0.00	0.00
NATURAL ENVIRONMENT	Natural Forests (acres)	42.33	39.35	42.02	22.87	25.24	37.90
	Normalized	100.00	84.69	98.38	0.00	12.19	77.23
	Stream/River Crossings (#)	7	6	7	3	3	3
	Normalized	100.00	75.00	100.00	0.00	0.00	0.00
	NWI Wetlands & Hydric Soil Areas (acres)	9.22	5.47	2.96	2.14	1.74	3.70
	Normalized	100.00	49.80	16.32	5.33	0.00	26.14
	Floodplain Areas (acres)	0.85	0.53	1.15	0.23	0.23	0.43
	Normalized	68.07	33.12	100.00	0.00	0.00	21.44
ENGINEERING VARIABLES	Length (miles)	3.81	3.68	3.65	3.76	3.75	4.25
	Normalized	26.80	3.99	0.00	17.81	16.89	100.00
	Miles of Co-location with Existing Utilities (Inverted)	0	0	0	3.68	3.24	1.09
	Normalized	100.00	100.00	100.00	0.00	11.97	70.47
	Miles Parallel with Roads or Railroads (Inverted)	0	0	0	0	0	0.30
	Normalized	100.00	100.00	100.00	100.00	100.00	0.00
	Number of Road and/or Railroad Crossings	7	6	6	6	6	10
	Normalized	25.00	0.00	0.00	0.00	0.00	100.00
	Areas of Steep Slopes (> 30%) (Acres)	8.16	8.28	12.93	8.89	8.93	16.91
	Normalized	0.00	1.35	54.52	8.32	8.79	100.00
	Number of Landowners	17	11	24	21	13	19
	Normalized	46.15	0.00	100.00	76.92	15.38	61.54
	Estimated Total Project Costs	$5,702,400	$5,462,900	$5,438,500	$5,101,700	$5,214,500	$6,253,800
	Normalized	52.14	31.35	29.23	0.00	9.79	100.00

TABLE 4-4: Weighted Quantitative Metrics and Totals for Alternative Routes

Quantitative Criteria	Weights	A	B	C	D	D-1	E
BUILT	**33.0%**						
NHRP-Listed/ Eligible Structures/ Districts (within 1,500 feet from edge of right-of-way)	**16.0%**	0	0	0	0	0	0
Weighted		0.00	0.00	0.00	0.00	0.00	0.00
Residences (within 300 feet of transmission center line)	**16.0%**	23.53	11.76	0.00	5.88	0.00	100.00
Weighted		3.76	1.88	0.00	0.94	0.00	16.00
Proposed Housing Developments (within 300 feet of transmission center line)	**5.0%**	100.00	0.00	0.00	0.00	100.00	100.00
Weighted		5.00	0.00	0.00	0.00	5.00	5.00
Commercial Buildings (within 300 feet of transmission center line)	**4.0%**	0	0	0	0	0	100
Weighted		0.00	0.00	0.00	0.00	0.00	4.00
Industrial Buildings (within 300 feet of transmission center line)	**2.0%**	0	0	0	0	0	0
Weighted		0.00	0.00	0.00	0.00	0.00	0.00
School, Day Care, Church, Cemetery, Park/Recreation Center Parcels (#) (within 1,000 feet of transmission center line)	**13.0%**	0	0	0	0	0	100
Weighted		0.00	0.00	0.00	0.00	0.00	13.00
Within Homes Curtilage	**44.0%**	0	0	0	100	0	0
Weighted		0.00	0.00	0.00	44.00	0.00	0.00
TOTAL	**100.0%**	8.76	1.88	0.00	44.94	5.00	38.00
WEIGHTED TOTAL		2.89	0.62	0.00	14.83	1.65	12.54
NATURAL	**33.0%**						
Natural Forests (acres)	**23.0%**	100.00	84.69	98.38	0.00	12.19	77.23
Weighted		23.00	19.48	22.63	0.00	2.80	17.76
Stream/River Crossings (#)	**30.0%**	100.00	75.00	100.00	0.00	0.00	0.00
Weighted		30.00	22.50	30.00	0.00	0.00	0.00
NWI Wetlands & Hydric Soil Areas (acres)	**35.0%**	100.00	49.80	16.32	5.33	0.00	26.14
Weighted		35.00	17.43	5.71	1.87	0.00	9.15
Floodplain Areas (acres)	**12.0%**	68.07	33.12	100.00	0.00	0.00	21.44
Weighted		8.17	3.97	12.00	0.00	0.00	2.57
TOTAL	**100.0%**	96.17	63.38	70.34	1.87	2.80	29.48
WEIGHTED TOTAL		31.74	20.92	23.21	0.62	0.93	9.73
ENGINEERING	**33.0%**						
Length (miles)	**10.0%**	26.80	3.99	0.00	17.81	16.89	100.00
Weighted		2.68	0.40	0.00	1.78	1.69	10.00
Miles of Co-location with Existing Utilities	**25.0%**	100.00	100.00	100.00	0.00	11.97	70.47
Weighted		25.00	25.00	25.00	0.00	2.99	17.62
Miles parallel with Roads or Railroads	**10.0%**	100.00	100.00	100.00	100.00	100.00	0.00
Weighted		10.00	10.00	10.00	10.00	10.00	0.00
Number of Road and Railroad Crossings	**10.0%**	25.00	0.00	0.00	0.00	0.00	100.00
Weighted		2.50	0.00	0.00	0.00	0.00	10.00
Areas of Steep Slopes (> 30%) (Acres)	**15.0%**	0.00	1.35	54.52	8.32	8.79	100.00
Weighted		0.00	0.20	8.18	1.25	1.32	15.00
Number of Landowners	**15.0%**	46.15	0.00	100.00	76.92	15.38	61.54
Weighted		6.92	0.00	15.00	11.54	2.31	9.23
Estimated Total Project Costs	**15.0%**	52.14	31.35	29.23	0.00	9.79	100.00
Weighted		7.82	4.70	4.39	0.00	1.47	15.00
TOTAL	**100.0%**	54.92	40.30	62.56	24.57	19.78	76.85
WEIGHTED TOTAL		18.13	13.30	20.65	8.11	6.53	25.36
SUM OF WEIGHTED TOTAL		**52.75**	**34.84**	**43.86**	**23.55**	**9.10**	**47.63**

2.6.1 Weighting Procedures and Modifications

The normalized metric values derived from **Table 4-3** were further adjusted through a weighting process shown in **Table 4-4**. **Table 4-4** shows the total of the weighted metrics within each of the three perspectives and an overall total for each Alternative Route. Each of the perspectives was assigned a weighted percentage and the results were normalized to that percentage. The rationale and process for determining the assigned percentages for each perspective are described below.

The Siting Team reviewed the weight criteria and assigned weights based on their analyses. Weights developed from the EPRI-GTC Siting Methodology were used as starting point values for the following reasons:

- The EPRI-GTC weights were developed through significant outreach and collaboration between multiple stakeholders from utilities, government agencies, and the general public.
- They use established collaborative and statistical techniques in their determination.
- They were calibrated against successfully developed transmission line routes.

The ranking, weights, and features considered for analysis were assigned by the Siting Team to address specific Pennsylvania regulations and features. For example, items within the natural environment matrix were modified to address protective measures recommended by state regulatory agencies for maintaining the ecological value associated with streams and wetlands.

As shown in **Table 4-4,** for the first step in the weighting process, a relative weight (percentage) was assigned to each specific metric. For example, proximity to *Residences* was assigned a weight of 16.0%, while proximity to *Industrial Buildings* was assigned a weight of only 2.0%. This weighting ensures that the features requiring the most protection are assigned a higher relative influence for the ranking process. Relative weights for all the metrics within each perspective category must add up to 100%. The total of the weighted metrics within each perspective are summarized and illustrated on the line entitled "Total" at the bottom of the perspective (e.g., **Alternative Route A** has a total of 8.76 for the built environment perspective).

In the second weighting process shown in **Table 4-4,** each total value was then applied against the assigned weight for the perspective, which was 33% for all three perspectives. The weighted metric total is provided on the line entitled "Weighted Total." The Weighted Total values for the entire process are summed at the bottom of **Table 4-4** on the line entitled "Sum of Weighted Total." The Sum of Weighted Total result effectively compares the cumulative impact of the Routes on the built and natural environment and shows which has the lowest cumulative impact while being technically feasible to construct from an engineering perspective.

2.6.2 Discussion of Quantitative Results

The results of the cumulative values indicate that **Alternative Route D (23.55)** and **Alternative Route D-1 (9.10)** would produce significantly fewer impacts relative to the other alternatives and be less costly. **Alternative Route B (34.84)** has the next lowest cumulative value. **Alternative Routes A (52.75), E (47.63),** and **C (43.86)** have the highest cumulative values.

2.6.2.1 Built Environment

Values for the built environment metrics are the highest for the **Alternative Route D (14.83)** and lowest for the **Alternative Route C (0.00)** and **Route B (0.62).** Specific factors that affected the built environment values for **Alternative Route D** include its proximity (within 100 meters; 328 feet) to four homes. **Alternative Route E (12.54),** which scored second highest, is affected by its proximity to 36 existing residential structures, its crossing of proposed residential development areas, and its proximity to the Camelback Ski Resort recreational facility.

Built environment values for **Alternative Route B (0.62)** are affected primarily by its proximity to a cluster of six residential structures. Values for **Alternative Route D-1 (1.65)** increased due to its crossing of a proposed development area. **Alternative Route A (2.89)** scored even higher than **Alternative Route D-1** due to its proximity to 10 residential structures and the necessity for crossing a proposed residential development area.

2.6.2.2 Natural Environment

Values for the natural environment metrics are the highest for the **Alternative Route A (31.74)** and **Alternative Route C (23.21)** and lowest for **Alternatives D (0.62)** and **D-1 (0.93)**. Higher environmental values for the **Alternative Routes A** and **C** are the result of their crossing through open forest (mostly associated with State Game Land #38), the number of acres of floodplain crossing, and their crossing of seven streams, three of which are classified as EV. **Alternative Route A** would also cross the most acres of NWI wetland/hydric soils, which are primarily identified as PFO. Values for **Alternative Route B (20.92)** are slightly lower than for **Alternative Route A** and **Alternative Route C** since it crosses fewer acres of forest and floodplain, and spans only six streams.

Conversely, **Alternative Routes D** and **D-1** cross the fewest acres of forest and hydric soils/wetlands, and only span three streams, only one of which is classified as EV. Values for **Alternative Route E (9.73)**, the natural environment perspective route, are moderately higher than **Alternative Routes D** and **D-1** primarily due to the need to create new right-of-way that would result in relatively more acreage of forest impacts and hydric soil crossings. Although **Alternative Route E** does not cross any NWI wetlands, it does cross substantial areas of forest cover and hydric soils, which may be deemed PFO wetlands based on official delineation that would need to be conducted prior to permitting.

2.6.2.3 Engineering Considerations

Values for engineering metrics are highest for **Alternative Route E (25.36)** and **Alternative Route C (20.65),** and lowest for **Alternative Routes D (8.11)** and **D-1 (6.53)**. Although **Alternative Route E** utilizes portions of the existing right-of-way and parallels sections of local roads, the high value is a result of its length (4.25 miles, the longest of the Alternative Routes), its crossing of numerous roads (10), and its crossing of a relatively high number of landowner properties (19). Although **Alternative Route C** is the shortest route (3.65 miles), the engineering values for this alternative are high because it does not parallel any existing transmission line or local road systems, it crosses more areas of steep slopes, and it crosses the highest number of landowner properties (24).

Alternative Route A (18.13) has high values for engineering metrics because it is the second longest route (3.81 miles), does not utilize existing transmission line or roadway systems, and crosses a moderately high number of landowner properties (17).

Conversely, values for **Alternative Route D** and **Route D-1** are low as a result of being two of the shortest lines (3.76 miles and 3.75 miles, respectively), primarily co-located along existing transmission line right-of-way, and being less costly to build. By co-locating along the existing right-of-way, these Alternatives Routes would use portions of the open right-of-way and would, therefore, require less right-of-way acquisition and forest clearing. Although **Alternative Route B (13.30)** does not parallel the transmission line or road systems, it also has relatively low engineering consideration values because it is the second shortest route (3.68 miles) and would involve the fewest landowners (11).

2.6.3 Quantitative Assessment

As a final step in the quantitative analysis, the Siting Team reviewed the results of the six Alternative Routes in an effort to reduce the number of alternatives to be qualitatively reviewed. The Siting Team, composed of technical experts associated with transmission line siting, design, and construction, as well as experts in the fields of environmental assessment, permitting, and public outreach, made the following conclusions:

- **Alternative Route A** was excluded from further review based on the following:
    - **Alternative Route A** had the highest cumulative value **(52.75),** primarily a result of having the highest potential natural environment impact
    - **Alternative Route A** also scored high on the engineering metrics
- **Alternative Route E** was excluded from further review based on the following:
    - **Alternative Route E** had the second highest cumulative value **(47.63)** as a result of having the highest potential built environment and engineering impacts associated with any of the alternatives.
- **Alternative Route C** was excluded from further review based on the following:
    - **Alternative Route C** had the third highest cumulative value **(43.86)** due to having the second highest natural environment and engineering impacts associated with any of the alternatives.

- **Alternative Route B** was retained for further review based on the following:
    - **Alternative Route B** had one of the lower cumulative values **(34.84)** due to the limited built environment and engineering impacts relative to the other alternatives.
- **Alternative Route D** was retained for further review based on the following:
    - **Alternative Route D** also had one of the lowest cumulative values **(23.55)** despite having the highest built environment value, which was significantly affected by its proximity to four homes along the proposed alignment.
- **Alternative Route D-1** was retained for further review based on the following:
    - **Alternative Route D-1** had the lowest cumulative value **(9.10)** of all the Alternative Route impacts.

2.6.4 Qualitative Analysis

The last phase in identifying the Selected Route for the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project involved the Siting Team's qualitative assessment of the three Alternative Routes with the lowest overall quantitative scores: **Alternative Route B**, **Alternative Route D**, and **Alternative Route D-1**. The Siting Team assessed the following five qualitative criteria for each alternative:

1) Visual concerns
2) Community concerns
3) Special permit issues
4) Construction, maintenance, and accessibility
5) Schedule delay risk

Each of these qualitative criteria was assigned a weight based on its significance within the scope of the Project as illustrated on **Table 4-5**. Siting Team members then assessed each Alternative Route based on these criteria, ranking each on a 1-5 scale, with one (1) indicating a low impact and five (5) indicating a high impact. A detailed discussion of the Siting Team considerations related to each of the five criteria is provided below.

TABLE 4-5: Siting Team Analysis of Qualitative Concerns

Qualitative Criteria	Weights	ROUTE B	ROUTE D	ROUTE D-1
Visual Concerns	10%	4	2	1
Weighted		0.4	0.2	0.1
Community Concerns	20%	4	2	1
Weighted		0.8	0.4	0.2
Special Permit Issues	30%	5	2	2
Weighted		1.5	0.6	0.6
Construction, Maintenance, and Accessibility	20%	4	3	3
Weighted		0.8	0.6	0.6
Schedule Delay Risk	20%	4	3	2
Weighted		0.8	0.6	0.4
TOTALS	**100%**	**4.3**	**2.4**	**1.9**

NOTE: The qualitative criteria are ranked on a scale of 1-5, with 1 indicating a low impact and 5 a high impact

2.6.4.1 Visual Concerns

The Siting Team noted that the transmission poles within the existing transmission line right-of-way have been in their present locations for over 40 years and, with the alignment climbing over the crest of Camelback Mountain and across I-80, they are generally visible to the surrounding local communities and to the general public.

The Siting Team noted that even though the **Alternative Route D** and **Route D-1** would basically parallel the existing transmission line right-of-way, the widening of the right-of-way and addition of new poles would generate a level of visual concern for the surrounding communities. It was acknowledged, however, that most specific concerns would be limited to a few landowners whose properties are located adjacent to the existing right-of-way and along the residential access road on the south side of Sullivan Trail Road. The Siting Team noted that **Alternative Route D** would parallel the existing right-of-way and the residential access road as they bisected several properties. This alignment would bring **Alternative Route D** within close proximity to four residential structures. **Alternative Route D-1**, conversely, would bypass to the east around this section, but still parallel the back edge of these properties.

Other visual concerns identified by the Siting Team included those for **Alternative Route B,** which would create a new alignment through an area without existing

transmission line right-of-way. Although the visibility of **Alternative Route B** would be relatively low as it crosses through sections of State Game Land #38, visibility would be significantly higher in the new right-of-way created over Camelback Mountain, as it crosses I-80, and especially as it passes through the residential cluster around Crescent Lake and Sullivan Trail Road.

The Siting Team concluded that a new overhead alignment through an area without existing transmission line right-of-way would result in a more negative visual impact on the landscape than a transmission line located parallel to existing right-of-way. Accordingly, the Team assigned **Alternative Route B** the high visual concern value of 4. The Siting Team further concluded that the visual concerns generated by **Alternative Route D** as it passes the two existing residential structures and over the residential access road would be relatively higher than concerns raised by the **Alternative Route D-1** alignment; therefore, **Alternative Route D** was assigned a moderately low visual concern value of 2, and **Alternative Route D-1** was assigned the lowest value of 1.

2.6.4.2 Community Concerns

Some of the potential concerns that could be raised by the general community were proactively addressed during the initial siting process. During the quantitative analyses process (described in **Section 2.1**), specific avoidance areas and buffers were identified to guide the potential Alternative Routes away from high-density areas, as well as maintain required distances away from residences.

The Siting Team reviewed the quantitative assessment and determined that it adequately accounted for these avoidance expectations. These alternatives cross through generally rural or isolated areas where construction and maintenance activities would not seriously impact the daily functioning of the local residents. Due to the increased activity and noise during construction, however, some minor community concern could be realized by homes adjacent to the right-of-way. These concerns would be diffused after construction is complete. The Siting Team noted, however, that community concerns related to **Alternative Route D** would be elevated since it parallels the existing residential access road and is in close proximity to existing residential homes, as discussed above.

Although **Alternative Route D-1** crosses through portions of a proposed development, the community concerns with this route would be relatively minor since this alignment bypasses the existing residential section.

The Siting Team noted that **Alternative Route B** includes a new transmission line right-of-way corridor over the crest of Camelback Mountain. It also crosses through un-fragmented sections of forest associated with State Game Land #38 and a TNC-identified natural area, and passes adjacent to a cluster of residential properties near Crescent Lake and Sullivan Trail Road. It is anticipated that this alternative would generate negative reactions from community leaders and groups due to the potential visual and social impacts, as well as from state and regional conservation groups due to the potential environmental impacts. Siting Team members noted that the community concerns for **Alternative Route B** would have long-term social ramifications on the local community and recognized that acquisition of the necessary state-owned and private property would be strongly contested.

The Siting Team concluded that a new alignment through areas without an existing transmission line right-of-way would result in a more negative community concern relative to paralleling existing right-of-way. Accordingly, the Team assigned **Alternative Route B** a high community impact value of 4. The Siting Team also concluded that community concerns generated by **Alternative Route D** as it passes the four existing residential structures and over the residential access road would be higher than the concerns raised by **Alternative Route D-1**. As such, **Alternative Route D** was assigned a moderately low community concern value of 2, and **Alternative Route D-1** was assigned the lowest value of 1.

2.6.4.3 Special Permit Requirements

Various types of permits may be required for developing a new transmission alignment or when re-building transmission lines within existing right-of-way. For example, in the Commonwealth of Pennsylvania, freshwater wetlands, open waters, and floodplains are regulated by the PADEP. Impacts to these features would require some type of permit

from PADEP, whether related to the complex positioning of a new structure in a large wetland or the simple crossing of a small tributary.

Similarly, additional coordination would be required with PADEP, as well as the local county conservation districts, to acquire erosion and sediment control permits required under the federal National Pollutant Discharge Elimination System (NPDES) permit program, which controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The level of NPDES permitting is further affected by the level of water quality associated with receiving streams, with EV-designated streams requiring the highest level of protection.

Issuance of required permits usually also requires compliance with state-mandated evaluation of potential environmental or social features, such as conducting detailed assessments of rare, threatened, and endangered (RTE) species habitats or local cultural resources. Impacts to these features can require mitigation efforts that would need to be addressed prior to obtaining the necessary permits. Furthermore, specific permits may be required for social safety considerations such as activities associated with highway crossings and paralleling or spanning along railroad right-of-way.

The Siting Team noted that the three remaining Alternative Routes would cross environmentally sensitive lands located within State Game Land #38 and associated with the TNC-identified Sand Spring Run/Wolf Swamp Run Natural Area. Development of any of the Alternative Routes would involve some degree of wetland impacts, EV stream crossings, and potential RTE species habitat encroachment. The extent of PADEP permits required, however, will vary based on the condition of the natural resources and degree of anticipated impact. The Siting Team also noted that each alternative would cross a similar number of local roads and I-80, thus coordination with PennDOT for roadway occupancy permits is required for all Routes and would be basically identical.

Based on the quantitative assessment, **Alternative Route B** would cross significantly more forest area, EV-designated streams, and wetland habitats relative to **Alternative Route D** and **Route D-1**. The Siting Team acknowledged that the new transmission line right-of-way associated with **Alternative Route B** bisects several presently undisturbed

portions of open forest and fragments interior forest areas. The evaluation of the impacts to the forest community, associated EV-designated streams and wetland areas, and potential RTE habitats required by PADEP could be extensive. Furthermore, due to the presence of EV-designated streams, erosion and sedimentation control measures required for a NPDES permit would involve more specific expectations. Since there are three EV-designated streams along **Alternative Route B**, the NPDES permit expectations for this route would involve a larger area, require more engineering to incorporate these expectations into the plans, and be more closely scrutinized by the regulatory officials than for the other two routes.

Conversely, by paralleling and overlapping onto the existing transmission line right-of-way, **Alternative Route D** and **Route D-1** would impact less forest area, cross fewer EV-designated streams and wetlands, and have a relatively limited effect on potential RTE habitats. Furthermore, acquisition of the NPDES permits would be less complex since these two routes cross only one EV-designated stream. **Alternative Route D** would impact relatively more wetland areas than **Alternative Route D-1**, whereas **Alternative Route D-1** would impact more forest areas than **Alternative Route D**. In terms of special permit requirements, these impacts are comparable and would not result in potential permit process delays for either route.

The Siting Team concluded that using the existing right-of-way would result in fewer special permit requirements relative to the development of new right-of-way. Accordingly, the Siting Team assigned **Alternative Route B** the highest special permit requirement value of 5, and **Alternative Route D** and **Route D-1** the moderately low value of 2.

2.6.4.4 Construction, Maintenance, and Accessibility

The Siting Team considered the variables involved in constructing transmission lines, conducting mandatory routine maintenance of the facilities, and providing appropriate access to all of the required areas. Initial phases of transmission line construction require the use of various types of heavy machinery (bulldozers, cranes, and cement mixers) that need to traverse the landscape to the proposed pole positions. These vehicles aid in

clearing the forest, leveling out access roads and footer/pad areas, digging footers or creating the concrete foundations, and erecting pole structures. Typically, wire installation is conducted by hand, with construction personnel carrying lighter leader lines between poles and using small power equipment to pull the line taut and haul the heavier wire into place. This process often allows the lines to be strung over wetlands or stream valleys, thereby decreasing potential impacts to protected features and avoiding areas of steep slopes. Due to the ability to bypass certain complex areas between the poles, the access road system does not necessarily need to extend the entire length of the proposed alignment. This decrease in access road length also facilitates the permit process as it minimizes impacts to regulated areas by reducing stream and wetland crossings. The access road system would only need to ensure access to the pole locations for routine inspections and maintenance requirements.

The Siting Team noted that construction related issues for **Alternative Route B** would involve the need to clear vegetation and other obstructions within the proposed new 100-foot wide right-of-way, develop new access roads, build new pole foundations, install the poles, and install the new 138/69 kV conductoring network along the alignment. Rocky terrain, steep slopes, and dense forest growth would encumber access and development of **Alternative Route B**. Once completed, however, access for routine maintenance would not be problematic.

Although **Alternative Route D** and **Route D-1** would involve similar footer and pole construction processes, other aspects would be relatively less difficult for these routes compared to **Alternative Route B**. Vegetation clearing work, for example, would be limited to widening the existing transmission line right-of-way by 25 to 50-feet for over 85 percent of the proposed route, and creating a new 100-foot wide right-of-way for the 0.5-mile portion that bypasses the residential area south of Sullivan Trail Road. Similarly, construction of these two routes would further benefit from the existing access road network along the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission line. On the other hand, since these routes involve switching sides of the existing transmission line, both **Alternative Route D** and **Route D-1** would involve a

higher level of complexity and coordination that may require special pole placements, structure modifications, and temporary planned power outages.

The Siting Team concluded that creating new transmission line right-of-way would result in more construction, maintenance, and access issues compared with paralleling an existing right-of-way. Accordingly, the Siting Team assigned **Alternative Route B** a moderately high construction, maintenance, and accessibility value of 4. Due to the relative similarity in construction complexity and limited access needs, the **Alternatives Route D** and **D-1** were assigned a moderate construction, maintenance, and accessibility value of 3.

2.6.4.5 Risk of Schedule Delay

Risk of schedule delay is directly related to the other qualitative criteria evaluated by the Siting Team. For example, negative community reaction, complicated right-of-way acquisition, required additional field studies for environmental permit clearance, and construction complexity can all result in delayed schedules. Many of the potential reasons for schedule delays along each of the Alternative Routes can be identified in advance. However, some reasons for delay may not be known until additional engineering studies have been completed and therefore may not be realized until later in the process.

As already noted, **Alternative Route B** would raise considerably more community concern relative to **Alternative Route D** and **Route D-1**. Schedule delays for **Alternative Route B** would be expected as a result of community opposition to the acquisition of new right-of-way adjacent to the residential cluster near Crescent Lake and Sullivan Trail Road. Other factors that could further delay the schedule for **Route B** include: potential state opposition to the acquisition of un-fragmented sections of State Game Land #38; opposition from local environmental groups over the potential impact to a Priority Natural Area; the need for additional environmental studies including coordination with PADEP to address environmental permit requirements, NPDES permit requirements; mitigation expectations associated with anticipated impacts to wetland, forest, EV-designated streams, and RTE habitat; and construction complexity due to the

rugged terrain. Cumulatively, these factors could significantly delay the construction schedule of **Alternative Route B**.

Alternative Route D and **Route D-1** would not require the same level of coordination with the community or various agencies. Being located adjacent to the existing transmission line right-of-way, these proposed alignments would generate relatively minor community issues with regard to visibility, and right-of-way acquisition processes would be limited to landowners currently living along the right-of-way. Similarly, although coordination with PADEP regarding wetland impacts, stream crossing requirements, RTE habitat avoidance, and NPDES permit requirements is anticipated to be a time consuming procedure, the process should be less cumbersome than for **Alternative Route B,** due to the relatively limited area of potential impact. **Alternative Route D** would be subject to more community-oriented schedule delays than **Alternative D-1** since it is closer to several existing residential structures and would involve relatively more landowners. **Alternative Route D-1** would avoid these potential delays by passing around these opposition areas and involving fewer landowners.

The Siting Team concluded that a new alignment through an area without existing transmission line right-of-way would result in more schedule delay risks relative to working adjacent to an existing right-of-way. Accordingly, the Siting Team assigned **Alternative Route B** a moderately high schedule delay value of 4. The Siting Team also concluded that schedule delays for **Alternative Route D** would be higher than for **Alternative Route D-1** due to the existing residential structures and number of landowners that would be affected along **Alternative Route D**. As such, **Alternative Route D** was assigned a moderate schedule delay value of 3 and **Alternative Route D-1** a moderately low value of 2.

2.7 Selected Route Determined by Siting Team

The results of the *quantitative assessment* of the Alternative Routes, discussed in detail in **Section 2.6.2** and **Section 2.6.3** and illustrated in **Table 4-3,** resulted in **Alternative Route D** and **Route D-1** being tied for the lowest overall weighted total value. These two routes also had the lowest weighted score for two of the three perspectives of the

siting process (natural environment and engineering consideration). **Alternative Route B** had the second lowest overall weighted total value and the lowest weighted score for the built environment perspective of the siting process. Based on the results of the quantitative assessment, the Siting Team retained the lowest scoring three alternatives and dismissed the other alternatives (**Alternative Routes A**, **C**, and **E**) from the qualitative assessment.

The results of the *qualitative assessment* of the Alternative Routes by the Siting Team, discussed in detail in **Section 2.6.4** and illustrated in **Table 4-4**, indicate that **Alternative Route D-1** has the lowest weighted scores for visual concerns, community concerns, and schedule delay risk. This route also scored favorably with regards to special permit issues and construction issues.

Therefore, based on the quantitative assessment of the Alternative Routes, in conjunction with a qualitative siting process, the Siting Team selected **Alternative Route D-1** for the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project, as illustrated on **Figure 4-5**.

3.0 Review of Selected Route

Per Pennsylvania Public Utility Commission (PUC) guidelines found at 52 Pa. Code, § 69.1101 (2)(3) and § 69.3104 (1), a review of the potential effect of the Selected Route on local comprehensive plans and zoning ordinances was conducted (**Section 3.1**). Based on the requirements of § 69.3106 (1), an assessment of the potential environmental and cultural mitigation measures and permit requirements anticipated for the Selected Route is also provided (**Section 3.2**). PUC regulation § 69.3105 (2) also requires that the status of the property acquisition process be provided as part of the siting study (**Section 3.3**). PUC regulation § 57.72 (c)(8) requires that a report of the efforts to locate and identify archaeological, geologic, historic, scenic, and wilderness areas within 2-miles of the Selected Route also be submitted as part of the siting study (**Section 3.4**). PPL Electric has reviewed the Project with Jackson and Pocono Townships and Monroe County, and none have provided any objection to the Project.

3.1 Review of Township Zoning and Comprehensive Plans

Public utility features, such as transmission lines and substations, are regulated by federal and state agencies as to their design, location, and construction, but are generally exempt from local municipal authority. [2] To further the Commonwealth's goal of making agency actions consistent with sound land use planning by considering the impact of its decision upon local comprehensive plans and zoning ordinances, the PUC adopted a new policy on January 11, 2001 that requires the public utility to review local zoning ordinances and comprehensive land use plans to evaluate the impact of proposed projects on these items (*See* 31 Pa. Bull. 951 (Feb. 17, 2001)). Local zoning ordinances and comprehensive land use plans were reviewed by PPL Electric to evaluate the impact of the proposed Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project on these local ordinances and plans.

Based on the Project Need (**Attachment 2**), PPL Electric proposes to develop a new double-circuit 138/69 kV transmission line in Monroe County to resolve identified thermal loading and reliability criteria violations along the existing Blooming Grove-Jackson 138/69 kV Line. The result of this siting study has concluded that the new 138/69 kV transmission line should generally parallel the existing transmission line right-of-way from the Jackson Substation north to the junction with the Lake Naomi 138/69 kV

[2] The lack of authority for a local municipality to regulate the design, location, or construction of public utility facilities is consistent with the long line of cases holding that public utilities are exempt from local ordinances. *See Duquesne Light Company v. Monroeville Borough*, 449 Pa. 573. 580, 298 A.2d 2352 (1972) ("This Court has consistently held, however, that the Public Utility Commission has exclusive regulatory jurisdiction over the implementation of public utility facilities") (citations omitted). *See, e.g., County of Chester v. Philadelphia Elec. Co.*, 420 Pa. 422, 218 A.2d 331 (1966) (holding that regulation by a multitude of jurisdictions would result in "twisted and knotted" public utilities with consequent harm to the general welfare); *Newtown Twp. v. Philadelphia Elec. Co.*, 594 A.2d 834, 837 (Pa. Cmwlth. 1991) (noting that "it is clear that no 'implied' power exists in the MPC which would allow the Township to regulate [the Philadelphia Electric Company] through its subdivision and land development ordinance"); *Heintzel v. Zoning Hearing Bd. of Millcreek Twp.*, 533 A.2d 832 (Pa.. 1987) (holding that township had no power to regulate, under its zoning ordinance, city's erection of water tower because that power was under the exclusive jurisdiction of the PUC); *South Coventry Twp. v. Philadelphia Elec. Co.*, 504 A.2d 368 (Pa. Cmwlth. 1986) (noting that to possibly subject [the Philadelphia Electric Company] to a miscellaneous collection of regulations upon its system would clearly burden and indeed disable it from successfully functioning as a utility); C*ommonwealth v. Delaware and Hudson Railway Co.*, 339 A.2d 155 (Pa. Cmwlth. 1975) (holding that the MPC did not authorize local governments to regulate public utilities in any manner which infringes upon the power of the Commission to so regulate).

Tap. Construction of the approximately 3.8-mile double-circuit Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Transmission Line will create a more reliable electrical system and reduce electrical loading which addresses the project goals. Since this route would be located within Monroe County, specifically through Jackson and Pocono Townships, PPL Electric evaluated the project's consistency with the zoning ordinances and comprehensive plans of these government entities.

3.1.1 Township Zoning

PPL Electric collected and reviewed the zoning maps and ordinances for Jackson Township and Pocono Township. The proposed line and right-of-way were assessed relative to the local zoning maps to identify the specific zoning districts through which the line would pass (see **Figure 3-12**). Ordinances associated with these zoning districts were subsequently evaluated by PPL Electric to determine the proposed transmission line's consistency with their requirements.

The various zoning ordinances or land development ordinances reviewed for Jackson Township and Pocono Township are comparable. Both municipalities have zoning ordinances and zoning districts established to guide future land use in the municipality by encouraging development of desirable residential, commercial, agricultural, and manufacturing areas with appropriate groupings of compatible and related uses. The stated goal of these ordinances is to protect and promote the health, morals, safety, and general welfare of the inhabitants of the municipality.

Electric transmission lines used by public utilities are generally referred to in municipal zoning codes as an "essential service," "public utility uses," or similar categorization. Jackson Township defines high voltage transmission lines, towers, and substations under its Public Utility Uses category, whereas Pocono Township defines electric transmission lines under the Essential Services category, which also includes the provision of gas, telephone, sewer, water, and other similar services.

3.1.1.1 Jackson Township

The proposed Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission line route traverses approximately 1.9 miles of Jackson Township. The route passes through one zoning district within the township: the Public Conservation District. The proposed route in Jackson Township will parallel existing transmission line right-of-way from its establishment at Jackson Substation until it crosses the northern township border.

3.1.1.1.1 Public Conservation District

All 1.9 miles of the route traverses the Public Conservation District, which is associated with State Game Land #38 in this portion of Jackson Township. The purpose of the Public Conservation District is to perpetuate the wooded, natural, undeveloped, and unimproved areas of the township, owned at the time of enactment of the regulation by Federal, State, county, city, or municipal bodies, agencies, or authorities (Jackson Township 1999). According to Section 1110 of the Jackson Township zoning ordinances, public utility uses are permitted in any zoning district with a special exception permit. The Zoning Hearing Board issues these permits after they determine that the proposed installation in a specific location is necessary and convenient for the efficiency of the public utility system or the satisfactory and convenient provision of service by the utility to the neighborhood, area, or region in which the particular use is to be located. Other provisions regarding building design and off-street parking are also reviewed but would not be relevant for this project. Since the proposed alignment has been considered electrically necessary through systems analysis by PPL Electric, and the selected alignment conveniently parallels existing transmission line right-of-way for the entire length within the township, the project would be consistent with the special exceptions ordinance and eligible for the special exception permit.

3.1.1.2 Pocono Township

The proposed Blooming Grove-Jackson and Peckville-Jackson 138/69 kV transmission line route traverses approximately 1.9 miles of Pocono Township. The route passes through three zoning districts within the township: Conservation, Recreational, and

Residential Districts. The proposed route in Pocono Township will parallel existing transmission line right-of-way where possible, with the exception of a 0.5-mile section south of Sullivan Trail Road where the proposed route will bypass an area of existing residential units.

3.1.1.2.1 Conservation District

Approximately 0.3-mile of the route traverses the Conservation District, which is associated with State Game Land #38 in this portion of Pocono Township. The purpose of the Conservation District is to provide open space areas in the township. According to Section 407 and Section 535 of the Pocono Township zoning ordinances, limited essential service structures (i.e., poles, wires) are permitted by right in the Conservation District, but major facility essential service buildings and structures (i.e., substations) are not permitted. Approved structures would be permitted in the Conservation District without regard to standard use, lot area, setbacks, and impervious area regulations (Pocono Township 2003). Based on the premise that PPL Electric is not planning to develop any new substations along this alignment, the project would be consistent with the ordinance.

3.1.1.2.2 Recreational District

Approximately 0.5-mile of the route traverses the Recreational District. The purpose of the Recreational District is to maximize open space while allowing for recreational activities that generate employment, retail trade, retail services, tourism, and related dining/lodging and entertainment uses. According to Section 404 of the Pocono Township zoning ordinances, essential services buildings and structures are permitted by right in the Recreational District. The proposed route would not interfere with any existing recreational facility or activities within the district. Based on this summary, the project would be consistent with the ordinance.

3.1.1.2.3 Residential District

Approximately 1.1-miles of the route traverses through the Residential District. The purpose of the Residential District is to provide suburban residential areas in the

township with limited public utility services where residential development may occur. Higher densities at a future date would be contingent upon the provision of public water and sewer service. According to Section 402 and Section 403 of the Pocono Township zoning ordinances, essential services buildings and structures are permitted by right in the Low and Medium Density Residential Districts. PPL Electric sited the proposed transmission line to avoid the curtilage (100 meters, or 328 feet) around residential units along the route. Based on this summary, the project would be consistent with the ordinance.

3.1.2 Comprehensive Plans

PPL Electric acquired and reviewed available county and municipal comprehensive or land use plans covering the areas through which the proposed Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Transmission Line would cross. These included the Monroe County Comprehensive Plan and township-specific comprehensive plans for Jackson and Pocono Townships, which were developed to guide growth at the county and municipal levels. Adopted Open Space and Greenways plans for the county and the townships were also reviewed. All of the plans are summarized below.

With the exception of a 0.5-mile section in Pocono Township south of Sullivan Trail Road, the entire proposed route is located parallel to existing transmission line right-of-way. Therefore, the proposed project is not anticipated to have significant impacts on any of the land, resources, or activities identified in the county and municipal plans.

3.1.2.1 Monroe County

Monroe County plans reviewed for the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Transmission Line project included the Monroe County Comprehensive Plan: Monroe 2020, the Monroe County Open Space Plan, and the Monroe County Natural Areas Inventory.

3.1.2.1.1 Monroe County Comprehensive Plan: Monroe 2020 (June 1999)

The Monroe County Comprehensive Plan: Monroe 2020 was coordinated by the Monroe

County Planning Commission (MCPC) and formulated to address pressures on the county and local municipalities generated by high population growth rates, loss of open space, and strains on the local tax base (MCPC 1999). Goals of the plan are to guide further economic development and environmental conservation in the county and associated municipalities. The Overview Section provides a summary of the challenges, identified patterns, and recommendations for obtaining these goals. Key to this process is the coordination of county and municipal entities to cooperatively make decisions on future development through delineation of growth areas and the identification of important agricultural and natural resource areas that should be preserved. This cooperative method is envisioned to occur through actions such as county funding of specific municipal open space acquisitions and municipal level planning and zoning processes that guide development at the township level. Concerns regarding utility infrastructure focused primarily on the need to provide adequate supplies of drinking water and proper methods of wastewater processing. Electric utilities were noted to have strong expansion capabilities in the county.

Primary growth issues identified in the plan include guiding development and preservation of natural resources. To address the development issues, the plan identified the need to focus growth in specific population centers such as Stroudsburg, Tannersville, Mount Pocono, and Brodheadsville, and to focus future economic development along specific transportation corridors including SR 209, SR 611, and SR 940. Strategies to guide this process include establishing efficient, compact patterns of land use and locating new development on sites served by existing infrastructure. To address the environmental conservation issues, the plan recommends preserving local environmentally valuable resources as identified by the County's Natural Areas Inventory, and providing incentives to protect local agricultural lands. Strategies to guide this process include using various land acquisition methods including capital expenditures, private land donations, and conservation easements that are based on matching state funds.

The Selected Route would traverse Jackson and Pocono Townships, through areas designated as conservation, recreational, and low density residential. The project will not

impact areas identified as growth centers or economic corridors. The proposed route will, however, cross areas some State Game Lands identified as environmentally sensitive by the County's Natural Areas Inventory, specifically the TNC-identified Sand Spring Run/Wolf Swamp Run Natural Area. Impacts to these areas were addressed and minimized during the siting process through the selection of a route that would parallel existing transmission line right-of-way that already crosses these sensitive resources. By avoiding growth areas and minimizing the impacts to natural resources in the area, the Selected Route is considered consistent with the principles of the Monroe County Comprehensive Plan.

3.1.2.1.2 Monroe County Open Space Plan (June 2001)

The Monroe County Open Space Plan was developed by the Monroe County Open Space Advisory Board (MCOSAB) and serves as a guidance document for planning and preservation at the county and local level (MCOSAB 2001). Identified in the plan is the need for the increased preservation of open space to protect natural resources and guide future land development. As part of the plan, an inventory was conducted of the environmental and cultural resources of the county including ecologically sensitive natural areas, agricultural lands, scenic landscapes, and historic areas. Various types of conservation opportunities are also presented that range from funding models to forms of preservation methods such as conservation design neighborhoods, county park systems, modification in the local land use regulations, and development of greenway corridors that provide linkage to the surrounding resources. The goal of the plan is to create an open space system with a network of interrelated preserved lands and trails protected through various private and public means.

Review of the cultural and natural resources identified in the Monroe County Open Space Plan concluded that the Selected Route would have no effect on agricultural lands or historic areas. The Selected Route would also not be visible from the closest scenic overlook, Pocono Knob, which is located east of the Selected Route in Big Pocono State Park. The Selected Route would, however, cross over Sullivan Trail Road, which is considered a scenic drive in Monroe County. Since the Selected Route would parallel the

existing transmission line right-of-way in this area, it would only be visible as a second set of transmission lines as it crossed this roadway. The route would also cross through existing recreational open space preserved though the State Game Lands system and, concurrently, the Sand Spring Run/Wolf Swamp Run Natural Area, which is located within the State Game Lands. PPL Electric notes, however, that the siting of the Selected Route to parallel existing transmission line right-of-way that already crosses these open space and natural areas has minimized any potential affect relative to the potential development of a new right-of-way corridor through the area.

The Monroe County Open Space further indicates that greenways are a preferential method for protecting the quality of life and resources of the county. Opportunities for greenway development typically involve natural corridors, such as stream valleys, but cultural corridors, such as abandoned railroads and utility right-of-way, are also considered viable and practical. As noted, the Selected Route traverses through State Game Land #38 by paralleling an existing transmission line right-of-way that is presently used as an active hunting ground, is part of a hiking trial network, and provides a scenic overlook of the surrounding landscape. In light of these conditions, PPL Electric notes that the Selected Route is consistent with using these existing opportunities.

3.1.2.1.3 Monroe County Natural Areas Inventory (1991, updated 1999)

The Monroe County Natural Areas Inventory was composed in 1991 by The Nature Conservancy (TNC) for the MCPC, and updated in 1999 to include new sites within the county (TNC 1991, 1991). The document involves a brief description of the geology, soils, and vegetation of the county and summarizes the highest quality natural areas with recommendations for conservation and an order of relative importance for preservation. Most of the natural areas are based on the presence of known animal or plant species of concern (endangered, threatened, or rare) as defined by the Pennsylvania Department of Conservation and Natural Resources (PADCNR). Natural area information relevant to the project was used in the siting analysis as discussed in **Attachment 3** (Environmental Setting).

3.1.2.2 Township Comprehensive and Open Space Plans

Township-level comprehensive plans relevant to the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Transmission Line project were also reviewed and are discussed below. These plans include Jackson Township and Pocono Township multi-municipal based comprehensive plans, which were developed and adopted in response to the coordination efforts recommended by the MCPC through their county-level Comprehensive Plan. Jackson and Pocono Townships have also developed a joint Open Space Plan that supplements their township-level comprehensive plans.

3.1.2.2.1 Jackson Township

Jackson Township is located in the central portion of Monroe County. The township coordinated with several surrounding townships to develop and adopt a comprehensive plan to address land use issues in the area. The township also coordinated specifically with Pocono Township to develop an open space plan.

3.1.2.2.1.1 Jackson Township Comprehensive Plan (November 2006)

Comprehensive planning in Jackson Township is guided by The Joint Comprehensive Plan for the CJER (Chestnuthill, Jackson, Eldred, and Ross Townships) Region (Jackson Township 2006). These townships are located at the western end of Monroe County and include large tracts of rural agricultural land uses, a growing number of residential neighborhoods, and a centralized commercial corridor along SR 209. The joint comprehensive plan was initiated because of the recognized need to examine the overall planning for the area in light of development trends and pressures in the region, and to determine common goals and objectives for land use. Issues addressed in the comprehensive plan include economic growth, agricultural and open space preservation, and the preservation of natural resources. The plan embraces the concept of Smart Growth, which encourages a more efficient use of the land by encouraging a larger share of growth within previously developed areas already served by public infrastructure.

As noted in the county-level discussion, the Selected Route would traverse a section of open space in Jackson Township that is designated as Public Conservation (State Game

Land #38) and also contains an area identified by the Monroe County Natural Areas Inventory (Sand Spring Run/Wolf Swamp Run Natural Area). Potential effects to these natural resources have been minimized by paralleling the proposed line along existing transmission line right-of-way through these areas. The Selected Route would not have any effect on existing agricultural or cultural resources (i.e., scenic vistas, historic sites) in Jackson Township. SR 715, which is identified in the plan as the Business Development area of Jackson Township, would similarly not be affected by the project.

3.1.2.2.1.2 Jackson Township/Pocono Township Open Space Plan (2003)

The HJP (Hamilton, Jackson, and Pocono Townships) Open Space and Recreation Plan is an action program for preserving open space and natural and cultural resources, as well as providing recreational opportunities through facilities and services to the local community (Jackson Township/Pocono Township 2003). The plan is not considered law, but a guide that will enable the townships to make sound decisions in allocating resources effectively.

The Selected Route will have minimal potential effect on an existing open space resource (State Game Land #38), an EV-designated watershed (Wolf Swamp Run), and on a proposed greenway along an abandoned railroad alignment. These effects are minimized by siting the Selected Route parallel to existing transmission line right-of-way across these areas. The Selected Route will not impact any existing services or facilities.

3.1.2.2.2 Pocono Township

Pocono Township is located in the north-central portion of Monroe County. The township coordinated with several surrounding townships to develop and adopt a comprehensive plan to address land use issues in the area. The township also worked with Jackson Township to develop an open space plan, which was reviewed above.

3.1.2.2.2.1 Pocono Township Comprehensive Plan (June 2005)

Comprehensive planning in Pocono Township is guided by a Multi-Municipal Comprehensive Plan, which includes Hamilton, Stroud, and Pocono Townships, as well

as Stroudsburg Borough (Pocono Township 2005). These townships are located at the central and eastern end of Monroe County and include large tracts of forest cover, a growing number of residential developments, and several concentrated areas of commercial development primarily along SR 611. As with Jackson Township's plan, this multi-municipal comprehensive plan was initiated to determine common goals and objectives for land use and also embraces the concept of Smart Growth.

Prior discussions indicated that the Selected Route would have a minimal potential effect along Sullivan Trail Road, which is considered a scenic road through Pocono Township. South of Sullivan Trail Road, the Selected Route would also cross through parcels that involve plans for Approved Residential Developments. The proposed route may limit the number of potential homes constructed in the proposed development areas. A conceptual greenway that would follow an abandoned railroad grade around to the north side of Camelback Mountain and west into Tobyhanna Township would be spanned, but not blocked, by the proposed alignment. The Selected Route would also cross public recreation (State Game Land #38) and forested areas, but potential effects to the public recreation area will be significantly reduced by siting the route along the existing transmission line right-of-way. There will be no effects of the project on Designated or Future Growth Areas.

3.2 Potential Mitigation and Permit Requirements

The following is a discussion of the potential project impacts and associated mitigation efforts along with the permit requirements of the proposed Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Line.

PPL Electric is working diligently with relevant property owners to secure additional easement areas along the existing right-of-way and new easements along the 0.5-mile segment that deviates away from the existing right-of-way. Efforts were made during the siting process to minimize impacts on existing and future land use. Where potential impacts are unavoidable, mitigating factors will be employed. To address water quality standards within the EV-designated and HQ-designated watersheds along the project corridor, PPL Electric will comply with the regulations of the National Pollutant

Discharge Elimination System (NPDES) permit program, obtain the required soil erosion and sedimentation control permits, and follow the specified conditions. In addition, any required waterway or floodplain encroachment permits will be obtained from PADEP and the United States Army Corps of Engineers (USACE) prior to construction and PPL Electric will comply with all special conditions placed on the permits.

3.2.1 Land Use

Siting analyses for the Selected Route was conducted with acknowledgement of existing and proposed land uses. Some impact on existing and future land use may occur, including clearing of forest areas and reducing potential areas for residential development. Development of right-of-way easement areas also preclude certain uses such as locating buildings, building swimming pools, or establishing fruit orchards and tree farms within the easement area. PPL Electric's Encroachment Policy, however, allows for compatible land use on transmission line easements such as row crop farms, horse pastures, and hiking trails. PPL Electric is working with relevant and cooperative property owners to locate the right-of-way easement across their land to minimize the impact on existing and future land uses. Potential effects created by the development of the Selected Route may include reduction of forest cover and reduction in potential residential subdivision lots on specific parcels. In all cases, property owners will be compensated at present land values for the right-of-way easement. Of note, the Selected Route will also be designed to avoid conflicts with other utilities currently located or proposed along the route.

3.2.2 Natural Features

Approximately 25.2 acres of forest clearing is required to ensure the safe and reliable operation of the Selected Route. Vegetation clearing processes and measures are reviewed in PPL Electric's "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" (**Attachment 6**). This process will preserve compatible species of low growing trees, shrubs, and grasses where practical. Herbicides used on the

right-of-way will be EPA-approved and will be applied selectively in accordance with all label instructions.

National Wetland Inventory (NWI) and Hydric Soils mapping indicate the potential presence of several wetland areas, totaling approximately 1.75 acres, along the Selected Route. A certified wetlands specialist will use USACE approved methodology to verify and delineate any wetland areas along the proposed alignment and within any area of disturbance created by access roads and staging areas. Wetland areas will be surveyed and added to the construction drawings. Wherever possible, suitable upland areas will be used for the placement of transmission structures and access roads to avoid or minimize wetland impacts. All required permits will be obtained from the PADEP and the USACE prior to construction.

The Selected Route will cross Wolf Swamp Run, which is an EV-designated stream, as well as Dry Sawmill Run and Transue Run, which are HQ-designated streams. Long-term impacts to these watercourses are expected to be minimal, as they will be spanned by the proposed transmission line. Due to the water quality level in these watersheds, an Individual NPDES permit will be required to mitigate any potential short-term impacts of erosion and sedimentation during construction. Additional and more sophisticated Best Management Practices (BMPs) may be required to maintain the high water quality standards in the watersheds and obtain the NPDES permit.

Floodplains are found adjacent to watercourses and include the areas that routinely flood during heavy rain events. Due to the steep, narrow valleys associated with the waterways along the Selected Route, the floodplains will be relatively narrow and can be spanned by the transmission line. Where practicable, transmission structures will be constructed outside the floodplain areas.

3.2.3 Threatened and Endangered Species

The USFWS have indicated that the Selected Route is within the range of the federally-threatened bog turtle *(Clemmys muhlenbergii)* and Indiana bat (*Myotis sodalist*). PPL Electric has retained the services of a qualified bog turtle specialist to provide additional

information that the USFWS will require to further evaluate the potential impact. USFWS guidance regarding the Indiana bat states that if tree-cutting activities can be accomplished during the bats' hibernation period (October 15 to March 31), then project-specific Indiana bat surveys will not be necessary. If practicable PPL Electric will perform tree cutting activities during this hibernation period to negate the need for bat surveys. If this tree-cutting restriction cannot be adopted however, then Indiana bat surveys will be conducted by a qualified surveyor in accordance with USFWS guidelines (**Attachment 12**).

Correspondence from the Pennsylvania Department of Conservation and Natural Resources (PADCNR) indicates that the variable sedge *(Carex polymorpha)* may inhabit a portion of the Selected Route alignment. PADCNR also indicated that a plant community of concern, the pitch pine-heath woodland, may be located along the ridge of Camelback Mountain. A PADCNR-qualified botanist (Ms. Janet Ebert) will perform a survey at the appropriate time of year to confirm the status of this plant and plant community along the Selected Route (**Attachment 12**).

Correspondence from the Pennsylvania Fish and Boat Commission (PFBC) indicates the potential habitat presence of the timber rattlesnake (*Crotalus horridus*), specifically within the mountainous region between Jackson Substation and Interstate-80. The PFBC has requested additional information to evaluate the presence of these habitats. Herpetological Associates, a PFBC-approved herpetological assessment group, performed a Phase I habitat survey of the identified area in October 2011 and has concluded that potential habitat only exists within the steep sloped southern-exposure areas just north of the Jackson Substation. Additional surveys for the presence/absence of the timber rattlesnake within this identified habitat area may also need to be conducted (**Attachment 12**).

Correspondence with the Pennsylvania Game Commission indicated that there would be no conflict with species under their jurisdiction. Any conflicts with the above species of concern will be resolved prior to the start of construction (**Attachment 12**).

3.2.4 Cultural Resources

No historic or archaeological sites, structures, or districts listed on the National Register of Historic Places (NRHP) are located along the Selected Route. Similarly, no NRHP-listed area is located within 2-miles of the Selected Route, thus visual impacts are not anticipated to be a factor. PPL Electric has also consulted with the Pennsylvania Historical and Museum Commission (PHMC), who has concluded that the development of the Selected Route will have no effect on any cultural resource[3] (**Attachment 12**).

3.2.5 Community Features

No schools, day care centers, churches, or cemeteries are located along the Selected Route. Therefore, no impacts to these features are anticipated.

3.2.6 Anticipated Agency Requirements and Permits

In summation of the items reviewed above, a delineation of the wetlands and waterways, as well as specific plant and animal studies, need to be conducted that will provide information on possible avoidance and impact areas along the route. Although only minimal direct natural resource potential impacts are anticipated for the project, an Individual Joint Permit Application process that incorporates both the PADEP Chapter 105 and the USACE Section 404 permit expectations is anticipated due to the presence of high quality waterways and environmentally sensitive habitats along the route. Similarly, as a result of the EV and HQ water standards, an Individual NPDES permit is expected from PADEP for erosion and sedimentation control during construction. **Attachment 14** (Permit Matrix) provides an overview of the State and Federal permits and associated cultural and environmental compliance measures that will be required for the development of the Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Transmission Line.

[3] File Number: ER 2011-1843-089-A

3.3 Property Acquisition Status

The Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project requires easement acquisition from six (6) property owners for the expansion of existing right-of-way and for new right-of-way development in specific areas. As of the completion of this siting report, there are still four (4) properties that have not been acquired due to the early stage of the project. All of the property owners have been informed of the need for the right-of-way easement and negotiations are ongoing.

3.4 Sensitive Features within 2-Miles

Desktop and field efforts were conducted to locate and identify archaeological, geologic, historic, scenic, and wilderness areas within 2-miles of the Selected Route. Some of the scenic and historic areas were addressed during initial analysis of the General Area of Study and were incorporated into the siting analysis conducted for the Selected Route. **Figure 4-6** provides an overview of these culturally and environmentally sensitive features within 2-miles of the Selected Route. Of note, there are no airports, archaeological, or wilderness areas within the 2-mile review area.

4.0 SUMMARY AND CONCLUSIONS

The Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project siting study was conducted to identify an overhead transmission line alignment that would result in the least amount of impact to the natural and built environments, while satisfying the need to construct a new 138/69 kV transmission line in the Project Study Area. The methodology identified major constraints in the Project Study Area to develop Macro Corridors, used a quantitative and qualitative evaluation process to generate and compare Alternative Routes within those corridors, and provided a framework from which to select the Alternative Route most suited for overhead electric transmission lines.

The Macro Corridors and Alternative Routes were generated based on the quantitative evaluation of a comprehensive spatial database developed for the area. The evaluation was conducted from three primary perspectives: 1) protection of the natural environment, 2) protection of the built environment, and 3) engineering considerations. The quantitative evaluation was supplemented by a qualitative assessment and review by a Siting Team composed of experts in fields associated with transmission line siting, design and construction, as well as environmental assessments, permitting, and public outreach.

Six Alternative Routes were identified within the Project Study Area. Results of the quantitative analyses narrowed the Alternative Routes down to three viable options for qualitative review by the Siting Team. Based on the relatively limited social and environmental impacts of its construction, the Siting Team chose **Alternative Route D-1** as the Selected Route for the new Blooming Grove-Jackson and Peckville-Jackson 138/69 kV Project.

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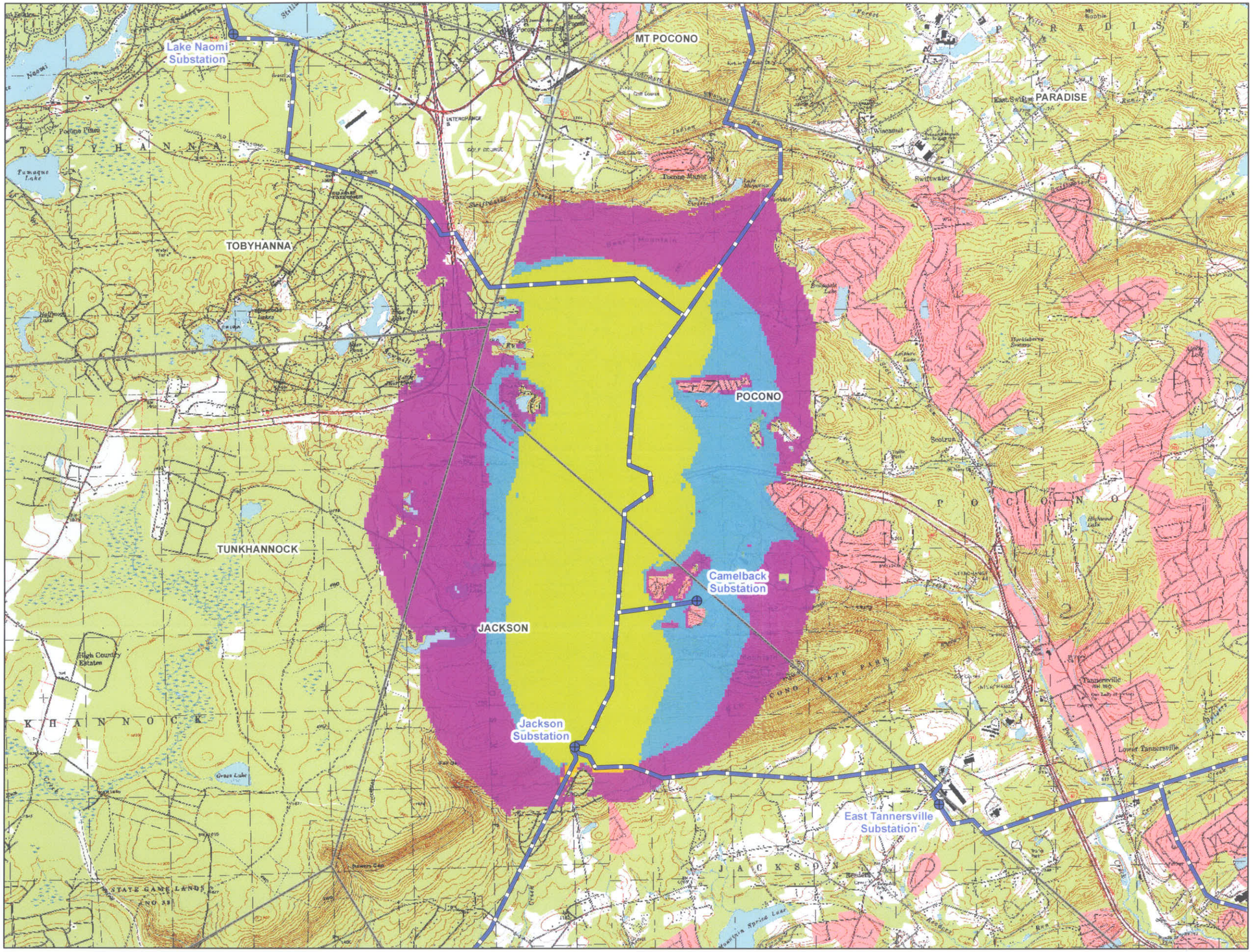
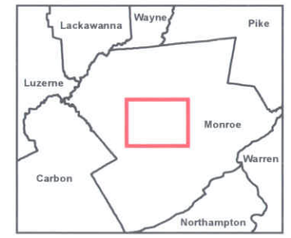
Attach. 4

Figures



Legend

- Substations
- Existing Transmission Lines
- Existing Transmission Line Macro Corridor
- Transportation and Other Utilities Macro Corridor
- Undeveloped Land Macro Corridor
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

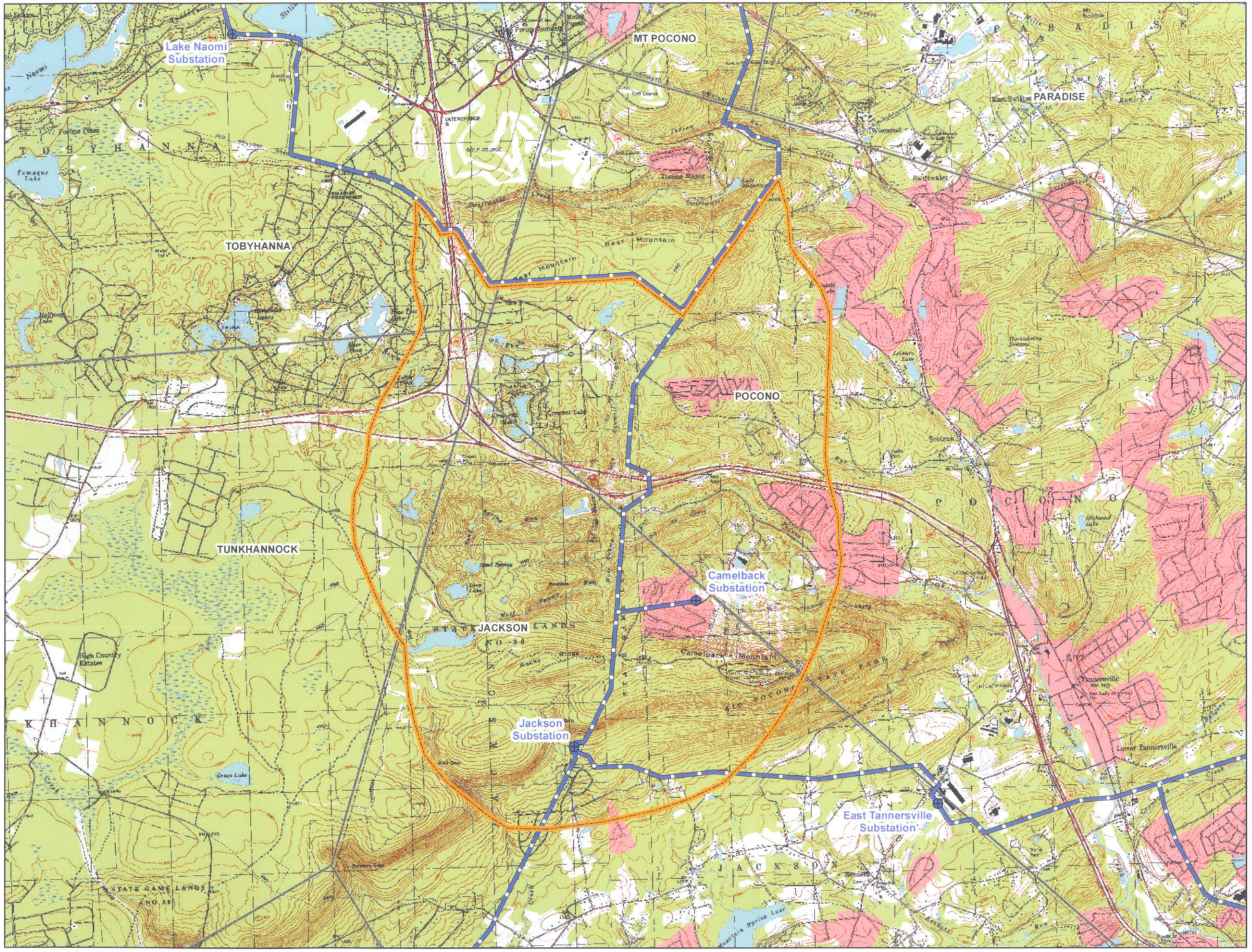
PPL Electric Utilities

URS

Figure 4-1
Macro Corridors

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

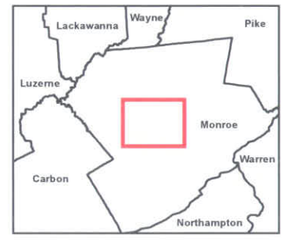
Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure C-1 - Area of Study.mxd



Legend

- Substations
- Existing Transmission Lines
- Project Study Area
- PA Municipalities

Note: The existing transmission line is slightly offset to the north for display clarity.



Key Map Not to Scale

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NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

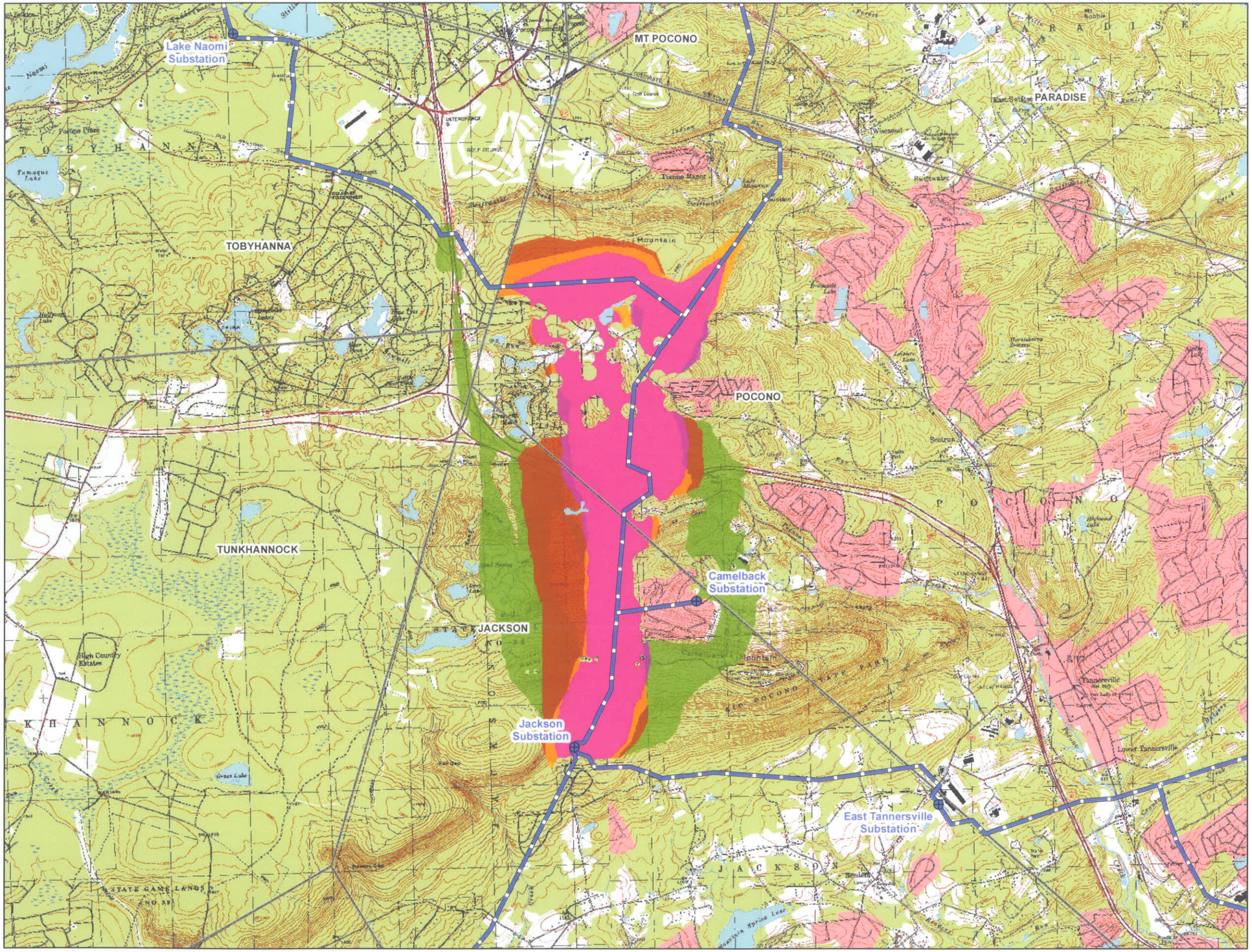
ppl PPL Electric Utilities

URS

Figure 4-2
Project Study Area

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 4-2 - Project Study Area.mxd

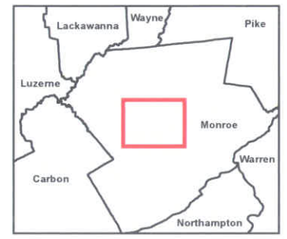


Legend

- Substations
- Existing Transmission Lines

Alternative Corridors

- Engineering Corridor
- Composite Corridor
- Built Environment Corridor
- Natural Environment Corridor
- PA Municipalities



Key Map Not to Scale

N

NAD 1983 State Plane Pennsylvania North FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

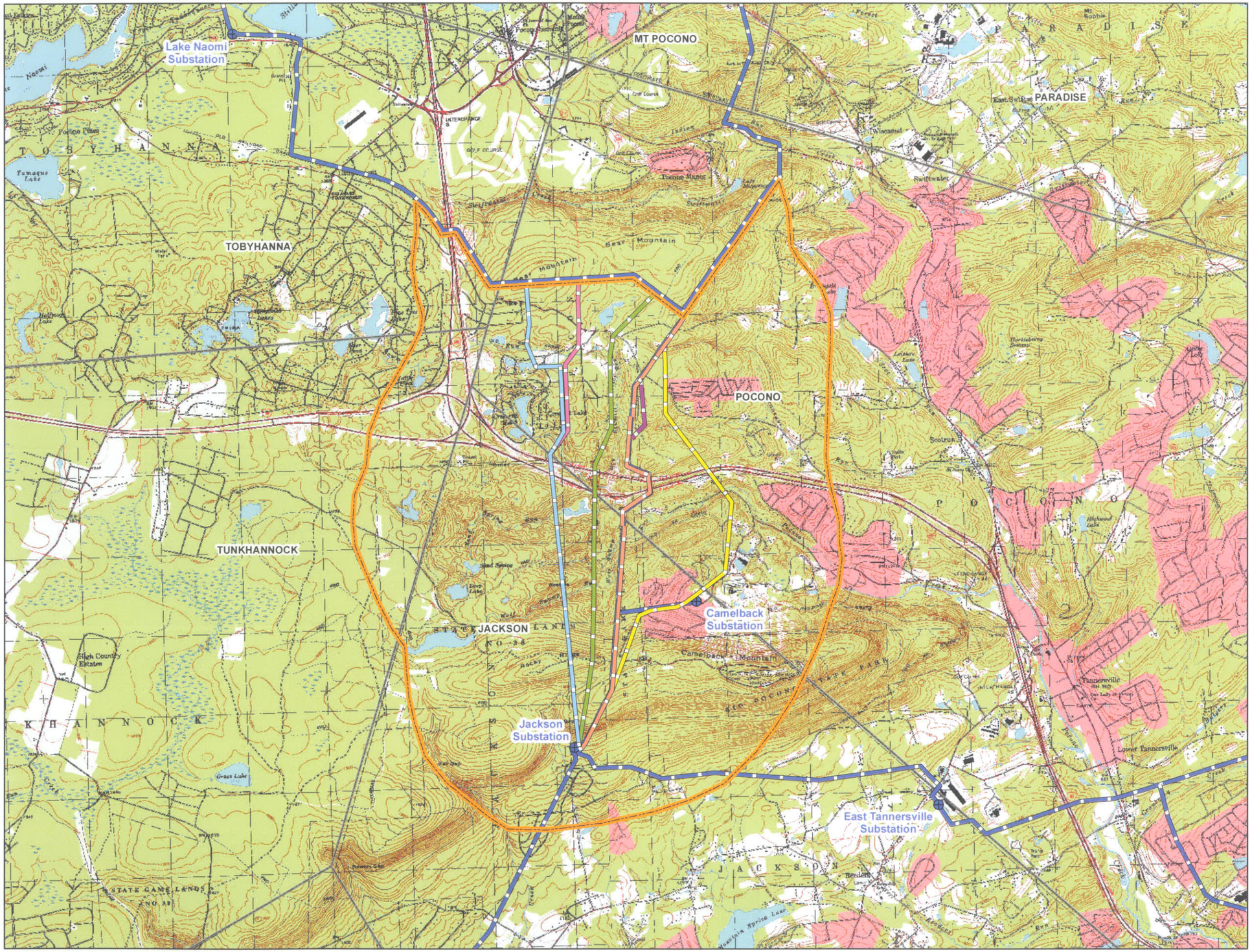
ppl PPL Electric Utilities

URS

Figure 4-3
Alternative Corridors

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

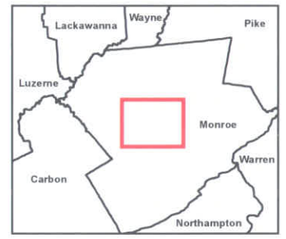
Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 4-3 Alternative Corridors.mxd



Legend

- Substations
- Existing Transmission Lines
- Alternative Route A
- Alternative Route B
- Alternative RouteC
- Alternative Route D
- Alternative Route D1
- Alternative Route E
- Project Study Area
- PA Municipalities

Note: The existing transmission line is slightly offset to the north for display clarity.



Key Map Not to Scale

N

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FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

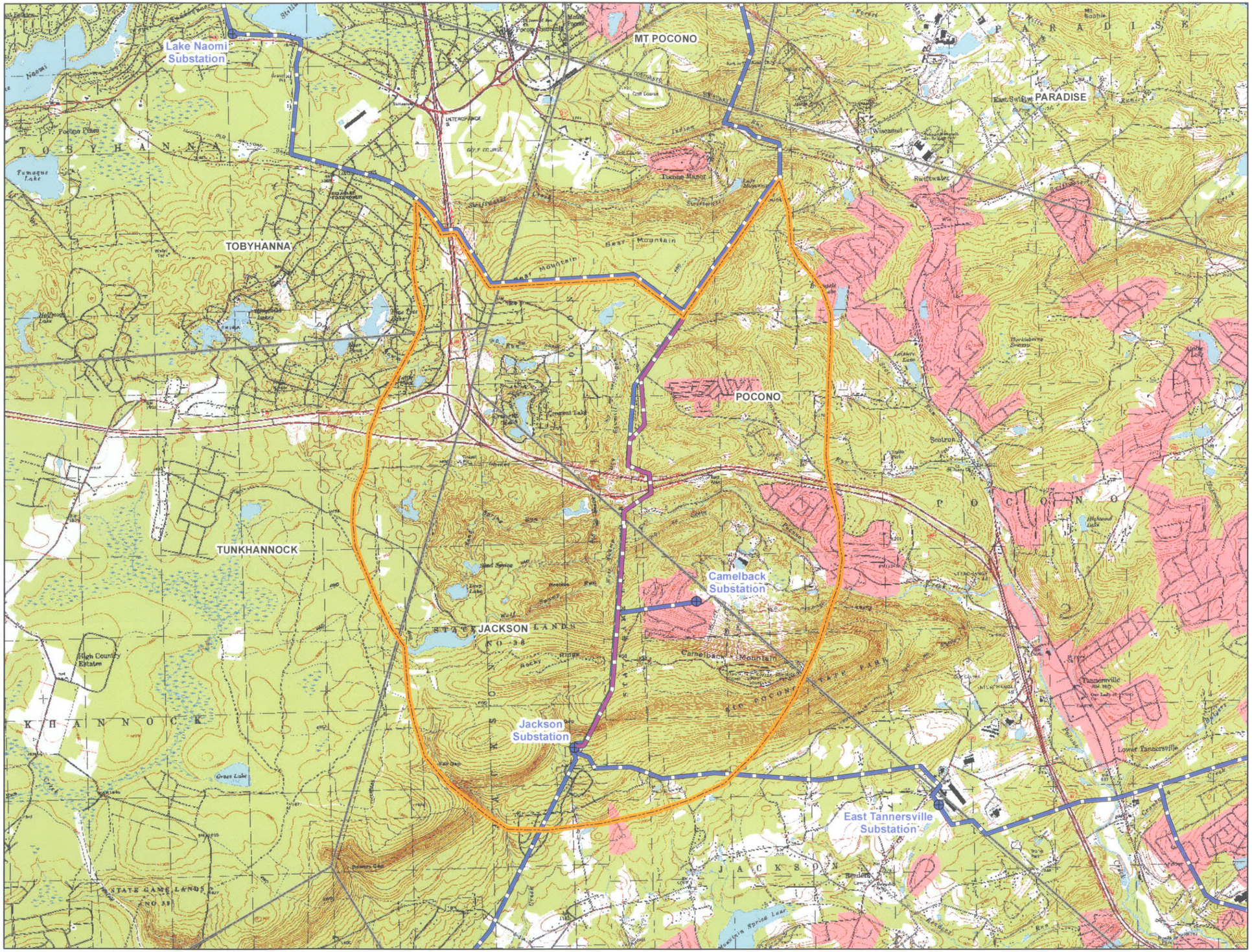
ppl PPL Electric Utilities

URS

Figure 4-4
Alernative Routes

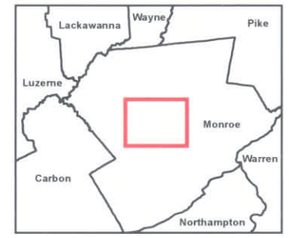
Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 4-4 - Alternative Routes.mxd



Legend

- Substations
- Existing Transmission Lines
- Alternative Route D1 - Selected Route
- Project Study Area
- PA Municipalities



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NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

USGS 24K Topographic Maps -
Mount Pocono (2001) and Pocono Pines (1998)
POWERmap Transmission Data - 2010

0 2,000 4,000 8,000 Feet

1 inch = 4,000 feet

(When Printed at 11x17)

PPL Electric Utilities

URS

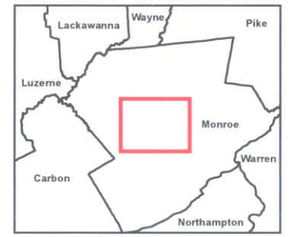
Figure 4-5
Selected Route

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\UCKSNLKNM\Projects\PPL JLN Figure 4-5 - Selected Route.mxd

Legend

- Scenic Overlook
- CGIS_Features
- NRHP Sites & Districts
- School
- Church
- Cemetery
- PA Municipalities



Key Map Not to Scale

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NAD 1983 State Plane Pennsylvania North
FIPS 3701
Projection: Lambert Conformal Conic
Linear Unit: US Foot

PaMAP Digital Imagery 2008
URS Custom Data
POWERmap Transmission Data - 2010
Monroe County Planning Commission -
Monroe County GIS Data 2010: Zoning

0 2,000 4,000 8,000 Feet

1 inch = 4,500 feet

(When Printed at 11x17)

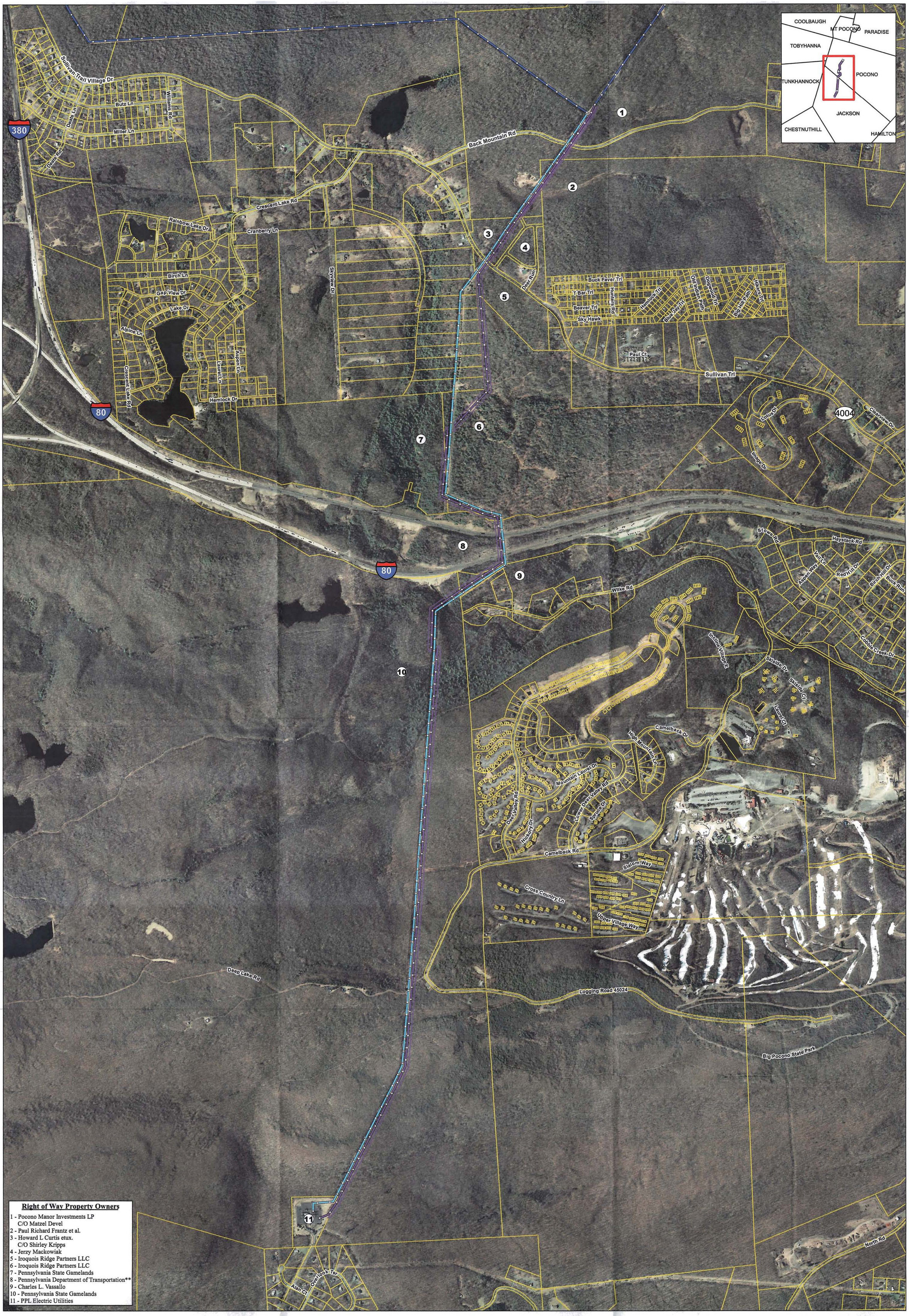
PPL Electric Utilities

URS

Figure 4-6
Sensitive Features within 2-Miles

Blooming Grove-Jackson &
Peckville - Jackson 138/69 kV Line
Monroe County, Pennsylvania

Prepared By: MAL	Checked By: BAB
Job: 19998614.00001	Map: \\GIS_Data\PPL\JCKSNLKNM\Projects\PPL JLN Figure 4-6 - Sensitive Features within 2-Miles.mxd



Right of Way Property Owners

1 - Pocono Manor Investments LP
C/O Matzel Devel
2 - Paul Richard Frantz et al.
3 - Howard L Curtis etux.
C/O Shirley Kripps
4 - Jerzy Mackowiak
5 - Iroquois Ridge Partners LLC
6 - Iroquois Ridge Partners LLC
7 - Pennsylvania State Gamelands
8 - Pennsylvania Department of Transportation**
9 - Charles L. Vassallo
10 - Pennsylvania State Gamelands
11 - PPL Electric Utilities

700 350 0 700 1,400 Feet

1 inch = 700 feet

Map formatted for "D" (22"x34") size sheet.
Ratio scale not valid for other page sizes.

NAD 1983 StatePlane Pennsylvania North
Projection: Lambert Conformal Conic
Linear Unit: US Foot
GCS North American 1983

Monroe County Parcel Data 2010
2008 PAMAP Imagery - Monroe County Mosaic
PennDOT State and Local Roads
PPL Electric Utilities' Data

**Property # 8 (PennDOT) is not included in the Monroe County Parcel Data.

Property Owners
Blooming Grove - Jackson & Peckville - Jackson 138/69 kV Line

Monroe County, Pennsylvania

Legend

- Tap Transmission Line
- Existing Transmission Line
- Proposed Blooming Grove - Jackson & Peckville - Jackson 138/69 kV Line
- New ROW Acquisition
- Monroe County Parcels

PPL Electric Utilities

Q:\GIS_Data\PPL\JCKSNLKNM\Projects\Real Estate\PPL JLN ROW PropertyOwners.mxd

Attachment 5

ATTACHMENT 5
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
ENGINEERING DESCRIPTION

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List of Tables

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1.0 INTRODUCTION

PPL Electric Utilities Corporation ("PPL Electric") proposes to reinforce the transmission system in Monroe County, Pennsylvania in order to avoid overloading certain transmission facilities and to resolve identified transmission reliability criteria violations on its 138/69 kV circuits in northeast Pennsylvania This project will also ensure reliable long-term service to customers in Monroe County. PPL Electric has identified excessive loading and multiple violations of its Reliability Principles and Practices ("RP&P") guidelines on its 138/69 kV circuits in northeast Pennsylvania beginning in 2013. Specifically, as explained in **Attachment 2** (Necessity Statement), PPL Electric's Transmission Planning Department has identified thermal overloads, excessive loads on a single-circuit, and excessive load interruptions under several contingencies. To resolve the identified violations, PPL Electric proposes to construct the new, approximately 4-mile, Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Line (the "Project"), which is the subject of this filing.

The total estimated cost to site, design, and construct this project is approximately $6.12 million. This cost includes the proposed transmission line and substation modifications at Jackson Substation. The estimated cost for the overhead transmission line is approximately $5.21 million and the estimated cost for the substation modifications is approximately $905,000. Construction of this project is scheduled to begin in January 2013 to meet a required in-service date of November 2013.

2.0 PROPOSED LINE DESIGN

PPL Electric proposes to construct the approximately 4-mile Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Transmission Line. The line will begin at PPL Electric's Jackson 138-69 kV Substation in Jackson Township, Monroe County and will terminate near the Lake Naomi 138/69 kV Tap point in Pocono Township, Monroe County. The preferred route for the new double-circuit line will travel, in general, along the edge of the existing right-of-way of the existing double-circuit Blooming Grove - Jackson and Peckville - Jackson 138/69 kV Transmission Line through Jackson and Pocono Townships in Monroe County.

The project involves the installation of a new double-circuit 138/69 kV transmission line on new structures. The tangent structures[1] for the proposed new double-circuit line will consist of single-shaft steel poles equipped with steel upswept arms. Angle structures will be single-pole or two-pole steel structures, depending on the severity of the line angle. Some poles will be installed on concrete foundations while the majority of poles will be direct embedded. Additionally, some angle structures may be guyed. Based on preliminary engineering, this project requires the installation of approximately 35 structures, ranging from 80-100 feet in height. The average span length will be approximately 650 feet. The proposed single and two pole structures are shown in **Figure 5-1** and **Figure 5-2**, respectively.

3.0 DESIGN CONSIDERATIONS

The proposed double-circuit line described above will be designed and constructed to meet, and generally exceed, all National Electrical Safety Code minimum standards. Design specifications and safety rules practiced by PPL Electric are included in **Attachment 10**. The line will consist of six power conductors and one overhead ground wire. Each conductor will consist of 556.5 kcmil,[2] 24/7 stranding ACSR.[3] The overhead ground wire will be a 48 fiber 0.567-inch-diameter Optical Ground Wire ("OPGW"). The overhead ground wire will provide lightning protection for the proposed tie line.

Table 5-1 and **Table 5-2** show the designed minimum conductor clearances and the conductor thermal ratings of the proposed line, respectively.

[1] A tangent structure is a pole with no line angle.
[2] A circular mil is the cross-sectional area of a wire one mil in diameter, where 1 kcmil = 0.5067 mm².
[3] Aluminum conductor steel reinforced.

TABLE 5-1

DESIGN MINIMUM CONDUCTOR CLEARANCES FOR 556.5 KCMIL 24/7 STRANDING ACSR*

Condition	Transmission Double-Circuit Design Clearance-to-Ground
Normal load; average weather (16°C ambient temperature)	35.9 feet
Predicted extreme thermal load (125°C conductor temperature)	30.0 feet
Predicted NESC Extreme wind load (90 mph, 16°C)	33.3 feet
Predicted extreme weather conditions (1-inch ice, 0 lbs. wind, -18°C)	32.9 feet

*Clearances based on a maximum tension of 9500 pounds at 1 inch ice, 0°F, 4 lbs. wind and a ruling span of 650 feet.

TABLE 5-2

CONDUCTOR THERMAL RATING 556.5 KCMIL 24/7 STRANDING ACSR (257°F) 125°C MAXIMUM CONDUCTOR TEMPERATURE

Condition	Ambient Temperature (°C)	Wind Speed (Knots)	Ampacity (Amps)
Summer Normal	35	0	815
Winter Normal	10	0	926
Summer Emergency	35	1.5	1041
Winter Emergency	10	1.5	1163

4.0 MAGNETIC FIELD MANAGEMENT PLAN

PPL Electric's Magnetic Field Management Program is summarized in **Attachment 11** and applied to new and reconstructed 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 line design that provides five feet higher ground clearances and reverses phasing of new double-circuit lines where it is feasible to do so at low or no cost. The implementation of additional modifications will be considered, provided those modifications can be made at low or no cost.

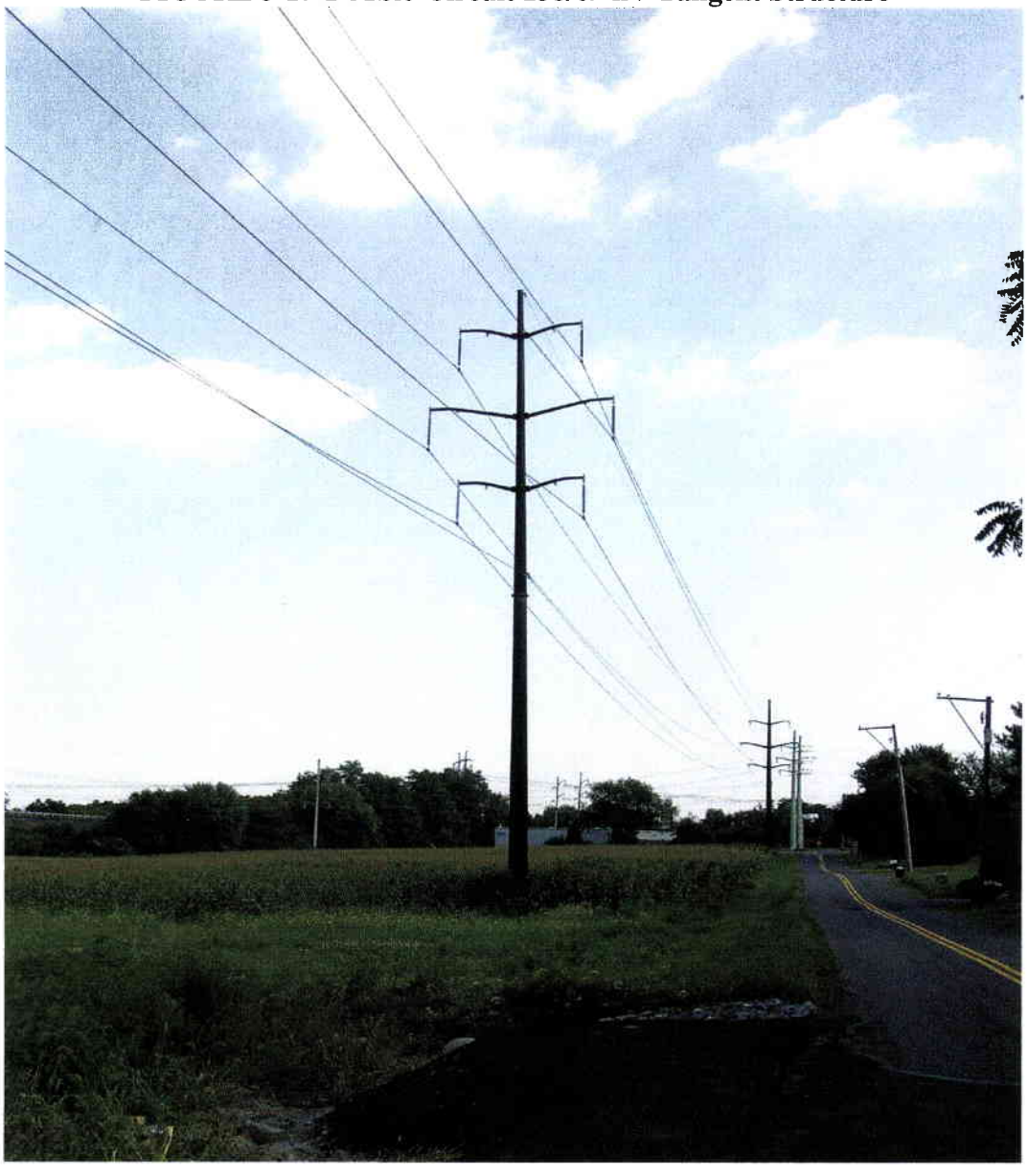
Consistent with the program, PPL Electric will construct this project for increased ground clearance to reduce magnetic field exposures. In addition, PPL Electric will reverse phase the two circuits, thus causing a reduction of magnetic fields.

5.0 RIGHT-OF-WAY REQUIREMENTS

PPL Electric's current standard right-of-way width for a double-circuit 138/69 kV transmission line is 100 feet. The right-of-way is determined by the structure type, design tensions, span length, and conductor "blowout" (the distance the wires are moved by a crosswind). A cross section of PPL Electric's current standard right-of-way for double-circuit 138/69 kV is illustrated in **Figure 5-3**. The aerial maps provided at the end of **Attachment 4** identify the location of PPL Electric's existing right-of-way and the proposed right-of-way.

PPL Electric has attempted to negotiate new easements with six (6) property owners. To date, agreements have been reached with 2 property owners. PPL Electric will continue to negotiate with the unsigned property owners.

FIGURE 5-1: Double-Circuit 138/69 kV Tangent Structure



POLE STATISTICS

Height Range – 80-100 feet
Arm Length – (Middle) – 11 feet
Arm Length (Top & Bottom) - 7 feet

Conductor Spacing:
Overhead Ground Wire to Top Phase – 15 feet
Phase to Phase – 10 feet

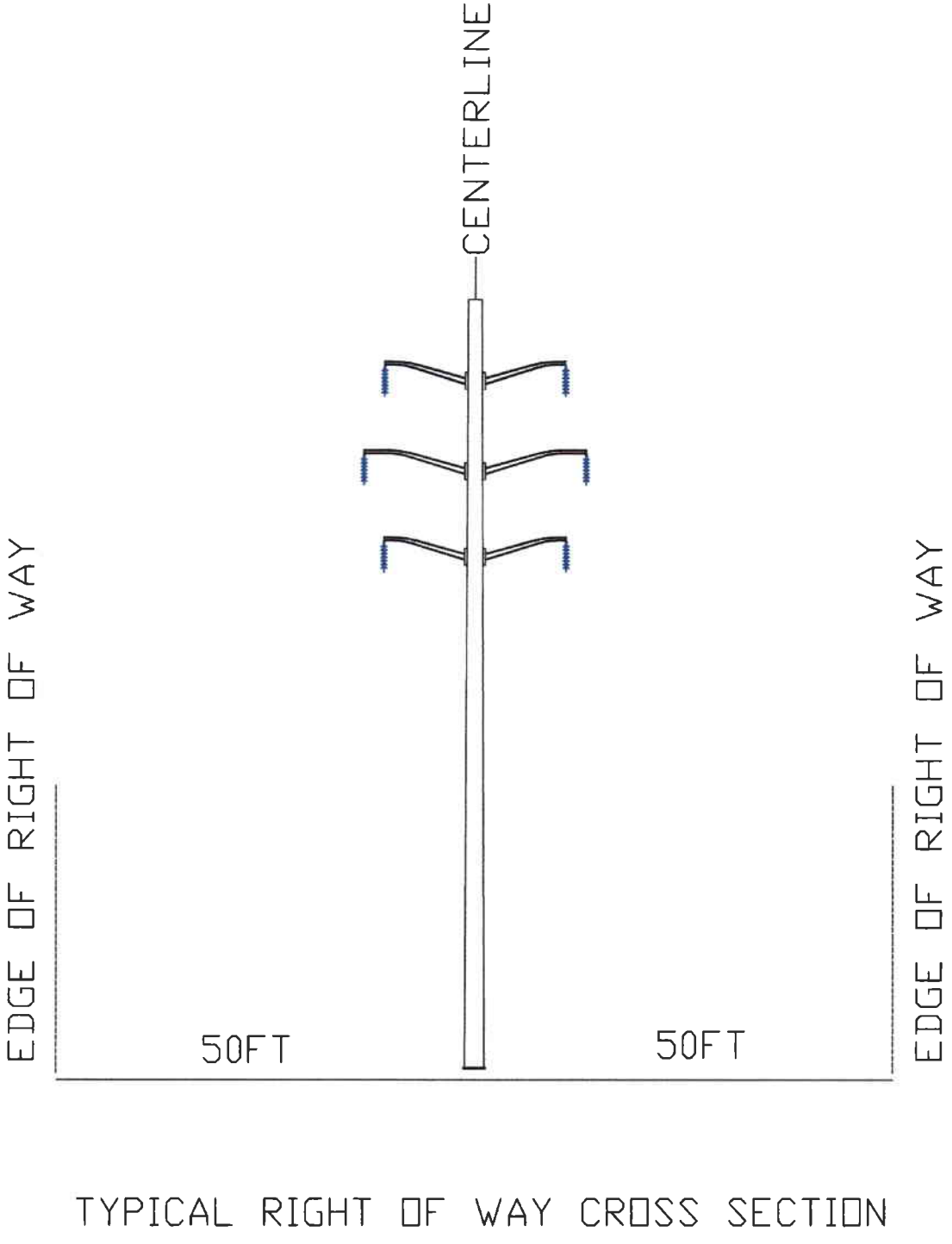
FIGURE 5-2: Double Circuit 138/69 kV Two-Pole Angle Structure

POLE STATISTICS

Height Range – 80 - 100 feet

Conductor Spacing:
Overhead Ground Wire to Top Phase – 10 feet
Phase to Phase – 10 feet

FIGURE 5-3: Double Circuit 138/69 kV Cross Section



Attachment 6

ATTACHMENT 6
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
VEGETATION MANAGEMENT

Specification For Initial Clearing and Control Maintenance Of Vegetation on Or Adjacent To Electric Line Right-of-Way through Use Of Herbicides, Mechanical, And Hand-clearing Techniques LA-79827-8

PPL ELECTRIC UTILITIES CORPORATION
Allentown, Pennsylvania

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I. SCOPE

This document describes methods and procedures for all transmission (69 kV and above) line right-of-way vegetation management practices, including: clearing, timber and slash disposal, use of herbicides, and specifying means of line access.

Methods and procedures for transmission line right-of-way erosion control practices, including access road construction, are contained in a separate document; Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way (A-118231).

II. CLEARING REQUIREMENTS

A. Conductor-to-Vegetation Clearances and Right-of-Way Widths**Error! Bookmark not defined.**

PPL Electric Utilities Corporation ("PPL Electric") has established minimum conductor-to-vegetation clearances and right-of-way widths to be cleared for each transmission line voltage (Table 1). These conductor-to-vegetation clearances are defined by the conductor positions between maximum vertical sag ("max sag") and a 30° conductor blowout.

Any clearing or chemical treatment performed on the right-of-way must adhere to these requirements:

1. The entire right-of-way width, as listed in **Table 1**, shall be treated.

2. Any vegetation, which could grow into the wire security zone (defined in **Table 1**), shall be treated to remove this hazard[1]. As more fully discussed in **Section III**, the treatment could involve cutting to ground line, pruning, or applying herbicides, depending on the type of clearing specified. However, in any case, sufficient vegetation shall be removed to create an additional space beneath the wire security zone (defined in **Table 1**) to allow for growth that would occur between scheduled treatments.

   Figure 1 and **Figure 2** illustrate the security zone concept and how the right-of-way should be cleared or maintained to keep the zone intact.

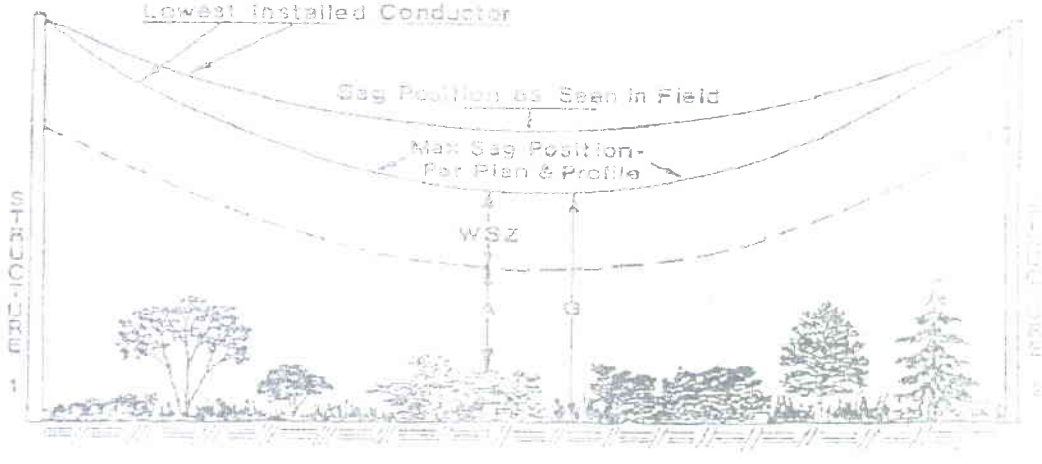
B. Danger Trees (**Figure 2** and **Table 2**)

To ensure line reliability, vegetation management operations must extend to trees located outside the clearing widths given in **Table 1**, which present a hazard to the line. These "danger trees" are those that, in falling, would either strike the

[1] No corrective remediation pruning actions required for encroachments of WSZ (only) where maximum-sag conductor conditions have been identified, species acceptability- per PPL EU Specification LA-79827-8 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

conductor or pass within the minimum conductor clearances noted in **Table 2** and shown on **Figure 2**. Danger trees should be removed or pruned as specified at the time of treatment. The PPL Electric representative identifies all danger trees during line clearing/maintenance operations.

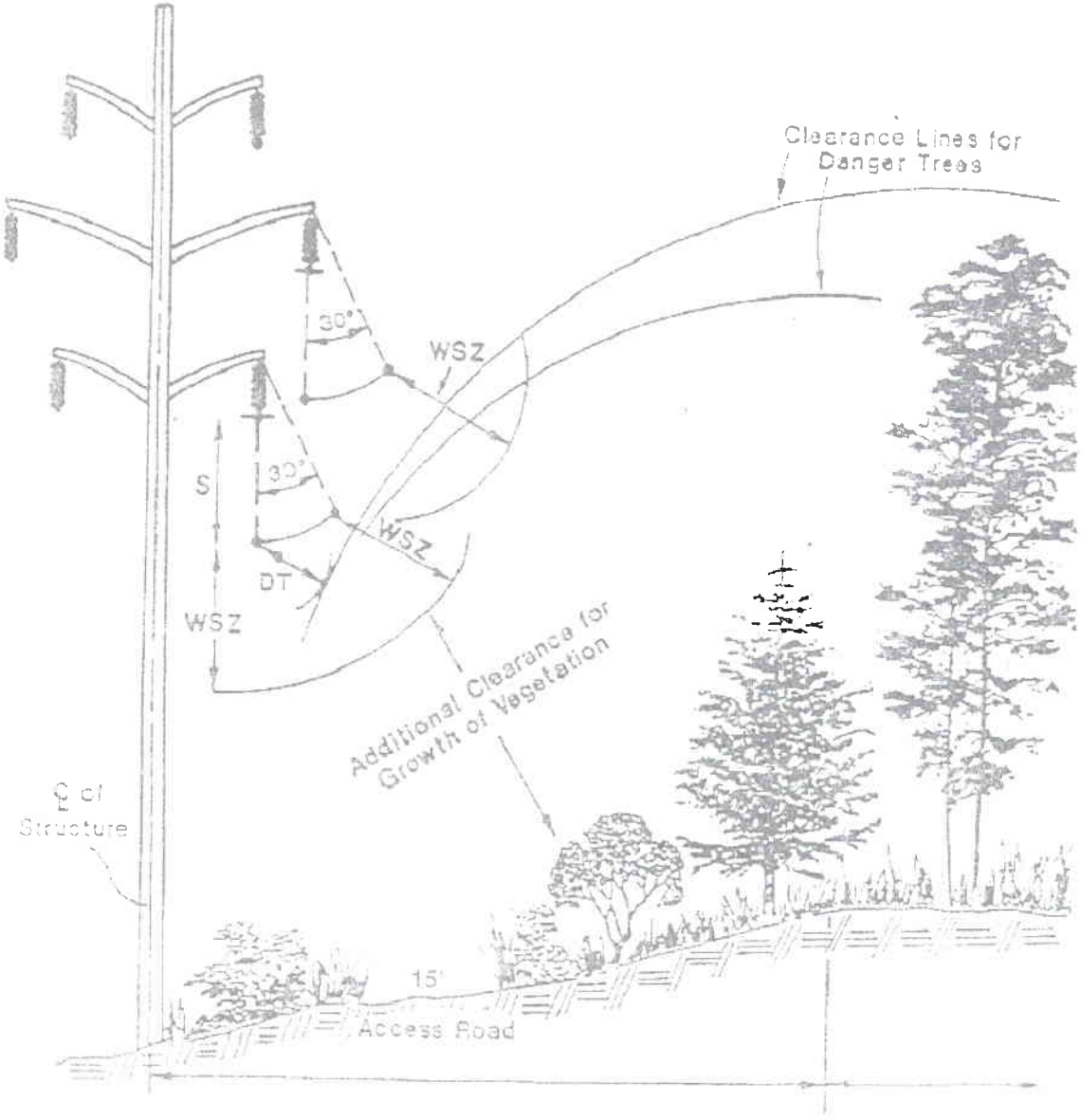
FIGURE 1: TRANSMISSION LINE PROFILE
WIRE SECURITY ZONE AND VEGETATION CLEARING



G = Max Sag Ground Clearance – Determined from Line Plan & Profile
WSZ = Wire Security Zone (Table 1)
A = Additional Clearance to allow for Growth of Vegetation
A = 5' per year apical (Under), 2' per year lateral (Around)
(WSZ + A) = Minimal Acceptable Clearance from Vegetation to Conductor at Time of Maintenance (Table 1)

FIGURE 2: TRANSMISSION LINE CROSS SECTION[1] WIRE SECURITY ZONE AND DANGER TREE CLEARING

S = Maximum Sag of Conductor
WSZ = Wire Security Zone (Table 1)
DT = Danger Tree Clearance (Table 2)



Required R/W Clearing Width (**Table 1**)
[1]To avoid repetition only one-half of the R/W is shown.

Danger Tree Width Limit

TABLE 1: Right-of-Way Clearing Widths And Conductor-to-Vegetation Clearances

Line Voltage	Clearing Width[1]	IEEE Distance[2]	Wire Security Zone (Figure 1, "WSZ)	Minimum Acceptable Clearance from Vegetation to Conductor at Time of Maintenance[3][4] Figure 1, (WSZ + A) Under / Around
69-138 kV	100'		7'	22'/ 13'
230 kV	150'	5.2'	10'	25'/ 16'
500 kV	200'	8.9'	17'	32'/ 23'

(1) Older lines may have right-of-way agreements specifying different widths. These agreements shall either be followed as written or renegotiated to meet the tabled clearing widths given above.

(2) Radial clearance to be maintained between vegetation and conductors under all rated electrical operating conditions.

(3) Clearance to be achieved at the time of vegetation maintenance work wherever possible (see **Table 1**, WSZ and 'A' in **Figure 1**). This distance is necessary to allow for vegetation growth until the next maintenance cycle and to maintain the minimum wire security zone separation. Compatible vegetation (defined in **Table 3**) that will never grow into the Wire Security Zone is excluded from this minimum clearance requirement

(4) No corrective remediation pruning actions required for encroachments of WSZ (only) where maximum-sag conductor conditions have been identified, species acceptability- per PPL EU Specification LA-79827-8 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

TABLE 2: Clearance for Danger Trees

Line Voltage	Danger Tree Clearance (Minimum Conductor Clearance – Falling Vegetation)
69-230 kV	5'
500 kV	10'

III. CLEARING PROCEDURES

A. Specific Procedures for Each Clearing Method

Starting in 2010, PPL Electric will be implementing the Wire Zone/ Border Zone (WZ/BZ) method of managing our transmission rights of way. This method of vegetation management is to be applied where practical and is not meant to be the sole management technique used on the transmission facilities.

1. Changes to Incorporate WZ/BZ

Clearing requirements as defined below are to be applied to those Right-of-Way conditions that are currently being treated with herbicide and re-clearing treatment applications.

Wire Zone – **Figure 1&2** (above) and WZ/BZ diagram below

- Defined as that area of the right of way corridor that extends from the centerline to a distance ten (10) feet from the outer most conductors. All species listed in Table 3 under the headings of "Small Shrubs" and "Native Grasses, Ferns, and Herbaceous Plants" shall be preserved to the greatest extent possible in the Wire Zone.

Border Zone – **Figure 1&2** (above) and WZ/BZ diagram below

- Defined as that area of the right of way corridor that extends from the limits of the Wire Zone (see **Section III** Clearing Requirements A.1. Wire Zone) to the cleared limits of the established right of way.

- All compatible species (**Table 3**) or other species noted to not pose a clearance threat shall be preserved where possible. Those, which would violate the wire security zone before the next scheduled treatment, shall be removed.

- As can be seen from **Figures 1 and 2**, in most cases, more of the taller compatible species can be retained at the right-of-way edges and closer to the line structure locations, where distance to the lowest conductor is usually greatest.

- All "noncompatible" or other species that exhibit growth characteristics that pose clearance concerns species shall be removed to the greatest extent possible.

- All trees and brush—both compatible and noncompatible species—shall be removed from access roads (15' width); in work areas (stringing cuts, vegetation disposal areas, structure erection areas); and within a 15' perimeter of a tower or immediately adjacent to any structure location.

Exceptions may occur where landscaped plantings have been propagated adjacent to facilities and these plantings do not interfere with accessibility to such facilities.

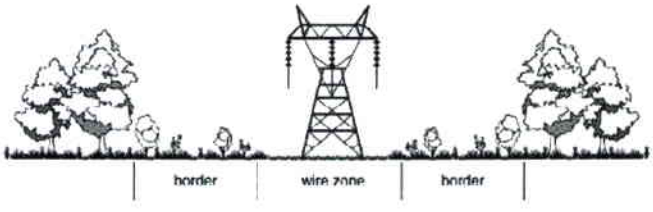
Wire Zone-Border Zone Vegetation Management

- With the Wire Zone-Border Zone VM, the typical right of way is show as below. Two distinct zones are identified:

1. The wire zone is typically defined as that area from centerline to 10' past the outer most set of conductors in either direction. The total width of the wire zone will vary by voltage class and easement definitions.
2. The border zone is that area of the right of way that extends from the wire zone to the limits of the defined width row.
3. The areas outside of the border zone are managed for hazard trees.

UTILITY VEGETATION MANAGEMENT FINAL REPORT

Bramble and Byrnes Wire Zone – Border Zone
(From Yahner, Bramble and Byrnes, 2000)



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Where wire zone/ border zone is not appropriate as previously described or cannot be applied due to easement restrictions or other limitations such as site or environmental concerns, the follow procedures shall be followed

2. Selective Clearing

- All compatible species (**Table 3**) shall be preserved to the greatest extent possible. Those, which would violate the wire security zone before the next scheduled treatment, shall be removed[1].

- As can be seen from **Figures 1 and 2**, in most cases, more of the taller compatible species can be retained at the right-of-way edges and closer to

[1] No corrective remediation pruning actions required for encroachments of WSZ (only) where maximum-sag conductor conditions have been identified, species acceptability- per PPL EU Specification LA-79827-8 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

the line structure locations, where distance to the low conductor is usually greatest.

- All "noncompatible" or other species that exhibit growth characteristics that pose clearance concerns species shall be removed to the greatest extent possible.

- All trees and brush—both compatible and noncompatible species—shall be removed from access roads (15' width); in work areas (stringing cuts, vegetation disposal areas, structure erection areas); and within a 15' perimeter of a tower or immediately adjacent to any structure location.

- Exceptions may occur where landscaped plantings have been propagated adjacent to facilities and these plantings doo not interfere with accessibility to such facilities.

3. Restricted Clearing

- All compatible species shall be preserved, wherever possible. Those which would violate the wire security zone before the next scheduled treatment shall be pruned or removed to obtain required "Desired Clearance from Vegetation to Conductor at Time of Maintenance" (defined in Table 1).

- Any non-compatible species, which have violated or would violate the wire security zone before the next scheduled treatment shall be removed[1].

- The remaining non-compatible species shall be preserved until the time comes when they can be removed without causing adverse impacts. This means that smaller (young) trees of noncompatible species are temporarily retained. As an adequate compatible cover becomes established over time, these non-compatible species may be removed.

- The only exception to the above applies to non-compatible trees growing in ravines or gullies or on side hills, where topography is such that they will never reach the wire security zone. In these areas, the non-compatibles, which are originally preserved, should be retained over the life of the line.

- All trees and brush—both compatible and non-compatible—shall be removed from access roads, work locations, or near structures, as described under Selective Clearing.

[1] No corrective remediation pruning actions required for encroachments of WSZ (only) where maximum-sag conductor conditions have been identified, species acceptability- per PPL EU Specification LA-79827-8 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

TABLE 3

Compatible Species List*(does not include Horticultural plant varieties)

1. SMALL TREES

   a) Flowering Dogwood *(Cornus florida)*

   b) Redbud *(Cercis canadensis)*

   c) Hawthorn *(Crataegus spp.)*

   d) Blue Beech (American Hornbeam) *(Carpinus caroliniana)*

   e) Shadbush (Juneberry, Serviceberry) *(Amelanchier spp.)*

   f) Eastern Red Cedar *(Juniperus virginia)*

   g) Northern White Cedar *(Thuja occidentalis)*

   h) American Chestnut *(Castanea dentata)*

   i) Dwarf Willow *(Salix spp.)*

   j) Deciduous Holly (Winterberry) (Ilex *verticillata)*

2. LARGE SHRUBS

   a) Alder (Alnus spp.)

   b) Witch-hazel *(Hamamelis virginiana)*

   c) Spicebush *(Lindera benzoin)*

   d) Common Chokecherry *(Prunus* virginiana)

   e) Elderberry *(Sambucus spp.)*

   f) Rhododendron *(Rhododendron maximum)*

   g) Virburnum *(Viburnum spp.)*
   h) Dogwood *(Cornus spp.)*

   i) Smooth (Dwarf) Sumac *(Rhus glabra)*

j) Staghorn Sumac *(Rhus typhina)*

k) Chokeberry *(Pyrus arbutifolia)*

3. SMALL SHRUBS (does not include horticultural varieties)

a) Mountain Laurel *(Kalmia latifolia)*

b) American Yew-Ground Hemlock (Taxus *canadensis)*

c) Sweetfern *(Comptonia peregrina)*

d) Honeysuckle *(Lonicera spp.)*

e) Huckleberries *(Gaylussacia spp.)*

f) Blueberries *(Vaccinium spp.)*

g) Viburnum *(Viburnum spp.)*

h) Meadowsweet *(Spirea spp.)*

i) Wintergreen *(Gaultheria procumbens)*

j) Trailing Arbutus *(Epigaea repens)*

k) Blackberry *(Rubus allegheniensis)*

l) Raspberry *(Rubus occidentalis)*

m) Hazlenut *(Corylus spp.)*

n) Scrub Oak *(Quercus spp.)*

4. ALL NATIVE GRASSES, FERNS AND HERBACEOUS PLANTS.

*These species are to be preserved wherever possible. Some of the taller trees and shrubs may be removed or pruned to establish the "Minimum Acceptable Clearance from Vegetation to Conductor at Time of Maintenance" as defined in **Table 1**. Woody growth must also be removed around structures, on access roads, and in construction activity areas (e.g., vegetation disposal areas. stringing cuts, structure erection areas).

4. Tree Pruning

Tree pruning is not considered the preferred management technique to provide clearances for vegetation located within an active right of way. Removal of vegetation that poses a clearance concern is the preferred method of management.

All trees will be pruned by the guidelines detailed in the most current revision of the American National Standard for Tree Care Operations-Tree, Shrub and Other Woody Plant Maintenance – Standard Practices (ANSI A300). All pruning cuts should be made back to lateral branches at least one-third the diameter of the limb being removed or to the branch collar at the parent stem.

No dead wood shall be removed unless it either endangers the reliability of the line or such action is authorized by PPL Electric's designated representative.

Every effort shall be made during the pruning process, to prevent damage to surrounding property and/or the tree itself. Tree climbers or hooks will not be permitted in any urban tree to be pruned. They will, however, be permitted in any tree to be removed or in rural trees to be pruned, unless objected to by the property owner.

Every effort shall be made to prune trees by the following acceptable methods:

If pruning is to be considered, the following guidelines are given:

Directional Pruning (only to be completed with PPL EU authorization)
This is the preferred pruning technique to be utilized when a tree is located directly under the conductor or located within the right of way corridor. In order to achieve "Minimum Acceptable Clearance from Vegetation to Conductor at Time of Maintenance" (defined in Table 1), entire branches and/or branches that have laterals growing towards the conductor(s) should be removed. All cuts should be made back to lateral branches that grow away from the conductor(s).

Crown Reduction (only to be completed with PPL EU authorization)
This technique is to be utilized when a tree is located under the conductors and directional pruning is not feasible. In this situation, all top branches must be pruned back to lower the crown of the tree to achieve the "Minimum Acceptable Clearance from Vegetation to Conductor at Time of Maintenance" (defined in Table 1). When feasible, entire branches that have sprouts from old topping cuts growing towards the lines should be removed.

Side Pruning (only to be completed with PPL EU authorization)
This method of pruning is utilized when a tree grows adjacent to the conductors. In this situation, it is necessary to remove the side branches extending into the right of way zone. When the parent stem of a tree is at the edge of the right-of-way, limbs protruding into the right-of-way should be removed at the branch bark collar on the main stem.

Any exceptions to the above methods of pruning will only be performed at the discretion of and with the approval of the appropriate Company representative.

B. General Procedures for All Clearing Methods

For all types of clearing specified, the following procedures should be followed:

- All cutting shall be done selectively
- Trees shall be felled in a manner to minimize damage to those trees or shrubs, which are to be preserved. This is particularly essential in performing Restricted Clearing.
- In cutting, all stumps shall be cut as low as possible to the ground. Stump heights should not exceed 3" for smaller trees (less than 1' diameter), while stump heights of 6" or less are acceptable for larger trees or where physical obstructions prevent cutting next to the ground (e.g., rocks, fencing). Stumps shall be cut parallel to the ground, with no sharp splinters or points remaining.
- Special care shall be taken in clearing near ornamentals or any type of cultivated tree, shrub, or vine.
- If areas are encountered that have already been cut over, any tree stubs of an excessive height shall be re-cut to the heights specified above.
- Danger trees shall be pruned or removed, as previously described under "Clearing Requirements".

IV. DISPOSAL OF CLEARED VEGETATION

In accordance with state and federal environmental regulations and policies, it shall be the policy of PPL Electric that no vegetation disposal (e.g.. piling, drop and lop, chipping, burning, etc.) shall occur in known or suspected wetland areas.

Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

A. Specific Procedures for Each Disposal Method

1. Piling and Slash

(a) Timber (6" or larger in diameter).

- All timber shall be placed in neat piles along the edge of the right-of-way, away from areas of preserved compatible vegetation. Under normal conditions timber piles will be interspersed with slash piles.

- Timber shall be stacked in tree length piles unless otherwise specified, in piles not greater in length than the longest tree length. A separation of at least 10' shall be provided on either side of each pile.

- All access roads, trails and streams (including their banks) shall be kept clear. Piling shall not be done where piles would be highly visible from any improved road.

(b) Slash

- All slash (i.e., trees less than 6" in diameter, tree tops, limbs) shall be stacked in flattened mounds along the edge of the right-of-way, away from areas of preserved compatible vegetation.

- Slash piles shall be dressed of excessively protruding limbs and compacted to keep visual obstruction to a minimum. Generally, they should not exceed 5-6' in height, except where site conditions are such that higher piles are acceptable (e.g., depressions, rough terrain in remote areas). Compaction of piles may be facilitated by use of equipment employed in the associated clearing operation.

- The length of a slash pile should not be any greater than a tree length timber pile, and its width limited so as not to interfere with access road construction or conductor stringing. A separation of at least 10' shall be provided on either side of each pile.

- All roads, trails, and streams (including their banks) shall be kept clear. No piling shall be undertaken where piles would be highly visible from any improved roads, at other locations involving high public visibility, or near tower or pole sites.

2. Drop and Lop

- All noncompatible vegetation shall be cut so that it falls toward the edge of the right-of-way, away from any designated access paths. After trees are felled, all long limbs shall be removed from the trunk, and the tree shall be bucked in order to keep the vegetation as close to the ground as possible.

- If necessary, trees and/or slash shall be moved to create a clear way for access and wire stringing, as needed.

3. Chipping

- All timber shall be stacked, according to the procedure described under "Piling," above.

- All slash shall be fed through a mechanical chipper immediately after cutting.

- Unless otherwise specified, chips shall be randomly scattered on the right-of-way, except in the following areas: fields, along city streets, park areas, or on the banks of streams, or ponds. In such areas, chips must be disposed of at an acceptable site, either on or off the right-of-way.

4. Burning

- All burning shall be undertaken only when safe burning conditions exist. Burning is not permitted within any air basin designated by the Pennsylvania Department of Conservation and Natural Resources. If outside an air basin, local ordinances shall be reviewed for restrictions.

- In starting fires, the use of rubber tires is prohibited. During burning

operations, careful watch (patrols) shall be maintained, so long as a fire hazard exists and hot embers are present in the bum piles. If burning conditions deteriorate, burning operations shall cease.

- When a fire is reduced to charcoal and ash, it shall be raked open to prevent hot embers from *remaining in* the ash piles. This shall only be done when fire danger is low.

B. General Procedures for all Disposal Methods

- The procedure and equipment used should minimize disturbance to both the right-of-way soil cover and to the vegetation that is to remain on the right-of-way.

  Specifically:

  Wheeled or tracked vehicles shall be equipped with brush rakes or forks with teeth protruding at least 8" below any bar or cutting edge. The use of bulldozer blades to handle slash or timber shall not be permitted.

  Track vehicles shall be equipped with grouser pads and operable winches with at least 50' of cable.

- All vehicles shall be equipped with cabs, to protect the operator from falling limbs and trees and to ensure the vehicle can withstand rolling accidents

- All felled trees, logs, slash, brush, and chips shall be removed beyond designated flood areas wherever possible with minimal disturbance to the soil and remaining tree roots. Where not possible, slash will be compacted in such a manner that it will not be carried away by high water. Chips should be spread and covered with soil. Every effort should be made to see that marketable wood is salvaged, and at least moved beyond normal flood areas.

- All disposal operations shall closely follow (by no more than 3 days) clearing operations to keep work confined to one area and to prevent unsightly and unsafe conditions.

V. HERBICIDE APPLICATION

A. Methods of Application

1. Four methods are currently accepted by PPL Electric as tools in its vegetation management program: Stump Treatment, Basal Application, and Foliage Application, and Cut –Stubble application.

B. Procedures

1. Specific Procedures and Precautionary Measures for Each Treatment Method

Stump Treatment

Used for the prevention of re-sprouting, stump treatment involves treating cut stumps with either an oil-based mixture or a ready-mixed non-oil solution. This type of treatment is prescribed when vegetation is cut to ground line. Therefore, its primary use is for initial clearing where it is applied to stumps of selectively cleared noncompatible species. However, it is also used for maintenance clearing, when trees have grown too tall for foliage application, and a decision is made to re-cut them to ground line.

Oil-based Stump Treatment

Using hand-held applicators, all newly cut stumps and all exposed roots shall be thoroughly treated as soon as possible after the tree is cut; or, if the label includes this method, all basal bark and root crowns of the trees shall be treated prior to cutting (at least one hour but not more than one day before the tree is cut). In either case, the stump, bark, and exposed roots shall be thoroughly wet to the ground line, unless the label directs otherwise. This type of stump treatment may be done any time during the year, except when snow or ice prevents contact of the herbicide with the stump as required for effective treatment.

Ready-Mix Non-Oil Stump Treatment

Using a hand-held applicator, the sapwood and cambium area of all newly cut stumps shall be thoroughly wet immediately after the tree is cut.

This type of stump treatment may be done any time during the year, except when snow or ice prevents contact of the herbicide with the stump.

Foliage Treatment

Using hand-held applicators, all foliage and stems of noncompatible

vegetation shall be thoroughly wet to the point of runoff, unless the label directs otherwise.

For most applications, treatment must be done from the time the plant is fully developed until it begins dormancy. For any foliage treatment which acts as a growth inhibitor (e.g., prevents budding), treatment must be made during late summer or early fall.

Adequate precautions shall be taken when wind direction is toward non-target vegetation, especially sensitive crops. Foliage application shall not be done during high or gusty winds, which will cause drift problems.

To minimize drift of foliage application the applicator shall:

Stand as close as possible to the target vegetation, keeping the spray gun low. If necessary, the target species should be bent over to avoid applying the herbicide solution high into the air.

Use a thickening agent to produce a coarse spray.

Use a nozzle type and pressure, which produce a coarse spray.

Application will be parallel to or toward the center of the right-of-way, not toward right-of-way edges.

Basal Treatment

The lower 12" to 15" of the stem and all the root crowns of noncompatible vegetation shall be completely saturated with the solution, unless the label directs otherwise.

Basal treatment may be done any time during the year, except when snow or ice prevent contact of the herbicide with the roots or stems as required for effective treatment

Cut-Stubble Treatment

This method of application is primarily applied following mechanical mowing operations, but may follow hand-cutting operation as well. Treatment may include low volume Thinvert applications or low volume basal treatment applications with Brown-Brush monitor type equipment.

2. General Procedures and Precautionary Measures for all Treatment Methods

- To ensure that herbicides are applied correctly and safely, all label instructions and precautions must be followed.

- To ensure effective treatment, the target areas of noncompatible species shall be thoroughly treated, as previously described for each treatment method.

- Herbicides shall not be applied during inclement weather, preventing the need for reapplication and reducing the chance of runoff into non-target areas. If rain does occur, application shall not begin until one hour after runoff has stopped. Early morning dew, when foliage is extremely wet, will be allowed to dry before application.

- Herbicides shall not be applied in the following areas (with the exceptions as noted):

  (1) Pasture areas.

  (2) Within 50' of any water body, except stump treatments and herbicides approved for watershed/aquatic use.

  (3) Within any actively maintained orchard or cultivated planting.

  (4) Near susceptible crops or other non-target vegetation, where drift, runoff, or vapors can cause injury. Exact safety distances shall be determined based on wind conditions, topography, soil type, vegetation (crop) type, and label instructions.

  (5) In cases where weather conditions create excessive drift, applications will be temporarily suspended until improved conditions warrant the continuation of the application.

  (6) On rights-of-way under jurisdiction of the Pennsylvania Department of Conservation and Natural Resources, Pennsylvania Game Commission, Pennsylvania Fish and Boat Commission, and the U.S. Park Service unless prior approval is granted by the Department or Commission.

  (7) On watershed properties, or in the vicinity of springs, irrigation ditches, or other potable water sources, unless prior approval is granted by the property owner for use of a watershed/aquatic approved herbicide.

  (8) In gullies or ravines where tree clearing is minimal.

- Contractor shall have sample or extra labels and material safety data sheets for all herbicides and surfactants being used at the job site at all times.

- Only herbicide application alternatives approved by PPL EU will be used by the Contractor in any given situation.

- For all treatments, used herbicide containers (other than returnable/refillable containers) shall be properly disposed of, in accordance with label instructions and/or applicable regulations.

- Contractor's personnel shall not be permitted to ride on any vehicles while applying herbicides except with prior approval of PPL Electric's representative.

TABLE 4

Approved Herbicides and Spray Mixtures

I. HERBICIDES

Trade Name	*Common Name*	*Carrier*
Garlon 3A	Triclopyr	Water
Garlon 4 Ultra	Triclopyr	Arborchem Basal Oil or Water
Tordon 101	Picloram/2,4-D	Water
Pathway	Picloram/2,4-D	None (Ready Mix)
Escort XP	Metsulfuron Methyl	Water
Krenite S	Fosamine Ammoniurn	Water
Rodeo	Glyphosate	Water
Accord Concentrate	Glyphosate	Water
Arsenal - Powerline	Imazapyr	Water
Habitat	Imazapyr	Water
Stalker	Imazapyr	Basal Oil or Water
Pathfinder II	Triclopyr	None (Ready Mix)
Milestone	Aminopyralid	Water

II. SPRAY MIXTURE ALTERNATIVES

Alternative 1

- Hydraulic (High Volume stem foliar) Application

Garlon 3A	½% (2 Quarts)
Tordon 101	½% (2 Quarts)
Arborchem Clean Cut or Approved Equivalent	¼% (1 Quart)
Water	98-3/4 Gallons
Drift Control Agent[1]	

or

- Back Pack - Power/Hand Operated (Low Volume) Application

Garlon 3A	3%
Tordon 101	3%
Arborchem Clean Cut or Approved Equivalent	1%
Water	93%
Drift Control Agent[1]	

Approximate Spray Season :[2] on or about first week of June through the middle of September.

Application: Hydraulic - Thorough wetting (leaves, stems, and root collars) to point of runoff, of all undesirable species of trees.

Back Pack - Hand or power operated (low-volume) - Wetting of leaves and stems of all undesirable species of trees.

Alternative 2

- Hydraulic (High Volume) Application

Krenite S	1.5% (6 Quarts)
Arsenal - Powerline	4 Ounces/100 gal
Arborchem Clean Cut or Approved Equivalent	¼% (1 Quart)
Water	98-1/4 Gallons
Drift Control Agent[1]	

or

- Back Pack- Power/Hand Operated (Low Volume) Application

Krenite S	5% (5 Gallons)
Arsenal – Powerline or Habitat	½% (2 Quarts)
Arborchem Clean Cut or Approved Equivalent	1% (4 Quarts)
Water	93-1/2 Gallons

or Ultra Low Volume Thinvert Backpack Application

Krenite S	7% (7 Gallons)
Arsenal – Habitat	1% (4 Quarts)
Escort XP	4 ounces/ 100 gal
Thinvert RTU	92 Gallons

Approximate Spray Season:[2] On or about the first week of June to the beginning of fall leaf coloration.

Application: The foliage of all undesirable species of trees must be thoroughly wet.

Alternative 3

- Low Volume
  Basal Application

Garlon 4 Ultra	25% (25 Gallons)
Stalker	1% (1 Gallon)
Arborchem Basal Oil	74 Gallons

- Low Volume
  Basal Application

Garlon 4	25 Gallons
Arborchem Basal Oil	75 Gallons

Approximate Spray Season [2] Apply at any time during the year except when snow or water prevents spraying to ground line.

Application: Spray the basal parts of all undesirable species of trees to a height of 12-15 inches from the ground. Spray to wet, no run-off.

Alternative 4

- Hydraulic (High Volume) Application

Accord Concentrate	1% (4 Quarts)
Arsenal – Habitat	4 ounces /100 gal
Arborchem Aquatic Surfactant or Approved Equivalent	2 Quarts
Water	98-1/2 Gallons
Drift Control Agent[(1)]	

or • Back Pack- Power/Hand Operated (Low Volume) Application

Accord Concentrate	5 Gallons
Arsenal – Habitat	½ % (2 Quarts)
Chemsurf 90 Surfactant or Approved Equivalent	1% (4 Quarts)
Water	93-1/2 Gallons
Drift Control Agent[(1)]	

or • Back Pack- Power/Hand Operated (Ultra Low Volume Thinvert) Application

Accord Concentrate	7% (7 Gallons)
Arsenal – Habitat	1% (4 Quarts)
Escort XP	4 ounces / 100 gal
Thinvert RTU	92 Gallons

Approximate Spray Season [(2)] Mid to late June until the end of September.

Application: The foliage of all undesirable species of trees must be sprayed to attain uniform coverage, although not necessarily to run-off.

Alternative 5

- Hydraulic (High Volume) Application

Garlon 3A	¾ % (3 Quarts)
Escort XP	1 Ounce/100 gal
Arborchem Clean Cut or Approved Equivalent	¼% (1 Quart)
Water	99 Gallons
Drift Control Agent[(1)]	

or • Back Pack- Power/Hand Operated (Low Volume) Application

Garlon 3A	4% (4 Gallons)
Escort XP	2 Ounces
Arsenal - Powerline	½% (2 Quarts)
Chemsurf 90 or Approved Equivalent	1% (4 Quarts)
Water	94 -1/2 Gallons
Drift Control Agent[(1)]	

Approximate Spray Season: On about the first week of June until the beginning of fall leaf coloration.

Application: Apply as a full coverage spray to foliage, stems, and limbs or all undesirable species of trees.

Alternative 6

- Hydraulic (High Volume) Application

Krenite S	1.5% (6 Quarts)
Arsenal - Powerline	4 Ounces/100 gal
Escort XP	1 Ounce/ 100 gal
Arborchem Clean Cut or Approved Equivalent	¼% (1 Quart)
Water	98-1/4 Gallons
Drift Control Agent[1]	

- Back Pack - Power/Hand Operated (Low Volume) Application

Krenite S	5% (5 Gallons)
Arsenal – Powerline or Habitat	½% (2 Quarts)
Escort XP	4 Ounces/100 gal
Arborchem Clean Cut or Approved Equivalent	1% (1 Gallon)
Water	93-1/2 Gallons
Drift Control Agent[1]	

or

Ultra Low Volume Thinvert Backpack	
Krenite S	7% (7 Gallons)
Arsenal – Habitat	1% (1 Gallon)
Escort XP	4 ounces/100 gal
Thinvert	92 Gallons

Cut-Stubble Applications:

Alternative 7

- Thinvert Application
  (applied at 5 Gallons /ac)

Tordon K	(2 Quarts)
Arsenal - Habitat	1 pint (16 ounces)
Milestone	7 ounces
Thinvert RTU	4.3 Gallons

- Low Volume
  Basal Application

Garlon 4	25 Gallons
Arborchem	75 Gallons
Basal Oil	

Alternative 8

- Thinvert Application
  (applied at 5 Gallons /ac)

Arsenal - Habitat	24 ounces
Milestone	7 ounces
Thinvert RTU	4.75 Gallons

- Low Volume Basal Application

Garlon 4	25 Gallons
Arborchem Basal Oil	75 Gallons

Alternative 9

- Thinvert Application
  (applied at 5 Gallons /ac)

Garlon 4	1.5 Gallons
Tordon K	1 Quart
Milestone	4 ounces
Arsenal - Habitat	12 ounces
Thinvert RTU	3.12 Gallons

- Low Volume Basal Application

Garlon 4	25 Gallons
Arborchem Basal Oil	75 Gallons

Approximate Spray Season [(2)]: On or about the first week of June to the beginning of fall leaf coloration.

Application: The foliage of all undesirable species of trees must be thoroughly wet.

(1) A Drift Control Agent must be added to this alternative at the manufacturer's recommended label rate.

(2) Spray seasons are approximate and subject to change and variation by geographical area.

Note: PPL Electric reserves the right to modify spray formulations within permissible limits set forth in the manufacturer's labeled instructions.

VI CONTRACTOR RESPONSIBILITIES

Contractor shall:

- Conduct all work as specified by PPL Electric (in the Clearing Plan and accompanying information) and as documented in right-of-way agreements.

- Follow the specific procedures contained in both this specification and PPL Electric's Specification for Soil Erosion and Sedimentation Control on Transmission Line Rights-of-Way (A-118231).

- Notify the Company representative of any changes that may be required in the Clearing Plan, including requests made by property owners.

- Make changes to Clearing Plan only upon Company written authorization.

- Provide all supervision, labor and equipment necessary for execution of the work. All equipment must meet PPL Electric specifications as described on page 17. All personnel must be adequately trained in the vegetation management techniques they practice, including species identification skills.

- Notify all property owners prior to start of any work involving initial clearing and maintenance procedures on previously cleared lines.

- Contractor personnel directly involved in contacting customers are required to have identification, complete with photograph, associating them with their employer.

- This identification will be prominently displayed while engaged in customer contact activities.

- Begin operations only after notification to proceed is received from PPL Electric. (The Company representative reserves the right to reject any personnel or equipment that does not meet Company's standards.)

- Maintain copies of all permits required by regulatory agencies at the job site, as provided by PPL Electric.

- Confine all activities to the limits shown on the Clearing Plan, or as detailed by PPL Electric, except for approved off-line access and Company-specified danger tree clearing. This includes storage of

equipment and materials, and exercise of proper care to avoid damage and litter outside these limits.

- Keep all roads open to traffic, as per the Pennsylvania Department of Transportation's "Work Zone Traffic Control" (67 PA Code, Chapter 203).

- Keep PPL Electric apprised of the progress of work on a daily basis, either verbally and/or through a daily work activity report as required by the Company representative.

- Regrade and seed according any deep cuts, ruts, stump holes, mounded areas, or general soil disturbance caused by the vegetation management operations when, in the opinion of the Company representative, they could cause future ground erosion or interfere with line access.

- Clean up all slash and rubbish resulting from work as the work progresses, leaving the area in a condition satisfactory to the Company representative.

- Provide adequate liability coverage, as specified by PPL Electric in the request for bids.

Clearing

- Prune or remove all danger trees as directed by a Company representative.

- Take precautions to preserve all surveyed stakes, hubs, and property comers. Those destroyed shall be replaced at Contractor's expense.

Herbicide Applications

- Possess an appropriate Commercial Applicator/Technician certification and pesticide application business license, in compliance with the Pennsylvania Pesticide Control Act of 1973, amended in 1986, Act 167.

- Maintain a record of all required property owner contacts on log sheets provided by PPL Electric. These records will be submitted to the appropriate Company representative at: (1) his request and (2) the completion of each line.

- Mix the herbicide solution according to Company specifications and label instructions.

- All target species will be adequately treated to produce the necessary control. A responsible Contractor Representative will review all prior year herbicide applications for quality control. The Contractor shall retreat at his own expense until the desired results are obtained.

- Vehicles used for application and property owner contacts must have Contractor identification of suitable size lettering as approved by the Company representative.

- Provide herbicide samples to the Company representative.

Vegetation Disposal

- Haul chips to acceptable disposal sites, either on or off the right-of-way, if specified by the Company.

- Assure that marketable wood is piled on its respective property.

- Assume responsibility for damage or injury resulting from burning operations

- Meet these safety requirements when burning:

  (1) Perform burning only upon Company authorization.

  (2) Notify the local Fire Department, Bureau of Forestry (District Office) of the Pennsylvania Department of Conservation and Natural Resources, and the Company representative prior to conducting a burning operation on a daily basis.

  (3) Provide adequate fire fighting equipment at the site of any burning activity. This equipment shall include Indian Fire Tanks and Rich Fire Rakes (or equivalent) mechanized fire fighting equipment (motor driven high-pressure pump and tank units), and a quantity of water sufficient to extinguish any outbreaks.

  (4) Provide continuous patrolling (day and night) as long as fire danger is high and hot embers exist in any of the bum piles.

  (5) Report to the Company representative any fire which burns beyond the right-of-way limits, and notify the Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry, (District Office) if additional help is needed to regain control of the fire.

Line Access

- Comply with all pertinent provisions of applicable local, state, and federal environmental regulations whenever using/constructing access roads.

- If access is required through a visual screen, the access road shall cross the screen at an angle to prevent a direct view down the right-of-way.

- Access roads along the right-of-way shall stay as close to the centerline as possible, to avoid clearing larger vegetation that may remain at the right-of-way edges.

- Access roads shall attempt to avoid springs, seeps, or other bodies of water found along the right-of-way.

- If temporary access is required prior to the completion of permanent access construction, all work shall be done so as to minimize erosion, ground disturbance, and siltation. Temporary bridges or culverts shall be constructed across streams, and corduroy roads used in wet areas.

- Review with the Company representative all existing roads, culverts, or bridges (either private or public) that form a portion of Contractor's means of access to the right-of-way. The Contractor shall take whatever steps the Company representative deems necessary to ensure that these facilities are restored to at least as good a condition after the Contractor's use as they were originally. At the request of the Company representative, contractor shall immediately repair damaged roads or bridges that would hinder or prevent the owner's or tenant's use.

- Immediately repair or replace all fences or gates damaged by Contractor at Contractor's expense. Any required addition of fence wire, brace posts, gate posts, or associated fence material shall be of new quality and of similar design as existing fence material. Install gates if so noted in the contract. The type of gate shall be specified by PPL Electric, which shall provide all gates or gate materials. Work shall be done under an hourly rate, according to the specifications provided by PPL Electric.

- Where existing usable fences are attached to trunks of trees to be felled, the trees shall be cut at a length approximately 6" above the top wire strand, unless otherwise specified. The continuity of all electric fences shall be maintained.

- Adequate care shall be taken to assure that gates are not left open or fences left in such condition that the property owner's livestock can escape. If existing fences or gates along a right-of-way are in a state of disrepair prior to the start of clearing and could allow livestock to escape, the property owner shall be so notified.

- The Contractor will take the necessary safety precautions to prevent injury to human life or damage to property and shall carry on his operations with a minimum of interference to traffic or inconvenience to the public. All applicable rules and regulations of OSHA and the Pennsylvania Department of Transportation shall be strictly adhered to. Any and all accidents or incidents resulting in injury to workmen or the public or damages to Company facilities (whether causing an interruption or not) will be reported to PPL Electric immediately.

- In the event of a work related interruption or upon identification of an imminent threat, the contractor shall:

1. If needed, call 911 for medical assistance.
2. Contact PPL VM, i.e. Forester or LCI with location and nature of event
3. If PPL VM personnel can not be contacted, contact the regional PPL S.O., or P.D.
4. Contact contractor management as needed.
5. If required, keep bystanders out of harms way and remain clear of any downed conductors until PPL crews isolate any safety concerns.

ATTACHMENT 7
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
LIST OF GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES CONTACTED

Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, Second Floor
400 North Street
Harrisburg, Pa 17120-0053
File No. ER 2011-1843-089-A
Contact: Mr. Douglas C. McLearen, Chief

US Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, Pa 16801-4850
USFWS Project # 20010770
Contact: Pam Schellenberger

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, Pa 17110-9797
Contact: Olivia A. Braun

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, Pa 16823-9620
SIR # 36407
Contact: Kathy Gipe

Pa Department of Conservation and Natural Resources
Rachel Carson State office Building
PO Box 8767
400 Market Street
Harrisburg, Pa 17105-8767
PNDI # 21325
Contact: Rebecca H. Bowen

Monroe County Commissioners
1 Quaker Plaza, Rm 201
Stroudsburg, Pa 18360-2141
Contacts: Suzanne McCool – Chairperson
Theresa Merli – Vice Chairperson
Robert Gress – Chief Clerk/Administrator

Monroe County Planning Commission
1 Quaker Plaza, #106
Stroudsburg, Pa 18360
Contact: John Woodling

Jackson Township Board of Supervisors
2162 Route 715
PO Box 213
Reeders, PA 18352
Contact: Jack Rader Jr. - Chairman

Pocono Township Board of Supervisors
PO Box 197
Tannersville, Pa 18372
Contact: Jane Cilurso

Monroe County Conservation District
8050 Running Valley Road
Stroudsburg, Pa 18360
Contact: Craig Todd

Pocono Mountain Economic Development Corporation
300 Community Drive, Suite D
Pocono Mountains Corporate Center East
Tobyhanna, Pa18466
Contact: Charles Leonard

The Nature Conservancy
Northeast Office
Hauser Nature Center
PO Box, 55 Long Pond Road
Long Pond, Pa 18334
Contact: Bud Cook

Pennsylvania Game Commission
Northeast Region
P.O. Box 220
Dallas, Pa 18612-0220
Contact: Michael Beahm

ELECTED OFFICIALS

State Representative Mario Scavello
Greater Pocono Chamber of Commerce
556 Main Street
Stroudsburg, Pa 18360

State Senator David Argall
PO Box 16
Saylorsburg, Pa 18353

State Senator John Yudichak
1201 North Street, Suite 3
Jim Thorpe, Pa 18229

Attachment 8.1

ATTACHMENT 8.1
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
LIST OF PROPERTY OWNERS WITHIN ROW

Jerzy Mackowaik
RR1 Box 115A
Scotrun, PA 18355

Estate of Charles L. Vassallo
C/O Ross Wood Williams, Executor
2684 Wellingham Drive
Livermore, CA 94551

Henry Speerstra, Greg Campbell, Charles Campbell, IR Development, L.L.C., UTM Development, L.L.C., and Steve Bacik Partners trading as Iroquois Ridge Partners, L.L.P.
C/O Henry Speerstra
2384 Horse Creek Road
Oil City, PA 16301

Howard L. Curtis et ux
C/O Kripps Shirley
RR1 Box 115
Scotrun, PA 18355

PPL Electric Utilities Corporation
2 North 9th Street
Allentown, PA 18101

Pocono Manor Investors
C/O Matzel Devel
PO Box 38
Pocono Manor, PA 18349

Pennsylvania State Game Lands No. 38
Harrisburg, PA 17120

Paul Richard et al Frantz
RR1 Box 43
Scotrun, PA 18355

Attachment 8.2

ATTACHMENT 8.2
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
LIST OF PROPERTY OWNERS ADJACENT TO ROW

Waltraub Krober
379 S Pleasant Ave
Ridgewood, NJ 07450

Charles McHugh
4 Charlton Street
Princeton, NJ 08540

Donald R. and Marjorie A. Peloubet
39 Decotah Ave
Lake Hiawatha, NJ 070034

Pamela Rowe
RR1 Box 117
Scotrun, PA 18355

Thomas and Glinda Johnson-Medland
RR2 Box 2750
Cresco, PA 18326

Matthew Gocek and Lori K. Halstead
RD1 Box 116
Scotrun, PA 18355

John F. and June Rinker
RD1 Box 17
Scotrun, PA 18355

Attachment 9

ATTACHMENT 9
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
LIST OF GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES RECEIVING A COPY OF THIS APPLICATION

COPY RECIPIENTS:

State Agencies

Pennsylvania Historical and Museum Commission
Bureau for Historic Preservation
Commonwealth Keystone Building, Second Floor
400 North Street
Harrisburg, Pennsylvania 17120-0053
Attn: Mr. Douglas C. McLearen, Chief

Pennsylvania Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, Pennsylvania 17120
Attn: Barry J. Schoch, P.E., Secretary

Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
PO Box 2063
400 Market Street
Harrisburg, Pennsylvania 17105-8767
Attn: Secretary's Office of Policy

Counties

Monroe County Commissioners
1 Quaker Plaza, Room 201
Stroudsburg, Pennsylvania 18360-2141

Monroe County Planning Commission
1 Quaker Plaza, #106
Stroudsburg, Pennsylvania 18360

Municipalities

Jackson Township Board of Supervisors
2162 Route 715
PO Box 213
Reeders, Pennsylvania 18352

Jackson Township Planning Commission
P.O. Box 213
Reeders, Pennsylvania 18352

Pocono Township Board of Supervisors
PO Box 197
Tannersville, Pennsylvania 18372

Pocono Township Planning Commission
PO Box 197
Tannersville, Pennsylvania 18372

NOTICE RECIPIENTS:

Federal Agencies

U.S. Army Corps of Engineers
Philadelphia District
Regulatory Branch
Wanamaker Building, 100 Penn Square East
Philadelphia, Pennsylvania 19107-3390

US Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850
Attn: Pam Shellenberger

State Agencies

Pa Department of Conservation and Natural Resources
Rachel Carson State office Building
PO Box 8767
400 Market Street
Harrisburg, Pennsylvania 17105-8767
Attn: Rebecca Bowen

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, Pennsylvania 17110-9797
Attn: Olivia Braun

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, Pennsylvania 16823-9620
Attn: Kathy Gipe

County Agencies

Monroe County Conservation District
8050 Running Valley Road
Stroudsburg, Pennsylvania 18360

Property Owners

See list in **Attachment 8.1**

Attachment 10

Attachment 10

PPL DESIGN CRITERIA AND SAFETY PRACTICES

The National Electrical Safety Code (NESC) is a set of rules to safeguard people during the installation, operation, and maintenance of electric power lines. The NESC contains the basic provisions considered necessary for the safety of employees and the public. Although it is not intended as a design specification, its provisions establish minimum design requirements. PPL Electric Utilities Corp. (PPL) 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 required by the NESC. The tables below compare PPL and NESC ground clearances for lines of various voltages.

138 kV

	Vertical Clearance to Ground	
Surface Underneath Conductors	NESC Standard	PPL Design
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

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
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

Surface Underneath Conductors	Vertical Clearance to Ground NESC Standard	PPL Design
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:

Voltage-kV	Minimum Clearance
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.

Attachment 11

MAGNETIC FIELD MANAGEMENT

PPL Electric Utilities Corporation

Attachment 11

DECEMBER 2004

TABLE OF CONTENTS

INTRODUCTION

At PPL Electric Utilities Corp. (PPL EU), magnetic field management means investigating and implementing methods at low or no cost to reduce magnetic fields in new or rebuilt transmission and distribution lines. This document explains PPL EU's Magnetic Field Management Program, which is part of PPL EU's larger Electric and Magnetic Fields (EMF) policy.

PPL EU's View

Some people are worried that electric and magnetic fields are harming their health. Others think the scientific research does not show a problem at all, and still others believe there's just too much scientific uncertainty to draw any conclusions.

Here's what we do know now. Various panels of scientists that have reviewed the EMF research generally have drawn two main conclusions. First, the large body of evidence does not demonstrate that EMF are harmful. Second, additional research is recommended to explore questions raised in some studies.

Given these conclusions, PPL EU is taking a reasoned approach in responding to the EMF issue. PPL EU's approach to the EMF issue consists of five elements:

- Providing EMF information to customers and employees
- Providing magnetic field measurements
- Establishing and implementing a magnetic field management program to reduce magnetic fields in new or rebuilt facilities when it can be done at no, or low, cost
- Integrating EMF in the public involvement process that PPL EU undertakes in the siting of transmission lines
- Have supported additional research

EMF Are All Around Us

Electric and magnetic fields occur in nature and in all living things. The earth, for instance, has a magnetic field, which makes the needle on a compass point north.

Electric fields and magnetic fields of a different type also surround every wire that carries electricity. In everyday life, these EMF arise from several basic sources, including power lines, electrical appliances, home and building wiring, other utility lines and cables, and currents flowing on water pipes. Though they often occur together, EMF are made up of two separate components:

Electric Fields

Electric fields are produced by the voltage—or electrical pressure—on a wire. The higher the voltage, the higher the electric field. As long as a wire is energized—has voltage present—an electric field is present (see Figure 1). In other words, an appliance, or an electric power line, doesn't actually have to be turned on to create an electric field. It just has to be plugged in. Electric fields diminish with distance and can be blocked or partially shielded by objects such as trees and houses.

Magnetic Fields

Magnetic fields are created by the current or flow of electricity through a wire. Generally speaking, the higher the current, the higher the magnetic field. Because they only occur when current is flowing, magnetic fields are present only when the power is turned on (see Figure 1). Magnetic fields also diminish with distance, but—unlike electric fields—are not blocked by common objects. In recent years, public and scientific interest has turned toward the magnetic field component of EMF because of some scientific studies regarding these fields.

Figure 1

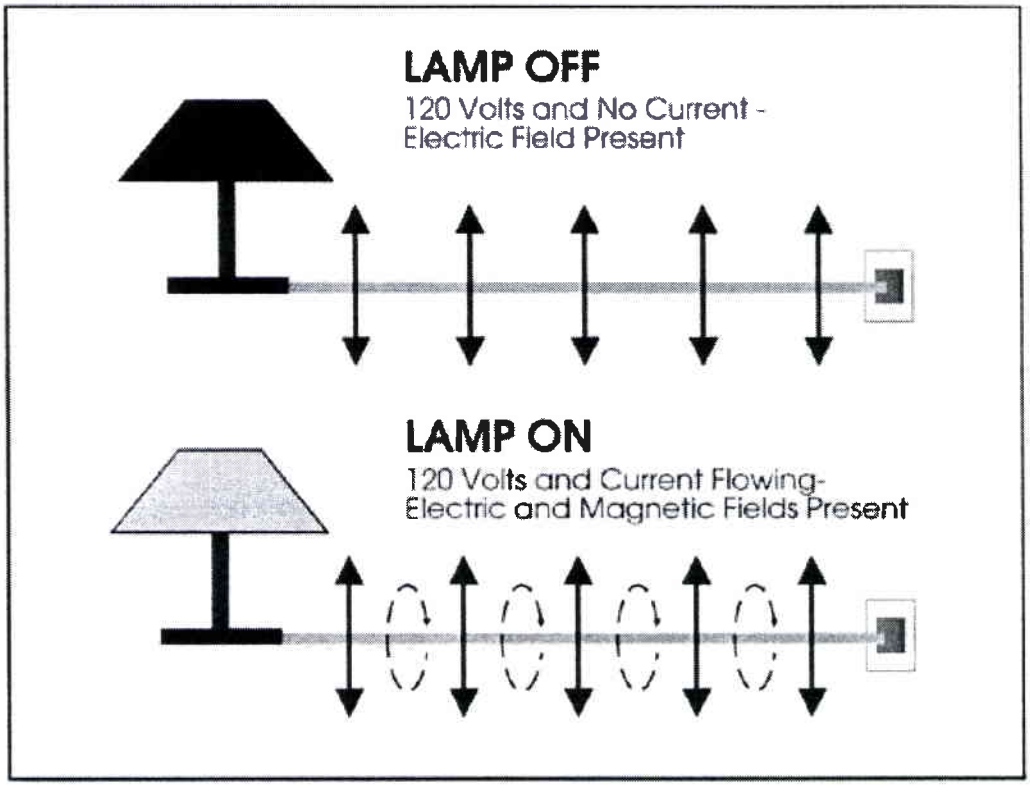

LAMP OFF
120 Volts and No Current -
Electric Field Present
LAMP ON
120 Volts and Current Flowing-
Electric and Magnetic Fields Present

Figure 2

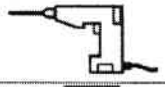
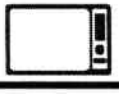
Magnetic field strengths decrease with distance Magnetic fields are measured in milligauss	Source: "EMF In Your Environment", U.S. Environmental Protection Agency 1992 At 6 inches	At 1 foot	At 2 feet
Clothes dryer 	2 to 10	* to 3	*
Microwave oven 	100 to 300	1 to 200	1 to 30
Toaster 	5 to 20	* to 7	*
Power drill 	100 to 200	20 to 40	3 to 6
Can opener 	500 to 1500	40 to 300	3 to 30
Mixer 	30 to 600	5 to 100	* to 10
Hair dryer 	1 to 700	* to 70	* to 10
Color television 	Data not available	* to 20	* to 8

FIGURE 2 * The magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

Measuring Magnetic Fields

Magnetic fields usually are measured in a unit called a milligauss. Magnetic field levels found in the living areas of homes typically range from less than 1 milligauss to about 4 milligauss according to the U.S. Environmental Protection Agency. They can be higher in some cases. The levels next to appliances can exceed 1,000 milligauss (1 gauss). Figures 2 and 3 show how the strength of the field falls off as you move away from the source, just as the heat of a campfire grows weaker as you walk away from it. For overhead power lines, the strength of the magnetic fields is dependent upon a number of factors that will be explained later. Those factors produce a magnetic field that drops off rapidly as you move away from the power line.

Figure 3

Sample Magnetic Field Levels in Milligauss				
Type of Overhead Power Line	**Distance from the line**			
	Under the line	**50 ft.**	**100 ft.**	**200 ft.**
220 kV and 500 kV	5-400	5-250	1-75	0.5-20
69 kV and 138 kV	3-80	0.5-2.5	0.1-10	0.1-3
12 kV and below	0.4-20	0.1-1	-	-

The magnetic field values provided in this table represent a general range of values associated with the types of overhead power lines listed and are provided for illustration. There will be circumstances in which there will be magnetic field levels above or below the range of values provided due to variations in such factors as height of the wires, current flow and so on.

DEVELOPMENT OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

One element of our response to EMF concerns expressed by some of our customers is PPL EU's Magnetic Field Management Program. The program was initiated in March 1991 because PPL EU believes it makes good sense, as a matter of policy, to respond to the concerns expressed by some of our customers and to reduce magnetic fields in new and rebuilt facilities where it can be done with either no-cost or low-cost design changes.

This document updates the original program which has been revised several times since 1991. These guidelines were developed by PPL EU's EMF Working Group.

VARIABLES THAT AFFECT MAGNETIC FIELDS

Magnetic fields from transmission and distribution lines are a function of a number of design variables. The following parameters affect the magnetic field levels produced by transmission and distribution lines:

- Current
- Height of conductors above ground
- Configuration of conductors
- Distance from the line

EFFECT OF PHASE CURRENT ON MAGNETIC FIELDS

At power frequencies (i.e., 60 hertz), the magnetic field level is a function of the current or flow of electricity through a wire. Keeping all other parameters the same, the magnetic field is proportional to the current. Hence, if the current increases by 25 percent, the resulting magnetic field level will increase by 25 percent.

The overall load current on any line varies with the demand for power. It's usually highest during daytime hours and lowest at night. There also are weekly, monthly, seasonal and yearly variations.

The difference in the currents between each phase in a multiphase line also can affect the magnetic field. This difference is called phase unbalance. For a constant load, a statistical analysis of this phase unbalance can be made to determine its effect on the magnetic field. Close to the line, there is very little effect. However, the phase unbalance slows the rate at which the magnetic field decreases with distance from the line.

Effect of Conductor Configuration on Magnetic Fields

In the transmission and distribution of power, utilities like PPL EU presently use both three-phase and single-phase lines. Each phase on a three-phase power line has either a single conductor or a bundle of two or more conductors. In a three-phase system, the ground-level magnetic field is a result of the fields produced by the currents in each of the phases. Placing the three phases as close together as possible (compaction) creates some field cancellation, and the ground-level magnetic field is reduced. However, appropriate phase separation is required for the reliable operation of the line. In addition, the arrangement of the phases can create some; field cancellation and reduction of the ground-level magnetic field.

Effect of Distance From the Magnetic Field Source

Magnetic field strength diminishes with the vertical and lateral distances from the magnetic field source. Increasing the height of the conductors above ground is useful for magnetic field reduction at ground level, but may result in increased structure costs and increased aesthetic impact of the structures. Another possible method of increasing the distance to the magnetic field source is to increase the right-of-way requirements. By keeping buildings off increased rights of way, thereby requiring the public to live and work further away from lines, exposure to magnetic fields produced by the lines can be reduced. Increases in right of way are not always practical and may increase costs significantly, however.

SUMMARY OF PPL EU's MAGNETIC FIELD MANAGEMENT PROGRAM

Under its Magnetic Field Management Program, PPL EU has changed the way it builds and rebuilds some of its transmission and distribution lines. These design changes reduce magnetic field levels (assuming balanced circuit loadings and phase currents) by up to 69 percent in most of the company's new transmission lines. These guidelines now are being applied to new and reconstructed transmission facilities, based on this program.

The distribution component of the program focuses on 12 kV lines, the company's standard distribution voltage. It concentrates on the three-phase, primary 12 kV lines, since these are the most heavily loaded facilities and often are located in densely populated areas. The guidelines in this program are being applied to these three-phase, primary 12 kV lines.

A maximum 3-5 percent change in estimated cost was used as the limit for the guidelines since this value is consistent with low cost, is within estimating accuracy and is likely to have little impact on overall line costs.

The magnetic field calculations used in this document for the design of PPL EU's overall magnetic field management plan assume balanced load conditions among the phases and a fixed level of current, not necessarily representative of specific transmission or distribution lines. These levels were calculated using the Electric Power Research Institute's ENVIRO computer program. Under actual operating conditions, the magnetic field levels that result may vary due to such things as actual load per circuit, overall current on each phase conductor and the electrical configuration and operation of each line.

MAGNETIC FIELD MANAGEMENT PROGRAM GUIDELINES

The guidelines for magnetic field management are noted below, with discussion points for each.

OVERHEAD LINES

NEW OR REBUILT TRANSMISSION LINES

1. **Balance transmission circuit loads and phase currents as much as possible.**
    - PPL EU should continue to make every effort to balance loadings between the two circuits of a double circuit line when planning new or rebuilt facilities to maximize the effects of reverse phasing.
    - PPL EU should continue the practice of balancing single-phase loads across the three phases of the distribution system. (Unbalanced phase currents on the distribution system are reflected through to the transmission system.)
        - Unbalanced phase currents result in higher magnetic fields that do not drop off as quickly with distance as do the fields resulting from balanced phase currents.
        - For a 5 percent phase current unbalance, the magnetic field 50 feet from the centerline of a single circuit 138 kV line could be more than twice the value than if the same line had balanced phase circuits.
    - Balanced phase currents on each three-phase distribution circuit also reduce magnetic fields from the distribution circuits themselves. In addition, they reduce magnetic fields on the transmission system from which the distribution system circuits are supplied and connected through substations.
    - Apart from magnetic field considerations, balanced phase currents on each three-phase distribution circuit also reduce line losses and improve the system voltage.

2. **Continue with the present practice of using long-span construction as the PPL EU 138/69 kV standard**

- Structure designs for short-span and long-span construction are illustrated on Charts I and II, respectively.
  - Short-span design does not significantly reduce magnetic fields when compared to long-span design even though it is more compact than long-span design. Comparison of the magnetic field values from Chart III indicates essentially the same values. Therefore, short-span design should not be used solely to reduce magnetic fields.
  - PPL EU will continue to use long-span construction for 138/69 kV double-circuit lines and for single-circuit/future-double-circuit lines.
  - For single-circuit/future-double-circuit lines, PPL EU will continue to install two conductors on the top positions and one in the middle position as shown in Chart IV.
    - This arrangement minimizes magnetic fields as shown in Chart V by placing the three initial conductors higher on the structure, which increases the ground clearances, and by placing the conductors in a triangular configuration.

3. **Compact design structures are not a low-cost alternative and should be used for magnetic field reduction only in special applications.**

Chart VI illustrates the compact design structure.

- The compact design increases the initial installation costs by 79 percent when compared to the long-span design but reduces the magnetic field from 9 mG to 3 mG (about 67 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.

4. **Reverse phase new or rebuilt double-circuit transmission lines for all voltage levels.**

- Reverse phasing was adopted by PPL EU in March 1991 for double-circuit 138/69 kV transmission lines and in April 1992 for all other double circuit transmission lines. Reverse phasing is shown in Chart VII. Reverse phasing will reduce the magnetic fields when the current flow on both circuits is in the same

direction. Calculated values contained here are based on balanced and equal phase currents on both circuits.

- Reverse phasing reduces the magnetic field of a double circuit 138 kV single pole transmission line from 29 mG to 9 mG (about 69 percent) at the edge of the 100-foot-wide right of way as shown on Chart III.
- Reverse phasing reduces the magnetic field of a double circuit 230 kV single pole transmission line from 49 mG to 16 mG (about 67 percent) at the edge of the 150-foot-wide right of way as shown on Chart VIII.
- Reverse phasing reduces the magnetic field of a double-circuit 500 kV single pole transmission line from 37 mG to 21 mG (about 43 percent) at the edge of the 200-foot-wide right of way as shown on Chart IX.

• When new or rebuilt double-circuit lines require tapping existing double-circuit lines, PPL EU will review the existing lines to determine if reverse phasing can be provided at low cost.

• Computer modeling is required to develop the optimum phasing and overall conductor arrangements for lines added to, or rebuilt in, multiple-line corridors.

- Merely adding a reverse-phase double-circuit line to an existing transmission line corridor or reverse phasing a rebuilt line in the multiple-line corridor will not necessarily produce lower magnetic field levels at the edge of the corridor right of way.
- The corridor must be computer modeled with all the lines, existing phase conductor locations and currents. Then, magnetic field calculations must be made varying the phase arrangements of the new or reconstructed line to determine the appropriate phasing arrangement.
- Current flow direction on a line also must be considered. For example, a reverse-phased line should have the current flowing in the same direction on both circuits. If the current flow is in the opposite direction for one circuit, reverse phasing will not produce the lowest magnetic field and another phase arrangement that produces lower fields may need to be utilized.

5. **Increase the minimum ground clearance for all new transmission lines.**

138/69 kV Transmission Lines

- Increasing the minimum line design ground clearance from 25 feet to 30 feet may add up to about 5 percent to the installed cost of a new double-circuit single pole 138/69 kV line. For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. With long-span reverse-phase design, the, magnetic field is reduced from 9 mG to 7 mG (about 22 percent) at the edge of a 100-foot-wide right of way as shown in Chart X.
  - In the actual design of transmission lines to include higher minimum ground clearances, there may be limited segments (such as highway crossings, severe slopes and transmission line crossing locations) where National Electrical Safety Code (NESC) minimum ground clearances may need to be used. The NESC minimum ground clearances are less than the increased ground clearance discussed previously.

230 kV Transmission Lines

- Increasing the minimum line design ground clearances from 27 feet to 32 feet may add up to about 5 percent to the cost of a single-circuit single-pole line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 30 mG to 28 mG (about 7 percent) at the edge of a 150-foot-wide right of way.
- Increasing clearances from 27 feet to 32 feet could theoretically add up to about 2.8 percent to the cost of a double-circuit single-pole line (current standard) and reduce the magnetic field of a reverse-phase line from 16 mG to 15 mG (about 6 percent) at the edge of a 150-foot-wide right of way. Chart XI is a summary of this data.
- Studies are required for each new 230 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such

studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced phase spacing (a "Delta" configuration on a single-circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

500 kV Transmission Lines

- Increasing ground clearances from 33 feet to 53 feet may add up to about 4.5 percent to the cost of a single-circuit "H-frame" line (current standard). For a given project, such cost may be substantially less, however. In fact, PPL EU frequently uses higher-than-minimum ground clearances due to such features as road crossings, line crossings and site-specific terrain. By increasing the clearances, the magnetic field is reduced from 42 mG to 35 mG (about 17 percent) at the edge of a 200-foot-wide right of way.
- Increasing ground clearances from 33 feet to 53 feet could theoretically add up to 2.8 percent to the cost of a double-circuit "H-frame" line (current standard) and reduces the magnetic field of a reverse-phase line from 21 mG to 16 mG (about 24 percent) at the edge of a 200-foot-wide right of way. Chart XII is a summary of this data.
- Studies are required for each new 500 kV line to determine optimum structure types, ground clearances, configurations and designs to reduce field levels. Such studies could include analysis of reduction measures such as additional minimum ground clearances, increasing conductor tensions, using reduced-phase spacing (a "Delta" configuration on a single circuit line), installing the second circuit initially, and/or adding a second set of conductors that are reverse phased and operated in parallel with the first set (bundled/split phase).

RECONDUCTORING OR ADDING ADDITIONAL CIRCUITS TO EXISTING TRANSMISSION LINES

When reconductoring or adding additional circuits to existing transmission lines, PPL EU will evaluate low-cost or no-cost options for magnetic field management on a case-by-case basis.

When reconductoring existing transmission lines or adding additional circuits, low-cost alternatives may not exist; however, the following steps will be taken:

- For a single-circuit line, the use of a Delta arrangement or other modifications on the existing structure, with reduced-phase spacing, will be evaluated.
- For double-circuit lines, application of reverse phasing may reduce the magnetic field under the line and within the right of way and will be evaluated.
- For single- and double-circuit lines, evaluate using higher conductor tensions that can increase the minimum line design ground clearance.

DISTRIBUTION LINES

At the 12 kV distribution level, new main three-phase lines will continue to be constructed with five feet of additional ground clearance.

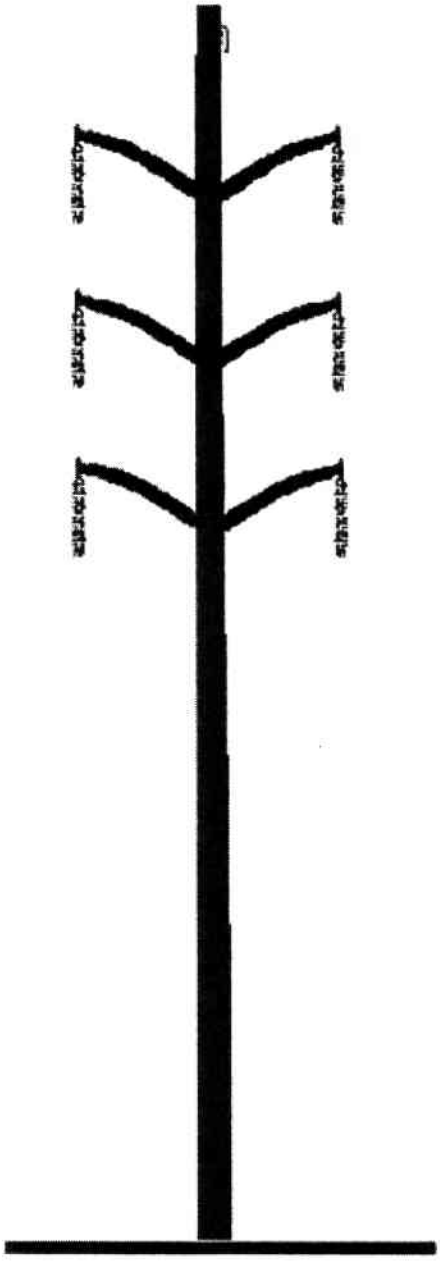
- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These values are based on increasing pole heights from 45 feet to 50 feet and a typical operating current of 300 amps per phase.
- Chart XIII is a summary of this data. Increasing ground clearance by five feet could theoretically add about 5 percent to the cost of a typical distribution line.

UNDERGROUND TRANSMISSION LINES

Underground transmission lines are required due to environmental or land use factors or restrictions on available clearances, PPL EU will evaluate options for magnetic field management techniques on a case-by-case basis.

- The phase arrangement that produces the lowest field will be determined.
- The depth of burial of the line will be determined considering the cost of excavation and the location of other buried utilities in the area.
- The use of steel pipe ferromagnetic shielding that reduces magnetic fields will be evaluated.

Short-Span Construction



- **More compact design**
- **Should not be used solely to reduce magnetic fields**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 7.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 10.0 feet sag
  Average span - 400 feet

Long-Span Construction Remains PPL EU 138 kV Standard

- **Lower cost alternative**
- **Reduces magnetic fields due to higher structures**
- **Typical conductor data:**

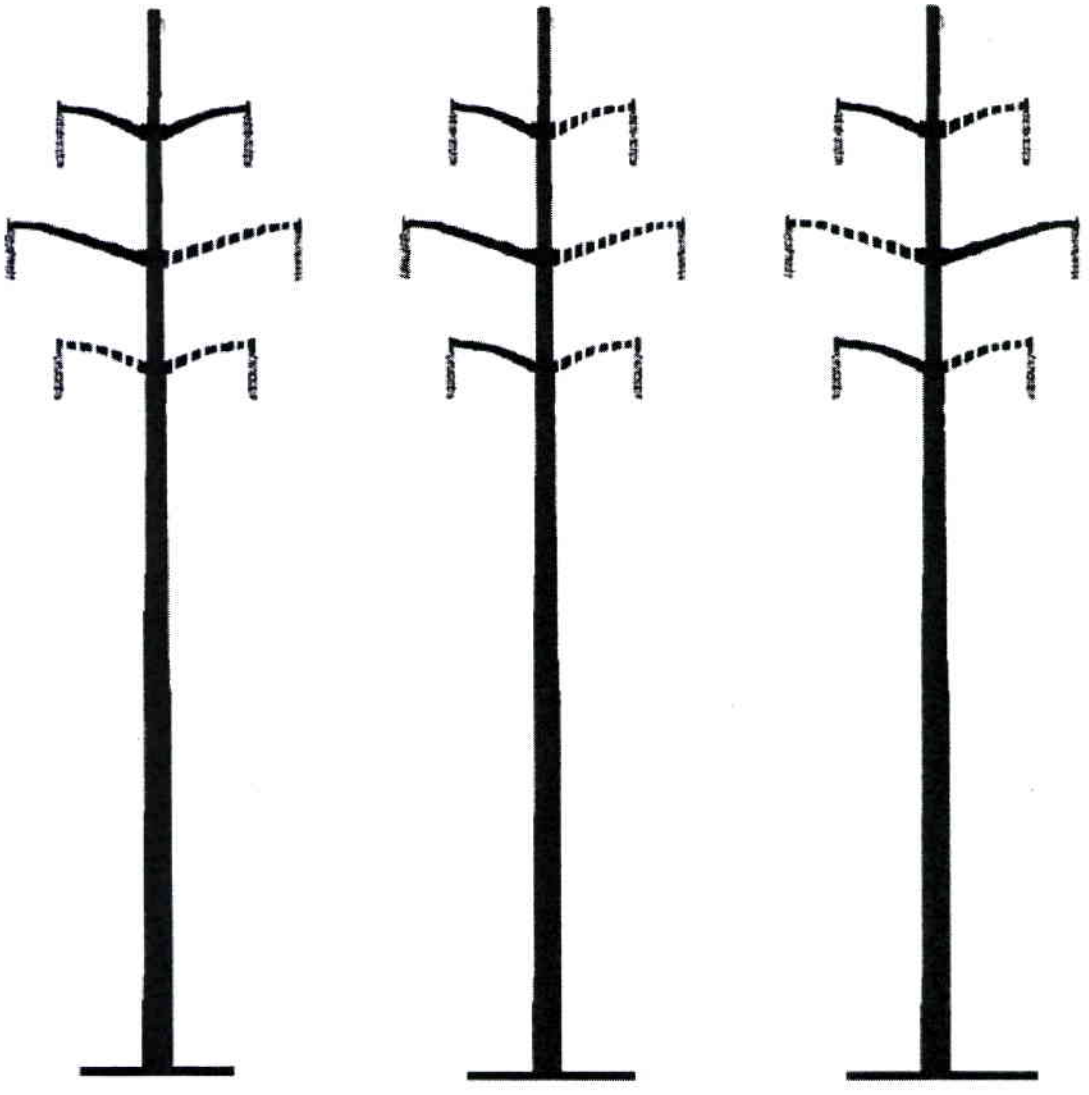
  1 3/8" HS steel overhead ground wire - 17.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
  Average span - 600 feet

138/69 kV REVERSE-PHASE TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SHORT SPAN (CHART I)	30
SHORT SPAN (REVERSE PHASE)	8
LONG SPAN (CHART II)	29
LONG SPAN (REVERSE PHASE)	9
COMPACT (CHART VI)	14
COMPACT (REVERSE PHASE)	3

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.
LONG SPAN, SHORT SPAN and COMPACT are double-circuit lines.

Typical Single-Circuit Structure Designs

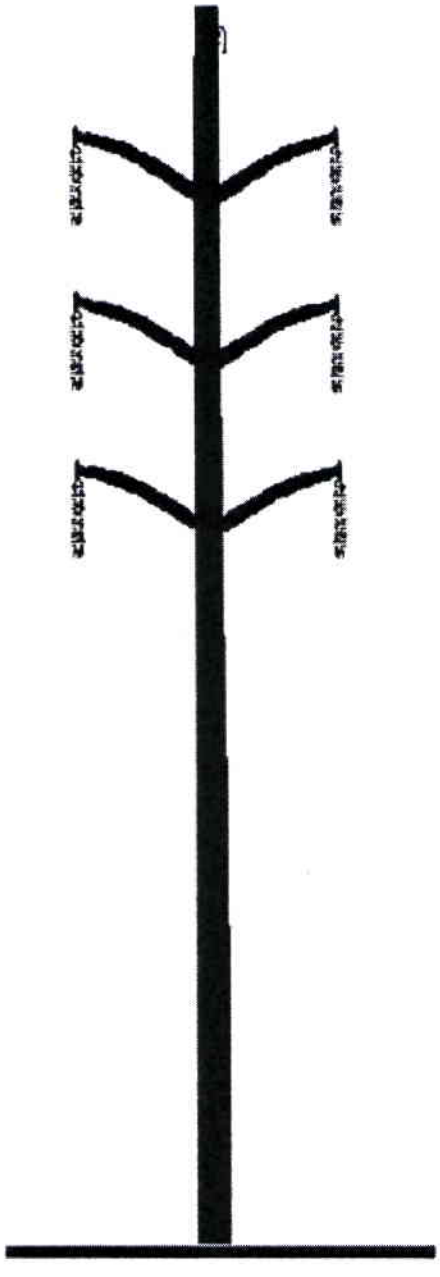


138/69 kV SINGLE CIRCUIT TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
TOP/MIDDLE/BOTTOM	20
VERTICAL	17
TOP/MIDDLE	12

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 25 feet.

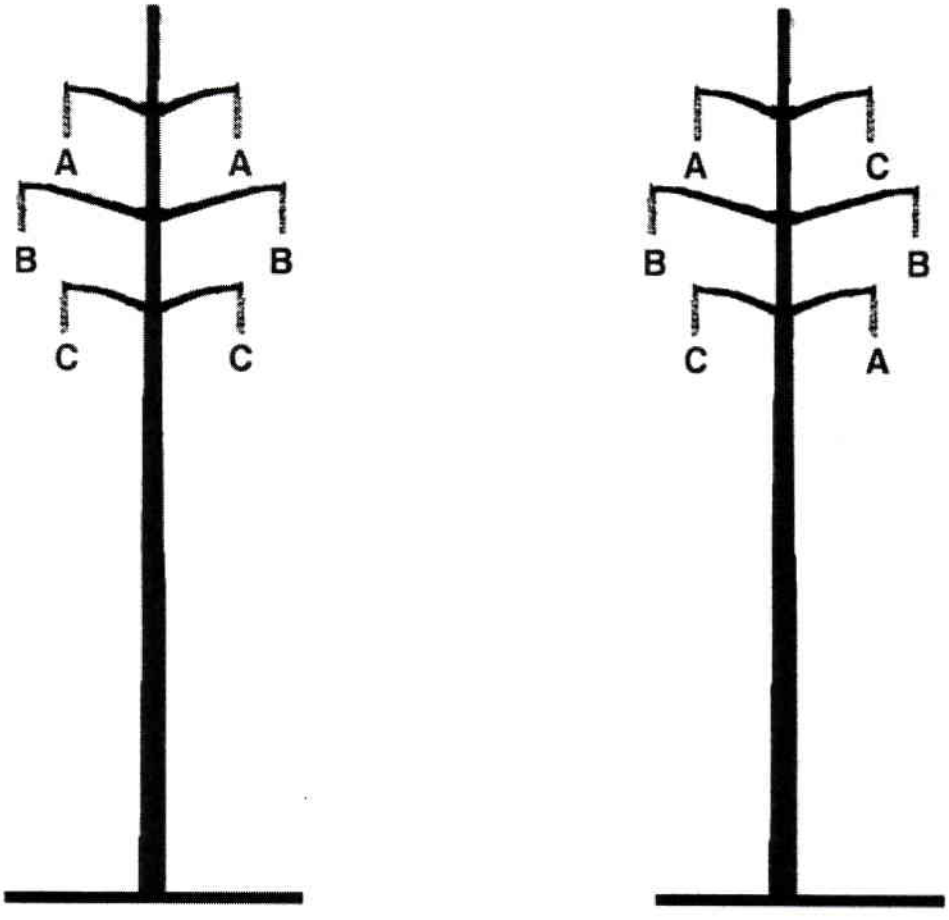
Compact Design Structure



- **Minimize magnetic fields due to compact design**
- **Not a low-cost alternative**
- **Typical conductor data:**

  1 3/8" HS steel overhead ground wire - 9.0 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 9.0 feet sag
  Average span - 300 feet

Reverse Phasing of Double-Circuit Transmission Lines



From: → → → → **To:**

Reverse phasing also can be one of the following phase arrangements:

A	B		B	A		B	C		C	A		C	B
C	C	or	C	C	or	A	A	or	B	B	or	A	A
B	A		A	B		C	B		A	C		B	C

CHART VIII

230 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	49
DOUBLE CIRCUIT POLE (REVERSE-PHASE)	16

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 27 feet.

CHART IX

500 kV REVERSE-PHASE TRANSMISSION LINES CALCULATED MAGNETIC FIELDS AT 1100 AMPERES

TYPE CONSTRUCTION	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
DOUBLE CIRCUIT POLE	37
DOUBLE CIRCUIT POLE (REVERSE PHASE)	21

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.
Calculations are based on a minimum ground clearance of 33 feet.

CHART X

INCREASED 138/69 kV MINIMUM GROUND CLEARANCE
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	25	12
SINGLE CIRCUIT TOP/MIDDLE	30	10
LONG SPAN	25	29
LONG SPAN	30	26
LONG SPAN (REVERSE PHASE)	25	9
LONG SPAN (REVERSE PHASE)	30	7

The edge of right of way is 50 feet from the line centerline.
The 400 ampere phase current is balanced between phases.

CHART XI

INCREASED 230 kV MINIMUM GROUND CLEARANCE
CALCULATED MAGNETIC FIELDS AT 800 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT TOP/MIDDLE	27	30
SINGLE CIRCUIT TOP/MIDDLE	32	28
DOUBLE CIRCUIT POLE	27	49
DOUBLE CIRCUIT POLE	32	46
DOUBLE CIRCUIT POLE (REVERSE PHASE)	27	16
DOUBLE CIRCUIT POLE (REVERSE PHASE)	32	15

The edge of right of way is 75 feet from the line centerline.
The 800 ampere phase current is balanced between phases.

CHART XII

INCREASED 500 kV MINIMUM GROUND CLEARANCE
CALCULATED MAGNETIC FIELDS AT 1,100 AMPERES

TYPE CONSTRUCTION	MINIMUM GROUND CLEARANCE FEET	MAGNETIC FIELD IN MILLIGAUSS AT THE EDGE OF THE RIGHT OF WAY
SINGLE CIRCUIT "H" STRUCTURE	33	42
SINGLE CIRCUIT "H" STRUCTURE	53	35
DOUBLE CIRCUIT POLE	33	37
DOUBLE CIRCUIT POLE	53	31
DOUBLE CIRCUIT POLE (REVERSE PHASE)	33	21
DOUBLE CIRCUIT POLE (REVERSE PHASE)	53	16

The edge of right of way is 100 feet from the line centerline.
The 1,100 ampere phase current is balanced between phases.

CHART XIII

12 kV DISTRIBUTION LINES
CALCULATED MAGNETIC FIELDS AT 300 AMPERES

TYPE CONSTRUCTION	POLE HEIGHT FEET	MAGNETIC FIELD IN MILLIGAUSS*	
		AT CENTERLINE	AT 30 FEET FROM CENTERLINE
STANDARD CROSSARM	45	14	7
STANDARD CROSSARM	50	11	6

* Field level under the line at mid-span based on 300 amps, balanced loading, one meter above ground level.

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Attachment 12

ATTACHMENT 12
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
AGENCY COORDINATION

On May 2, 2011, information regarding the Blooming Grove – Jackson and Peckville - Jackson 138/69 kV Project was provided to the U.S Fish and Wildlife Service (USFWS), the Pennsylvania Fish and Boat Commission (PFBC), the Pennsylvania Game Commission (PGC), and the Pennsylvania Department of Conservation and Natural Resources (DCNR). This information was provided in accordance with the Pennsylvania Natural Heritage Program's Pennsylvania Natural Diversity Inventory (PNDI) program, which provides information on the location and status of important ecological resources such as plants, mammals, fish, insects, and natural communities. Correspondences from these agencies regarding the potential presence of these ecological resources within the project area are provided in this attachment.

Information regarding the project was also provided to the Pennsylvania Historical and Museum Commission (PHMC) in June 2011. On July 12, 2011, PHMC issued the attached response letter stating that based on their review there are no National Register eligible or listed historic or archaeological properties in the area of the proposed project and that no further action would be required.

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

19998614.600

BUREAU OF FORESTRY

May 20, 2011

PNDI Number: 21325

David Yezuita
URS Corporation – Philadelphia Office
335 Commerce Drive, Suite 300
Fort Washington, PA 19034-2623
FAX: 215-367-1000 (hard copy will not follow)

Re: PPL – Jackson-Lake Naomi 138/69 kV Transmission Line
Jackson & Pocono Twps., Monroe County

Dear Mr. Yezuita,

Thank you for your submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **21325** for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources of concern under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located within the vicinity of the project area. Based on a detailed PNDI review, DCNR determined potential impacts to the following threatened or endangered species or species of special concern.

Survey Request
Our records indicate that species of special concern were previously found nearby. It appears that there may be potential habitat present, therefore, we are requesting a survey for the following species. (Habitat and flowering time information from *The Plants of Pennsylvania, 2nd Edition*, by Rhoads and Block). Please note our new survey protocols are available at *http://www.gis.dcnr.state.pa.us/hgis-er/Login.aspx* .

Plant Species of Concern:

***Carex polymorpha* (Variable sedge):** Currently PA Endangered, Proposed PA Threatened; flowers/fruits in summer; FACU. While the literature defines Variable sedge's habitat as thin woods and barrens in sandy-peaty soil, our records describe the habitat in which it was found as a young forest dominated by white oak with other hardwoods and dampish soil along intermittent or permanent streamlets. There are numerous occurrences of Variable sedge in this area. Other nearby records describe it as a pitch pine-heath forest as well as a white oak-heath forest on a north-facing slope with sandy loam substrate; thickets, open woods, woods borders, trails and road edges with somewhat damp soil. Most recently Variable sedge was found along Hyspy Run Trail in 2007, within the proposed project area.

Communities of Concern:

Pitch pine heath woodland: This is a woodland community type that occurs on rocky ridge-tops, on sandy soils, or both. A similar type occurs on serpentinite-derived soils on the Piedmont (see related types section below). Soils for this community are acidic; conditions are dry. Trees are drought-stressed and of small stature. *Pinus rigida* (pitch pine) is usually the dominant tree, although in southern Pennsylvania, *P. virginiana* (Virginia pine), and *Pinus pungens* (Table-mountain pine) may accompany or replace *P rigida.*

PNDI Number: **21325**

Pinus resinosa (red pine) may also occur on some sites. Hardwoods may be present but do not contribute more than 25% of the tree layer. Various shrubs, mostly ericads, form a low shrub layer. Our records show this community type is also adjacent to the proposed project alignment and if found in the project area, please delineate the boundaries of the community. (see http://www.dcnr.state.pa.us/wrcp/fikebook/12Chapter3.pdf).

A survey for the above species should be conducted by a qualified botanist *at the appropriate time of year and then submitted to our office for review.* **Your botanist should carefully review the new DCNR Botanical Survey Protocols available at http://www.gis.dcnr.state.pa.us/hgis-er/Login.aspx. These protocols are recommended to ensure that the all necessary information is collected and that survey reports are prepared properly. It is the expectation of DCNR that these protocols will be followed when conducting surveys for species under our jurisdiction.** Contact our office prior to the survey for detailed information about the species, or for a list of qualified surveyors.

Any target and non-target state-listed species found during the site visit should be reported to our office. Mitigation measures and monitoring may be requested if species or communities of special concern are found on or adjacent to site. If the land type(s) does not exist onsite a survey may not be necessary; please submit a habitat assessment report which describes the current land cover, habitat types and species found onsite.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map).

This finding applies to impacts to DCNR only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure the U.S. Fish and Wildlife Service, PA Game Commission, and the Pennsylvania Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Rebecca H. Bowen

Rebecca H. Bowen, Environmental Review Manager FOR Chris Firestone, Wild Plant Program Mgr.
Ph: 717-772-0258 ~ c-rbowen@state.pa.us

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

May 27, 2011

IN REPLY REFER TO
SIR# 36407

DAVID YEZUITA
URS CORPORATION
335 COMMERCE DRIVE, SUITE 300
FORT WASHINGTON, PA 19034-2623

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
PNDI Search No. LARGE PROJECT REVIEW
JACKSON-LAKE NAOMI 138/69 TRANSMISSION LINE
JACKSON, POCONO Townships, MONROE County, Pennsylvania

Dear Mr. YEZUITA:

I have reviewed the map accompanying your recent correspondence, which concerns the above-referenced project. Based on records maintained in the Pennsylvania Natural Diversity Inventory (PNDI) database and Pennsylvania Fish & Boat Commission (PFBC) files, the **timber rattlesnake (*Crotalus horridus*, PA candidate)** is known from the vicinity of the proposed project site. Timber rattlesnakes occur in the forested, mountainous regions of the Commonwealth. They prefer forested areas to forage for small mammals (e.g., mice and chipmunks) and southerly-facing slopes for hibernating and other thermoregulatory activities. The timber rattlesnake is threatened by habitat loss/alteration, wanton killing, and poaching.

Given the proximity of the project to known critical timber rattlesnake habitat, we request that a timber rattlesnake habitat assessment be conducted in the project area ***on the portion south of Interstate 80*** by *a PFBC recognized/qualified timber rattlesnake surveyor*. We have included the list of PFBC recognized/qualified surveyors and habitat assessment protocol for your convenience. Upon completion of the habitat survey, the qualified rattlesnake biologist is to submit a report to this office (Natural Diversity Section) for review and comment. The habitat survey report should include color photographs of the project area (keyed to a site map or diagram) and a description of habitats occurring within the immediate area to be developed (**including access roads**), as well as the surrounding area. Potential timber rattlesnake critical habitat (denning/gestating areas) should be photographed and mapped accordingly. In addition, the report should also include detailed project plans and maps with a description of the proposed work (including access roads), project impacts and alternatives. Pending the review of this information, a survey targeting the presence of the timber rattlesnake in the project area and/or other project modifications may be requested.

In any future correspondence with us regarding this specific project, please contact Kathy Gipe at 814-359-5186 and refer to the SIR number above. Thank you for your cooperation and attention to this

matter of timber rattlesnake conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/KDG/mr

Enclosures (2)

COMMONWEALTH OF PENNSYLVANIA
Pennsylvania Game Commission
2001 ELMERTON AVENUE
HARRISBURG, PA 17110-9797

"To manage all wild birds, mammals and their habitats for current and future generations."

Division of Environmental Planning and Habitat Protection
717-783-5957

ADMINISTRATIVE BUREAUS:

ADMINISTRATION	717-787-5670
HUMAN RESOURCES	717-787-7836
FISCAL MANAGEMENT	717-787-7314
CONTRACTS AND PROCUREMENT	717-787-6594
LICENSING	717-787-2084
OFFICE SERVICES	717-787-2116
WILDLIFE MANAGEMENT	717-787-5529
INFORMATION & EDUCATION	717-787-6286
WILDLIFE PROTECTION	717-783-6526
WILDLIFE HABITAT MANAGEMENT	717-787-6818
REAL ESTATE DIVISION	717-787-6568
AUTOMATED TECHNOLOGY SERVICES	717-787-4076

www.pgc.state.pa.us

July 8, 2011

Large Project Review

Mr. David Yezuita
URS Corporation
335 Commerce Drive
Fort Washington, Pennsylvania 19034

Re: Jackson-Lake Naomi 138/69 kV Transmission Line
Jackson and Pocono Townships, Monroe County, Pennsylvania

Dear Mr. Yezuita,

Thank you for submitting the Jackson-Lake Naomi 138/69 kV Transmission Line project to the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review for review. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. However, based on the information you submitted concerning the nature of the project, the immediate location, and our detailed resource information, the PGC has determined that no impacts to state listed **threatened or endangered** bird or mammal species are likely. However, portions of the above referenced project are located adjacent to State Game Lands # 038. Please contact the Northeast Regional Office at (570) 675-1143 to discuss the project activities and coordinate obtaining the necessary approvals if your project will impact State Game Lands. It is recommended that you coordinate with Game Commission Staff early in your project planning process.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for an additional year.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Olivia A. Braun
Environmental Planner
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3128
Fax: 717-787-6957
e-Mail:OBraun@state.pa.us

A PNHP Partner

Pennsylvania Natural Heritage Program

OAB/oab

cc: Librandi Mumma, PGC
Schweitzer, PGC
Sussenbach, PGC
Shirk, PGC
File

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

November 22, 2011

David Yezuita
URS Corporation
335 Commerce Drive, Suite 300
Fort Washington, PA 19034-2623

RE: USFWS Project #2011-0770

Dear Mr. Yezuita:

This responds to your letter of May 2, 2011, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed PPL – Jackson-Lake Naomi 138/69kV Transmission Line located in Monroe County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species and the Migratory Bird Treaty Act (MBTA, 16 U.S.C. 703-712; Ch. 128; July 13, 1918; 40 Stat. 755, as amended) to ensure the protection of migratory bird species.

Federally Listed Species

Indiana bat

The project is within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. According to our review of the project information provided, it appears that approximately 100 acres of forest habitat will be affected by the proposed project. Land-clearing associated with the project may result in the death or injury of roosting Indiana bats if tree-cutting is conducted during the time of year when bats may be present (*i.e.*, April 1 to September 30). Due to the potential for Indiana bats to occur within the project area, the Service recommends that measures be implemented to avoid killing or injuring them. This can be accomplished by carrying out tree-cutting activities from October 15 to March 31, during which time bats are hibernating or concentrated near their hibernacula. This seasonal restriction on tree cutting applies to trees that are greater than or equal to 5 inches in diameter at breast height (d.b.h). Where possible, retain shagbark hickory trees, dead and dying trees, and large diameter trees (greater than 12 inches d.b.h.) to serve as roost trees for bats. Where possible, also retain forested riparian corridors and forested wetlands.

If you are unable to adopt the tree-cutting restrictions detailed above, an Indiana bat survey should be conducted by a qualified surveyor (list enclosed) in accordance with the enclosed *Mist Netting Guidelines*. Survey results should be submitted to the Fish and Wildlife Service for

review and comment. Should Indiana bats be found during the survey, further consultation with the Service will be necessary.

Please advise this office as to whether you intend to conduct bat surveys, or assume bats are present and implement a seasonal restriction on tree-cutting.

Bog turtle

Additionally, the proposed project is within the known range of the bog turtle (*Clemmys muhlenbergii*), a species that is federally listed as threatened. Bog turtles inhabit shallow, spring-fed fens, sphagnum bogs, swamps, marshy meadows, and pastures characterized by soft, muddy bottoms; clear, cool, slow-flowing water, often forming a network of rivulets; high humidity; and an open canopy. Bog turtles usually occur in small, discrete populations occupying suitable wetland habitat dispersed along a watershed. The occupied "intermediate successional stage" wetland habitat is usually a mosaic of micro-habitats ranging from dry pockets, to areas that are saturated with water, to areas that are periodically flooded. Some wetlands occupied by bog turtles are located in agricultural areas and are subject to grazing by livestock.

Because wetlands occur within the project area, their potential suitability as bog turtle habitat should be assessed, as described under "*Bog Turtle Habitat Survey*" (Phase 1 survey) of the enclosed *Guidelines for Bog Turtle Surveys*. This Phase 1 survey should evaluate all wetlands within the project action area. The project "action area" includes all areas that will be directly or indirectly affected by the proposed project (including all phases of multi-phased projects) and all project-associated features, such as roads, water and sewer lines, utility lines, stormwater and sedimentation basins, buildings and other structures, driveways, parking lots, yards/lawns, and wells.

Due to the skill required to correctly identify potential bog turtle habitat, we recommend that the Phase 1 survey be done by a qualified surveyor (see enclosed list). Survey results should be submitted to the Service for review and concurrence. If the Phase 1 survey is done by someone who is not on this list, it is likely that a site visit by a Fish and Wildlife Service biologist will be necessary to verify their findings. Due to the limited availability of staff from this office, such a visit may not be possible for some time. Use of a qualified surveyor will expedite our review of the survey results.

If potential bog turtle habitat is found in the project action area, efforts should be made to avoid any direct or indirect impacts to those wetlands (see enclosed *Bog Turtle Conservation Zones*). Avoidance of direct and indirect effects means no disturbance to or encroachment into the wetlands (e.g., filling, ditching or draining) for any project-associated features or activities. Adverse effects may also be anticipated to occur when lot lines include portions of the wetland; when an adequate upland buffer is not designated around the wetland (see *Bog Turtle Conservation Zones*); or when roads, stormwater/sedimentation basins, impervious surfaces, or wells affect the hydrology of the wetland.

If potential habitat is found, submit (along with your Phase 1 survey results) a detailed project description and detailed project plans documenting how direct and indirect impacts to the wetlands will be avoided. If adverse effects to these wetlands cannot be avoided, a more detailed and thorough survey will be necessary, as described under "*Bog Turtle Survey*" (Phase 2 survey)

of the *Guidelines*. The Phase 2 survey should be conducted by a qualified biologist with bog turtle field survey experience (see enclosed list of qualified surveyors). Submit survey results to the Service for review and concurrence.

Assessment of Risks to Migratory Birds including Bald and Golden Eagles

The Fish and Wildlife Service (Service) is the principal Federal agency charged with protecting and enhancing populations and habitat of migratory bird species. The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for authorizing incidental take, the Service recognizes that some birds may be killed even if all reasonable measures to avoid take are implemented. Unless the take is authorized, it is not possible to absolve individuals, companies or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures). However, the Office of Law Enforcement focuses enforcement action on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law.

In addition to the MBTA, bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (Eagle Act), which prohibits killing; selling; or otherwise harming eagles, their nests, or their eggs. The Eagle Act also includes provisions not included in the MBTA, including the protection of unoccupied nests and a definition of take that prohibits disturbing eagles. The Service recommends that applicants carefully evaluate their proposed project in light of the *National Bald Eagle Management Guidelines* to determine whether or not eagles might be disturbed as a direct or indirect result of the project. These guidelines as well as additional eagle information are available at http://www.fws.gov/migratorybirds/BaldEagle.htm

The potential exists for avian mortality from electrocutions or collisions with power lines as well as direct impacts from habitat loss for wintering, migrating, and breeding migratory birds and indirect impacts from fragmentation, site avoidance, and disturbance of birds within the project boundaries. Electrocutions from power lines are of particular concern to raptors, as their size, hunting strategy, and nesting preferences make them particularly vulnerable. Other species, such as corvids (crows and ravens) and cormorants also show an affinity for nesting on power lines. Collisions are most common at night, or under low visibility conditions, because migratory birds and land birds either cannot see the utility lines, or they lack the ability to negotiate obstacles quickly enough to avoid them. Site-specific factors that should be considered in project siting to avoid and minimize the risk to birds include avian abundance; the quality, quantity, and type of habitat; geographic location; type and extent of bird use (*e.g.* breeding, foraging, migrating, etc.); and landscape features.

The Avian Power Line Interaction Committee (APLIC; www.aplic.org) and the Service (http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/BirdHazards.html) have developed guidelines for power lines to minimize impacts from existing facilities and in the construction of new utility and energy systems and associated infrastructure (APLIC 1994, 1996, and 2006; APLIC and Service 2005). In addition to those recommendations and suggestions, we offer the following recommendations to avoid and minimize impacts to migratory birds within and around the project area.

1. Develop an Avian Protection Plan that minimizes the risk of electrocution, collision, and

nest disturbance for migratory birds (APLIC and Service 2005).

2. Minimize the risk of bird electrocutions by using horizontal and vertical separation between energized and/or grounded parts that allows sufficient clearance for wrist-to-wrist (flesh-to-flesh) and head-to-foot (flesh-to-flesh) clearance for the largest migratory birds in the project area (the standard is 60 inches of horizontal separation and 40-48 inches of vertical separation for eagles) and apply insulating conductors on corner and transformer poles. Apply covers on phases or grounds where adequate separation is not feasible (*e.g.*, insulator/conductor covers, bushing covers, arrester covers, cutout covers, jumper wire covers).

3. Minimize the risk of collisions by marking the wires to increase visibility to flying birds (*e.g.*, hanging markers, bird flight diverters, aviation marker balls).

4. Minimize land and vegetation disturbance and reduce habitat fragmentation during project design and construction, especially if habitat cannot be fully restored after construction. Where practicable, concentrate construction activities, infrastructure, and man-made structures (*e.g.*, poles, roads) on lands already altered or cultivated, and away from areas of intact and healthy native habitats. Co-locate roads, staging areas, and other infrastructure in or immediately adjacent to already-disturbed areas (*e.g.*, existing rights-of-way, agricultural fields). If co-location is not feasible, select fragmented or degraded habitats rather than relatively intact areas.

5. Where disturbance is necessary, clear natural or semi-natural habitats (*e.g.*, forests, woodlots, reverting fields, shrubby areas) and perform maintenance activities (*e.g.*, mowing) between September 1 and March 31, which is outside the nesting season for most native bird species. Without undertaking specific analysis of breeding species and their respective nesting seasons on the project site, implementation of this seasonal restriction will avoid take of most breeding birds, their nests, and their young (*i.e.*, eggs, hatchlings, fledglings).

6. Avoid permanent habitat alterations in areas where birds are highly concentrated or where sizable prey bases exist. Avoid establishing sizable structures along known bird migration pathways or known daily movement flyways (*e.g.*, between roosting and feeding areas). Examples of high concentration areas for birds are wetlands, State or Federal refuges, Audubon Important Bird Areas, private duck clubs, rookeries, roosts, and riparian areas.

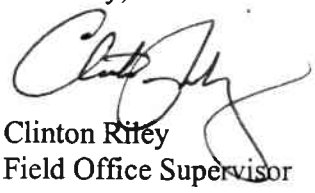
7. Develop a habitat restoration plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife. Use only plant species that are native to the local area for revegetation of the project area.

No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have any questions regarding this matter, please contact Pamela Shellenberger of my staff at 814-234-4090.

Sincerely,



Clinton Riley
Field Office Supervisor

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

July 12, 2011

Martin Abbot
URS Corporation
335 Commerce Drive, Suite 300
Fort Washington, PA 19134

EXPEDITE REVIEW USE
SHP REFERENCE NUMBER

Re: File No. ER 2011-1843-089-A
PUC: PPL Electric Utilities, Jackson-Lake Naomi 138/69 kV Transmission Line Construction, Jackson & Pocono Twps. Monroe Co.

Dear Mr. Abbot:

The Bureau for Historic Preservation has reviewed the above named project under the authority of 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). This review includes comments on the project's potential effect on both historic and archaeological resources.

Based on our survey files, which include both archaeological sites and standing structures, there are no National Register eligible or listed historic or archaeological properties in the area of this proposed project. Therefore, your responsibility for consultation with the State Historic Preservation Office for this project is complete. Should you become aware, from any source, that historic or archaeological properties are located at or near the project site, please notify the Bureau for Historic Preservation at (717) 783-8946.

Sincerely,

Douglas C. McLearen, Chief
Division of Archaeology & Protection

DCM/tmw

Attachment 13

ATTACHMENT 13
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
PUBLIC NOTICE REQUIREMENTS

PPL Electric Utilities Corporation ("PPL Electric") proposes to reinforce the 138/69 kV transmission system in Monroe County, Pennsylvania to resolve identified transmission reliability criteria violations and excessive loading on its 138/69 kV circuits in northeast Pennsylvania, and to ensure reliable long-term service to customers in Monroe County. Specifically, and as explained in greater detail in **Attachment 2** (Necessity Statement), PPL Electric's Transmission Planning Department has identified thermal overloads, excessive loads on a single-circuit, and excessive load interruptions under several contingencies. To resolve the identified violations, PPL Electric proposes to construct a new, approximately 4-mile, Blooming Grove – Jackson and Peckville – Jackson 138/69 kV Line (the "Project") which is the subject of this filing.

The total estimated cost to site, design, and construct this project is approximately $6.12 million. The overhead transmission portion is estimated to cost approximately $5.21 million and the required substation modifications are estimated to cost approximately $905,000. Construction of this project is scheduled to begin in January 2013 to meet an in-service date of November 2013.

Pursuant to Subchapters G and I of the Commission regulations, 52 Pa. Code §§ 57.71-57.77, 57.91-57.93, and the Commission's Interim Siting Guidelines, 52 Pa. Code §§ 69.3101-69.3107, PPL Electric has provided packets of information to fully notify landowners that may be affected by the proposed Project. For those landowners that PPL Electric intends to negotiate right-of-way agreements with, the packet of information ("Negotiation Packet") included the following:

- A Cover Letter from a PPL Electric Senior Real Estate Specialist.
- A Disclosure of Eminent Domain Power of Electric Utilities Required by 52 Pa. Code § 57.91.
- Notification of Right-of-Way Maintenance Practices Required by 52 Pa. Code § 57.91.

- PPL Electric's Internal Practices for Dealing with the Public on Power Line Projects Required by 52 Pa. Code § 69.3102.
- Notification to Contact the Commission or Office of Consumer Advocate for Improper Land Agent Practices.
- A Brochure on Electromagnetic Fields.
- A Brochure on Vegetation Management.
- A Glossary of Real Estate Terms.

Those property owners, who own a property located adjacent to the right-of-way, but with whom PPL Electric is not attempting to negotiate a right-of-way agreement, received a packet ("Non-negotiating Packet") that includes the following:

- A Cover Letter from a PPL Electric Senior Real Estate Specialist.
- Notification of Right-of-Way Maintenance Practices Required by 52 Pa. Code § 57.91.
- PPL Electric's Internal Practices for Dealing with the Public on Power Line Projects Required by 52 Pa. Code § 69.3102.
- Notification to Contact the Commission or Office of Consumer Advocate for Improper Land Agent Practices.
- A Brochure on Electromagnetic Fields.
- A Brochure on Vegetation Management.
- A Glossary of Real Estate Terms.

Following this Attachment are the forms of the Negotiation and Non-negotiating Packets that were sent to all affected landowners. In addition, copies of the Application and supporting Attachments are being served in accordance with the provisions of Section 57.74 of the Commission's regulations, 52 Pa. Code 57.74.

NEGOTIATING PACKET

Packet of Information Provided to Landowners that PPL Electric Plans to Negotiate with to Acquire Right-of-Way

DATE

Customer Name and Address

Dear

PPL Electric Utilities Corporation (PPL) is planning to build an electric transmission line, Jackson-Lake Naomi Tap 138/69 KV, in Pocono and Jackson Townships, Monroe County, Pennsylvania. The upgrade is needed to prevent overloads from occurring and ensure reliable electric service to customers in this region. I am writing to notify you of the proposed project as required by the Pennsylvania Public Utility Commission.

The majority of the new transmission line will parallel the existing Blooming Grove-Jackson and Peckville-Jackson lines. PPL plans to negotiate with the applicable landowners to acquire additional right-of-way to accommodate both transmission lines. Depending on PPL Electrics existing rights, an additional 25 – 50 feet of new right-of-way will be negotiated in this area. In the area where the new line will not parallel the existing transmission lines, PPL will negotiate to acquire 100 feet of right-of-way.

Since the proposed right-of-way needs of this project may involve your property, enclosed are notices required by the Pennsylvania Public Utility Commission that provide important information regarding eminent domain, right-of-way maintenance practices, and land agents conduct. Also enclosed is PPL's Internal Practices for Dealing with the Public on Power Line Projects. The Pennsylvania Public Utility Commission's regulations require that PPL provide you with this information at least 15 days in advance of our discussions. For your convenience, I also have enclosed information on electromagnetic fields and a brochure on vegetation management, as well as a glossary of real estate terms.

If you have any questions on any of the enclosed information, please contact me at XXX-XXX-XXXX.

I kindly request that you sign in the space provided below to indicate that you have received this information.

Very truly yours,

Agents Name

PPL Senior Real Estate Specialist

I acknowledge receiving the information referred to in the letter above and understand that it does not obligate me in any way.

_____

Date _____

Phone _____

Attachments:
Disclosure of Eminent Domain Power
Notification of Right-of-Way Maintenance Practices
Internal Practices for Dealing with the Public on Power Line Project
Notification Regarding Land Agent Practices
Information on Electromagnetic Fields
Brochure on Vegetation Management

NOTICE
EMINENT DOMAIN POWER

The Pennsylvania Public Utility Commission requires that PPL Electric Utilities Corporation give you the following information:

PPL Electric Utilities Corporation is presently planning to construct a 138/69kv electric transmission line to be known as the Jackson-Lake Naomi line in Pocono and Jackson Townships in Monroe County, Pennsylvania.

Since a field survey and detailed engineering has not been completed, the physical dimensions of the proposed lines and the type and height of supporting structures to be used cannot be precisely determined at this time. However, based on past experience it is expected that the structures normally will be 90 to 100 feet in height. There may be isolated physical conditions that would require either higher or lower structures than those mentioned above. At this time, we do not know the number of structures to be placed on any properties. PPL Electric's current 138/69kv standard right of way width is 100 feet.

Since the route could affect your property, a representative of the utility will contact you in the near future to discuss the utility's plans as they may affect your property. In order to better prepare you for these discussions and to avoid possible misunderstandings, we want to take this opportunity to inform you of your legal rights and the legal rights of PPL Electric Utilities Corporation with regard to this project. You have the right to have legal counsel represent you in these negotiations. You do not have to sign any agreement without the advice of counsel. If you do not know an attorney, you may contact your local bar association.

MUST YOU ACCEPT AN OFFER MADE BY THE UTILITY FOR YOUR PROPERTY?

No. You may refuse to accept it. However, the utility has the power to take property by eminent domain, subject to the approval of the Public Utility Commission, for the construction of transmission lines if the utility is unable to negotiate an agreement to buy a right of way. If your property is condemned, you must be paid "just compensation". "Just compensation" has been defined by the courts in Pennsylvania as the difference between the fair market value of your property before condemnation, unaffected by the condemnation, and the fair market value of your remaining property after condemnation, as affected by the condemnation.

CAN THE UTILITY CONDEMN YOUR HOUSE?

The company cannot condemn your house or a reasonable "curtilage" around your house. Generally, "curtilage" includes the land or buildings within 100 meters of your

house which are used for your domestic purposes. However, the 100 meter limit does not automatically extend beyond the homeowner's property line.

DO YOU HAVE A RIGHT TO A PUBLIC HEARING WHEN THE UTILITY SEEKS TO CONDEMN YOUR PROPERTY?

Yes. When an electric utility seeks to have your property condemned, the utility must first apply to the Pennsylvania Public Utility Commission for a certificate finding the condemnation to be necessary or proper for the service, accommodation, convenience, or safety of the public. The Commission will then hold a public hearing. As the landowner whose property may be condemned, you are a party to the proceeding and may retain counsel, present evidence, and/or testify yourself in opposition to the application for a certificate. If you wish to testify at the public hearing, you should make your intention known by letter to Secretary, Pennsylvania Public Utility Commission, P.O. Box 3265, Harrisburg, PA 17120.

If the Commission approves the utility's application for a certificate finding the condemnation in the public interest, then the utility may proceed before the local Court of Common Pleas to condemn your land. If the Commission denies the utility's application, the utility cannot condemn your land. If you retain an attorney to represent you before the Commission, you must do so at your own expense.

The Commission will not decide how much money you should receive if your land is condemned. The only issue the Commission will decide is whether the condemnation serves the public interest. If the Commission approves the utility's application for condemnation, the amount of money to which you are entitled will be determined by a local Board of View of the Court of Common Pleas. However, you may at any time make an agreement with the utility as to the amount of damages you are to be paid.

NOTICE
RIGHT OF WAY MAINTENANCE PRACTICES

The Pennsylvania Public Utility Commission requires that PPL Electric Utilities Corporation give you the following information on the RIGHT OF WAY MAINTENANCE PRACTICES for the 138/69kv line:

The methods currently used by PPL Electric Utilities Corporation are set forth in PPL Electric Utilities Corporation "Program for Vegetation Management", which will be made available to you for your inspection upon request. If you wish further information concerning right of way maintenance methods, you may contact the person named on the cover letter. You may discuss with this person, either before or during negotiation of the right of way agreement, these methods and any other questions you may have about right of way maintenance.

Once a utility has constructed an electric transmission line on a right of way across your land, the utility must maintain the right of way free of tall growing trees and brush which might impair the reliability of electric service, the safety of the line, and access to the line or its towers. The utility or its contractors may remove and control tall growing trees and brush by several methods: handcutting of trees, limbs and brush; mechanical cutting with chain saws or motorized cutting machines; application of herbicides, either from the ground or from a helicopter. The utility must confine its maintenance activities to the approved right of way across your land, except where tall growing trees or brush or their root systems grow into the right of way from adjoining land and constitute a threat to the electric transmission line and its structures.

If you believe that the maintenance method(s) used by the company would raise problems with your use of your land adjacent to the right of way, it is your responsibility as the landowner to bring this to the attention of the utility before you sign the right of way agreement.

The utility company has the responsibility to maintain its right of way, and regular maintenance must occur. Although you as the landowner cannot determine whether or not maintenance will occur, your right of way agreement may specify certain conditions on the performance of the maintenance program which are important to you. These conditions can be part of the negotiations between you and the utility company for your land, since a right of way agreement is a legal contract between a landowner and a utility company. It is important for you to understand also that the maintenance methods used by the utility company may change over time as the costs of maintenance or the methods of performing maintenance change. You may want to specify in your right of way agreement that the utility company inform you of changes in its maintenance methods or in the maintenance schedule for your land.

The provisions of the right of way agreement are enforceable in the local Court of Common Pleas. The right of way agreement cannot be enforced by the Pennsylvania Public Utility Commission. Any claims for damages resulting from improper maintenance of the right of way must be settled with the utility, its contractors, or in the local Court of Common Pleas at your own expense. The Commission cannot award damages for violations of the right of way agreement.

Internal Practices for Dealing with the Public on Power Line Projects
PPL Electric Utilities

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- Act with integrity at all times.
- Treat people courteously and in a professional manner.
- Be forthright and honest in all actions and communications.
- Comply with applicable laws and regulations.
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NOTICE
LAND AGENT PRACTICES

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James P. Melia
Pennsylvania Public Utility Commission
400 North Street
Harrisburg PA 17105
717-787-1859
jmelia@state.pa.us

Sonny Popowsky
Pennsylvania Consumer Advocate
Pennsylvania Office of Consumer Advocate
555 Walnut Street
5th Floor Forum Place
Harrisburg, PA 17101-1923
Phone: 717-783-5048 or toll free 800-684-6560 (PA only)
Fax: 717-783-7152
Email: consumer@paoca.org

BROCHURE ON ELECTROMAGNETIC FIELDS

PPL's Position on EMF

PPL takes a reasoned, prudent approach in responding to the EMF issue. PPL has a magnetic field management program to design and build new lines when practicable in ways that allow us to reduce magnetic fields at low cost to our customers. For instance, we reverse the phases of new overhead double-circuit transmission lines, which results in some cancellation of magnetic fields from the line and lowers the magnetic fields at the edge of the right of way. PPL also is increasing ground clearances for transmission lines.

On distribution lines, we're reducing magnetic fields at ground level by using taller poles. Magnetic field management is considered in the process we use to site new facilities, balancing cost and function with land use and environmental concerns. PPL has supported EMF research, both through financial contributions to national organizations and actual participation by PPL employees and customers.

We're also providing information to customers and others interested in the subject. EMF coordinators have been assigned to serve as local contact points for EMF inquiries. PPL representatives are available to talk with groups interested in EMF. PPL also has an EMF issue manager who directs all aspects of the company's EMF program.

Frequently Asked Questions about EMF

From time to time, some of our customers ask us about EMF — electric and magnetic fields. We have compiled common questions and answers, which we hope you will find helpful. If you have additional questions, please don't hesitate to ask us.

Q. What are electric and magnetic fields?
A. Electric and magnetic fields are present wherever there is a flow of electric current, whether in wires in the home, electrical appliances or power lines. Electric fields are produced by the voltage or electrical pressure in a wire and are present as long as an appliance is connected to a source of electricity — even if an appliance is turned off. Magnetic fields are produced whenever there is a flow of electric current through a wire. Electric and magnetic fields are not visible, like other fields such as a gravitational field or a temperature field.

Q. Are EMF the same as X-rays or microwaves?
A. No. Electric and magnetic fields are very low in energy compared with much stronger X-rays or microwaves. X-rays have enough power to dislodge electrons, and microwaves can be strong enough to heat objects. Electric power EMF do not have enough energy to do those things. EMF from power lines, electrical wiring and appliances have a frequency of 60 hertz, which means they alternate, or go back and forth, 60 times a second. On the other hand, microwaves alternate billions of times a second, and X-rays alternate even faster than that.

Q. How do magnetic fields associated with power lines compare with fields from other sources in our everyday environments?
A. The chart shows some typical magnetic field levels around power lines and other common sources. The standard unit of measurement is called a milligauss, or mG. Common indoor sources of magnetic fields include appliances, electronic equipment, household wiring and currents that may flow on water pipes or telephone cables. Fields from some sources inside a home can be higher than the fields from power lines outside. Note how the strength of the field becomes lower as you move away from the source.

Q. Does putting power lines underground reduce magnetic field exposures?
A. Yes and no. It depends on distance from the line and how the line is configured — the earth itself does not shield magnetic fields. Magnetic field levels directly above a typical underground line may be about twice the levels from a typical overhead line carrying the same electrical load. This is because an underground line is usually buried only a few feet below the surface of the ground and is closer than an overhead line that is suspended well above the ground. The wires of an underground line usually are closer to each other than the wires of an overhead line, and thus cancel the magnetic fields to some extent. Some underground designs can reduce magnetic field levels further. All underground options can cost up to 10 times more than overhead construction.

Q. What about EMF and health?
A. Since the 1970s, many credible scientific panels, government agencies and public health entities have reviewed the scientific research on electric and magnetic fields. Evaluations have been conducted by the U.S. National Academy of Sciences, the U.S. National Institute of Environmental Health Sciences, the U.K. National Radiological Protection Board, the International Agency for Research on Cancer and the World Health Organization, among others. None of these review groups has found that there is a demonstrated cause and effect relationship between exposure to EMF and cancer or other diseases.

In 1999, the director of U.S. NIEHS sent a detailed report on EMF and health to the U.S. Congress. The NIEHS Report concluded that "the scientific evidence suggesting that extremely low frequency (ELF)-EMF exposures pose any risk is weak." The NIEHS report noted that while some epidemiology studies showed associations with some leukemias, there was no support for these findings in laboratory research. The NIEHS report concluded that "this finding is insufficient to warrant an aggressive regulatory concern." The NIEHS in 2002 issued updated information, which concluded that for most health outcomes there is no evidence of EMF causing adverse effects. However, the NIEHS said there is some evidence of an association with childhood leukemia, which is difficult to interpret without supporting laboratory evidence. The NIEHS 2002 update concludes that "although questions remain about the possibility of health effects related to EMF, recent reviews have substantially reduced the level of concern." NIEHS did not recommend regulatory action to reduce EMF levels. The NIEHS information about EMF can be found online at http://www.niehs.nih.gov/health/topics/agents/emf/.

Q. What does the latest research show on EMF?

A. The World Health Organization conducted an extensive review of EMF in 2007. This review concluded that there is "inadequate evidence" that EMF causes or contributes to almost all health endpoints, that based on "limited evidence" of an association from epidemiology studies, there is a "possible" relationship with childhood leukemia, and that a cause and effect relationship has not been established. On its Web site, WHO further emphasizes that: "Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields."

Q. Do EMF affect livestock, wildlife, crops or other plant life?

A. Many studies have been conducted in the laboratory and in the field to study the effects of EMF exposures on plants and wildlife. Research and years of operating experience have not shown that electric and magnetic fields cause any adverse effects in livestock, wildlife or plants. A group of researchers from Westinghouse Electric Co. and the Pennsylvania State University exposed more than 80 species of plants to power line electric fields at high intensities. No statistically significant differences were found between exposed and unexposed plants in seed germination, seedling emergence, seedling growth, leaf area for plant, flowering, seed production, biomass production and longevity. One response, damage to the leaf tips of sharp-pointed plants, was observed. Near the leaf tip of a sharply pointed plant, an electric field can be very high and can cause drying of the leaf tips. An extensive series of field experiments on plant responses has been carried out near 765,000-volt transmission lines and a variety of farm crops developed normally.

Q. How can a fluorescent light glow under a transmission line, even if it's not plugged into an electrical source?

A. If the electric field is sufficiently strong, it will stimulate the phosphors from the chemicals that coat the inside of the tube and cause them to glow slightly. A fluorescent tube also will glow when held near a car ignition or a radio transmitter, which typically produce enough electric field to cause a glow in a fluorescent light. Fluorescent lights sometimes can be made to glow by rubbing them with a glove or a dry hand, or by carrying them when sliding your feet across a rug.

Q. Have some states set exposure standards for EMF?
A. A few states have established limits for electric fields on transmission line right-of-ways: Florida, Minnesota, Montana, New Jersey, New York, North Dakota and Oregon. Only New York and Florida have established right-of-way limits for magnetic fields from new transmission lines. In 1990, New York established a 200-milligauss limit for transmission lines. In 1989, Florida established a 150-milligauss limit for 230,000-volt lines and smaller, and a 250-milligauss limit for 500,000-volt double-circuit transmission lines. Both the New York and Florida limits for new transmission lines were based on the maximum fields from the existing lines in those states at the time. Pennsylvania has not adopted any electric or magnetic field exposure limits.

Q. What is PPL doing about EMF?
A. PPL has a magnetic field management program to design and build new lines when practicable in ways that allow us to reduce magnetic fields at low cost to our customers. For instance, we reverse the phases of new overhead double-circuit transmission lines, which results in some cancellation of magnetic fields from the line and lowers the magnetic fields at the edge of the right of way. PPL also is increasing ground clearances for transmission lines. On distribution lines, we're reducing magnetic fields at ground level by using taller poles. Magnetic field management is considered in the process we use to site new facilities, balancing cost and function with land use and environmental concerns. PPL has supported EMF research, both through financial contributions to national organizations and actual participation in research by PPL employees and customers. We're also providing information to customers and others interested in the subject. EMF coordinators have been assigned to serve as local contact points for EMF inquiries. PPL representatives are available to talk with groups interested in EMF. PPL also has an EMF issue manager who directs all aspects of the company's EMF program.

Q. Where can I get additional information on EMF?
A. PPL has an EMF coordinator near you who can provide additional technical background. Call 1-800-DIAL-PPL (1-800-342-5775), and you'll be referred to the coordinator in your area or to PPL's EMF issue manager, Jay Keeler. In addition to the NIEHS Web site http://www.niehs.nih.gov/health/topics/agents/emf/), other responsible organizations provide information about EMF, including the World Health Organization (www.who.int/peh-emf).

Magnetic field strengths decrease with distance

Magnetic fields are measured in milligauss

Source: National Institute of Environmental Health Sciences (2002)

	At 6 inches	At 1 foot	At 2 feet
Clothes dryer	2 to 10	* to 3	*
Microwave oven	100 to 300	1 to 200	1 to 30
Toaster	5 to 20	* to 7	*
Power drill	100 to 200	20 to 40	3 to 6
Can opener	500 to 1500	40 to 300	3 to 30
Mixer	30 to 600	5 to 100	* to 10
Hair dryer	1 to 700	* to 70	* to 10
Color television	Data not available	* to 20	* to 8

BROCHURE ON VEGETATION MANAGEMENT

A new approach

Transmission power lines are the backbone of the regional electric grid, vital to our economic health and nation's security.

The Northeast blackout of 2003 demonstrated how closely managed the nation's transmission system needs to be operated and maintained.

As a result, PPL Electric Utilities developed changes to its transmission vegetation management program to safeguard system reliability and to comply with recently enacted federal reliability standards. These standards assume a "zero tolerance" for tree-related outages involving transmission lines and for tree "encroachments" near the overhead high-voltage power lines.

Keeping trees away from transmission lines is essential. So the utility industry's best practices require a more proactive approach to ensuring clearance under our transmission facilities. This brochure will outline what PPL Electric Utilities must do to keep trees from causing a problem on the electric grid, so we can maintain the quality of electric service our customers expect.

Our commitment

We have a longstanding respect for the environment in how we operate as a business and in our community involvement. We respect the rights of property owners, will keep customers informed about any planned work and will perform only work that we believe is absolutely necessary.

Compliance with federal reliability standards

Under federal reliability standards, certain clearances must be maintained between overhead power lines and any vegetation. In response, PPL Electric Utilities agreed to follow an industry best practice referred to as Wire Zone-Border Zone.

While we may have only selectively pruned tall-growing trees away from the transmission lines in the past, tree species that may have been allowed in certain locations previously will be cleared so no trees are allowed to grow directly under the lines.

What is Wire Zone-Border Zone?

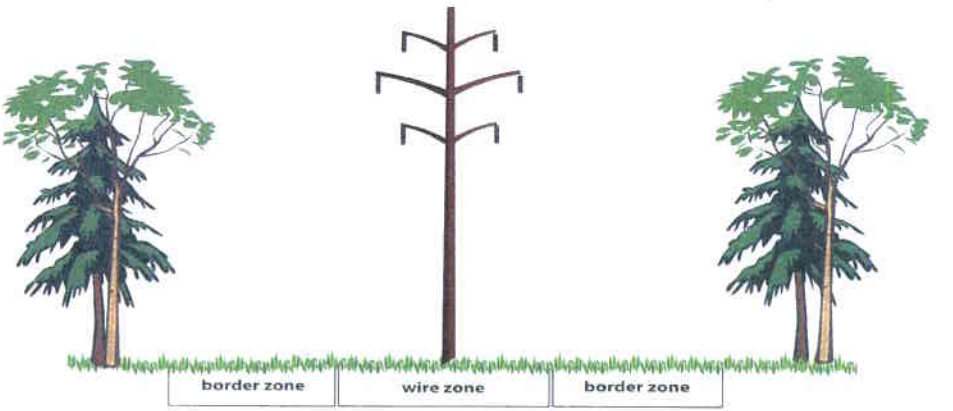
The wire zone is the area directly under the power lines. Trees are typically removed from the wire zone because they are incompatible with high-voltage wires. Over time, low-growing grasses and other species native to the area will be permitted.

In the border zone, small trees and certain shrubs will be allowed to grow back over time if they do not pose a risk to power reliability.

PPL Electric Utilities does not remove or dispose of any vegetation from transmission rights of way after cutting. These materials are left for the property owner. In some areas, like hillsides, leaving cut vegetation can protect against erosion.

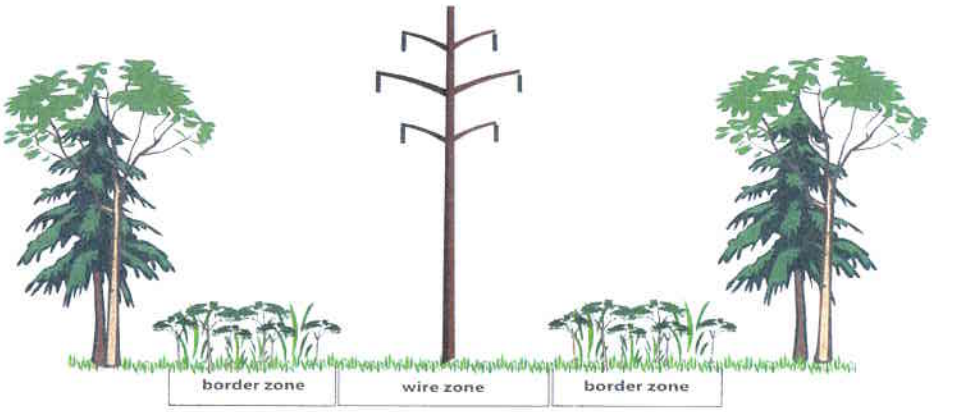
In some areas, we use herbicides to effectively manage undesirable vegetation conditions along our power lines. We only use herbicide products that have been approved for use by the U.S. Environmental Protection Agency. Some of the materials our contractors will use are the same as those commonly used by homeowners.

Property immediately after work



The wire zone extends 10 feet from the outermost wire. The border zone extends from the edge of the wire zone to the edge of our right of way. Initially, we are clearing vegetation from both zones.

Property over time



However, we will permit small trees and certain shrubs to grow back in the border zone in coming years if they do not pose a reliability risk.

An award-winning program

PPL Electric Utilities is a proud recipient of the Tree Line USA® award from the Arbor Day Foundation and the National Association of State Foresters. The groups seek to promote proper utility arboriculture and public education through the following five areas: annual worker training; quality tree care; tree planting and public education; energy conservation; and collaboration with community groups. For information about planting the right tree in the right place, visit *www.arborday.org*.

TREE LINE USA
Arbor Day Foundation

A number of state and federal agencies have established sound integrated vegetation management practices as the standard for utility rights of way. These practices involve regular surveying, tree pruning, mowing and herbicides to control invasive plant species and promote greater plant diversity.

The desired outcome is the development of areas with native grasses and low-lying shrubs that cannot interfere with overhead power lines.

Likewise, PPL Electric Utilities works with state and local conservation, land management and environmental groups to advance common goals of electric reliability and environmental stewardship.

Vegetation management is critical to electric reliability

Our customers depend on reliable power, and vegetation management is a critical part of maintaining the reliability of our delivery system.

PPL Electric Utilities operates 1,351 miles of higher-voltage transmission lines that are considered part of the nation's "bulk electric system." Our maintenance of these power lines falls under the jurisdiction of the Federal Energy Regulatory Commission, or FERC, and its enforcement arm, the North American Electric Reliability Corporation, known as NERC. Following the massive blackout in 2003, these two authorities developed strict new reliability standards and stiff penalties for utilities that do not comply.

Transmission lines are interconnected regionally, so power can move long distances from power plants to local communities. It is vital that trees cannot pose any threat to the transmission lines. Tree contact with high-voltage lines can result in widespread power outages.

Now, PPL Electric Utilities' vegetation management program is intended to ensure reliability as well as compliance with these federal reliability standards.

For more information, call 1-877-528-2889, e-mail us at *PPLVegetationManagement@pplweb.com* or visit *www.pplweb.com/vegetation*.

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PPL Electric Utilities

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Transmission Line Vegetation Management

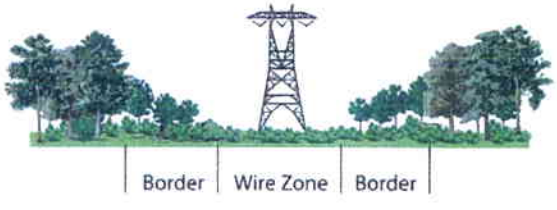
Keeping electricity reliability strong

Audubon PENNSYLVANIA

PPL Rights-of-way as Bird Habitat

Golden-winged Warbler. Photo ©Laurie Smaglick Johnson

Federal guidelines make it necessary to clear the areas under power lines (Wire Zone) in utility rights-of-way, but the area bordering the wire zone (the "Border Zone") can be planted with plants compatible with those guidelines and managed to control vegetation while providing critical habitat to birds and other wildlife. With the right plants and targeted management, Border Zones can become and remain early successional scrubland (scrub-shrub), a habitat that is important to several bird species of conservation concern in Pennsylvania and other parts of the northeast.



Scrub-Shrub Habitat

When an old field is left unmanaged, woody shrubs become established, which eventually give way to small trees and, ultimately, forest. Scrub-shrub or "successional" habitat refers to the middle time period when shrubs and small trees dominate. A host of bird species, including ruffed grouse, brown thrasher, eastern towhee, field sparrow, and golden-winged warbler, are dependent on these transitional habitats.

Planting and Managing Scrub-Shrub Habitat

Typically scrub-shrub habitat is only a temporary condition before conversion to forest. In areas near power lines, however, it is necessary to keep vegetation height low in perpetuity. This can be accomplished by planting compatible species and selectively removing saplings of large trees. Removing invasive plants like multiflora rose and honeysuckle will allow native shrubs (see compatible list below), which provide nutritious berries and seeds, to flourish. Habitat that includes a variety of species and heights will produce the best habitat for many bird species, so selective removal of individuals from areas where one species dominates may be considered.

Scrub-shrub habitat at forest edge. Photo ©Laurie Smaglick Johnson

Compatible Plant Species

The following list of native plants are appropriate for planting in Border Zones and provide cover and food to desirable birds and native plants noted above.

Small trees
Flowering dogwood
Redbud
Hawthorn
American Hornbeam
Serviceberry
Eastern Red Cedar
American Chestnut
Dwarf Willow
Winterberry Holly

Large shrubs
Alder
Witch-hazel
Spicebush
Common Chokecherry
Elderberry
Rhododendron
Viburnum
Dogwood
Sumac species
Chokeberry

Small shrubs
Mountain laurel
American Yew
Sweetfern
Trumpet Honeysuckle
Huckleberries
Blueberries
Viburnums
Meadowsweet (Spirea)
Wintergreen
Trailing Arbutus
Blackberry (Allegheny)
Raspberry
Hazelnut
Scrub Oak species

All native grasses, ferns, herbaceous plants

For more information, go to http://pa.audubon.org/habitat

GLOSSARY OF COMMON REAL ESTATE TERMS

ABSTRACT OF TITLE – The condensed history of ownership to a particular parcel of real estate, consisting of a summary of ownership from a given time to the present owner.

ACRE – A measure of land equal to 43,560 square feet.

APPRAISAL – An estimate of the value of property. The process through which conclusions of property value are reached.

APPRECIATION – An increase in the worth or value of a property.

CHAIN OF TITLE – A history of ownership of a particular property (see abstract of title).

CONDEMNATION – A judicial or administrative proceeding to exercise the power of eminent domain through which private property is taken for public use.

CONDUCTOR – The wire which carries electric energy.

CONVEYANCE – A transfer of property ownership.

DEED – A written document that, when executed and delivered, conveys title to or an interest in real estate.

DEED RESTRICTIONS – Clauses in a deed limiting the use of the property.

DEPRECIATION – A loss of value in property.

EASEMENT – A right to use the land of another for a specific purpose. (Such as a right of way for utilities.)

EGRESS – The right to exit a tract of land.

EMINENT DOMAIN – The right of a government, municipal body or public utility to acquire property for public use. (See condemnation)

ENCROACHMENT – An intrusion, such as a house, sign, wall or fence, that intrudes on another's property or right of way.

FAIR MARKET VALUE – The highest price which a willing buyer would pay and the lowest price a willing seller would accept.

FEE OR FEE SIMPLE – The complete and absolute ownership of real estate.

GRANT – The transfer of property rights through a legal document.

GRANTEE – One who acquires property or any property rights from another person.

GRANTOR – One who transfers property or any property rights to another person.

INGRESS – The right to enter a tract of land.

KV – Kilovolt or 1000 volts (138 KV = 138 x 1000)

LIEN – A claim against real or personal property for satisfaction of a debt.

METES-AND-BOUNDS DESCRIPTION – A legal description of a parcel of land that begins at a well – marked point and follows the boundaries, using directions and distances.

MONUMENT – A fixed natural or artificial object used to establish real estate boundaries.

OPTION – The right to purchase a certain property at stated terms, price and time.

RECORDING – The act of entering documents in the Recorder of Deeds office established in each county.

RIGHT OF WAY – Used interchangeably with the word easement. (See easement)

SURVEY – The process of scientifically measuring the quantity and location of a parcel of land.

TAX MAP – Maps used by the county Tax Assessment office showing the locations of properties.

TITLE – The evidence of ownership of land.

ZONING – The regulation of the use of land and/or buildings.

NON-NEGOTIATING PACKET

Packet of Information Provided to Landowners Adjacent to the Right-of-Way from whom PPL Electric is Not Attempting to Acquire Right-of-Way

DATE

Customer Name and Address

Dear

PPL Electric Utilities Corporation (PPL) is planning to build an electric transmission line, Jackson-Lake Naomi 138/69 KV Tap, in Pocono and Jackson Townships, Monroe County, Pennsylvania. The upgrade is needed to prevent overloads from occurring and ensure reliable electric service to customers in this region. Since your property is adjacent to the right-of-way for the new Jackson-Lake Naomi Tap, I am writing to notify you of the proposed project as required by the Pennsylvania Public Utility Commission.

Enclosed are two notices required by the Pennsylvania Public Utility Commission that provide important information regarding right-of-way maintenance practices and land agents conduct. Also enclosed is PPL's Internal Practices for Dealing with the Public on Power Line Projects. For your convenience, I also have enclosed information on electromagnetic fields and a brochure on vegetation management, as well as a glossary of real estate terms.

If you have any questions on any of the enclosed information, please contact me at XXX-XXX-XXXX.

I kindly request that you sign in the space provided below to indicate that you have received this information.

Very truly yours,

Agents Name

PPL Senior Real Estate Specialist

I acknowledge receiving the information referred to in the letter above and understand that it does not obligate me in any way.

_____

Date _____

Phone _____

Attachments:
Notification of Right-of-Way Maintenance Practices
Internal Practices for Dealing with the Public on Power Line Project
Notification Regarding Land Agent Practices
Brochure on Electromagnetic Fields
Brochure on Vegetation Management
Glossary of Real Estate Terms

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James P. Melia
Pennsylvania Public Utility Commission
400 North Street
Harrisburg PA 17105
717-787-1859
jmelia@state.pa.us

Sonny Popowsky
Pennsylvania Consumer Advocate
Pennsylvania Office of Consumer Advocate
555 Walnut Street
5th Floor Forum Place
Harrisburg, PA 17101-1923
Phone: 717-783-5048 or toll free 800-684-6560 (PA only)
Fax: 717-783-7152
Email: consumer@paoca.org

BROCHURE ON ELECTROMAGNETIC FIELDS

PPL's Position on EMF

PPL takes a reasoned, prudent approach in responding to the EMF issue. PPL has a magnetic field management program to design and build new lines when practicable in ways that allow us to reduce magnetic fields at low cost to our customers. For instance, we reverse the phases of new overhead double-circuit transmission lines, which results in some cancellation of magnetic fields from the line and lowers the magnetic fields at the edge of the right of way. PPL also is increasing ground clearances for transmission lines.

On distribution lines, we're reducing magnetic fields at ground level by using taller poles. Magnetic field management is considered in the process we use to site new facilities, balancing cost and function with land use and environmental concerns. PPL has supported EMF research, both through financial contributions to national organizations and actual participation by PPL employees and customers.

We're also providing information to customers and others interested in the subject. EMF coordinators have been assigned to serve as local contact points for EMF inquiries. PPL representatives are available to talk with groups interested in EMF. PPL also has an EMF issue manager who directs all aspects of the company's EMF program.

Frequently Asked Questions about EMF

From time to time, some of our customers ask us about EMF — electric and magnetic fields. We have compiled common questions and answers, which we hope you will find helpful. If you have additional questions, please don't hesitate to ask us.

Q. What are electric and magnetic fields?
A. Electric and magnetic fields are present wherever there is a flow of electric current, whether in wires in the home, electrical appliances or power lines. Electric fields are produced by the voltage or electrical pressure in a wire and are present as long as an appliance is connected to a source of electricity — even if an appliance is turned off. Magnetic fields are produced whenever there is a flow of electric current through a wire. Electric and magnetic fields are not visible, like other fields such as a gravitational field or a temperature field.

Q. Are EMF the same as X-rays or microwaves?
A. No. Electric and magnetic fields are very low in energy compared with much stronger X-rays or microwaves. X-rays have enough power to dislodge electrons, and microwaves can be strong enough to heat objects. Electric power EMF do not have enough energy to do those things. EMF from power lines, electrical wiring and appliances have a frequency of 60 hertz, which means they alternate, or go back and forth, 60 times a second. On the other hand, microwaves alternate billions of times a second, and X-rays alternate even faster than that.

Q. How do magnetic fields associated with power lines compare with fields from other sources in our everyday environments?
A. The chart shows some typical magnetic field levels around power lines and other common sources. The standard unit of measurement is called a milligauss, or mG. Common indoor sources of magnetic fields include appliances, electronic equipment, household wiring and currents that may flow on water pipes or telephone cables. Fields from some sources inside a home can be higher than the fields from power lines outside. Note how the strength of the field becomes lower as you move away from the source.

Q. Does putting power lines underground reduce magnetic field exposures?
A. Yes and no. It depends on distance from the line and how the line is configured — the earth itself does not shield magnetic fields. Magnetic field levels directly above a typical underground line may be about twice the levels from a typical overhead line carrying the same electrical load. This is because an underground line is usually buried only a few feet below the surface of the ground and is closer than an overhead line that is suspended well above the ground. The wires of an underground line usually are closer to each other than the wires of an overhead line, and thus cancel the magnetic fields to some extent. Some underground designs can reduce magnetic field levels further. All underground options can cost up to 10 times more than overhead construction.

Q. What about EMF and health?
A. Since the 1970s, many credible scientific panels, government agencies and public health entities have reviewed the scientific research on electric and magnetic fields. Evaluations have been conducted by the U.S. National Academy of Sciences, the U.S. National Institute of Environmental Health Sciences, the U.K. National Radiological Protection Board, the International Agency for Research on Cancer and the World Health Organization, among others. None of these review groups has found that there is a demonstrated cause and effect relationship between exposure to EMF and cancer or other diseases.

In 1999, the director of U.S. NIEHS sent a detailed report on EMF and health to the U.S. Congress. The NIEHS Report concluded that "the scientific evidence suggesting that extremely low frequency (ELF)-EMF exposures pose any risk is weak." The NIEHS report noted that while some epidemiology studies showed associations with some leukemias, there was no support for these findings in laboratory research. The NIEHS report concluded that "this finding is insufficient to warrant an aggressive regulatory concern." The NIEHS in 2002 issued updated information, which concluded that for most health outcomes there is no evidence of EMF causing adverse effects. However, the NIEHS said there is some evidence of an association with childhood leukemia, which is difficult to interpret without supporting laboratory evidence. The NIEHS 2002 update concludes that "although questions remain about the possibility of health effects related to EMF, recent reviews have substantially reduced the level of concern." NIEHS did not recommend regulatory action to reduce EMF levels. The NIEHS information about EMF can be found online at http://www.niehs.nih.gov/health/topics/agents/emf/.

Q. What does the latest research show on EMF?

A. The World Health Organization conducted an extensive review of EMF in 2007. This review concluded that there is "inadequate evidence" that EMF causes or contributes to almost all health endpoints, that based on "limited evidence" of an association from epidemiology studies, there is a "possible" relationship with childhood leukemia, and that a cause and effect relationship has not been established. On its Web site, WHO further emphasizes that: "Based on a recent in-depth review of the scientific literature, the WHO concluded that current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields."

Q. Do EMF affect livestock, wildlife, crops or other plant life?

A. Many studies have been conducted in the laboratory and in the field to study the effects of EMF exposures on plants and wildlife. Research and years of operating experience have not shown that electric and magnetic fields cause any adverse effects in livestock, wildlife or plants. A group of researchers from Westinghouse Electric Co. and the Pennsylvania State University exposed more than 80 species of plants to power line electric fields at high intensities. No statistically significant differences were found between exposed and unexposed plants in seed germination, seedling emergence, seedling growth, leaf area for plant, flowering, seed production, biomass production and longevity. One response, damage to the leaf tips of sharp-pointed plants, was observed. Near the leaf tip of a sharply pointed plant, an electric field can be very high and can cause drying of the leaf tips. An extensive series of field experiments on plant responses has been carried out near 765,000-volt transmission lines and a variety of farm crops developed normally.

Q. How can a fluorescent light glow under a transmission line, even if it's not plugged into an electrical source?

A. If the electric field is sufficiently strong, it will stimulate the phosphors from the chemicals that coat the inside of the tube and cause them to glow slightly. A fluorescent tube also will glow when held near a car ignition or a radio transmitter, which typically produce enough electric field to cause a glow in a fluorescent light. Fluorescent lights sometimes can be made to glow by rubbing them with a glove or a dry hand, or by carrying them when sliding your feet across a rug.

Q. Have some states set exposure standards for EMF?
A. A few states have established limits for electric fields on transmission line right-of-ways: Florida, Minnesota, Montana, New Jersey, New York, North Dakota and Oregon. Only New York and Florida have established right-of-way limits for magnetic fields from new transmission lines. In 1990, New York established a 200-milligauss limit for transmission lines. In 1989, Florida established a 150-milligauss limit for 230,000-volt lines and smaller, and a 250-milligauss limit for 500,000-volt double-circuit transmission lines. Both the New York and Florida limits for new transmission lines were based on the maximum fields from the existing lines in those states at the time. Pennsylvania has not adopted any electric or magnetic field exposure limits.

Q. What is PPL doing about EMF?
A. PPL has a magnetic field management program to design and build new lines when practicable in ways that allow us to reduce magnetic fields at low cost to our customers. For instance, we reverse the phases of new overhead double-circuit transmission lines, which results in some cancellation of magnetic fields from the line and lowers the magnetic fields at the edge of the right of way. PPL also is increasing ground clearances for transmission lines. On distribution lines, we're reducing magnetic fields at ground level by using taller poles. Magnetic field management is considered in the process we use to site new facilities, balancing cost and function with land use and environmental concerns. PPL has supported EMF research, both through financial contributions to national organizations and actual participation in research by PPL employees and customers. We're also providing information to customers and others interested in the subject. EMF coordinators have been assigned to serve as local contact points for EMF inquiries. PPL representatives are available to talk with groups interested in EMF. PPL also has an EMF issue manager who directs all aspects of the company's EMF program.

Q. Where can I get additional information on EMF?
A. PPL has an EMF coordinator near you who can provide additional technical background. Call 1-800-DIAL-PPL (1-800-342-5775), and you'll be referred to the coordinator in your area or to PPL's EMF issue manager, Jay Keeler. In addition to the NIEHS Web site http://www.niehs.nih.gov/health/topics/agents/emf/), other responsible organizations provide information about EMF, including the World Health Organization (www.who.int/peh-emf).

Magnetic field strengths decrease with distance

Magnetic fields are measured in milligauss

Source: National Institute of Environmental Health Sciences (2002)

	At 6 inches	At 1 foot	At 2 feet
Clothes dryer	2 to 10	* to 3	*
Microwave oven	100 to 300	1 to 200	1 to 30
Toaster	5 to 20	* to 7	*
Power drill	100 to 200	20 to 40	3 to 6
Can opener	500 to 1500	40 to 300	3 to 30
Mixer	30 to 600	5 to 100	* to 10
Hair dryer	1 to 700	* to 70	* to 10
Color television	Data not available	* to 20	* to 8

BROCHURE ON VEGETATION MANAGEMENT

A new approach

Transmission power lines are the backbone of the regional electric grid, vital to our economic health and nation's security.

The Northeast blackout of 2003 demonstrated how closely managed the nation's transmission system needs to be operated and maintained.

As a result, PPL Electric Utilities developed changes to its transmission vegetation management program to safeguard system reliability and to comply with recently enacted federal reliability standards. These standards assume a "zero tolerance" for tree-related outages involving transmission lines and for tree "encroachments" near the overhead high-voltage power lines.

Keeping trees away from transmission lines is essential. So the utility industry's best practices require a more proactive approach to ensuring clearance under our transmission facilities. This brochure will outline what PPL Electric Utilities must do to keep trees from causing a problem on the electric grid, so we can maintain the quality of electric service our customers expect.

Our commitment

We have a longstanding respect for the environment in how we operate as a business and in our community involvement. We respect the rights of property owners, will keep customers informed about any planned work and will perform only work that we believe is absolutely necessary.

Compliance with federal reliability standards

Under federal reliability standards, certain clearances must be maintained between overhead power lines and any vegetation. In response, PPL Electric Utilities agreed to follow an industry best practice referred to as Wire Zone-Border Zone.

While we may have only selectively pruned tall-growing trees away from the transmission lines in the past, tree species that may have been allowed in certain locations previously will be cleared so no trees are allowed to grow directly under the lines.

What is Wire Zone-Border Zone?

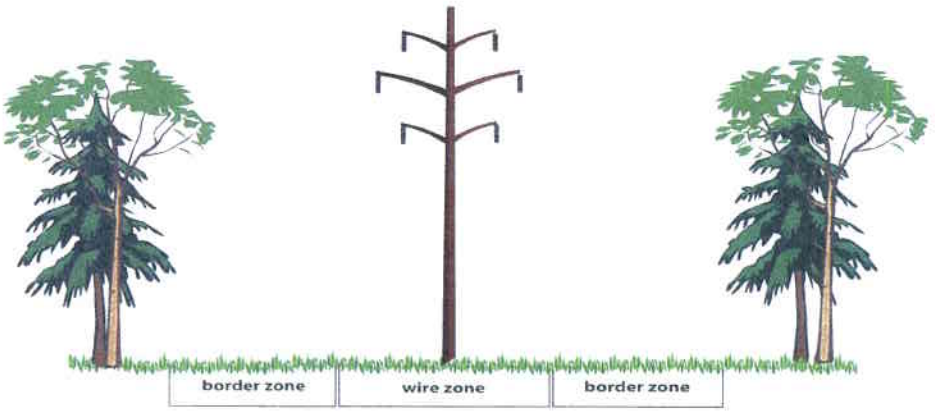
The wire zone is the area directly under the power lines. Trees are typically removed from the wire zone because they are incompatible with high-voltage wires. Over time, low-growing grasses and other species native to the area will be permitted.

In the border zone, small trees and certain shrubs will be allowed to grow back over time if they do not pose a risk to power reliability.

PPL Electric Utilities does not remove or dispose of any vegetation from transmission rights of way after cutting. These materials are left for the property owner. In some areas, like hillsides, leaving cut vegetation can protect against erosion.

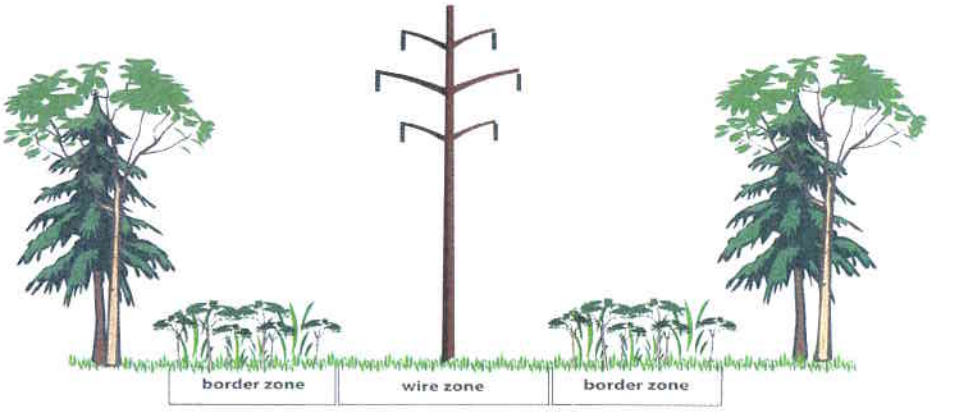
In some areas, we use herbicides to effectively manage undesirable vegetation conditions along our power lines. We only use herbicide products that have been approved for use by the U.S. Environmental Protection Agency. Some of the materials our contractors will use are the same as those commonly used by homeowners.

Property immediately after work



The wire zone extends 10 feet from the outermost wire. The border zone extends from the edge of the wire zone to the edge of our right of way. Initially, we are clearing vegetation from both zones.

Property over time



However, we will permit small trees and certain shrubs to grow back in the border zone in coming years if they do not pose a reliability risk.

An award-winning program

PPL Electric Utilities is a proud recipient of the Tree Line USA® award from the Arbor Day Foundation and the National Association of State Foresters. The groups seek to promote proper utility arboriculture and public education through the following five areas: annual worker training; quality tree care; tree planting and public education; energy conservation; and collaboration with community groups. For information about planting the right tree in the right place, visit *www.arborday.org*.

TREE LINE USA.
Arbor Day Foundation

A number of state and federal agencies have established sound integrated vegetation management practices as the standard for utility rights of way. These practices involve regular surveying, tree pruning, mowing and herbicides to control invasive plant species and promote greater plant diversity.

The desired outcome is the development of areas with native grasses and low-lying shrubs that cannot interfere with overhead power lines.

Likewise, PPL Electric Utilities works with state and local conservation, land management and environmental groups to advance common goals of electric reliability and environmental stewardship.

Vegetation management is critical to electric reliability

Our customers depend on reliable power, and vegetation management is a critical part of maintaining the reliability of our delivery system.

PPL Electric Utilities operates 1,351 miles of higher-voltage transmission lines that are considered part of the nation's "bulk electric system." Our maintenance of these power lines falls under the jurisdiction of the Federal Energy Regulatory Commission, or FERC, and its enforcement arm, the North American Electric Reliability Corporation, known as NERC. Following the massive blackout in 2003, these two authorities developed strict new reliability standards and stiff penalties for utilities that do not comply.

Transmission lines are interconnected regionally, so power can move long distances from power plants to local communities. It is vital that trees cannot pose any threat to the transmission lines. Tree contact with high-voltage lines can result in widespread power outages.

Now, PPL Electric Utilities' vegetation management program is intended to ensure reliability as well as compliance with these federal reliability standards.

For more information, call 1-877-528-2889, e-mail us at *PPLVegetationManagement@pplweb.com* or visit *www.pplweb.com/vegetation*.

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Transmission Line Vegetation Management

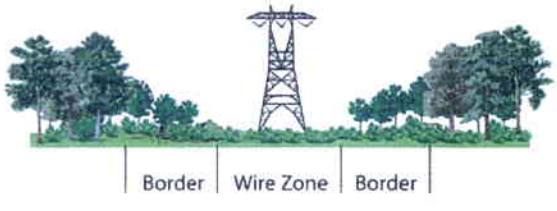
Keeping electricity reliability strong

Audubon PENNSYLVANIA

PPL Rights-of-way as Bird Habitat

Golden-winged Warbler. Photo ©Laurie Smaglick Johnson

Federal guidelines make it necessary to clear the areas under power lines (Wire Zone) in utility rights-of-way, but the area bordering the wire zone (the "Border Zone") can be planted with plants compatible with those guidelines and managed to control vegetation while providing critical habitat to birds and other wildlife. With the right plants and targeted management, Border Zones can become and remain early successional scrubland (scrub-shrub), a habitat that is important to several bird species of conservation concern in Pennsylvania and other parts of the northeast.



Scrub-Shrub Habitat

When an old field is left unmanaged, woody shrubs become established, which eventually give way to small trees and, ultimately, forest. Scrub-shrub or "successional" habitat refers to the middle time period when shrubs and small trees dominate. A host of bird species, including ruffed grouse, brown thrasher, eastern towhee, field sparrow, and golden-winged warbler, are dependent on these transitional habitats.

Planting and Managing Scrub-Shrub Habitat

Typically scrub-shrub habitat is only a temporary condition before conversion to forest. In areas near power lines, however, it is necessary to keep vegetation height low in perpetuity. This can be accomplished by planting compatible species and selectively removing saplings of large trees. Removing invasive plants like multiflora rose and honeysuckle will allow native shrubs (see compatible list below), which provide nutritious berries and seeds, to flourish. Habitat that includes a variety of species and heights will produce the best habitat for many bird species, so selective removal of individuals from areas where one species dominates may be considered.

Scrub-shrub habitat at forest edge. Photo ©Laurie Smaglick Johnson

Compatible Plant Species

The following list of native plants are appropriate for planting in Border Zones and provide cover and food to desirable birds and native plants noted above.

Small trees
Flowering dogwood
Redbud
Hawthorn
American Hornbeam
Serviceberry
Eastern Red Cedar
American Chestnut
Dwarf Willow
Winterberry Holly

Large shrubs
Alder
Witch-hazel
Spicebush
Common Chokecherry
Elderberry
Rhododendron
Viburnum
Dogwood
Sumac species
Chokeberry

Small shrubs
Mountain laurel
American Yew
Sweetfern
Trumpet Honeysuckle
Huckleberries
Blueberries
Viburnums
Meadowsweet (Spirea)
Wintergreen
Trailing Arbutus
Blackberry (Allegheny)
Raspberry
Hazelnut
Scrub Oak species

All native grasses, ferns, herbaceous plants

For more information, go to http://pa.audubon.org/habitat

GLOSSARY OF COMMON REAL ESTATE TERMS

ABSTRACT OF TITLE – The condensed history of ownership to a particular parcel of real estate, consisting of a summary of ownership from a given time to the present owner.

ACRE – A measure of land equal to 43,560 square feet.

APPRAISAL – An estimate of the value of property. The process through which conclusions of property value are reached.

APPRECIATION – An increase in the worth or value of a property.

CHAIN OF TITLE – A history of ownership of a particular property (see abstract of title).

CONDEMNATION – A judicial or administrative proceeding to exercise the power of eminent domain through which private property is taken for public use.

CONDUCTOR – The wire which carries electric energy.

CONVEYANCE – A transfer of property ownership.

DEED – A written document that, when executed and delivered, conveys title to or an interest in real estate.

DEED RESTRICTIONS – Clauses in a deed limiting the use of the property.

DEPRECIATION – A loss of value in property.

EASEMENT – A right to use the land of another for a specific purpose. (Such as a right of way for utilities.)

EGRESS – The right to exit a tract of land.

EMINENT DOMAIN – The right of a government, municipal body or public utility to acquire property for public use. (See condemnation)

ENCROACHMENT – An intrusion, such as a house, sign, wall or fence, that intrudes on another's property or right of way.

FAIR MARKET VALUE – The highest price which a willing buyer would pay and the lowest price a willing seller would accept.

FEE OR FEE SIMPLE – The complete and absolute ownership of real estate.

GRANT – The transfer of property rights through a legal document.

GRANTEE – One who acquires property or any property rights from another person.

GRANTOR – One who transfers property or any property rights to another person.

INGRESS – The right to enter a tract of land.

KV – Kilovolt or 1000 volts (138 KV = 138 x 1000)

LIEN – A claim against real or personal property for satisfaction of a debt.

METES-AND-BOUNDS DESCRIPTION – A legal description of a parcel of land that begins at a well – marked point and follows the boundaries, using directions and distances.

MONUMENT – A fixed natural or artificial object used to establish real estate boundaries.

OPTION – The right to purchase a certain property at stated terms, price and time.

RECORDING – The act of entering documents in the Recorder of Deeds office established in each county.

RIGHT OF WAY – Used interchangeably with the word easement. (See easement)

SURVEY – The process of scientifically measuring the quantity and location of a parcel of land.

TAX MAP – Maps used by the county Tax Assessment office showing the locations of properties.

TITLE – The evidence of ownership of land.

ZONING – The regulation of the use of land and/or buildings.

Attachment 14

ATTACHMENT 14
BLOOMING GROVE – JACKSON AND PECKVILLE – JACKSON 138/69 kV LINE
AGENCY PERMIT REQUIREMENTS

Agency	Permit, Approvals, or Documents	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
Local Agencies				
County Soil Conservation District (CCD) – Monroe CCD	Erosion and Sedimentation Control Plan (E&SC PLAN) approvals (coordinated through PADEP)	MCCD Approval anticipated by September 2012	Not Yet Submitted	Activities that require earth disturbance must institute practices that minimize accelerated erosion and resulting sediment pollution to the waters of the Commonwealth or US.
Commonwealth of Pennsylvania Agencies				
PA Department of Environmental Protection (PADEP)	Waters/wetlands Obstruction and Encroachment Permits (Chapter 105) and Floodplain Management Permit (Chapter 106) (Joint Permit Application for State Programmatic General Permit (PASPGP-4) from PADEP and USACE) Approval of Coverage under National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharges Associated with Construction Activities (Chapter 102) (likely Individual NPDES due to EV and HQ Watersheds)	- If General Permits (GP), PADEP review 3-4 months; permits anticipated by February/March 2013 - If JPA, PADEP review 9-12 months; permits anticipated by August/November 2013 PADEP NPDES Permit anticipated November 2012	Not Yet Submitted PADEP Chapter 105/106 Permit – submit after MCCD approval of E&SC Plan and PNDI clearance	• Activities in watercourses, floodways, bodies of water (incl. wetlands) (25 Pa. Code §105) • Floodplains obstructed by highways and public utilities (25 Pa. Code §106) • Discharge of storm water associated with construction activities (25 Pa. Codes § 92, National Pollutant Discharge Elimination System; § 93, Water Quality Standards; and §102, Erosion and Sediment Control).

Agency	Permit, Approvals, or Documents	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
PA Department of Conservation & Natural Resources (DCNR) – Bureau of Forestry (plants)	Consultation on-going - State rare, threatened, and endangered (RTE) species consultation and approvals; surveys for rare plants	DCNR Clearance anticipated by July 2012	PNDI response received - Plant survey to be conducted in Late Spring 2012	Determination of potential impact to state listed and candidate threatened & endangered species and habitat if present & impacted
PA Fish & Boat Commission (PFBC) (fish, reptiles, amphibians)	Consultation on-going - State rare, threatened, and endangered (RTE) species consultation and approvals; surveys for rattlesnake habitat	PFBC Clearance anticipated by September 2012	PNDI response received – Rattlesnake Phase 1 completed October 2011 – to be submitted to PFBC – Phase II assessment near Jackson Substation may be required (Spring/Summer 2012)	Same as above
PA Game Commission (birds & mammals)	Consultation complete – no impacts (see Attachment 7)	**Approved**	PNDI clearance letter received	Same as above
PA Historical & Museum Commission (PHMC)	Consultation complete – no impacts (see Attachment 12)	**Approved**	PHMC clearance letter received	Historic and cultural resources listed or eligible for listing on the State &/or Federal Natural Register of Historic Places.
PA Department of Transportation (PennDOT)	Various highway occupancy permits	PennDOT Permits anticipated by July 2012	Not Yet Submitted	Road crossings by utilities
PennDOT Bureau of Aviation (BOA)	PennDOT Notice of Proposed Construction or Alteration (Form AV-57)	PennDOT BOA Approval anticipated by July 2012	Not Yet Submitted	Notify BOA of transmission towers greater than 200 feet or within 20,000 feet of airport

Agency	Permit, Approvals, or Documents	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
PA Public Utility Commission (PUC)	Application for permission to site and construct transmission line	PUC Approval anticipated by February 2013	To be submitted February 2012	Construction of new transmission line
Federal Agencies				
US Army Corps of Engineers (USACE) – Philadelphia District	Clean Water Act permits for regulated water and wetland encroachments (Section 404) (Joint Permit Application for State Programmatic General Permit (PASPGP-4) from PADEP and USACE) Bog Turtle screening to be required	USACE Permits anticipated by February/March 2013 if GP; if JPA August/November 2013	Not Yet Submitted	Discharge of dredged or fill material into waters of the US
US Fish & Wildlife Service – State Ecological Services (USFWS)	Consultation on-going - Federal rare, threatened, and endangered (RTE) species reporting and compliance with Section 7 of Endangered Species Act for Federal permits, if necessary; surveys for bog turtle habitat (Phase 1) at minimum	USFWS Clearance anticipated by June 2012 if no habitat; If habitat noted, need Phase II survey that may extend clearance to August 2012	PNDI request received – - Phase I bog turtle habitat survey required of wetlands within ROW and 300-foot buffer around ROW. - Indiana bat assessment not required if tree-cutting is conducted between October 15 and March 31 when bats are hibernating. Otherwise, need to conduct Indiana bat survey by qualified surveyor using approved mist netting guidelines.	Determination of potential impact to Federal listed and candidate threatened & endangered species and habitat if present & impacted
Federal Aviation Administration (FAA)	FAA Notice of Proposed Construction or Alteration (Form 7460-1)	FAA Approval anticipated by July 2012	Not Yet Submitted	Notify FAA of transmission towers greater than 200 feet or within 20,000 feet of airport