

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

**RE: APPLICATION OF PPL ELECTRIC :
UTILITIES CORPORATION FILED :
PURSUANT TO 52 PA CODE CHAPTER :
57, SUBCHAPTER G, FOR APPROVAL :
OF THE SITING AND CONSTRUCTION : Docket No. A-2010- _____
OF THE EFFORT MOUNTAIN #1 & #2 :
138 KV TAPS IN CHESTNUTHILL AND :
POLK TOWNSHIPS, MONROE :
COUNTY, PENNSYLVANIA :**

APPLICATION OF PPL ELECTRIC UTILITES CORPORATION

TO THE PENNSYLVANIA PUBLIC UTILITY COMMISSION:

I. INTRODUCTION AND OVERVIEW

1. The Applicant is PPL Electric Utilities Corporation (“PPL Electric”), Two North Ninth Street, Allentown, Pennsylvania 18101.

2. PPL Electric is a Pennsylvania corporation which supplies electric distribution and provider of last resort electric supply services pursuant to the regulatory jurisdiction of the Pennsylvania Public Utility Commission (“Commission”) to approximately 1.4 million customers. Its service territory covers approximately 10,000 square miles in all or portions of twenty-nine counties in eastern and central Pennsylvania.

3. PPL Electric's attorneys are:

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

4. This Application is filed pursuant to Chapter 57, Subchapter G of the Commission's regulations at 52 Pa. Code §§ 57.71–57.77, governing the siting and construction of high voltage transmission lines, and seeks Commission approval for the siting and construction of the Effort Mountain #1 and #2 138 kV Taps ("Effort Mountain Taps"). The Effort Mountain Taps will be approximately 5.7 miles in length.

5. In conjunction with the proposed Effort Mountain #1 and #2 138 kV Taps, PPL Electric proposes to construct the new 138-12 kV Effort Mountain Substation in Chestnuthill

Township, Monroe County. PPL Electric, by separate petition, that will be filed in the near future, will ask the Commission to find that the control equipment building at that substation is reasonably necessary for the convenience or welfare of the public.

6. The proposed transmission line will originate at the PPL Electric's Siegfried-Jackson #1 & #2 138 kV Transmission Line in Chestnuthill Township, Monroe County and proceed to the proposed new Effort Mountain 138-12 Substation in Chestnuthill Township, Monroe County. In addition, a portion of the Effort Mountain Taps will pass through Polk Township, Monroe County.

7. The Effort Mountain Taps will be built for double circuit 138 kV operation although, initially, only one circuit will be installed on 4.6 miles of the transmission line. The remaining portion of the line, approximately 1.1 miles in length, will be constructed for double circuit 138 kV operation. One circuit will be operated at 138 kV, and the second circuit will be operated as a distribution line at 12 kV. The source for the line to be operated initially at 12 kV will be the proposed Effort Mountain Substation.

8. The purpose of the total project, which includes the Effort Mountain Taps, the proposed 138-12 kV Effort Mountain Substation and additional distribution facilities, is to relieve existing and projected overloaded conditions on distribution lines and transformers serving the Sun Valley/Jonas area.

9. In order to provide adequate and reliable service to the public, PPL Electric follows a system planning process that is designed to assure that its distribution and transmission systems are able to supply electricity to customers in a reliable and economic manner. PPL Electric distribution and transmission systems are designed to meet summer and winter peak conditions and provide service at acceptable voltage levels throughout the daily load cycle.

10. In order to meet these objectives, PPL Electric has adopted a defined set of planning standards. These standards are set forth in PPL Electric's Reliability Principles and Practices manual ("RP&P").

11. Due to load growth in the Sun Valley/Jonas area, facilities serving the area are operating during peak periods at or near their capacity. The principal affected facilities are the Meckesville 69-12 Substation and the 12 kV distribution lines that are supplied by it, the Meckesville 69-1 and 69-2 12 kV lines. These circuits have overloaded or will overload their normal planning guidelines by the fall of 2011. More specifically, the load on the Meckesville 69-1 12 kV line is projected to exceed normal planning guidelines in 2011 and the load on the Meckesville 69-2 12 kV line actually exceeded emergency planning guidelines in 2008. The loads on these distribution lines are expected to continue to exceed their applicable guidelines until new facilities are constructed to relieve loading conditions.

12. Continuing to operate these lines beyond their planning ratings will overheat the lines and anneal the conductors which could result in an outage of the facilities. Further, exceeding normal planning guidelines violates the planning standards in the RP&P.

13. Similarly, PPL Electric projects that the loads on the transformers at the 69-12 kV Meckesville Substation will exceed their normal planning guidelines commencing in 2011. Operating the transformers beyond their planning guidelines could result in extended outages until repairs could be made.

14. Ordinarily, PPL Electric would attempt to resolve outages in its distribution system by transferring load to other substations and circuits. In this area, however, only a small amount of load can be transferred because all of the other substations and circuits to which load could be transferred are operating at loads which approach their maximum capacities. Therefore,

transfers of significant load to nearby facilities, especially during periods when the area is experiencing peak loads, could cause the nearby circuits and transformers to fail.

15. A detailed description of the Effort Mountain Taps is provided in accompanying Exhibit E, the Engineering Description. Tangent poles, *i.e.*, poles with no line angle, on the proposed Effort Mountain Taps will consist of single poles equipped with steel upswept conductor support arms. Some tangent poles will be direct embedded. Other tangent poles, depending on span length, will require concrete foundations. Angle structures will be either single steel poles or two-pole steel structures depending on the severity of the line angle. All angle structures will be installed on concrete foundations. Some angle structures may be guyed. It is estimated that approximately 44 poles, with an average height of 100 feet will be required for the Effort Mountain Taps.

16. It is estimated that the cost to site, design and construct the overhead transmission facilities will be \$5,721,000. The total cost of the project, including the Effort Mountain 138-12 kV Substation and additional distribution facilities, is estimated to be \$8,755,000. Construction of the project should begin as soon as practical in order to meet an in-service date of November, 2011.

17. Accompanying this Application is a separate three-ring binder containing Exhibits A through G and Appendices 1 through 8, which provide additional detailed information regarding the Effort Mountain Taps. Exhibit B explains the need for Effort Mountain Taps. Exhibit C explains the environmental setting of the project. Exhibit D explains the development of alternative routes and the analysis that led to the selection of the proposed route. Exhibit E contains the engineering description of the Effort Mountain Taps. Exhibit F contains a list of the owners of lands that will be subject to rights-of-way and easements for the Effort Mountain #1

and #2 138 kV Taps. Exhibit G provides a list of the local, state and federal regulatory requirements applicable to the Effort Mountain #1 and #2 138 kV Taps.

II. DESCRIPTION OF THE PROPOSED TRANSMISSION LINE

18. In order to continue to provide adequate and reliable service in the Sun Valley/Jonas area in Monroe County, PPL Electric proposes to construct the Effort Mountain Taps, approximately 5.7 miles of new 138 kV transmission line, which will supply the new Effort Mountain 138-12 kV Substation. Completion the project will relieve the neighboring Meckesville 69-12 substation and distribution lines supplied by it, which serve the Sun Valley/Jonas area.

19. The proposed Effort Mountain Taps will extend from the existing Siegfried-Jackson #1 & #2 138 kV Transmission Line to the site of the new Effort Mountain 138-12 kV Substation. It will be built for double circuit 138 kV operation, but initially, only one circuit will be installed on 4.6 miles of the transmission line. The remaining 1.1 miles of the transmission line will be constructed for double circuit 138 kV operation. Both circuits will be installed on this portion of the Effort Mountain #1 and #2 138 kV Taps. One circuit will be operated at 138 kV, and the second circuit will be operated at 12 kV. The 12 kV circuit will relieve the existing Meckesville 69-01 12 kV line. The Effort Mountain Taps will be located in Polk and Chestnuthill Townships, Monroe County.

20. Poles with no line angle, *i.e.*, tangent poles will be monopoles equipped with steel upswept conductor support arms. Angle structures will be either single steel poles or two-pole structures depending on the severity of the line angle. Some tangent poles will be direct embedded depending on span length, with some tangent poles requiring concrete foundations. All angle poles will be installed on concrete foundations. Some angle structures may be guyed.

Approximately 44 poles with an average height of 100 feet will be needed for the construction of the Effort Mountain Taps. The average span length will be about 700 feet.

21. Photographs and sketches showing proposed structure types are shown at the end of Exhibit E to this Application.

22. A one-line diagram of the existing facilities in the area is shown in Figure B-1.

23. A one-line diagram of the existing facilities together with the proposed facilities is provided in Figure B-3. This Figure shows the proposed electrical system in the area, including the Effort Mountain 138 kV Taps and the Effort Mountain 138-12 kV Substation and the distribution lines supplies by the Effort Mountain 138-12 kV Substation.

24. Each circuit for the Effort Mountain Taps will have three power conductors, The conductors will be 556.5 KCMIL (thousand circular mils) 24/7 stranding ACSR (aluminum core steel reinforced). There will be one ground wire, which will be 3/8 inch high strength steel wire.

25. The Effort Mountain Taps will be designed according to and will generally exceed, all National Electric Safety Code minimum standards. Further information regarding the engineering design of the project is provided in Exhibit E to this Siting Application.

26. The project will be designed and constructed in accordance with PPL Electric's Magnetic Field Management Program and Electric and Magnetic Fields Policy. That policy is explained in Exhibit E and Appendix 4 to this Application.

27. PPL Electric requests specifically that the Commission approve future operation of the transmission lines described above, including the addition of a second circuit in the area where the structures are designed to accommodate two circuits but only one circuit will be installed initially.

III. NECESSITY OF THE EFFORT MOUNTAIN TAPS

28. PPL Electric, in order to maintain reliable service to its customers, monitors and, when appropriate, reinforces both its transmission and distribution systems. The Sun Valley/Jonas area is one of PPL Electric's poorest performing areas. To address and resolve this problem, PPL Electric has developed an overall reinforcement plan for this Sun Valley/Jonas area. A central part of this plan, and subject of this filing, requires approximately 5.7 miles of new 138 kV transmission line which will supply a new 138-12 kV substation. Completion of this project will relieve overloaded conditions on the neighboring Meckesville 69-12 kV Substation and its 12 kV circuits supplies from the Meckesville 69-12 kV Substation, which serve the Sun Valley/Jonas area.

29. In order to assure that PPL Electric's transmission and distribution systems can supply load reliably during summer and winter peak conditions and provide service at an acceptable voltage level through the daily load cycle, PPL Electric has adopted a set of defined planning standards, which are set forth in the RP&P. The principles set forth in the RP&P recognize the necessity of maintaining a proper balance between service reliability and the cost of service and that large, long and frequent interruptions are to be avoided.

30. At times, reinforcement of distribution facilities requires expansion of the regional transmission system. This Application presents such a situation. Here PPL Electric seeks approval of new transmission taps which will supply a new substation. The purpose of the substation is to relieve overloading on the distribution system in the Sun Valley/Jonas area.

31. Presently, the Effort/Jonas/Sun Valley area is served from the Meckesville 69-12 kV substation. This substation has two 69-12 kV transformers. One transformer has a rating of 11.2 MVA ("Megavolt Amperes"), and the rating of the second transformer is 15 MVA. Currently, electricity for the Effort/Jonas/Sun Valley area flows from these two transformers into

two 12 kV distribution lines. The Meckesville 69-1 12 kV Line extends south from the substation to serve more than 2,350 customers. The Meckesville 69-2 12 kV Line extends east from the substation and serves more than 2,700 customers.

32. The Meckesville 69-12 kV Substation is supplied from a single circuit 69 kV line which taps both the East Palmerton-Wagners #1 and #2 69 kV lines. The substation is normally supplied from the East Palmerton-Wagners #1 line, but the East Palmerton-Wagners #2 69 kV line can be used during maintenance or unplanned outages of the East Palmerton-Wagners #1 line.

33. In the Effort/Jonas/Sun Valley area, load growth due to housing development has placed greater demand on electrical facilities. Specifically, the number of customers served from the Meckesville 69-1 12 kV line has increased by 300 customers, an average of 3% per year, and the number of customers served from the Meckesville 69-2 12 kV line has increased by 650 customers, an average of 6% per year. As a result of this load growth, the electrical system is heavily loaded.

34. Due to the load increases, the Meckesville 69-1 12 kV line is projected to exceed its normal planning guidelines commencing in 2009 and continuing in each year thereafter until the system in the area can be reinforced. The Meckesville 69-2 12 kV line began to exceed its normal planning guidelines in 2006, and in 2008, it exceeded emergency guidelines. It is expected to exceed emergency guidelines in each year thereafter until the system in the area can be reinforced.

35. Continuing to operate the Meckesville 69-1 and 69-2 12 kV lines beyond their planning ratings will overheat the lines. In time, the overheating will anneal the conductors, which could cause an outage. A failure of the Meckesville 69-1 12 kV line would leave more

than 1,100 customers without service for an extended period of time until the line could be repaired or replaced. Similarly, a failure of the Meckesville 69-2 12 kV line would interrupt service to approximately 2,000 customers for extended periods of times until the line could be repaired or replaced.

36. Normally, PPL Electric would temporarily resolve or at least mitigate interruptions of service by transferring load to neighboring circuits. In the Sun Valley/Jonas area, however, load transfer capability is limited, especially at times of peak loads, because loads on neighboring circuits are also approaching their emergency planning guidelines. If additional load were transferred to these neighboring lines, their emergency planning guidelines would be exceeded, which could result in their failures.

37. Like the distribution lines, the transformers at the Meckesville substation will become overloaded. It is projected that, in 2011, the load on the two transformers will exceed their normal planning guidelines. Again because there is limited capacity available to transfer load away from the Meckesville transformers to other transformers, a transformer failure at the Meckesville substation would lead to an extended outage for more than 3,000 customers until repairs could be made or a transformer could be replaced.

38. In addition to being heavily loaded, the system in this area is one of the poorest performing areas in PPL Electric's system. The distribution lines perform poorly because they are very long and are exposed to hazards such as falling trees for much of their lengths.

39. To address these problems, PPL Electric has performed a planning analysis to determine the most appropriate long range system reinforcement plan for the area.

40. PPL Electric has determined that the best plan to resolve the distribution system problems explained above is to construct new transmission taps from the Siegfried-Jackson 138

kV lines to a new distribution substation. The transmission taps will be constructed for and will operate at 138 kV and will supply the Effort Mountain 138-12 kV substation. The new substation will relieve the line load on the Meckesville 69-1 and 69-2 kV lines, as well as relieving the neighboring Gilbert 78-4 line.

41. One 12 kV distribution line from the Effort Mountain substation will extend north and serve a portion of the Indian Mountain Lakes Development, thereby reducing the load on the Meckesville 69-2 12 kV line. The new line will serve approximately 1,400 customers. The second line from the Effort Mountain substation will extend south and serve residential developments along Jonas Road and State Route 534. This line will relieve the Meckesville 69-1 and the Gilbert 78-4 12 kV distribution lines. The new line will serve approximately 1,500 customers. The functional arrangement of the present distribution facilities and the facilities with the proposed solution are provided in Figure B-2 and Figure B-4, respectively.

42. The Effort Mountain Taps will connect the Siegfried-Jackson 138 kV lines to the new Effort Mountain 138-12 kV substation. The site for the substation was selected by PPL Electric to be central to the load it will serve. Locating the substation central to the load it will serve will increase reliability and operating flexibility.

43. Before selecting the preferred alternative, PPL Electric considered two alternatives, both which were ultimately rejected because they would be functionally inferior and more expensive than the proposed solution.

44. One alternative would involve building two new lines from the Meckesville substation to relieve the existing 69-1 and 69-2 12 kV distribution lines. Due to the limited availability of routes from the substation, however, the new lines would have to be attached to existing poles for the 69-1 and 69-2 12 kV lines. This method of construction would be

expensive and would not reduce outages because having two distribution circuits on the same poles would expose both circuits to the same hazards that cause outages. Further, because the load on the transformers at the Meckesville substation is approaching their capacity, the transformers at the Meckesville substation would have to be replaced with larger units to accommodate the load growth. Moreover, an additional substation to the east of the Meckesville substation would be needed in the future. After the new substation is built, the two new lines from Meckesville would no longer be needed and would represent a wasted asset. This alternative was rejected because upgrading the existing facilities would not provide reliability benefits, load relief or operating flexibility that a new substation would provide.

45. PPL Electric also considered a solution that would have involved building two substations. One substation would be built north of the existing Meckesville 69-2 12 kV line and an additional substation would be built approximately 1.5 miles south of the proposed Effort Mountain 138-12 kV substation.

46. Under this alternative, the first substation would relieve the Meckesville 69-2 12 kV line. New 12 kV lines from the substation would provide a tie with the Meckesville 69-2 12 kV line. The new substation would be supplied by extending the existing Meckesville 69 kV tap, which is supplied from the East Palmerton-Wagners # 1 69 kV radial line. The East Palmerton-Wagners # 1 69 kV line, however, is heavily loaded. One reason that this alternative was rejected is that adding more load to an already heavily loaded transmission line is not good transmission system planning. In addition, voltage at the end of the East Palmerton-Wagners # 1 69 kV line is approaching PPL Electric's RP&P standard of 62 kV. Adding load to this line would further degrade the voltage.

47. The Siegfried-Jackson #1 138 kV Line is superior to the East Palmerton-Wagner #1 69 kV Line. The Siegfried-Jackson #1 & #2 138 kV Line is a good source to meet the additional load because it utilizes a high capacity conductor which is capable of accepting future load increases as the substation expands. Further, the Siegfried-Jackson #1 & #2 138 kV line is a network line that will provide more reliable supply than the East Palmerton-Wagners # 1 69 kV line which is a radial line.

48. Under the second alternative to the proposed project, the second substation, north of the Meckesville 69-2 12 kV line would relieve the Meckesville 69-1 12 kV line. The new substation would be supplied from the Siegfried-Jackson #1 & #2 138 kV line. Load from the Meckesville 69-1 12 kV line would be transferred to new 12 kV lines to the substation.

49. PPL Electric rejected this “two substation” alternative for the reasons explained above and because more than 7.7 miles of new transmission lines would be needed as well as two substations and additional distribution facilities. The estimated total cost of this “two substation” alternative is \$12,000,000. The total cost of the solution proposed by PPL Electric is estimated to be \$8,755,000. In addition to costing less, the preferred alternative provides greater reliability, greater load relief, and greater operating flexibility.

IV. ENVIRONMENTAL SETTING

50. The project study area for the Effort Mountain #1 and #2 138 kV taps was established based upon the project’s purpose which is to connect the Siegfried-Jackson #1 138 kV transmission line with the Effort Mountain 138-12 kV substation to relieve overloading of facilities and improve service in the Sun Valley/Jonas area.

51. The project study area is located in northeastern Pennsylvania, primarily in Monroe County. It also includes a small area in Carbon County. The project study area includes

portions of Chestnuthill Township, Polk Township and Tunkhannock Township in Monroe County, and Penn Forest Township in Carbon County.

52. The project study area does not contain any special use areas.
- (a) The project study area contains no areas designated as “scenic” by the Pennsylvania Department of Conservation and Natural Resources.
 - (b) No portion of the project study area is located in the National Wilderness Preservation System. One preservation area, that is not part of the Wilderness Preservation System, has been named the Jonas Mountain Nature Preserve, and it is located in Polk Township and is managed by the Pocono Heritage Land Trust. The Jonas Mountain Nature Preserve does not have marked trails or defined recreational areas.
 - (c) No rivers in the project study have been designated as wild or scenic rivers pursuant to the federal Wild & Scenic Rivers Act or the Pennsylvania Scenic Rivers Act.
 - (d) There are no state game lands in the project study area.
 - (e) No “Priority Natural Areas” have been identified by The Nature Conservancy for Monroe County in the project study area.
 - (f) Most of the project study area is used for agriculture, is forested, or is used for residential purposes.
 - (g) There are no railroads or airports in the project study area
 - (h) There are no federal, state, county, or municipal parks in the project study area.
 - (i) No public or private schools are located in the project study area.

- (j) There are very few industries in the project study area. Industrial sites are limited to several parcels along Route 115 north of Effort.
- (k) Commercial land use in the area of study occurs primarily as retail operations along Routes 209 and 115.
- (l) The project study area includes the Trexler Boy Scout Reservation and the New Jersey Camp Jaycees. These camps cover large areas that are composed primarily of forested land.
- (m) The area of study contains two pipelines. The Williams Gas Pipeline Transco operates a 24-inch natural gas pipeline adjacent to the eastern edge of the project study area. A City of Bethlehem Bureau of Water Pipeline extends northeast-southwest through Sun Valley.

53. The project study area does not contain historic, cultural, or archeological resources. Research for these resources involved a comprehensive shovel testing program that did not reveal any prehistoric cultural assets. This result was expected given the poor soil drainage in the area and the absence of any moderate to large drainage line. Based upon the research and shovel testing program, the project area offers little potential for significant prehistoric cultural resources. Any sites that might occur are likely small, geographically restricted hunting or forging camps that can easily be avoided during construction of the proposed power line, primarily by spanning them.

54. Based on a search of the Pennsylvania Natural Diversity Inventory database the consultations with the U.S. Fish and Wildlife Service, the Pennsylvania Fish and Boat Commission, the Pennsylvania Game Commission and the Pennsylvania Department of Conservation and Natural Resources, the Project Study Area may be inhabited by certain rare,

threatened or endangered species. These include one reptile (the bog turtle), two plants (the variable sedge and the pale duckweed), and three moths (the toothed apharetra, the pine barrens *Zanclognatha* and the barrens itame). A Phase 1 Bog Turtle Habitat Survey was conducted for the selected transmission corridors as part of the wetland delineation. As part of the environmental permitting and approval process for the selected route, additional surveys of rare, threatened, or endangered species may be required. PPL Electric will comply with all required permits, including all conditions placed on the issuance of such permits.

55. The study area has experienced significant growth in population. Monroe County's population grew by about 20 percent from 2000 to 2008 and by about 70 percent from 1990 to 2008. Polk Township experienced similar growth, and Chestnuthill Township experienced even greater growth. Chestnuthill Township's population grew by 20 percent from 2000 to 2008 and nearly doubled from 1990 to 2008. In 1999, the Monroe County Comprehensive Plan predicted in 1999 that 30,000 new dwellings would be constructed between 1998 and 2020.

V. SITING ANALYSIS

56. Below, PPL Electric explains the methodology used to define the alternative routes and to select the proposed transmission line route for this project. The siting study uses quantitative and qualitative evaluations to compare alternative transmission routes for the project. The methodology used for the siting study provided a framework from which to select the route most suited for an overhead electric transmission line while satisfying the regulatory filing requirements for such a project. The ultimate goal was to select a route that avoids or minimizes adverse impacts to natural, cultural and social environments to the maximum extent practical, while maintaining the economic viability and technical feasibility of the project.

57. The siting method consists of three principal steps:

- (a) Generate Macro Corridors. These macro corridors define the outer edges of the study area.
- (b) Generate Alternative Corridors. Alternative corridors most suitable for the transmission line are generated from three primary perspectives:
 - (i) protection of the natural environment;
 - (ii) protection of the built environment; and
 - (iii) engineering requirements.
- (c) Identify alternative routes within the alternative corridors and select the preferred route.

58. The siting methodology used for determining the preferred route for the Effort Mountain Taps uses a series of grid cells on aerial photographs or maps, 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 methodology utilized was adapted from a protocol developed by the Electric Power Research Institute (“EPRI”) and the Georgia Transmission Corporation. This method incorporates Geographic Information System (“GIS”) technology, statistical evaluation and stakeholder collaboration into the decision-making process. The methodology formalizes many of the methods and principles used in the industry and by consultants to site transmission lines. It was developed over many years 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.

59. Data used in the analysis fall into three broad categories – ecological, land use/cultural, and technical/engineering. Data were obtained from a wide variety of sources, including state and local GIS databases, field reconnaissance surveys, information supplied by public agencies, published documents, and publically available electronic information.

60. The quantitative analysis performed by PPL Electric uses a series of grid cells across the 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 cost” 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 cost” is the corridor or path with the least adverse impacts. In this context, “cost” does not refer to a monetary value. Instead, it refers to the least impact to critical features.

61. Macro corridor analysis begins after the start and end points of the new transmission lines have been established. The first step in macro corridor development is to develop a land use/land cover GIS database that identifies the key opportunity and constraint areas that are traditionally reviewed in a siting study.

62. A GIS map of the area of study is created using land use and land cover data and other feature data that include roads, rail, and existing transmission lines. From the GIS map, a Composite Suitability Surface Map, composed of grid cells, is created. The features of each cell are identified and the features are ranked from one (most suitable) to nine (least suitable). Corridors with the cells having the lowest values have the highest overall suitability for a transmission line.

63. This composite suitability surface is used to produce a series of potential broad corridor areas for the following three scenarios:

- (a) Opportunities to rebuild or parallel existing transmission lines or other linear features.
- (b) Opportunities to parallel existing road right-of-ways.
- (c) Opportunities to cross undeveloped land (cross country).

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

65. The starting point of the assignment of values was the EPRI/GTC Methodology, which assigned values through a collaborative outreach involving stakeholders from federal, state and local governments, environmental and engineering experts, homeowner associations and other groups. The values obtained from EPRI/GTC were then reviewed by PPL Electric's siting team. Values for certain land uses and land covers were modified to reflect circumstances presented in the area of study. For example, modifications and additions were made to the natural environment features related to streams and wetlands. These modifications included development of protective buffers and associated rankings that are relevant for streams and wetland types in the area of study.

66. The results of the macro corridor analysis are shown in Figure 1 to Exhibit D. The macro corridor includes all areas determined to be most suitable from all of the three

perspectives. The outer boundary of this Macro Corridor area also effectively defines the Project Study Area.

67. The next step in the process is to identify alternative corridors. In order to identify alternative corridors, additional and more detailed data are gathered. Such data are obtained from existing data clearing houses or may be specially created for the project. For example, data on parcel lines and municipal boundaries are typically obtained from county or local municipal agencies. Other data, such as slope, is usually derived from United States Geological Services Digital Elevation Models that are acquired from federal government clearing houses. In addition, smaller cells were analyzed in order to facilitate a more detailed assessment. In order to conduct the quantitative analyses, values were assigned to each of the smaller cells for different land uses and land covers as explained above. Least cost corridors were determined by adding the values of the cells within the Project Study Area.

68. Evaluations for the Alternative Corridors are created from three different perspectives – the Built Environment, the Natural Environment and Engineering Requirements.

- (a) The “Built Environment” refers to protecting human and cultural areas by reducing potential conflicts with existing residential neighborhoods and other community-valued buildings or historic sites.
- (b) The “Natural Environment” refers to protecting plants, animals and aquatic resources by minimizing the impact to ecological resources and natural habitat.
- (c) The “Engineering Requirements” refer to maximizing co-location and minimizing cost and schedule challenges by seeking the shortest path or

utilizing existing rights-of-way, while avoiding areas that pose significant construction obstacles such steep slopes or unique agricultural practices.

69. The same fundamental data sets are used in determining the alternative corridors for each of the above perspectives, *e.g.*, slope data and wetlands data are used in developing alternative corridors in all perspectives. For each perspective, however, a higher weighting is applied to data based on the perspective. For example, a Built Environment assessment applies higher weight into features related to proximity and density of buildings in the Project Study Area. The Natural Environment assessment applies a higher weight to flood plain and wildlife habitat. The Engineering Assessment seeks to avoid construction obstacles such as slopes and utilize linear infrastructure features. By selecting the corridor that is optimal from each of the three perspectives, PPL Electric was able to compare environmental, social, and financial cost and benefits of each of the corridors.

70. Based on the foregoing analysis, PPL Electric determined the alternative corridors for the Effort Mountain Taps – one from each of the three perspectives. Each of the alternative corridors is shown on Figure 9 to Exhibit D.

71. The next phase of the process was route development, *i.e.*, determining the alternate routes within the alternative corridors. The alternative transmission line route development utilized a least cost tool similar to the one used to identify alternative corridors. The alternative route analysis, however, focuses on a single alignment rather than a broad corridor area. The alternative route analysis minimizes the least preferred areas that are crossed along a route connecting the starting and ending locations. Again, routes are selected from each of the three perspectives.

72. To assess the advantages and disadvantages of alternative routes, specific features, such as the number of residences or streams crossed per route, were considered. The quantitative feature metrics are normalized, assigned relative weights, and organized within the three perspectives — the Built Environment, the Natural Environment and Engineering Requirements. The overall score for each alternative route was then calculated. As before, lower scores indicated less potential impacts of the route.

73. Using the above methodology, three alternative routes were identified, one from the Built Environment perspective, one from the Natural Environment perspective, and one from the Engineering Requirements perspective. Each route connected the Siegfried-Jackson 138 kV transmission line to the proposed substation site. The route based on the perspective of Engineering Requirements connected to the Siegfried-Jackson 138 kV Transmission Line in the northern portion of the Project Study Area. The other two routes connected to the Siegfried-Jackson 138 kV Transmission Line in the southern portion of the Project Study Area. The three routes initially identified are shown in Figure 10 to Exhibit D.

74. In evaluating the three routes, it was observed that two of the two southern routes, the route from the Built perspective and the route from the Natural perspective, were very similar. Due to their similarity, the Built and Natural alternative routes were combined into a single route. By combining the two southern routes into a single alignment, the process provided two alternative routes, the northern route, which was selected based on an Engineering perspective, and the southern route, which was based upon Built and Natural environment prospectives.

75. The two routes that were selected for further evaluation and analysis are shown on Figure 12 to Exhibit D.

76. These two routes were then adjusted to further reduce their impacts. PPL Electric's siting team noted that both of the alternative routes had potential impacts on the Trexler Boy Scout Reservation. Based upon a review of aerial maps and direct communications with Boy Scout officials, routes were modified to avoid high-use areas of the camp along the southern edge of the property and Lake Trexler. To avoid these areas, the routes were modified to follow the eastern boundary of the Boy Scout parcel and then follow the southern edge of Jonas Road.

77. The proposed routes were also adjusted for engineering considerations. Such changes included straightening of proposed alignments to avoid "zig zagging" through open fields, setting the pole sites to minimize impacts to environmental and sensitive land features, setting pole sites to span some features such as crop fields and to make turns that avoid other features such as residential areas. The routes were modified also to align the routes along edges of open fields or farm roads, in order to decrease potential impacts on farming operations. Further, routes were adjusted to increase distances from residential properties. The routes were also modified to remove them from the edges of forests in order to decrease the transmission line's visibility.

78. The result of these processes was two routes. One route, the Northern Route, is referred to as Route A. Route A is 5.86 miles in length. It ties into the Siegfried-Jackson 138 kV transmission line on the east side of Route 115, 1.2 miles north of the village of Effort in Chestnuthill Township.

79. Route B, the Southern Route, is 5.54 miles in length. This alternative ties into the Siegfried-Jackson 138 kV transmission line on the west side of Route 115, 0.5 miles northwest of the village of Effort in Chestnuthill Township.

80. Route A and Route B are shown on Figure 12 to Exhibit D.

81. The next phase for the project was to obtain and incorporate public comment regarding the alternative routes. Feedback from landowners and the surrounding community was incorporated into the route selection.

82. In order to obtain public comment, PPL Electric's siting team held open houses to receive public feedback concerning the alternative routes. The outreach effort included meetings with, phone calls with and mailings to owners of property within 1,000 feet of the two alternate routes. In addition, PPL Electric established a website to disseminate information regarding the project.

83. In addition, an open house was held on April 13, 2009, in Brodheadsville, Pennsylvania. Owners of property within 1,000 feet of the two routes were invited to attend. In addition, the public was invited through advertisements.

84. Based on the public input, PPL Electric modified both routes. Route A was modified to avoid interfering with the operations of an orchard. The route was also modified to reduce impacts on residential properties between Zeigler Road and Mountain Road. In addition, Route A was modified to further reduce the impact on the Trexler Boy Scout Reservation.

85. Similarly, Route B was modified as a result of the public outreach. Property owners along Pheasant Run Road requested that the line be moved to avoid interfering with farming activities. To avoid lands protected by Agricultural Conservation Easements, the route was moved onto adjacent fallow lands that are not agriculturally protected. Route B also was modified to further reduce impacts on the Trexler Boy Scout Reservation. In order to reduce forest fragmentation north of Jonas Road, the route was modified to parallel an existing water main right-of-way owned by the City of Bethlehem's Bureau of Water.

86. The modified routes are referred to as Route A1 and Route B1.

87. The four alternative routes, A, A1, B, and B1 are shown in Figure 13 to Exhibit D. As a result of these modifications, Route A1 is approximately 6.28 miles in length and Route B1 is approximately 5.87 miles in length.

88. The next step in the evaluation process was a qualitative assessment of the routes determined by the quantitative analysis. The assessment was performed by applying expert judgment to rank the alternative routes. PPL Electric's siting team qualitatively ranked the preferred routes based on several important considerations such as visual concerns, community concerns, schedule delay risk, special permit issues, and construction and maintenance accessibility. The goal of the qualitative expert judgment was to select a preferred route from the two or three routes through the project study area.

89. During this qualitative assessment phase, minor adjustments to route alignment, based upon best practices, were conducted to decrease potential impacts of the specific routes. These changes may reduce the visibility of a proposed line by placing it closer to an existing tree line or moving the alignment to parallel an active agricultural field rather than bisecting the field.

90. In regards to visibility concerns, the northern routes, Routes A and A1 were considered more problematic. The area along these routes is more densely populated, has several more road crossings, a higher instances of steep slopes, and an extended length of alignment that would make the line visible for a great distance. Visibility concerns regarding Route B and Route B1 are similar to each other, but less than the concerns regarding Routes A and A1.

91. Community concerns were considered equal for all four potential routes.

92. The potential for delay was considered greater for Routes A and A1. This conclusion was based on the increased visibility of the proposed routes, additional permit

requirements for the intricate crossing of the Pohopoco Creek and adjoining wetlands, and construction complexity associated with steep slopes and roadway crossing. The siting team also concluded that the potential for schedule delays was more problematic for Route B than Route B1. Route B has the potential need for more special permits and studies as well as increased construction complexity.

93. Regarding special permits, it was concluded that the northern routes, Routes A and A1, would require extensive permit requirements for roadway crossings, storm water management and the intricate crossing of the Pohopoco Creek and adjoining wetlands. Further, it was concluded that Route B would require more special permits than Route B1 due to the increased presence of hydric soils and floodplain areas along Route B.

94. Accessibility for construction and maintenance was more problematic for the northern routes. This conclusion is based upon the observation that the alignment along the two northern routes has higher incidents of steep slopes, more stream crossings, larger wetland areas, and longer length. A large area along the southern routes was observed to be fallow overgrown fields with no active farming. The siting team also concluded that alternative Route B would pose more accessibility issues than Route B1. There are more steep slopes and more alignment turns along Route B.

95. Based upon the foregoing, PPL Electric selected Route B1 as the preferred route.

96. In order to receive further comment on Route B1, a further open house was held on May 28, 2009. At the open house, PPL Electric, among other things, expressed a willingness to listen to the concerns of interested parties and to continue to work with them to complete the project in a way that minimizes the project's impact.

97. After Route B1 was selected as the preferred route and after the open house was held, PPL Electric continued to work with landowners and other interested persons to further reduce the impact of the project.

98. By October 2009, a modified route alignment was coordinated with the landowners. This relocation of Route B1 would address the concerns of homeowners in Birch Hollow Estates that the line ran too close to their homes. The relocation involved moving the line further into the Jonas Mountain Preserve. Although the alignment would increase forest fragmentation in the Jonas Mountain Preserve, PPL Electric, along with other stakeholders, have coordinated the purchase of an adjacent forested parcel through which the modified Route B1 also traverses, which all stakeholders have agreed will be donated to the Jonas Mountain Preserve thereby substantially expanding the reserve and protecting the additional land from future development. By this means, PPL Electric has addressed the concerns of the residents of Birch Hollow Estates, the Pocono Heritage Land Trust, which owns and manages the Jonas Mountain Preserve and the owners of the adjacent forested parcel of land that will become part of the Jonas Mountain Preserve. This modified version of Route B1 is shown on Figure 15 to Exhibit D.

99. Based on all the foregoing, PPL Electric has selected the modified version of Route B1 as the route that will have the least impact on surrounding areas. A detailed description of the proposed route for the Effort Mountain Taps is provided at pages 53-55 of Exhibit D.

VI. RIGHTS-OF-WAY

100. The right-of-way width for the Effort Mountain Taps is 100 feet. The right-of-way width is determined by structure type, design tensions, span length and conductor “blowout” (the distance wires are moved by cross winds). A cross section of the proposed right-of-way is

illustrated in Figure 5 to Exhibit E. PPL Electric's preferred route crosses lands of 18 property owners. To date, agreements have been secured from 15 property owners. PPL Electric will continue to negotiate with the 3 unsigned property owners. PPL Electric anticipates that some of these negotiations will be unsuccessful and that it is likely that PPL Electric will request that the Commission grant authority for the exercise of the power of eminent domain across properties of any unsigned owners.

VII. MISCELLANEOUS

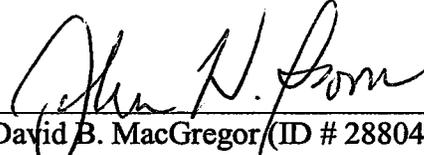
101. Copies of this Application are being served in accordance with the provisions of Section 57.74 of the Commission's regulations (52 Pa. Code § 57.74).

102. As soon as practicable after the filing of this Application, PPL Electric will publish notice of the filing in two newspapers of general circulation in the area of the line. This notice will: (a) note the filing with the Commission; (b) provide a brief description of the project and its location; (c) provide area locations where the complete Application may be reviewed by the public; and (d) provide the date, time and location of the initial Prehearing Conference in this proceeding.

VIII. CONCLUSION

PPL Electric respectfully requests that the Commission approve the siting and construction of the Effort Mountain #1 and #2 138 kV Taps in Chestnuthill and Polk Townships, Monroe County, Pennsylvania that is described herein above as soon as practical.

Respectfully submitted,



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Post & Schell, P.C.

Date: January 8, 2010

Attorneys for PPL Electric Utilities Corporation

VERIFICATION

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


David G. DeCampli

January 5th, 2010