EXECUTIVE SUMMARY

This Siting Application 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 the new the North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Lines in Lancaster County, Pennsylvania (the North Lancaster-Honey Brook Project). As explained in the Attachments and Testimony filed with this Siting Application, the proposed Project is required to improve reliability of service for approximately 32,000 customers in Honey Brook and Caernarvon Townships in Chester, Berks, and Lancaster Counties.

Load growth in the in eastern Lancaster County, southwestern Berks County and western Chester County areas has been significant. The existing 138/69 kV transmission lines serving the customers in this region are long in length and each serve a significant number of customers who are exposed to long duration outages in the event of the loss of one of these transmission lines. Currently, there are no alternate electrical transmission sources within these areas of high population density, and the existing power supply is too distant to reliably and effectively serve that customer load.

The North Lancaster-Honey Brook Project will bring a new alternate source of supply closer to the growing load centers and reduce the line length and loading on the existing 138/69 kV lines serving the area. The new transmission lines also will allow for improved operating flexibility to restore customer load more quickly after a facility outage.

The proposed North Lancaster-Honey Brook Project involves the construction of approximately 8 miles of new double-circuit 138/69 kV transmission line. The proposed transmission line will extend approximately 4.2 miles between the Lauschtown 500-230-69 kV Substation in Brecknock Township and the Brecknock 69-12 kV Substation in Brecknock Township, and then proceed approximately 3.8 miles to the South Akron-Morgantown #2 Transmission Line located in Caernarvon Township.

A comprehensive route selection study was conducted to establish a Preferred Route for the North Lancaster – Honey Brook 138/69 kV Transmission Line. Using established routing guidelines, the Routing Team identified constraints and opportunity features within the Study Area that would minimize impacts to the natural and human environment. The Routing Team evaluated the advantages and disadvantages of the Potential Routes based on the established routing criteria and an inventory of land use, environmental, and cultural factors along each of the routes. Less favorable Potential Routes were eliminated and four potentially viable Alternative Routes were retained for further consideration. Two alternative routes were identified within the "northern" portion of the Study Area, Alternative Route A and Alternative Route B. Two alternative routes were also identified within the "southern" portion of the Study Area, Alternative Route C and Alternative Route D.

A quantitative and qualitative assessment was conducted to compare the alternative routes. The alternative routes were compared and preferred routes were selected based upon a detailed analysis and balance of societal concerns, environmental impacts, engineering considerations, and costs. Based on an assessment of the advantages and disadvantages of the four alternative routes under consideration, the Routing Team selected Alternative Route B as the northern route and Alternative Route D as the southern route. Overall, the preferred routes will have substantially less impact on the natural and built environments, land use, and citizens in Lancaster County.

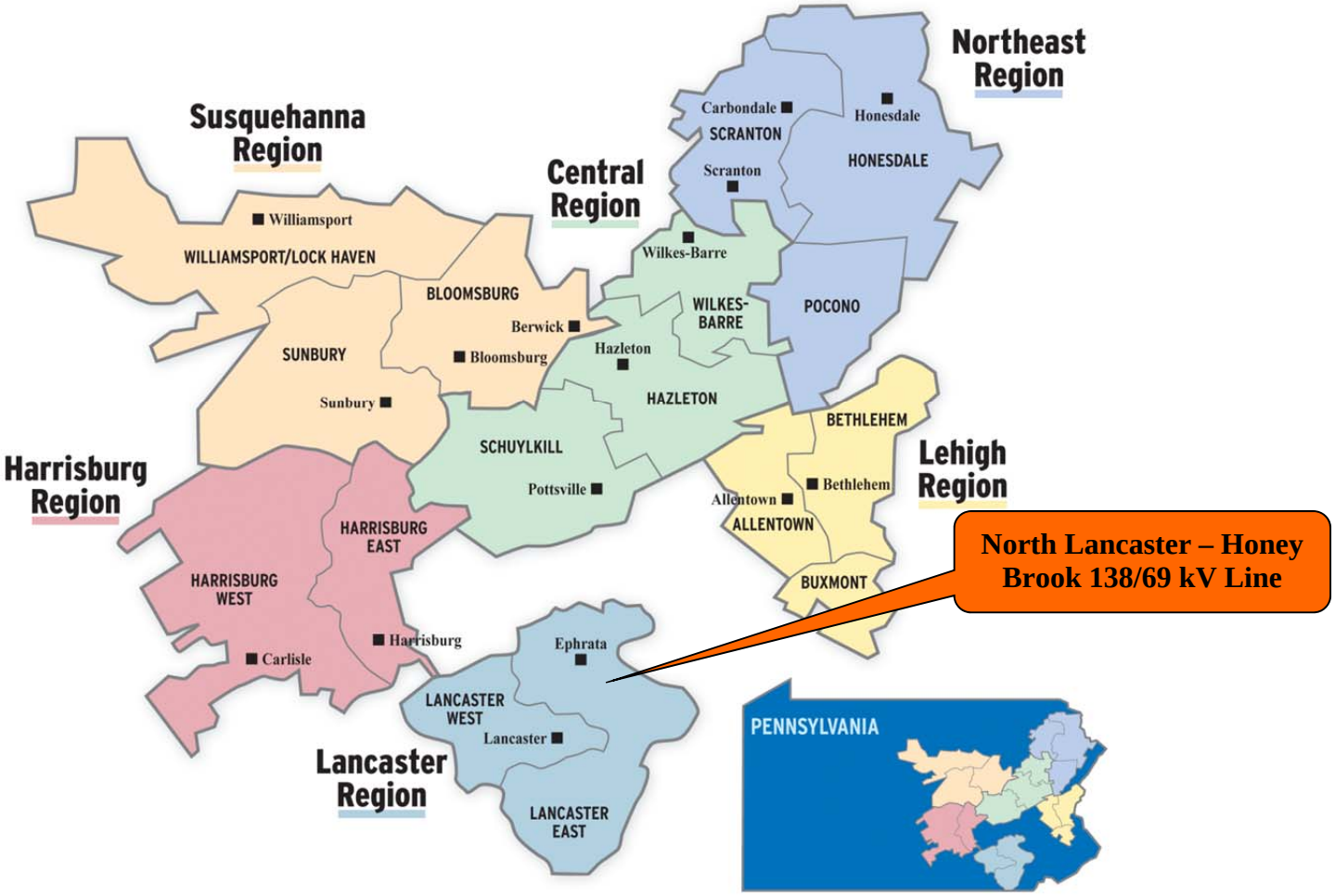
The estimated cost of the North Lancaster-Honey Brook Project is approximately $18 million. Subject to Commission approval, construction is scheduled to begin in January 2015 to meet a May 2016 in-service date.

Included with this Siting Application are the following Attachments:

Attachment 1	PUC Regulation Cross Reference Matrix
Attachment 2	Necessity Statement
Attachment 3	Environmental Setting

Attachment 4	Siting Analysis
Attachment 5	Design and Engineering Description
Attachment 6	List of Owners of Property Within the Right-of-Way
Attachment 7	Agency Permit Requirements
Attachment 8	List of Involved Governmental Agencies, Municipalities and Other Public Entities Receiving the Application
Attachment 9	List of Government Agencies, Municipalities, and Other Public Entities Contacted
Attachment 10	List of Public Locations Where Application can be Examined
Attachment 11	PPL Electric Magnetic Field Management Program
Attachment 12	Vegetation Management
Attachment 13	PPL Design Criteria and Safety Practices
Attachment 14	Agency Coordination (PNDI/Wetlands)
Attachment 15	Cultural Resources Report
Attachment 16	Public Notice Requirements

PPL ELECTRIC UTILITIES SERVICE TERRITORY



ATTACHMENT 1

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ATTACHMENT 1
NORTH LANCASTER – HONEYBROOK 138/69 KV LINE
PUC REGULATION CROSS-REFERENCE MATRIX

Administrative Code Section or Statute	PUC Regulation Requirement	Location
57.72	Form and content of application	
57.72(a)	Applications shall be in conformity with Section 1.31 (relating to form of documentary filings generally). Supporting exhibits such as maps, photographs and other engineering materials may be on paper not exceeding 28 inches by 40 inches.	Attachments 1 – 16 Attachment 3 – Environmental Maps Attachment 4 – Siting Analysis Maps Attachment 4 – Aerial Maps
57.72(b)	The application shall be signed by a person having authority with respect thereto and having knowledge of the matters herein set forth and shall be verified under oath.	Certification Application
57.72(c)	An 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 right-of-way width and the location of the proposed HV line within each city, borough, town and township traversed.	Certification Application Attachment 4 – Section 3.5 Attachment 4 – Tables 4-3 and 4-5
57.72(c)(4)	The names and addresses of known persons, corporations and other entities of record owning property within the proposed right-of-way, together with an indication of HV line rights-of-way acquired by the applicant.	Attachment 4 – Aerial Maps Attachment 6
57.72(c)(5)	A general statement of the need for the proposed HV line in meeting identified present and future demands for service, of how the proposed HV line will meet that need and of the engineering justifications for the proposed HV line.	Attachment 2

Administrative Code Section or Statute	PUC Regulation Requirement	Location
57.72(c)(6)	A statement of the safety considerations which will be incorporated into the design, construction and maintenance of the proposed HV line.	Attachment 5 – Section 3.0 Attachment 11 Attachment 12
57.72(c)(7)	A description of 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 which will be made to minimize the impact of the HV line upon the environmental 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 – Section 4.0 Attachment 8 Attachment 14 Attachment 15
52.72(c)(8)	A description of the efforts of the applicant to locate and identify archaeologic, geologic, historic, scenic or wilderness areas of significance within 2 miles of the proposed right-of-way and the location and identity of the areas discovered by the applicant.	Attachment 3 – Sections 2.0 through 3.0, Attachment 3 – Figures 3-2 through 3-6 Attachment 4 – Section 4.0 Attachment 4 – Figures 4-8 through 4-12 Attachment 15
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 – Section 2.1.3 Attachment 4 – Section 4.2.1 Attachment 4 – Figures 4-9A and 4-9B Attachment 4 – Aerial Maps
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 merit and detriments of each route, and a statement of	Attachment 4

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	the reasons for selecting the proposed HV line route.	
57.72(c)(11)	A list of the local, State and Federal governmental agencies which have requirements which 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 7
57.72(c)(12)	The estimated cost of construction of the proposed HV line, and the projected date for completion.	Certification Application Attachment 2 – Section 1.0 Attachment 4 – Section 1.2
57.72(c)(13)	The following exhibits:	
57.72(c)(13)(i)	A depiction of the proposed route on aerial photographs and topographic maps of suitable detail.	Attachment 4 – Aerial Maps Attachment 4 – Figures 4-9A and 4-9B
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 clearances at mid-span under normal load and average weather conditions and under predicted extreme load and weather conditions.	Certification Application Attachment 5
57.72(c)(13)(iii)	A simple drawing of a cross section of the proposed right-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 – Figures 5-3 and 5-4
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	Attachment 2

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	substations.	
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
57.72(c)(15)	Additional information as the Commission may require.	N/A
57.74(a)	(a) *Filing.* The applicant shall file with the Commission the original and six copies of the application. An affidavit of service showing the identity of those served under subsections (b) and (c) shall accompany the original and the copies of the application filed with the Commission.	Attachment 6 Attachment 8 Notice of Filing Certificate of Service
57.74(b)	(b) *Copies.* At the time of filing, the applicant shall serve a copy of the application by registered or certified mail, return receipt requested, upon the following: (1) The chief executive officer, the governing body and the body charged with the duty of planning land use in each city, borough, town, township and county in which any portion of the HV line is proposed to be located. (2) The president of the public utility, other than the applicant, in whose service territory any portion of the HV line is proposed to be located. (3) The Department of Environmental Resources, Attention: Bureau of Environmental Planning; Post Office Box 2357, 101 S. Second Street, Harrisburg, Pennsylvania, 17120. (NOTE: now Department of Environmental Protection at different Harrisburg office).	Attachment 8
57.74(c)	(c) *Notice.* (1) At the time of filing, the applicant shall serve a notice of filing and a map of suitable detail showing the proposed route of the proposed facility by registered or certified mail, return receipt requested, upon the following: (i) The Secretary of the Department of Transportation, Room 1200 Transportation and Safety Building, Harrisburg, Pennsylvania 17120. (ii) The Chairman of the Historical and Museum	Notice of Filing Attachment 6 Attachment 8

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	Commission, Post Office Box 1026, Harrisburg, Pennsylvania 17120. (iii) Other local, State or Federal agencies designated in § 57.72 (c)(11)(relating to form and content of application). (iv) The persons, corporations, and other entities designated in § 57.72(c)(4), unless they are served with a copy of the application under § 57.75(i) (relating to hearing and notice).	
57.74(c)	(2) The notice of filing shall contain a statement identifying the filing, the date on which the filing was or is to be made, a description of the proposed line, the design voltage, the number of route miles, the right-of-way width and the location of the proposed HV line within each township traversed and a statement that a copy of the application is available for public examination as provided in subsection (d).	Notice of Filing Certification Application Attachment 10
57.74(d)	(d) *Examination.* On the day of filing of the application, the applicant shall make a copy of the application available for public examination during ordinary business hours at a convenient location within a county in which any part of the proposed HV will be located.	Attachment 10
57.74(e)	(e) *Additional notice.* The applicant shall provide an additional notice and shall serve such additional copies of the application without cost as the Commission may require.	N/A
69.3102(a)	(a) Applications for electric transmission siting authority should provide the following information with the initial application for siting approval demonstrating its efforts to fully notify landowners who are either owners of land that will be purchased for the transmission project or will be subject to right of way/easement requirements: (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. (2) Copies of information provided to landowners by the public utility of any publicly disseminated notices advising landowners to contact the Commission or the Office of Consumer Advocate (OCA) in the event of	Attachment 16

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	improper land agent practices. (3) Copies of all notices sent under § 57.91 (relating to disclosure of eminent domain power of electric utilities).	
69.3102(b)	(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 16
69.3102(c)	(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	Applicants for eminent domain authority should follow the following requirements and provide the following information as part of the application: (1) Applicants for transmission siting authority should file applications for all known eminent domain authority as separate filings, but simultaneously with the associated transmission siting applications. Testimonial evidence in support of an eminent domain application should be filed with the application. Subsequent eminent domain authority applications should be filed as soon as reasonably known during the course of the transmission siting application. (2) As part of an eminent domain application, the public utility applicant should present, for those properties subject to condemnation at the time the transmission siting application is filed or later in the siting proceeding, the reason for the exercise of condemnation power for each property and the precise location of the affected property. Supporting maps or legal descriptions of the property to be condemned should be supplied to the extent feasible. Submission of information pursuant to this guideline should be	Condemnation Application

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	consistent with the filing requirements for the exercise of eminent domain powers under 26 Pa.C.S. § 302(b)(5) (relating to declaration of taking). (3) A public utility transmission siting application should include a summary status report for those properties along the proposed transmission route where negotiations for either property acquisition or rights of way/easements may be ongoing. This information should be supplemented as requested by the administrative law judge or the parties during the course of the transmission siting proceeding.	
69.3104	Applications for exemption from municipal zoning requirements should provide the following information with the application: (1) Copies of comprehensive land use plans, zoning ordinances and other documentation relevant to the buildings affected by the exemption request. This information may be filed in either hard copy or electronic format. (2) Provision of metes and bounds or site maps of building sites. (3) A procedure for providing notice to affected municipalities of the request for exemption.	N/A
69.3105(1)	Applications for the siting of electric transmission lines should provide the following information as part of the § 57.72(c) (relating to form and content of application) requirements: (1) Transmission applicants should utilize a combination of transmission route evaluation procedures including high-level GIS data, traditional mapping (including United States Geological Survey data and compilation), aerial maps and analysis of physical site specific constraints raised by affected landowners.	Attachment 3 Attachment 4
69.3105(2)	Applications for the siting of electric transmission lines should provide the following information as part of the § 57.72(c) (relating to form and content of application) requirements: (2) Transmission applicants should summarize the	Attachment 5

Administrative Code Section or Statute	PUC Regulation Requirement	Location
	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.	
69.3105(3)	Applications for the siting of electric transmission lines should provide the following information as part of the § 57.72(c) (relating to form and content of application) requirements: (3) 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: (i) The environmental, historical, cultural and aesthetic considerations of each route. (ii) The proximity of these alternative routes to residential and nonresidential structures. (iii) The applicant's consideration of relevant existing rights of way. (iv) The comparative construction costs associated with each route.	Attachment 3 Attachment 4
69.3106	Applications for siting of electric transmission lines should include as part of the filing requirement under § 57.72(e)(7) the following information: 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 7

Administrative Code Section or Statute	PUC Regulation Requirement	Location
69.3107(a)	(a) *Interim guidelines for the use of herbicides and pesticides.* Applicants for transmission line siting authority should provide a detailed vegetation management plan that includes the following components: (1) A general description of the utility's vegetation management plan. (2) Factors that dictate when each method, including aerial spraying, is utilized. (3) Vegetation management practices near aquatic and other sensitive locations. (4) Notice procedures to affected landowners regarding vegetation management practices. (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 12
69.3107(b)	(b) *Interim guidelines for Electromagnetic Field (EMF) impacts.* 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 5 Attachment 11 Attachment 13

ATTACHMENT 2

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ATTACHMENT 2
NORTH LANCASTER – HONEY BROOK 138/69 kV LINE
NECESSITY STATEMENT

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1.0 INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) proposes to construct the North Lancaster – Honey Brook #1 & #2 138/69 kV Transmission Lines in Lancaster County, Pennsylvania (the "Project"). The proposed Project involves the construction of approximately 8 miles of new 138/69 kV transmission line between the Lauschtown 500-230-69 kV Substation in Brecknock Township and the South Akron-Morgantown #2 Transmission Line located in Caernarvon Township.

The proposed Project is required to improve reliability of service for approximately 32,000 customers in Honey Brook and Caernarvon Townships in Chester, Berks, and Lancaster Counties. The new transmission line also will allow for improved operating flexibility for the Transmission System Operators to restore customer load more quickly after a facility outage. This Project is needed to:

(i) Address load growth in the area

(ii) Decrease number of outages experienced by customers in the area

(iii) Improve ability to restore service to customers after a transmission facility outage.

(iv) Address the lack of alternative transmission sources in the area

(v) Prevent the extended interruption of customer load that would exceed PPL Electric's Reliability Principles and Practices (RP&P) if service from the existing South Akron – Morgantown #2 & #3 69 kV transmission line at the South Akron Substation were interrupted.

The estimated cost to site, design, and construct the proposed North Lancaster – Honey Brook 138/69 kV Transmission Lines is approximately $18 million.[1] Subject to the Commission's approval, construction is scheduled to begin in January 2015 to support

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

the Project's required in-service date of May 2016. The required in-service date for this Project is defined as the date that the proposed facility must be placed in service to minimize extended service interruptions to customers.

Maps showing the location and operational voltage of the existing and proposed transmission facilities within the project area are included at the end of this Attachment. This filing addresses only the existing and proposed transmission system in this portion of Chester, Berks, and Lancaster counties.

2.0 SYSTEM PLANNING PROCESS

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

- They are able to accommodate forecasted system flows during summer and winter peak load;
- They can adequately serve each customer's needs with regard to capacity, voltage, and reliability for all load levels throughout the daily load cycle;
- They can sustain probable contingencies and disturbances with minimal customer service interruptions; and
- They conform to PPL Electric's transmission planning reliability principles, practices, and standards for all normal and emergency operating conditions.

The process of planning the transmission system requires PPL Electric to look into the future to develop a reinforcement plan far enough in advance to be able to complete a project when it is needed. Ideally, transmission facility upgrades are planned such that the in-service date corresponds with the time frame that the facility is required to meet the planning criteria established by the RP&P. Significant lead times are needed to site,

[2] The BES includes transmission facilities operating at 100 kV or higher. Non-BES transmission facilities are those operated at less than 100 kV.

design and install new line and substation facilities, especially where new sites and/or rights-of-way (ROW) must be acquired.

The reliable and economical operation of PPL Electric's transmission system requires planning standards for system expansion and reinforcement. The principles upon which these planning practices are based recognize that:

- The system expansion should be coordinated to achieve the most economical balance of construction and operating expenditures;
- The system should maintain a proper balance among the degree of risk, amount and type of load interrupted, and the cost of providing the 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.

PPL Electric undertakes an independent analysis of both its BES transmission facilities and its non-BES transmission system facilities. The PPL Electric planning practices are outlined in the RP&P, which was developed to ensure adequate and appropriate levels of electric service to its customers consistent with good utility practice.

The fundamental purpose of the RP&P is to provide PPL Electric planning engineers with a comprehensive set of planning criteria that enable them to plan for reliable transmission and distribution systems for PPL Electric's customers. The RP&P is reviewed periodically by PPL Electric engineers and planners. The document is updated as required to reflect current standards. Updates to the document are approved by PPL Electric's senior management. PPL Electric's RP&P is consistent with good utility practices and with the reliability criteria and standards used by similarly situated distribution and transmission utilities.

In accordance with these practices and PPL Electric's Reliability Criteria, PPL Electric's transmission system is planned so that it can be operated at all projected load levels and during normal scheduled outages and to withstand specific unscheduled contingencies without exceeding the equipment capability, causing system instability or cascade tripping, or exceeding voltage tolerances. The transmission system is required to have adequate capability so that it can be operated normally and can withstand the following unscheduled contingencies and other system conditions:

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, 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 non-BES transmission system.
5. The stability of the electric system must be maintained for from permanent three-phase transmission line faults that clear 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 interruptions may cause excessive load loss due to their adverse effects on, and hazard to, the public.
7. Load in excess of the specified limits as defined in the RP&P 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 PJM.

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 determination is accomplished by simulating the contingency conditions outlined above. 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 compliance. 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 PJM'S ROLE IN THE PROJECT

PJM Interconnection, L.L.C. (PJM) is a Federal Energy Regulatory Commission (FERC)-approved Regional Transmission Organization (RTO) charged with ensuring the reliability of the electric transmission system under its functional control and coordinating the movement of electricity in all or parts of thirteen states and the District of Columbia, including Pennsylvania. In order to ensure reliable transmission service, PJM prepares an annual Regional Transmission Expansion Plan (RTEP) to identify system reinforcements that are required to, among other things, meet the North American Electric Reliability Corporation (NERC) Reliability Standards,[3] PJM reliability planning

[3] On February 3, 2006, FERC certified the NERC as the organization required to establish and enforce reliability standards for the BES. Thereafter, NERC develops and enforces reliability standards, which define the reliability requirements for planning and operating transmission systems in North America. The NERC Reliability Standards apply to all users, owners, and operators of the nation's interconnected transmission grid, including PPL Electric.

criteria, and transmission owner (TO) reliability criteria. The RTEP is a FERC-approved transmission planning process that results from a comprehensive analysis to identify existing and forecasted violations of the NERC Reliability Standards on the transmission systems within PJM's service territory.[4]

PJM's RTEP is an annual process that encompasses a comprehensive series of detailed analyses to ensure power continues to flow reliably to customers under stringent reliability criteria set by NERC. The NERC reliability standards, TO criteria, and PJM reliability planning criteria are used by PJM and the transmission owners to analyze the system and to determine the specific transmission upgrade projects, as part of the overall reliability solution, that are needed to ensure long-term reliable electric service to customers and competitive power markets.

With respect to the BES, PJM conducts RTEP studies in conjunction with its transmission owners and applies NERC or PJM reliability criteria to specific conditions on the transmission system. When the studies show an inability of the transmission system to meet a specific reliability standard under these conditions, solutions such as construction of one or more new transmission lines or one or more upgrades to existing transmission facilities may be necessary. PPL Electric, an owner of transmission facilities in Pennsylvania, is a member of PJM and actively participates in the PJM transmission planning process.

The proposed North Lancaster – Honey Brook 138/69 kV Transmission Line Project will resolve reliability criteria violations of PPL Electric's local planning criteria (RP&P) on the 69 kV transmission (i.e., non-BES) System. For non-BES system reliability violations, the local TO, in this case PPL Electric, is responsible for identifying the

[4]PJM's RTEP process is currently set forth in Schedule 6 of PJM's Amended and Restated Operating Agreement ("Schedule 6"). Schedule 6 governs the process by which PJM's members rely on PJM to prepare an annual regional plan for the enhancement and expansion of the transmission facilities to ensure long-term, reliable electric service consistent with established reliability criteria. In addition, Schedule 6 addresses the procedures used to develop the RTEP, the review and approval process for the RTEP, the obligation of transmission owners to build transmission upgrades included in the RTEP, and the process by which interregional transmission upgrades will be developed.

reliability violations and correcting any violations to meet its own local transmission planning criteria. PPL's local transmission planning criteria for ensuring the reliability of the non-BES transmission system are based on the principles of the NERC and PJM reliability criteria for the BES. PJM relies on the local TOs to ensure the reliability of their non-BES system by meeting their own local transmission planning criteria. Projects that are necessary to resolve either NERC criteria, PJM reliability criteria, or the transmission owners' own local transmission planning criteria are included as baseline projects in PJM's RTEP.

To meet the objective of FERC Order 890 for a more open and transparent transmission planning process, PJM has taken a more active role in ensuring that the transmission owners communicate their plans for the development of their lower voltage transmission systems. In order to comply with FERC Order 890, TOs began submitting their lower voltage reliability projects to PJM in 2009 so that they can be presented before the PJM stakeholders at the Sub-Regional RTEP Committee meetings.

The PJM Sub-Regional RTEP Committee review includes, but is not limited to, the review of the TO criteria, assumptions and models used to identify reliability criteria violations and proposed solutions prior to finalizing the Local Plan. The Committee members are provided an opportunity to review and provide written comments to the transmission owners on the criteria, assumptions, and models used in local planning activities prior to finalizing the Local Plan. Once the Local Plan is finalized, the Committee is provided an opportunity to review and provide written comments to the TOs on the Local Plans as they are integrated into the RTEP. The transmission owners' Local Plans, that were reviewed and endorsed by the Committee, are then included in the final draft RTEP, which is sent to the PJM Board for review and approval. Once the PJM Board approves the RTEP that includes the TO Local Plans, the TOs then move forward to implement the RTEP BES transmission and the non-BES facilities as they are obligated to do under the PJM Tariff and Operating Agreements.

The purpose of the North Lancaster – Honey Brook #1 & #2 138/69 kV Transmission Line Project is to resolve the underlying causes that have led to reliability violations on the non-BES system serving the eastern portion of the Lancaster Region of PPL Electric's service territory. PPL Electric submitted the proposed Project to PJM for review and inclusion in the RTEP in November 2010. The Project was presented before stakeholders at the Mid-Atlantic Sub-Regional RTEP meeting on March 2, 2011, approved by the PJM Board, and included in the 2011 RTEP Report as baseline project b1527.1.

4.0 EXISTING SYSTEM

The South Akron 230-138-69 kV Substation supplies the existing South Akron – Morgantown #1, #2, and #3 69 kV lines, which serve 20,600 customers in the Chester, Berks and Lancaster Counties. The South Akron – Morgantown #1 69 kV line occupies a corridor that extends for approximately 21.5 miles from the South Akron 230-138-69 kV Substation to the Twin Valley 69-12 kV Substation. The existing South Akron – Morgantown #2 and #3 69 kV circuits are supported by common double-circuit structures for approximately 1.2 miles from the South Akron Substation to a point near the Earl 69-12 kV Distribution Substation. The South Akron – Morgantown #3 69 kV line terminates at the Earl 69-12 kV Substation. The South Akron – Morgantown #2 line continues east from the Earl 69-12 kV Distribution Substation as a single-circuit line for approximately 11.5 miles to the Morgantown 69-12 kV Substation. The South Akron – Morgantown #1 and # 2 69 kV lines become a double circuit for approximately 0.5 miles to a point near the Morgantown 69-12 kV substation.

A map depicting the existing facilities in the North Lancaster – Honey Brook Area is provided in Figure 2-1. A one line diagram of the existing system is shown in Figure 2-2.

5.0 DEFINITION OF THE PROBLEM

Load Growth:

Load growth in the in eastern Lancaster County, southwestern Berks County and western Chester County areas has been significant. The South Akron – Morgantown #1, #2 & #3 69 kV circuits serving customers in eastern Lancaster County, southwestern Berks County and western Chester County areas have experienced a 1.4% average annual increase in electric peak demand over the past 10 years, which is a significant increase. PJM projects a 1.3% annual future summer growth rate of peak demand for the overall PPL zone for the next 10 years (2014-2024). In addition, this area is experiencing significant industrial development that could result in an acceleration of load growth. Given the experienced and projected load growth in this area, it is imperative for PPL Electric to ensure that its facilities have the operational flexibility to maintain reliable service and to accommodate the load growth in the area.

Extended Service Interruptions:

The South Akron – Morgantown #1, #2 & #3 69 kV circuits have experienced 18 interruptions over the past 20 years. These interruptions resulted in extended outages for the customers served from these circuits. For each of these events, service to customers could have been restored more quickly if an alternative transmission supply line had been available.

Limited Transfer Capability:

Recent experience has shown that during particular severe weather events that resulted in interruptions to the South Akron-Morgantown transmission facilities, a backup or alternate transmission supply line would have enabled PPL Electric to restore more customer load in shorter periods of time. Load restoration is key to customer satisfaction and the provision of safe and reliable service. There is currently limited transfer capability between the transmission facilities in the eastern Lancaster County, southwestern Berks County, and western Chester County areas. The existing South Akron-Morgantown #1, #2, & #3 69 kV lines that serve these areas are long and heavily loaded. Transferring load from an interrupted circuit to another heavily loaded circuit

would result in unacceptable low voltage. As a result, certain customer load would need to remain interrupted if there were a transmission line outage in order to maintain proper voltage.

RP&P Violations:

Starting in 2016 , transmission planning studies project that the loss of the double-circuit South Akron – Morgantown #2 & #3 69 kV lines would initially interrupt approximately 114 MW of load, which equates to approximately 16,200 customers, including large industrial loads. The Transmission System Operator would be able to sectionalize[5] the transmission system to restore a portion of this load within a few hours. However, after all possible transmission switching moves are made to restore customer load, approximately 56 MW of load, or 8,400 customers, would remain interrupted at Earl, Honey Brook, and Morgantown substations for extended periods of time until repairs are made. The RP&P states that the maximum allowable load loss is 45 MW for a double-circuit outage. This is a violation of that practice.

PPL Electric uses the RP&P criteria to identify electric power system weaknesses that require reinforcement. The underlying causes for the system weaknesses need to be addressed to effectively resolve any criteria violations. The underlying reasons for the significant load loss concerns identified in this "Definition of the Problem" section are the long, heavily loaded South Akron – Morgantown 69 kV transmission lines and the lack of an alternative transmission source serving this area. Because there is currently no alternate electrical transmission source within the areas of high population density, the existing power supply is too distant to reliably and effectively serve that customer load. The existing 138/69 kV lines serving the customers in this region are very long in length and each serve a significant number of customers. Further, as explained above, there has been substantial load growth in this area and PPL Electric expects the load growth on these long, already heavily-loaded lines to continue. Therefore, there is a need to not

[5] Transmission line facilities are "sectionalized" with electrical switches. When the switch is "closed," the electric current flows across the switch and the transmission line operates as one single transmission line. When the switch is "open," the electric current is disrupted and the transmission line is sectionalized at the open point.

only resolve the projected violation of the RP&P criteria, but also to address the underlying causes which led to the violation.

6.0 PROPOSED SOLUTION

To improve the reliability of the system in the eastern Lancaster County, southwestern Berks County and western Chester County areas and address the underlying causes described above, PPL Electric, following approval from the PUC, plans to construct a new double-circuit 138 kV transmission line, initially operated as a double-circuit 69 kV line, between the planned Lauschtown 500-230-69 kV Substation southeast to the existing South Akron – Morgantown #1 69 kV line, a distance of approximately 4.2 miles. The proposed line will continue southeast from that point as a single-circuit 69 kV line, future double-circuit 138 kV line, to the existing South Akron – Morgantown #2 69 kV line, a distance of approximately 3.8 miles. PPL Electric will design the new line to current 138 kV standards, but initially will operate the line at 69 kV.

The proposed new 138/69 kV line will:

(i) Address load growth in the area by providing increased transmission line capacity

(ii) Decrease number of outages experienced by customers in the area by reducing the line exposure on existing transmission facilities

(iii) Improve ability to restore service to customers after a transmission facility outage by providing an alternate path for service restoration.

(iv) Address the lack of alternative transmission sources in the area

(v) Prevent the extended interruption of customer load that would exceed PPL Electric's RP&P criteria if service from the existing South Akron – Morgantown #2 & #3 69 kV transmission line at the South Akron Substation were interrupted.

After this reinforcement Project is constructed and in-service, additional capacity will be available to serve the growing load on the South Akron-Morgantown 69 kV lines. A portion of the load currently normally served from the double circuit South Akron-Morgantown #1 & #2 69 kV lines will be transferred to and normally served from the new North Lancaster-Honey Brook #1 & #2 69 kV lines. This arrangement will decrease the exposure on the existing South Akron-Morgantown #1 & #2 69 kV lines and reduce the number of customers affected by a transmission line interruption from approximately 13,000 to approximately 5,000. The new double-circuit line will serve as an alternate source for customers in the region for quicker service restoration if there is a transmission line interruption.

The new North Lancaster-Honey Brook #1 & #2 69 kV lines will address the identified RP&P transmission violation for maximum allowable load interruption. For a double-circuit outage of the South Akron – Morgantown #2 and #3 69 kV lines, the new North Lancaster-Honey Brook #1 & #2 69 kV lines will be able to restore approximately 15 MW more load to come within acceptable RP&P criteria limits through re-sectionalizing[6] of the South Akron-Morgantown 69 kV lines.

A map depicting the proposed facilities in the North Lancaster – Honey Brook Area is provided in Figure 2-3. A one-line diagram of the proposed transmission facilities in the area is shown in Figure 2-4.

[6] Re-sectionalizing is changing the status of the normally open and normally closed switches on a transmission line in order to transfer load from one transmission line to another.

Figure 2-1. Funtional Area Map of Existing Facilities in the North Lancaster - Honey Brook Area

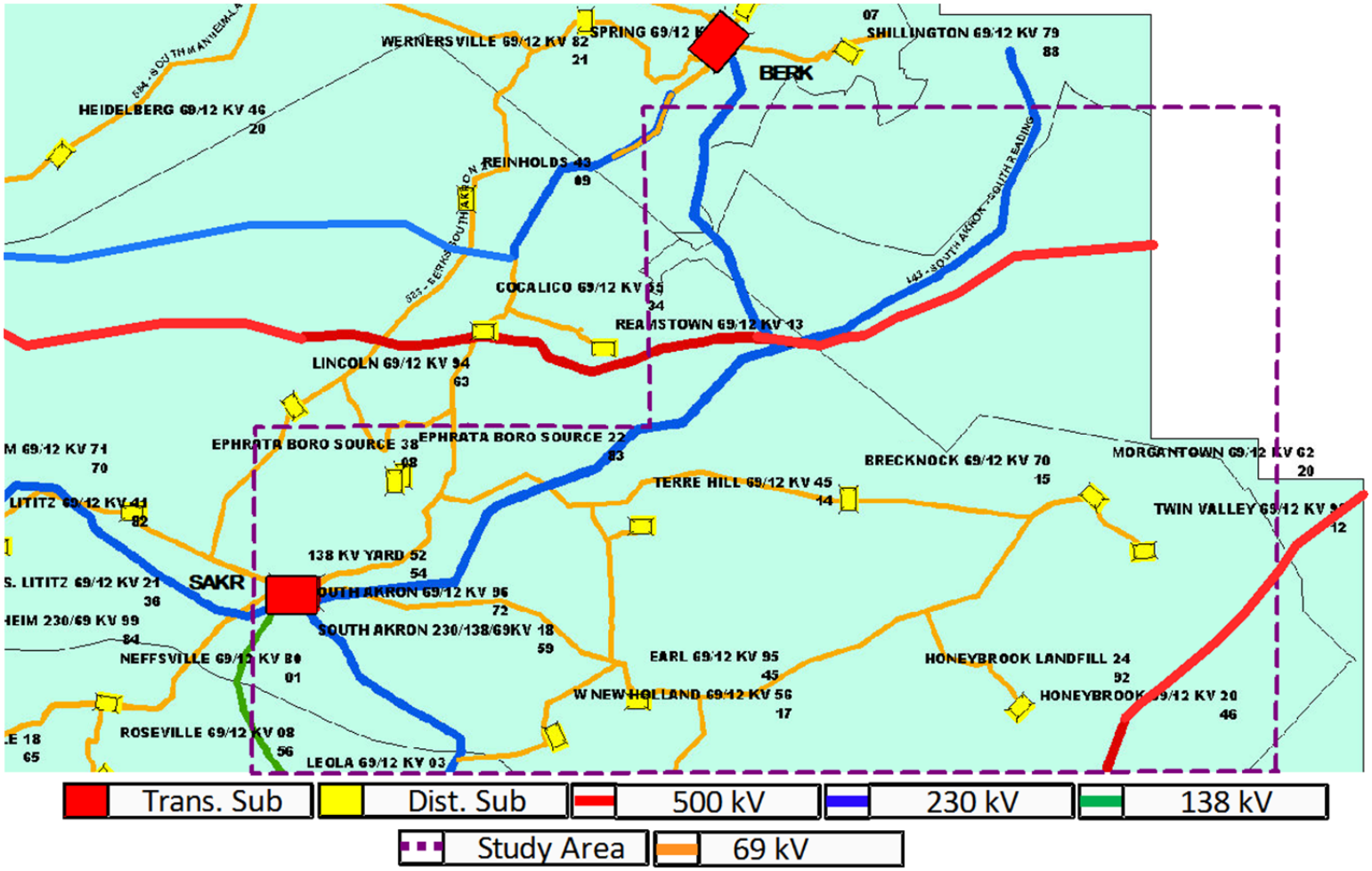


Figure 2-2. Functional Area Map of the North Lancaster - Honey Brook Area With Proposed Transmission Facilities

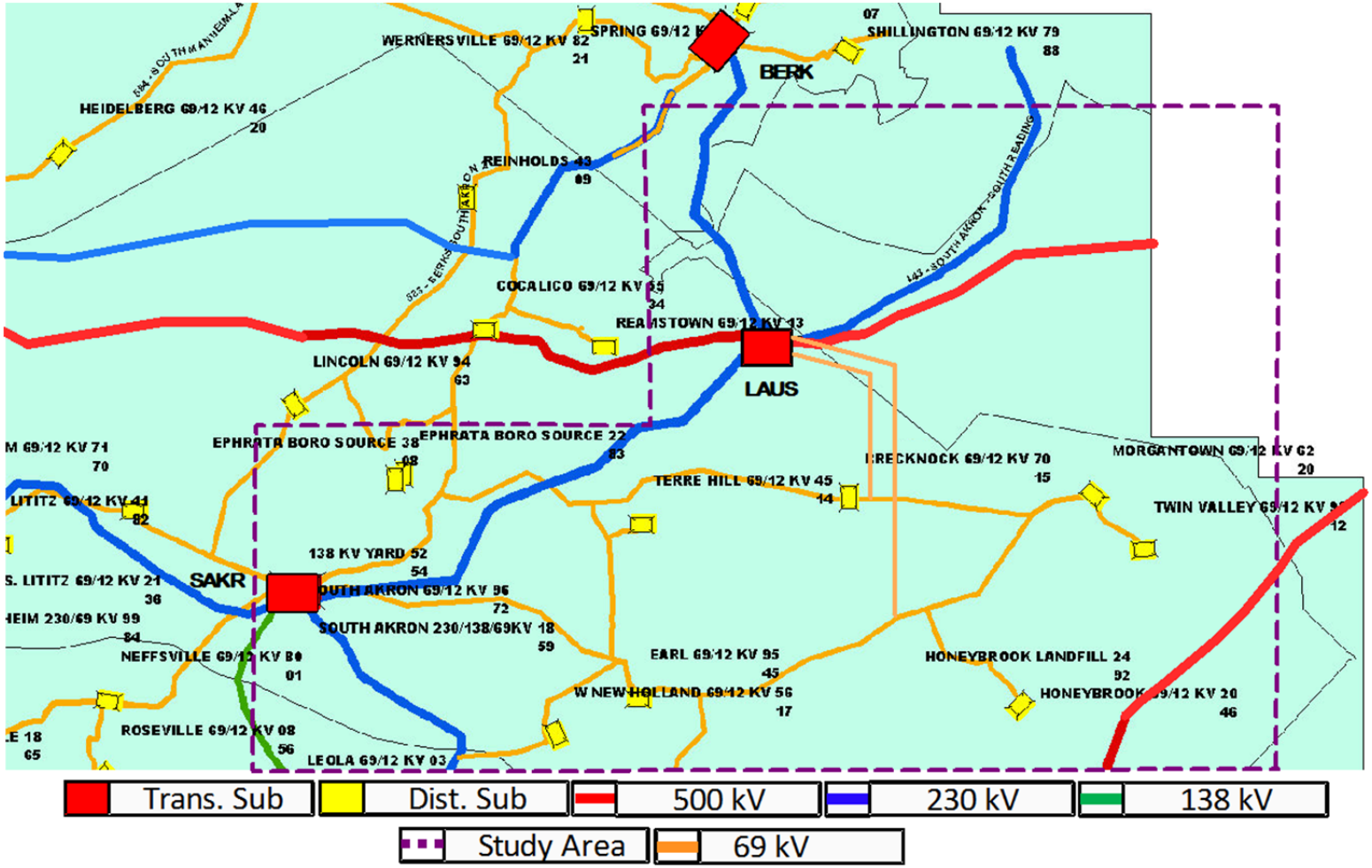


Figure 2-3. One Line Diagram of Existing Transmission Facilities

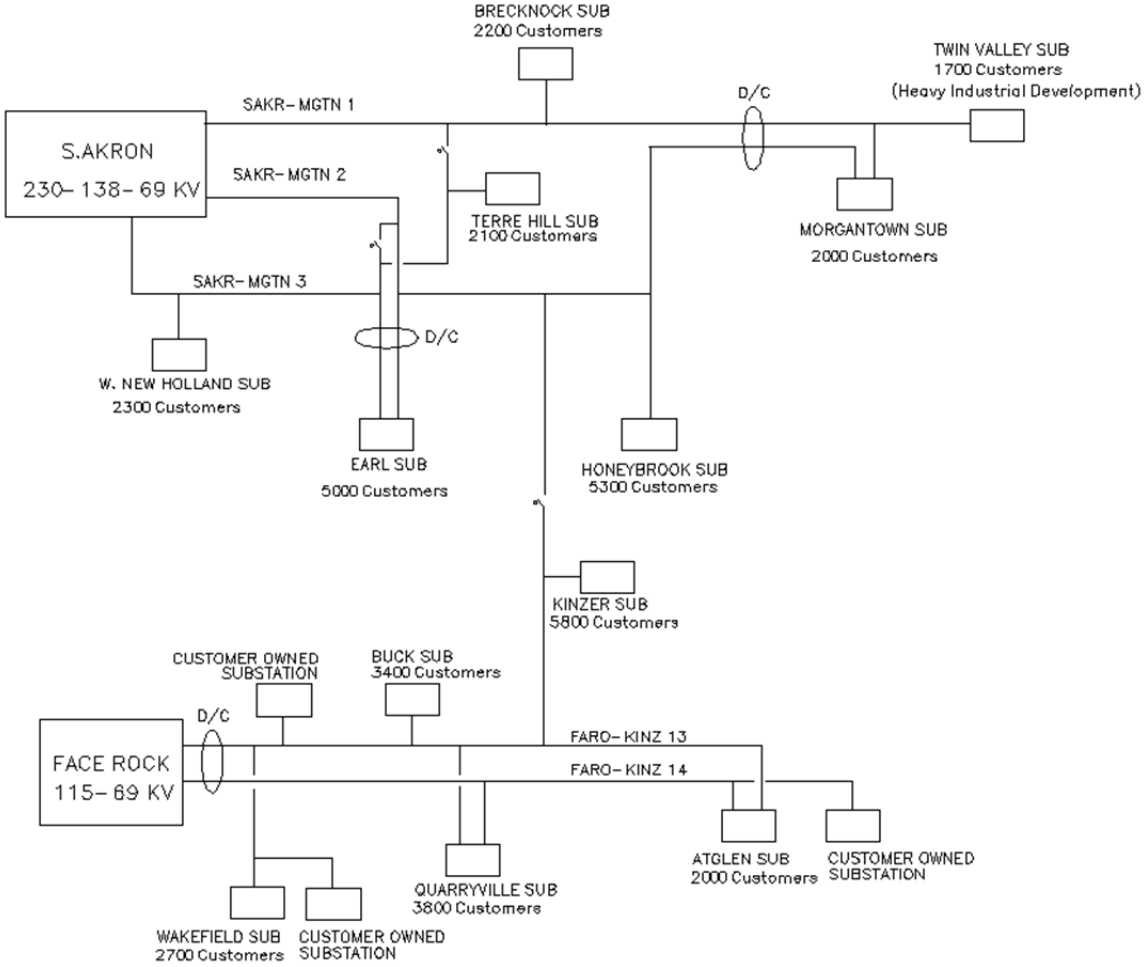
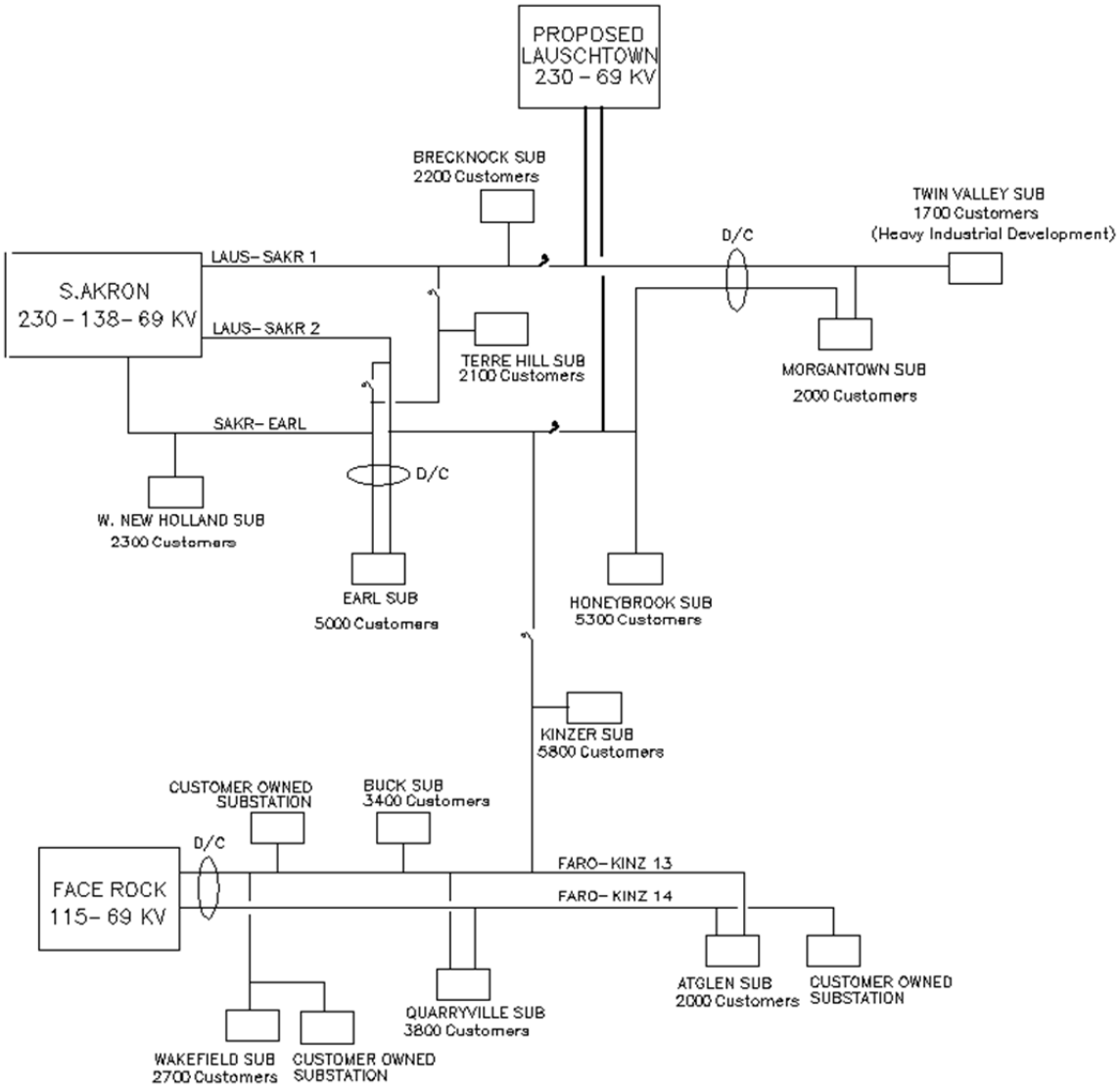


Figure 2-4. One Line Diagram of Proposed Transmission Facilities



ATTACHMENT 3

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ATTACHMENT 3
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
ENVIRONMENTAL ANALYSIS

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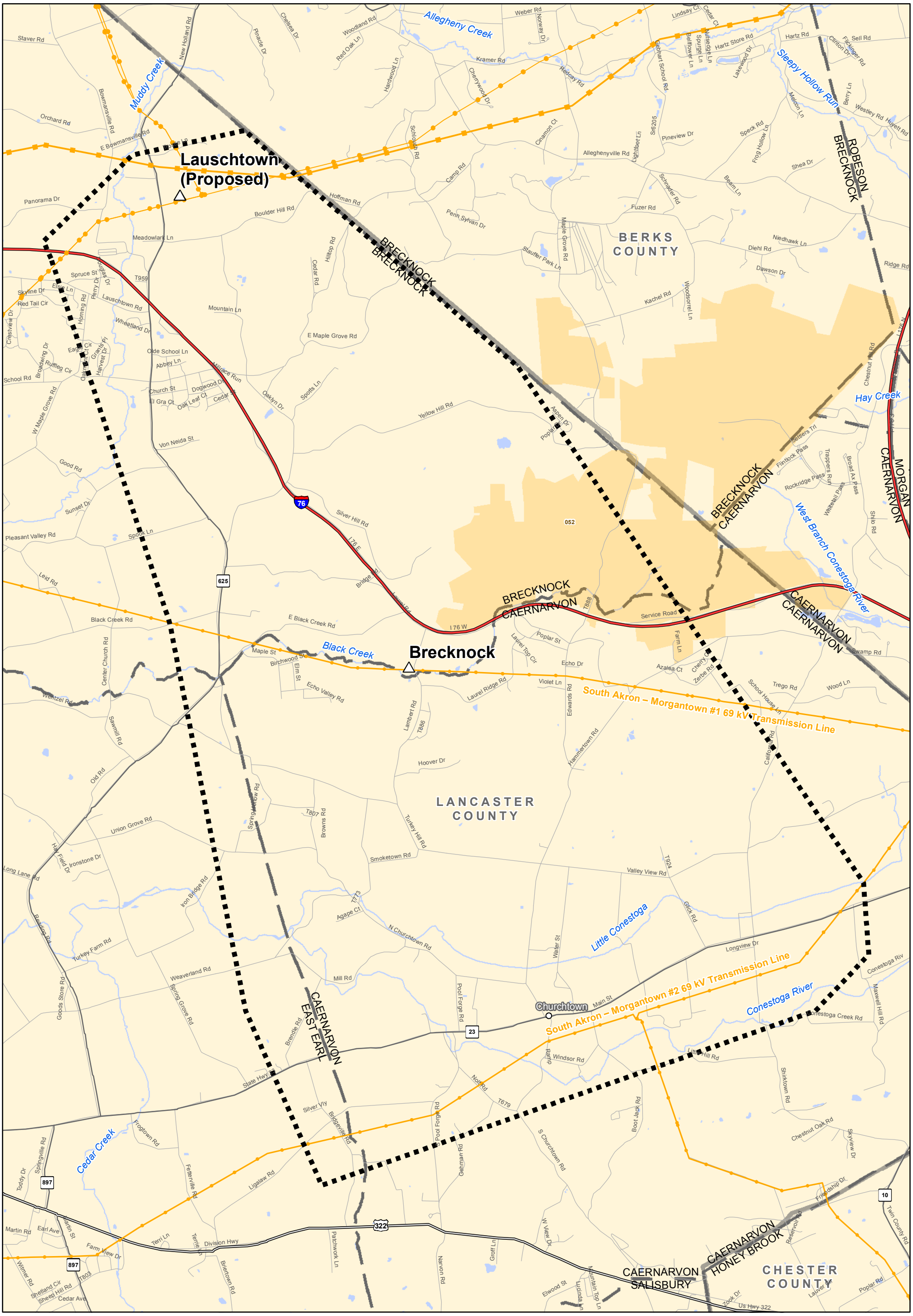
1.0 INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) seeks approval from the Pennsylvania Public Utility Commission (PUC) to site and construct a new 138/69 kV transmission line, the North Lancaster – Honey Brook 138/69 kV Transmission Line (the "Project"). As described in Attachment 2, PPL Electric has identified the need to construct a new, double-circuit 138/69 kV transmission line between PPL's proposed Lauschtown Substation in Brecknock Township, Lancaster County and an existing transmission line in Caernarvon and East Earl Townships, Lancaster County.

The purpose of this Attachment is to provide background information on the natural and built environment located within the Project Study Area (Study Area), which provides the basis for the comprehensive Route Selection Study discussed in Attachment 4. The routing process involved a series of steps, including identification of a suitable Study Area; Potential Route development, analysis, and refinement; Alternative Route development; public outreach activities; and identification of Preferred and Alternate routes.

The Routing Team identified a Study Area encompassing approximately 14,582 acres (22.8 square miles) within Caernarvon, Brecknock and East Earl townships within Lancaster County, Pennsylvania (**Figure 3-1**). The Project Study Area is bounded generally to the north by the proposed location of the Lauschtown Substation, located east of State Route 625 and north of Boulder Hill Road; to the east by the Berks and Lancaster County border; to the south by the existing South Akron – Morgantown 69 kV Transmission Line south of State Route 23; and to the west in the vicinity of State Route 625.



North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-1: Study Area

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

The Routing Team used many sources of information to evaluate the Study Area including aerial imagery, federal, state and local Geographic Information System (GIS) data, U.S. Geological Survey (USGS) maps, county and municipal planning reports, and field reconnaissance. A detailed list of GIS data sources is provided in Attachment 4.

2.0 BUILT ENVIRONMENT

The built environment includes land use, residential, commercial and industrial development, institutional uses (e.g., schools, places of worship, cemeteries, and hospitals) and cultural resources. The following sections describe the aspects of the built environment located within the Study Area.

2.1 Land Use

Agriculture is the most prevalent land use within the Study Area. Other land uses in the Study Area include forest land, suburban and rural development, commercial development, open space and fields, water and wetlands, and industrial lands (i.e., Silver Hill Quarry). The use of such lands and the public's general desire to develop or protect areas are managed by federal, state, and especially local plans, policies, and zoning.

A breakdown of the general classifications of land use (i.e., water/wetlands, developed lands, barren land, forest cover, grassland/pasture, and cultivated crops) within the Study Area based on the National Land Cover Database (NLCD) is presented in **Table 3-1**. General land uses in the Study Area are depicted graphically in **Figure 3-2**.

Table 3-1. Summary of Land Use Types

Land Use Type	Percentage of Land Use within Study Area
Water/wetlands	0.3%
Developed (Low, Medium, and High Intensity)	12.1%
Barren Land	0.2%
Forest Cover	34.2%
Grassland/Pasture	29.6%
Cultivated Crops	23.6%

Lauschtown (Proposed)
Brecknock
Churchtown
Allegheny Creek
Sleepy Hollow Run
ROBESON
BRECKNOCK
BERKS COUNTY
BRECKNOCK
BRECKNOCK
Muddy Creek
LANCASTER COUNTY
Hay Creek
ROBESON
CAERNARVON
BRECKNOCK
CAERNARVON
MORGAN
CAERNARVON
West Branch Conestoga River
BRECKNOCK
CAERNARVON
CAERNARVON
CAERNARVON
Black Creek
Little Conestoga
Conestoga
Conestoga River
CAERNARVON
EAST EARL
Cedar Creek
CAERNARVON
HONEY BROOK
CHESTER COUNTY
CAERNARVON
SALISBURY
625
76
23
897
322
897
10
176

Legend

- Populated Place
- Substation
- Study Area
- Municipality

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

- Open Water
- Developed Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

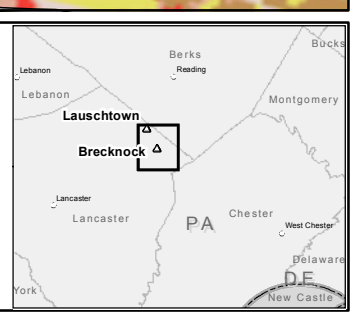
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-2: Land Use

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS). National Land Cover Dataset (NLCD).

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



2.1.1 Forestry Uses

The aesthetic attractions of forested landscapes provide settings for a wide variety of recreational experiences such as hunting, fishing, hiking, skiing, nature observations, camping, and many other outdoor activities (recreational uses are discussed in Section 2.2). Forested lands also provide habitat for various types of flora and fauna, as well as watershed protection. In residentially developed areas, forest remnants and woodlots serve as landscaping and provide privacy screening. Areas of forest exist on private and public lands scattered throughout the Study Area, particularly along Yellow Hill and Silver Hill located in the eastern part of the Study Area and along Turkey Hill, located in the central portion of the Study Area. A portion of State Game Land #52 is located within the eastern portion of the Study Area. No state forest lands are located within the Study Area.

2.1.2 Agricultural Uses

Agricultural uses constitute the predominant land use type in the Study Area, and agriculture is the largest industry in Pennsylvania. Based on 2007 census data, farms within the state produce a wide variety of food and fiber products worth over $5.8 billion annually (USDA, 2007). Agriculture also represents a significant portion of the local economy in the Study Area. Lancaster County ranks first among all Pennsylvania counties in total value of agricultural products sold. The leading agricultural products in Lancaster County are poultry, cattle, dairy products, and cultivated crops (USDA, 2007). In 2007, livestock/poultry products were valued at $922.9 million and cultivated crops were valued at $149.3 million (USDA, 2007).

The Pennsylvania Agricultural Security Law of 1981, 3 Pa. C.S. §§ 901-915, provides certain protections for farmland voluntarily enrolled in Agricultural Security Areas (ASAs) (Pennsylvania Department of Agriculture [PDA], no date). The Pennsylvania Agricultural Conservation Easement Purchase Program, created in 1989, enables state and local governments to pay farmers for agreeing to limit the use of their land to agricultural production or agriculture and related activities (PDA, 2013b).

Lauschtown (Proposed)

Brecknock

BERKS COUNTY

LANCASTER COUNTY

CHESTER COUNTY

BRECKNOCK
BRECKNOCK

BRECKNOCK
CAERNARVON

ROBESON
BRECKNOCK

ROBESON
CAERNARVON

CAERNARVON
CAERNARVON

CAERNARVON
EAST EARL

CAERNARVON
HONEY BROOK

CAERNARVON
SALISBURY

MORGAN
CAERNARVON

Allegheny Creek
Sleepy Hollow Run
Muddy Creek
Hay Creek
West Branch Conestoga River
Black Creek
Conestoga River
Little Conestoga
Cedar Creek

Staver Rd
New Holland Rd
Pinade Dr
Chelsea Dr
Woodland Rd
Red Oak Ln
Weber Rd
Norway Dr
Kramer Rd
Hardwood Ln
Cherrywood Dr
Lindsay Ct
Cedar Ct
Nutsedge Ln
Spurge Ln
Belfflower Ln
Gebhart School Rd
Hartz Store Rd
Lakewood Dr
Wesley Rd
Hartz Rd
Clinton Dr
Fleckinger Rd
Sell Rd
Orchard Rd
Bowmansville Rd
E Bowmansville Rd
Brosle Ln
Panorama Dr
Boulder Hill Rd
Hoffman Rd
Schlouch Rd
Camp Rd
Cinnamon Ct
Lightfoot Ln
SR6205
Pineview Dr
Alleghenyville Rd
Speck Rd
Frog Hollow Ln
Meloon Ln
Huyett Rd
Shea Dr
Beam Ln
Schnader Rd
Fuzer Rd
Penn Sylvan Dr
Maple Grove Rd
Stauffer Park Ln
Niedhawk Ln
Diehl Rd
Dawson Dr
Ridge Rd
Kachel Rd
Woodsorrel Ln
Meadowlark Ln
Hilltop Rd
Cedar Rd
Lauschtown Rd
Spruce St
Elsie Ln
Perry Dr
Skyline Dr
Red Tail Cir
Horning Rd
T959
Crestview Dr
Wheatland Dr
Mountain Ln
E Maple Grove Rd
Olde School Ln
Abbey Ln
Eagle Cir
Oakmont Ct
Grants Pl
Harvest Dr
Broadwing Dr
Ruffleg Cir
School Rd
Hallrace Run
Church St
Dogwood Dr
El Gra Ct
Oak Leaf Ct
Cedar St
Oaklyn Dr
Spotts Ln
Yellow Hill Rd
Aspen Dr
Poplar Dr
W Maple Grove Rd
Von Neida St
Good Rd
Sunset Dr
Pleasant Valley Rd
Spook Ln
Silver Hill Rd
I 76 E
I 76 W
Bridge St
Laurel Dr
Leid Rd
Black Creek Rd
E Black Creek Rd
Center Church Rd
Maple St
Birchwood St
Elm St
Echo Valley Rd
Wentzel Rd
Sawmill Rd
Old Rd
Union Grove Rd
Hay Field Dr
Ironstone Dr
Long Lane Rd
Iron Bridge Rd
Beading Rd
Turkey Farm Rd
Weaverland Rd
Goods Store Rd
Spring Grove Rd
Mill Rd
Brendle Rd
Main St
Churchtown
Windsor Rd
Ramp
Nolt Rd
T679
State Hwy 23
Silver Vly
Bridgeville Rd
Frogtown Rd
Fetterville Rd
Ligalaw Rd
Springville Rd
Toddy Dr
Martin Rd
Earl Ave
Martin St
Farm View Dr
Terri Ln
Terrie Ln
Division Hwy
Shetland Cir
Sheep Hill Rd
Cedar Ave
Wilmer Rd
T803
Briertown Rd
Patchwork Ln
Narvon Rd
Groff Ln
W View Dr
Elwood St
Lucinda Ln
Mountain Top Ln
Look Dr
Us Hwy 322
Lambert Rd
T886
Hoover Dr
Browns Rd
T807
Turkey Hill Rd
Smoketown Rd
Valley View Rd
T924
T713
Agape Ct
N Churchtown Rd
Water St
Glick Rd
Longview Dr
Conestoga Creek Rd
Maxwell Hill Rd
Little Hill Rd
Ramp
Shirktown Rd
Boot Jack Rd
S Churchtown Rd
Chestnut Oak Rd
Skyview Dr
Friendship Dr
Reservoir Rd
Twin County Rd
Trego Rd
Wood Ln
School House Ln
Hammertown Rd
California Rd
Edwards Rd
Laurel Ridge Rd
Violet Ln
Echo Dr
Azalea Ct
Cherry Ct
Zerbe Rd
Laurel Top Cir
Poplar St
Farm Ln
Service Road
T888
Swamp Rd
Chestnut Hill Rd
Flintlock Pass
Rockridge Pass
Trappers Run
Broad Ax Pass
Whitetail Pass
Shilo Rd
Lebanon
Reading
Montgomery
Lancaster
Chester
West Chester
Delaware
York
New Castle
PA
DE
Berks
Bucks

625
76
23
897
322
052
10

Legend

- Populated Place
- Substation
- Study Area
- Agricultural Easements
- Agricultural Security Areas
- Municipality
- PA Gameland
- Stream
- Waterbody

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-3. Agricultural Security Areas and Easements

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

The Pennsylvania Farmland and Forest Land Assessment (Clean and Green) Act of 1974 assists in preserving farmland through setting property taxes by actual land use instead of at the prevailing market rate (Penn State University, 2013). In addition, the non-profit Lancaster Farmland Trust formed in 1985 to address farmland preservation in farms owned by the Amish and Mennonite (Plain Sect) community. A few farms located within the Study Area are part of the Farmland Trust program. Designated Agricultural Security Areas and easements in the Study Area are shown on **Figure 3-3**.

Agricultural security areas are created by local municipalities in cooperation with individual landowners who agree to collectively place at least 250 acres in an agricultural security area (PDA, no date). Additionally, the Pennsylvania Agricultural Security Law requires that counties must appoint Agricultural Land Preservation Boards to administer County conservation easement programs (PDA, 2013a). Therefore, Lancaster County operates an Agricultural Conservation Easement Purchase Program that works to preserve important agricultural lands through the purchase of agricultural conservation easements.

In accordance with Pennsylvania ASA regulations (1381 Pa. Code § § 138l.4), Public Utility facilities that have been reviewed and approved by the PUC are permitted within ASAs (PDA, 2008). Public utilities are also permitted in Agricultural Conservation Easements based on the granting of a right-of-way by the property owner, according to the Agricultural Conservation Easement Purchase Program regulations (138e Pa. Code § 138e.241 (2) (v)). Lancaster Farmland Trust land use restrictions vary with each individual easement. In general, the Lancaster Farmland Trust seeks to "protect agricultural and open space land by significantly limiting the right to subdivide and build dwellings on the property" (Lancaster Farmland Trust, 2013).

According to the East Lancaster County Comprehensive Plan (ELANCO), which includes Caernarvon, Brecknock and East Earl townships, approximately 60 percent of eastern Lancaster County is agricultural land. Of this land, approximately 48 percent is held in ASAs. The area has strong cultural and agricultural traditions, including the rural way of life of the Plain Sect community (ELANCO, 2008).

2.1.3 Urban and Developed Land Uses

There are no high density developed areas located within the Study Area. Bowmansville, located in the north in Brecknock Township, and Churchtown, located in the south in Caernarvon Township, are the most populated places within the Study Area. Many smaller residential areas are scattered throughout the Study Area. Most commercial businesses are within the urban areas or along the Pennsylvania Turnpike (I-76), State Route 625 or State Route 23. Many smaller residential areas are scattered throughout the Study Area. During the routing process (see Attachment 4), the Routing Team identified a few scattered new homes that were not identified through a review of aerial imagery in the vicinity of the Alternative Routes.

As shown in Table 3-2, the population within the Study Area increased between 2000 and 2010 and is generally projected to increase by another 8 to 13 percent between 2010 and 2020.

Table 3-2. Study Area Population Demographics

County/ Municipality	2000[1]	2010[1]	Percent Change	2020[2] (Projected)	Percent Change (Projected)
Lancaster County	470,658	519,445	+10	569,343	+10
Caernarvon Township	4,278	4,748	+11	5,162	+9
Brecknock Township	6,699	7,199	+7	8,172	+13
East Earl Township	5,723	6,507	+14	7,020	+8

Sources: [1]U.S. Census (2010); [2]Delaware Valley Regional Planning Commission (2012)

No airports are located within the Study Area or within 2 miles of the nearest limit of the right-of-way of each Alternative Route. This satisfies PUC regulations (52 Pa. Code § 57.72(c)(9)), which requires the identification of all airports located with 2 miles of the nearest limits of the right-of-way of each Alternative Route. The closest airport, the Morgantown Airport, is located approximately 4 miles outside of the Study Area. The Morgantown Airport is classified as a general service airport by the Pennsylvania Department of Transportation (PennDOT) Bureau of Aviation.

2.1.4 Linear Infrastructure

The Study Area is served by several roads including the Pennsylvania Turnpike, State Highways 10, 23 and 625, and numerous county and local roads. None of the Alternative Routes cross federal or Pennsylvania Department of Transportation (PennDOT) designated scenic byways. However, according to the ELANCO Comprehensive Plan, Routes 23, 625, and 897 have been identified as potential candidates for the County Heritage Byways Program[1].

A network of 69 kV transmission lines fed by a substation in the vicinity of South Akron serves electric customers in eastern Lancaster County; however, no existing transmission lines traverse the Study Area north to south. The South Akron – South Reading 230 kV Transmission Line traverses the Study Area and the proposed Lauschtown Substation property from east to west. The South Akron – Berks 230 kV Transmission Line and a Met-Ed 500 kV transmission line also converge at the proposed Lauschtown Substation. The Brecknock Substation is served by the South Akron – Morgantown #1 69 kV Transmission Line in the center of the Study Area. The South Akron – Morgantown #2 69 kV Transmission Line traverses east to west within the southern portion of the Study Area.

2.1.5 Municipal Zoning

All of the townships within the Study Area have enacted zoning ordinances. PPL Electric's siting consultant, The Louis Berger Group, Inc. (Louis Berger), collected and reviewed the zoning maps and ordinances for the three municipalities in the Study Area (Brecknock, Caernarvon and East Earl townships). The zoning districts established by these ordinances are generally designed to guide future land use in the municipality by encouraging the development of desirable residential, commercial, agricultural and manufacturing areas within appropriate groups of compatible and related uses.

[1] The Lancaster County Heritage Byways Program consists of automobile routes that highlight the natural, cultural and historic heritage of Lancaster County. This program is managed separately from the state and federal byways program.

Caernarvon, East Earl and Brecknock townships are largely made up of lands zoned for Agricultural Use. The Study Area also includes lands that are zoned Residential, Open Space/Conservation, Forest Recreational, and Mineral Recovery. Areas zoned for Light Industrial, Neighborhood Commercial, and Highway Commercial uses are located in and around Bowmansville in Brecknock Township (Caernarvon Township 2006; Brecknock Township 1993).

As a general rule, public utility facilities are exempt from local zoning ordinances. Nevertheless, electric transmission lines by public utilities are typically addressed in municipal zoning codes as an "essential service," "public utility" or similar categorization. Caernarvon Township (1991) defines a utility as "any utility coming under the jurisdiction of the Public Utility Commission of Pennsylvania," but does not specifically address public utilities or electric transmission lines as a permitted use in any of its zoning districts. Brecknock and East Earl townships do not specifically address public utilities or electric transmission lines, but they are expected to be permitted as a special exception or conditional use, if not by right.

2.1.6 Comprehensive and Land Use Plans

Louis Berger collected and reviewed all county and township comprehensive or land use plans applicable to the municipalities located in the Study Area. Comprehensive plans serve as a means for local governments to assess existing development and guide future development within their boundaries.

Lancaster County has adopted a county-wide comprehensive plan to guide development within the County, as well as an Open Space and Greenways plan. The Lancaster County Comprehensive Plan is composed of three elements: the Policy Element, the Growth Management Element, and six Functional Elements that cover cultural resources, greenscapes, housing, tourism, transportation and water resources (Lancaster County, 1999). In addition, all three of the townships located within the Study Area have adopted the multi-municipal ELANCO Region Comprehensive Plan. The primary goal of the ELANCO comprehensive plan is to manage growth in order to maintain the rural and agricultural character of the region (Lancaster County, 2008). Caernarvon Township has

also adopted its own comprehensive plan. Common themes among the plans include a discussion of challenges associated with accommodating significant growth in the region and the importance of preserving farmland and open space.

2.2 Recreation/Aesthetics

2.2.1 Federal, State, and Local Recreation Areas

Pennsylvania supports a wide array of both dispersed and developed recreational opportunities that occur on federal, state, local, and private lands. Dispersed recreational uses include recreation that occurs over a broad area and not at a specific developed site, but may include developments or facilities that provide access to recreational opportunities. Examples of dispersed recreational activities include hiking, scenic driving, bicycling, backpacking, hunting, fishing, off-road vehicle use, snowmobiling, bird watching, and cross-country skiing, among others. Developed recreation provides permanent facilities designed to accommodate uses such as camping, boat launching, sports and athletic activities, or day-use activities (e.g., picnicking, interpretive exhibits, and hiking/biking trails).

No federal- or county-owned recreational areas exist within approximately 2 miles of the Alternative Routes or within the entire Study Area. Approximately 775 acres of State Game Land #52 are located within the eastern portion of the Study Area. Three local campgrounds are located within the Study Area. Sun Valley Campground, a privately owned 86-acre campground and RV resort located in Brecknock Township, offers 265 campsites, a swimming pool, fishing pond, outdoor pavilion, game room, playground, basketball court, horseshoes, volleyball and organized activities (Sun Valley Campground, 2013). Sun Valley Campground is situated in the northeastern portion of the Study Area, east of I-76, on East Maple Grove Road. Adventure Bound Camping Resorts Oak Creek, a privately owned 200-acre campground and RV park is located in Brecknock Township, offers 277 campsites, water slides, shuffleboard court, horse shoe pits, game room, three playgrounds, shower and laundry facilities, and organized activities (Adventure Bound Camping Resorts, 2011).). Adventure Bound Camping Resorts is located in the northeastern portion of the Study Area, east of I-76, on East Maple Grove Road. The campground includes a trail to Devil's Den, which is a scenic

local geologic site. Lake in Wood Campground, a privately owned 105-acre campground and RV resort located in Brecknock Township, offers 350 campsites, sports, recreation, and leisure activities (Lake in Wood Camping Resort, 2014). The centerpiece of the resort is a 6-acre lake. Lake in Wood Campground is situated in the northeastern portion of the Study Area, east of I-76 on Yellow Hill Road. No other privately owned recreational opportunities were identified within the Study Area.

2.2.2 Aesthetics

For the purpose of this Application, aesthetics are defined as a mix of landscape character, the context in which the landscape is being viewed, and the scenic integrity of the landscape. The Routing Team considered the aesthetic impact of the Project by evaluating the existing landscape character, reviewing available GIS data, and reviewing the Study Area in the field from points of public access.

Landscape character encompasses the patterns of landform (topography), vegetation, land use, and aquatic resources (i.e., lakes, streams, and wetlands). The landscape character is influenced both by natural systems (e.g., soils, surface water, wetlands, and vegetation), as well as people's interactions with and use of land (e.g., land use, recreation, and cultural resources). In natural settings, the landscape character attributes are natural elements, whereas in pastoral or rural/agricultural settings they may include man-made elements such as fences, walls, barns and occasional residences. In a more developed setting, the landscape character may include buildings, lawn areas and landscaping, pavement, and utility infrastructure.

The Study Area is part of the region known as the Piedmont, with a topography consisting of rolling hills and valleys. Several streams and their tributaries meander through the Study Area, the largest being the Conestoga River. Major tributaries of the Conestoga River within the Study Area include Muddy Creek, Little Muddy Creek, Black Creek, and the Little Conestoga River. The landscape is generally characterized by large areas of farmland and open space, with expanses of forest along the higher ridges in the eastern and central portions of the Study Area. Smaller pockets of forest are interspersed throughout the landscape. The aesthetics of the Study Area are largely characteristic of a

rural/agricultural setting, while the aesthetics of areas around Bowmansville, Churchtown, and portions of the I-76 corridor are more typical of developed areas as described above.

2.3 Cultural Resources

Resources of historic architectural and archaeological significance are located in the vicinity of the Study Area. Initial analysis of the Project's potential to affect cultural resources involved a review of the Pennsylvania Historical and Museum Commission (PHMC)/Bureau of Historic Preservation (BHP) Cultural Resource Geographic Information System (CRGIS) on-line inventory of cultural resources. The review involved identifying all known prehistoric and historic period archaeological sites and all known historic architectural resources and historic districts within the Study Area in accordance with PUC regulations (52 Pa. Code § 57.72). A list of architectural and archaeological resources identified in the CRGIS within the Study Area is included in the tables in Attachment 15. Known architectural resources and sites (i.e., historic buildings, structures, districts, and roadways) in the Study Area are shown on **Figure 3-4**. Known archaeological resources are not shown on the figure to protect any such sites.

2.3.1 Historic Architectural Sites

Seventy-two previously recorded historic architectural sites were identified within the Study Area. Each of these sites and its listing status on the National Register of Historic Places is shown in Table 15-1 in Attachment 15.

2.3.2 Archeological Sites

Forty previously recorded archaeological sites were identified within the Study Area. According to CRGIS, six sites were listed or determined eligible by the Keeper of the National Register, four sites were considered eligible by the submitter, and 30 of the 40 sites were of undetermined eligibility due to insufficient data available. Each of these sites and its status is shown in Table 15-2 in Attachment 15.

Precise locations of the archaeological resources are often uncertain due to mapping inaccuracies or intentionally vague because of concern for sensitivity of the resource and will need to be confirmed in the field and through further consultation with the

PHMC/BHP. In addition, the number of resources identified in the CRGIS databases in and/or near the respective routes is not necessarily indicative of the relative potential of transmission line construction along each route to affect cultural resources. Differing survey intensities and methods have resulted in an inventory of cultural resources in the CRGIS that is not necessarily representative of the actual number and distribution of resources that would be identified were the routes to be thoroughly and comparably surveyed.

Lauschtown (Proposed)

Brecknock

BERKS COUNTY

LANCASTER COUNTY

CHESTER COUNTY

BRECKNOCK BRECKNOCK

BRECKNOCK CAERNARVON

CAERNARVON EAST EARL

CAERNARVON CAERNARVON

CAERNARVON HONEY BROOK

CAERNARVON SALISBURY

ROBESON BRECKNOCK

MORGAN CAERNARVON

Allegheny Creek

Muddy Creek

Sleepy Hollow Run

Hay Creek

Black Creek

Cedar Creek

Conestoga River

Little Conestoga

West Branch Conestoga River

West Branch Brandyw

093610 093616 093618 093613 093614 093617 093619 093626

122695

036741 036747 036753 036749 036739 036761 036740 036760 036762 036780 036769 036772 036759 036775 036744 036743 036725 036728 036770 036729 036727 036730 070946 070955 070945 070921 070965 070967 070966 070963 070896 070915 070958 070914 070961 070960 070855 070957 070959 070936 070934 070919 070935 070938 070893 070941 070891 070890 070857 070832 070859 070841 070849 070843 070844 070848 070888 070835 070836 070847 070856 070869 070868 070867 070861 070872 070846 070898 070866 070882 070903 070900 070901 070850 070886 070887 070845 070897 070852 070851 070838 070840 106058 050792 070881

156146

Legend

- Populated Place
- Substation
- Study Area
- Architectural Site (Resource No.)
- Municipality
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

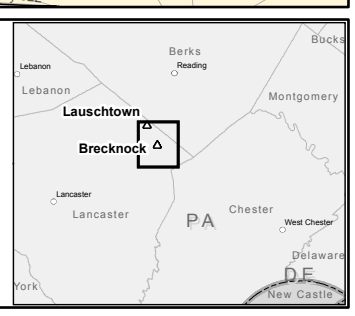
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-4. Cultural Resources

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), Pennsylvania Historical & Museum Commission (PHMC), United States Fish and Wildlife Service (USFWS).

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



3.0 NATURAL ENVIRONMENT

Natural resources evaluated include geology and soils, water resources, vegetation, and wildlife. Each of these resources is discussed in the following sections.

3.1 Geology and Soil Resources

3.1.1 Geology

The project Study Area is located in the southeastern portion of the Commonwealth in the Piedmont Province[2]. Within the Province, the routes cross three different Sections: the Gettysburg-Newark Lowland Section, the Piedmont Upland Section, and the Piedmont Lowland Section. A Section (i.e., a succession of rock units) is composed of a number of individual geologic units or formations. The majority of the Study Area is located within the Gettysburg-Newark Lowland Section. The Gettysburg-Newark Lowland Section is characterized by rolling low hills and valleys developed on red sedimentary rock. There are also isolated higher hills developed on diabase, baked sedimentary rock (hornfels), and conglomerates. Almost all of the underlying sedimentary rock dips to the north or northwest. Relief [3]is generally in the area of 100 to 200 feet, but locally is up to 600 feet on some of the isolated hills. The underlying rock types of this section are sedimentary rocks. Elevation in the Section ranges from 20 to 1,355 feet (PADCNR, 2010).

The Piedmont Upland Section, located in the southwest portion of the Study Area, is characterized by broad, gently rolling hills and valleys. This upland area is developed mainly on metamorphic rocks called schists, which commonly have a very well-developed plane. Relief is generally less than 300 feet, but it can be as much as 600 feet with elevations ranging from generally between 400 and 600 feet.

The Piedmont Lowland Section, located in the southernmost portion of the Study Area, is characterized by broad, moderately dissected valleys separated by broad low hills. This

[2] A Province is a region having a pattern of relief features or landforms that differs significantly from that of adjacent regions.
[3] Relief is the difference in elevation between the highest and lowest points of a land surface (USGS, 2014).

Section is developed primarily on limestone and dolomite rock and karst topography is common. Relief is generally less than 100 feet, but may be as much as 300 feet. Elevations in the Section range from 60 feet to 700 feet (PADCNR, 2010).

3.1.2 Soils

Soil groups in the vicinity of the Alternative Routes were determined using the soil survey geographic (SSURGO) database. SSURGO is the most detailed level of soil mapping done by the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA).

Three soil associations are located within the Study Area (**Figure 3-5**). The Hagerstown-Duffield-Clarksburg soil association predominates in the southern portion of the Study Area. This association consists of deep and very deep, well-drained soils with moderate permeability[4]. Some areas are less well drained with slow to moderately slow permeability. These soils weathered mostly from limestone. Most of this association is used as cropland or pasture. The Manor-Glenelg-Chester soil association prevails in the northern section of the Study Area. These soils are characterized by well-drained, chiefly rolling and hilly soils. The Ungers-Penn soil association comprises a small portion in the southeastern corner of the Study Area. This association is comprised of well-developed clay loams suitable to cropland or pastures.

Approximately 3 percent of the soil series can generally be characterized as hydric while approximately 23 percent are partially hydric, 74 percent are non-hydric, and 0.1 percent is an unknown characteristic. The NRSC National Soil Survey Handbook (NSSH), Part 614, defines hydric soil as a soil that forms under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soils can indicate the presence of wetlands, ponds, streams and other hydro-related features.

[4] The state or quality of a material or membrane that causes it to allow liquids or gases to pass through it.

Lauschtown
(Proposed)

Brecknock

Churchtown

BERKS
COUNTY

LANCASTER
COUNTY

CHESTER
COUNTY

BRECKNOCK
BRECKNOCK

ROBESON
BRECKNOCK

BRECKNOCK
CAERNARVON

ROBESON
CAERNARVON

CAERNARVON
CAERNARVON

CAERNARVON
EAST EARL

CAERNARVON
HONEY BROOK

CAERNARVON
SALISBURY

MORGAN
CAERNARVON

Allegheny Creek
Sleepy Hollow Run
Hay Creek
West Branch Conestoga River
Little Conestoga
Little Conestoga
Conestoga River
Black Creek
Muddy Creek
Cedar Creek

76
176
625
23
897
322
10

Legend

- Populated Place
- Substation
- Study Area
- Municipality
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

Soil Association

- Hagerstown-Duffield-Clarksburg
- Manor-Glenelg-Chester
- Neshaminy-Lehigh-Glenelg
- Ungers-Penn

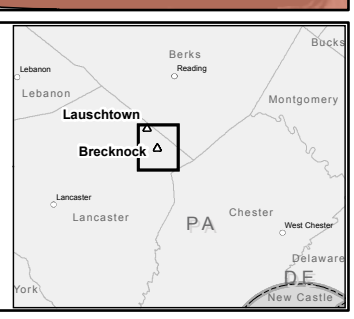
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-5: Soil Associations

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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



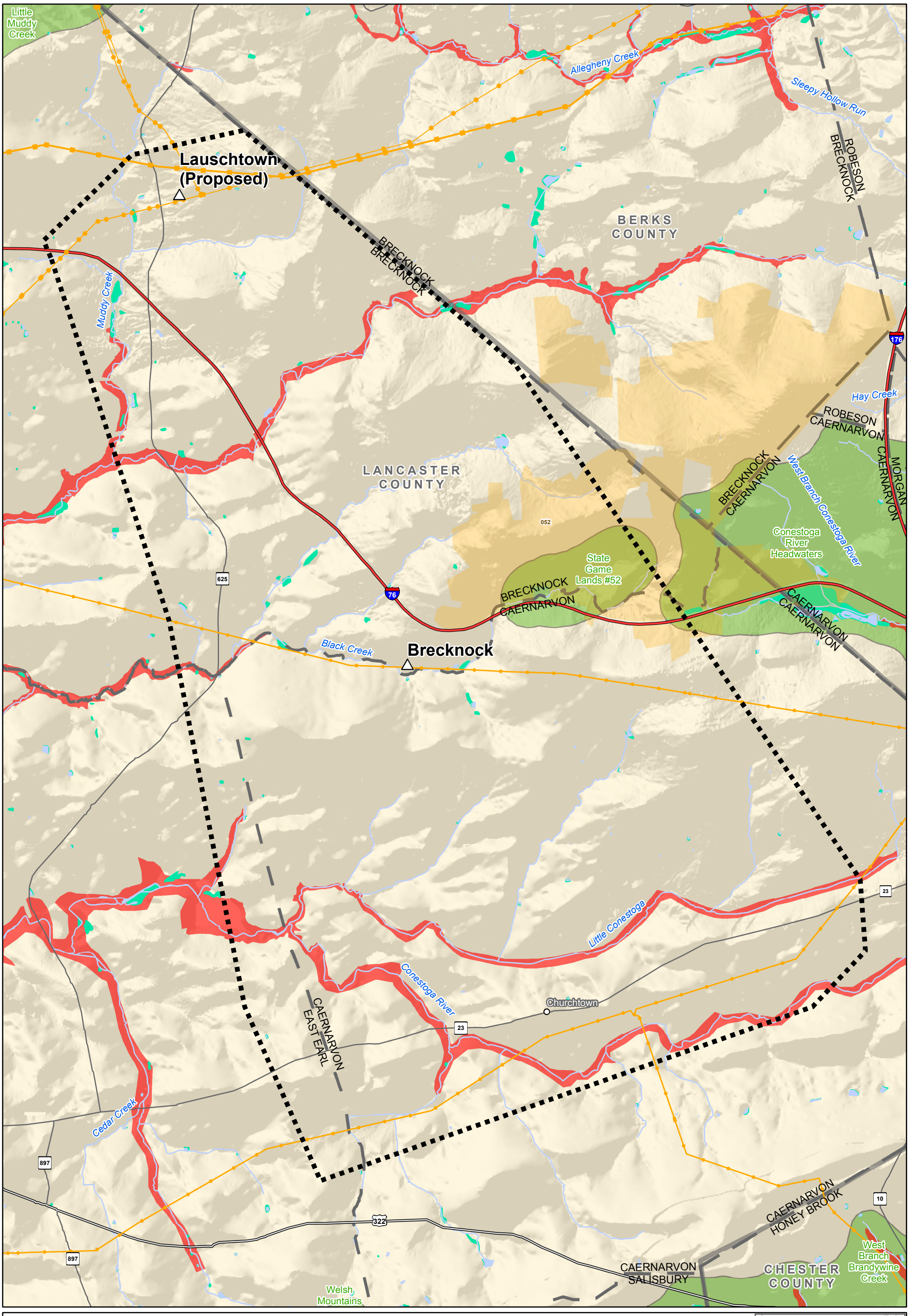
Approximately 46 percent of the soil associations in the Study Area can generally be characterized as prime farmland while approximately 18 percent are farmland of statewide importance and 37 percent are not prime farmland. No soil conditions were found that would potentially limit construction of the proposed Project.

3.2 Water Resources

3.2.1 Streams

The entire Study Area is located within the Lower Susquehanna watershed within the Susquehanna River Basin. Major rivers located within the Study Area include the Conestoga River, Little Conestoga River, Muddy Creek and Black Creek. The Conestoga River is a tributary of the Susquehanna River and flows predominantly northeast to southwest through Berks and Lancaster counties and drains an area of approximately 217 square miles (Lancaster County, 2005). The Conestoga River and Little Conestoga Creek traverse in a general east-west direction within the southern portion of the Study Area. Muddy Creek, a tributary to the Conestoga, is located within the northern portion of the Study Area. Black Creek is another tributary to the Conestoga which bisects the Study Area east to west, crossing just south of the Brecknock Substation. Black Creek serves as the boundary between Brecknock and Caernarvon townships. Streams within the Study Area are shown on **Figure 3-6**.

Pennsylvania Water Quality Standards (Title 25 Pa. Code § 93.3) designate protected water uses which provide the basis for the development of water quality criteria. Special quality waters consist of exceptional value and high quality waters. Those pertaining to biological uses include the maintenance and propagation of aquatic life, including cold water and warm water fisheries, and anadromous fish (i.e., those that live their lives in the sea and migrate to freshwater to spawn) and catadromous fish (i.e., those that live their lives in freshwater and travel to the sea to spawn), which ascend into flowing waters to complete their life cycle. The Pennsylvania DEP routinely re-evaluates its water quality designations. Water bodies that have been granted a new designated use status that has not



Legend

- Populated Place
- Substation
- Study Area

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

- Stream
- Waterbody
- Wetland (NWI)
- 100-Year Floodplain
- BDA-Core Area
- PA Gameland
- Municipality

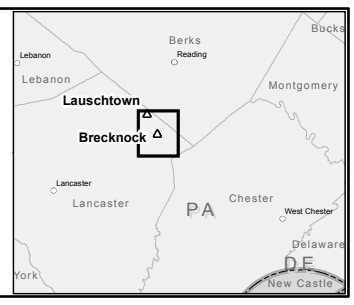
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 3-6: Natural Features

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Pennsylvania Natural Heritage Program (PNHP)>

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



yet been incorporated into the Pennsylvania Code are still classified according to their existing use with regard to permitting. According to this code, the majority of the drainages crossed in the Study Area are designated as warm water fisheries, migratory fisheries, high quality cold water fishery, high quality trout stocking fish, and trout stocking. Study Area streams in the Susquehanna River basin and their designated water uses are shown in **Table 3-3.**

Table 3-3. Study Area Basin Streams and Designated Uses

Name of Surface Water Body	PADEP Chapter 93 Designated Water Use
Conestoga River	WWF
Little Conestoga	WWF
Muddy Creek	TSF
Black Creek	HQ-WWF

EV = Exceptional value; HQ = High quality; CWF = Cold water fishery; WWF = Warm water fishery; TSF = Trout stocking fish

The Pennsylvania DEP protects four stream water uses: aquatic life, fish consumption, potable water supply, and recreation. If a stream segment is not attaining any of these four uses, it is considered impaired (Pennsylvania Office of Water Management, 2006). A small portion of the Conestoga River located in the southeast corner of the Study Area is considered impaired for nutrients, organic enrichment and low dissolved oxygen.

3.2.2 Wetlands and Lakes

The Routing Team used the U.S. Fish & Wildlife Service's National Wetland Inventory (NWI) shapefiles and maps to preliminarily identify potential wetlands within the Study Area. The NWI produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. The accuracy of NWI maps varies based upon age, wetland type and size, source photography, and survey methods. Therefore, actual wetland totals are expected to change based upon field surveys and formal delineations using the U.S. Army Corps of Engineers 1987 Methodology. Field surveys or delineations along the Alternative Routes are not practical during the routing process due to the large geographic area, as well as the lack of land access for portions of the Alternative Routes.

PPL Electric is in the process of delineating wetlands located along the Preferred Route (see Attachment 4) using the U.S. Army Corps of Engineers 1987 Methodology. In addition, the Routing Team used hydric soils mapped by the Natural Resource Conservation Service. A hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. All wetlands contain hydric soils. Therefore, they are a good indicator of potential wetland locations. Wetlands and water resources are shown in Figure 3-6.

NWI wetlands are mapped using the Cowardin (1979) wetland classification system. Within the Study Area, there is one system represented: palustrine. The palustrine system includes all nontidal freshwater wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, as well as unvegetated shallow water wetlands such as ponds. Classes within the palustrine system are defined based upon the dominant vegetation type and include forested (PFO), scrub shrub (PSS), emergent marsh (PEM), and open water (ponds) (POW). There are approximately 61 NWI palustrine wetlands scattered throughout the Study Area (see Figure 3-6).

3.2.3 100-year Floodplains

Floodplains are typically associated with streams and wetland complexes. Within the Study Area, floodplains are generally concentrated to the north along Muddy Creek and Little Muddy Creek; along Black Creek in the central portion of the Study Area; and to the south along the Conestoga River and Little Conestoga River (see Figure 3-6). Less than half of the palustrine wetlands in the Study Area are located within these floodplains.

3.3 Vegetation

All of the routes cross through one level III ecoregion (Woods *et al*, 1999), the Northern Piedmont ecoregion. Level III ecoregions are ecological areas or divisions small enough to enhance regional environmental monitoring, assessment and reporting, as well as decision-making. Because level III ecoregions are smaller (i.e., compared to level I and II ecoregions), they allow locally defining characteristics to be identified, and more specific management strategies to be formulated. The natural vegetation of the Northern Piedmont Section primarily consisted of Appalachian Oak

Forest (dominated by white and red oaks [*Quercus* sp.]) (Woods *et al*, 1999). Much of the land within the Study Area has been farmed. Forested areas located in drier uplands remain dominated by species of oak (Lancaster County NAI, 2008). Forests located on lower slopes and within narrow, shaded valleys tend to be dominated by tulip popular (*Liriodendron tulipifera*), red (*Acer rubrum*) and sugar maple (*A. Saccharum*), American beech (*Fagus grandifolia*), basswood (*Tilia americana*), eastern hemlock (*Tsuga Canadensis*) and ash (*Fraxinus americana*) (TNC, 2008).

According to the National Land Cover Dataset (NLCD, 2001) and as shown in Table 3-2, the Study Area is dominated by grassland/pasture and cultivated crops, which combined represent approximately 53 percent followed by forest (34 percent) and other uses. Grassland/pasture and cultivated croplands comprise the northwestern and southern portions of the Study Area whereas forest cover is concentrated in the northeastern and central portions of the Study Area.

3.4 Special Natural Areas

A Natural Areas Inventories (NAI) has been prepared by The Nature Conservancy in association with the Pennsylvania Natural Heritage Program (PNHP) for Lancaster County. The NAI includes information on the locations of rare, threatened, and endangered species and the highest quality natural areas located within the County.

Two natural areas within the Study Area were identified in the NAI: State Game Land #52 (Brecknock and Caernarvon townships, Lancaster County) and the Conestoga River Headwaters (Caernarvon Township, Berks County; Caernarvon Township, Lancaster County; and Honey Brook Township, Chester County). The State Game Land #52 NAI consists of a small portion of a larger forest on diabase bedrock that contains a small population of a plant species of concern. The specific plant species of concern is not identified in the NAI. The adjacent forested landscape includes relatively large patches of interior forest that connect to the larger forested landscape. State Game Land #52 is located in the eastern-central portion of the Study Area on either side of Black Creek.

The Conestoga River Headwaters NAI is primarily located within Berks County—only a small portion is located within the Study Area in Lancaster County east of the State Game Land #52 NAI. This NAI contains a diversity of habitats within a landscape formerly dominated by

agriculture. Riparian habitats along the Conestoga River and its tributaries provide habitat for a species of concern. The NAI indicates that a species of concern may be present in this area, but is not specifically identified.

3.5 Threatened, Endangered and Rare Species

On April 27, 2012, PPL Electric submitted a Large Project Review Pennsylvania Natural Diversity Inventory (PNDI) request to the three agencies responsible for the protection of rare wildlife species in Pennsylvania: U.S. Fish & Wildlife Service (USFWS), Pennsylvania Game Commission (PGC), and Pennsylvania Fish and Boat Commission (PFBC). On June 5, 2012, PPL Electric received a response letter from USFWS indicating that the Project is located within the range of the federally threatened bog turtle (*Clemmys muhlenbergii*). Bog turtles usually occur in small, discrete populations, generally occupying open-canopy, herbaceous sedge meadows and fens bordered by wooded areas. These wetlands are a mosaic of micro-habitats that include dry pockets, saturated areas, and areas that are periodically flooded. Bog turtles depend upon this diversity of micro-habitats for foraging, nesting, basking, hibernation, and shelter (USFWS, 2001). No specific locations of recorded bog turtle habitat were identified in the letter. The PFBC's May 29, 2012 response letter indicated that no adverse impacts are anticipated to any state rare, candidate, threatened or endangered fish, reptile, amphibian, or aquatic invertebrate species under the PFBC's jurisdiction.

The PGC's July 13, 2012 response indicated that the Project is located in the vicinity of a state bat species of special concern, the northern myotis (*Myotis septentrionalis*). Northern myotis hunt at night over small ponds, in forest clearings, at tree top level and along forest edges. This species uses caves and underground mines for hibernation and individuals may travel up to 35 miles from their summer habitat for hibernation. Maternity roosts are located in tree cavities, under exfoliating tree bark and in buildings (PNHP, 2013). No specific locations of recorded northern myotis habitat were identified in the PGC letter.

PPL Electric sent an initial letter to the Pennsylvania Department of Conservation and Natural Resources (DCNR) on April 27, 2012, requesting current information on state, and rare plant species that may occur in proximity to the Study Area. DCNR's May 18, 2012 response suggested potential impacts to two state species of special concern: nodding trillium (*Trillium cernuum*),

which is proposed as a state threatened species, and puttyroot (*Aplectrum hyemale*), which is currently designated as rare. The areas identified by DCNR where potential impacts to these species or their habitat could occur lie along Alternative Route A (see Attachment 4) and in the vicinity of the Brecknock Substation. The DCNR letter is included in Attachment 8.

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ATTACHMENT 4

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ATTACHMENT 4
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
ALTERNATIVES AND SITING ANALYSIS

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Acronyms and Abbreviations

BHP	Bureau of Historic Preservation
CRGIS	Cultural Resource Geographic Information System
EHV	Extra-high voltage
EPA	U.S. Environmental Protection Agency
ESRI	Environmental Systems Research Institute
FAQs	Frequently asked questions
BDA	Biological diversity area
CNHI	County Natural Heritage Inventories
CWF	Coldwater fishery
DBH	Diameter at breast height
DCNR	Pennsylvania Department of Conservation and Natural Resources
GIS	Geographic information system
GPS	Global positioning system
HQ-CWF	High Quality Cold Water Fisheries
HUC	Hydrologic unit code
kV	Kilovolt
mcf	Million cubic feet
msl	Mean sea level
MRLC	Multi-resolution land characteristics
NAI	Natural Areas Inventory
NAIP	National Agricultural Inventory Project
NERC	North American Electric Reliability Corporation
NGOs	Non-government agencies
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resources Conservation Service of the U.S. Department of Agriculture
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OHV	Off-highway vehicle
OPGW	Optical ground wire
PE	Potentially eligible
PFBC	Pennsylvania Fish and Boat Commission
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
PUC	Pennsylvania Public Utility Commission
ROW	Right-of-way
SHPO	State historic preservation office
SSURGO	Soil Survey Geographic Database
T&E	Threatened and endangered (species)

UNT	Unnamed tributary
USACE	United States Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WWF	Warm water fishery

EXECUTIVE SUMMARY

PPL Electric Utilities Corporation (PPL Electric) has identified the need to construct a new, double-circuit 138/69 kV transmission line in Lancaster County, Pennsylvania between the proposed Lauschtown 230/69 kV Substation located in Brecknock Township and the existing South Akron – Morgantown #2 69 kV Transmission Line located in Caernarvon Township. One circuit will tie into the South Akron – Morgantown #1 Transmission Line just west of the existing Brecknock Substation, and the second circuit will continue south to tie into the South Akron – Morgantown #2 Transmission Line near the Honey Brook Tap. The Louis Berger Group, Inc. (Louis Berger) was retained by PPL Electric to support the route selection study process for the proposed North Lancaster – Honey Brook 138/69 kV Transmission Line Project (the "Project").

A multi-disciplinary Routing Team (see Section 2.1 below), consisting of members of PPL Electric and Louis Berger, conducted a comprehensive Route Selection Study to establish a Preferred Route for the North Lancaster – Honey Brook 138/69 kV Transmission Line. Using established routing guidelines, the Routing Team identified constraints and opportunity features within the study area that would minimize impacts to the natural and human environment and take advantage of existing corridors to the extent practicable. The Routing Team acquired environmental and engineering data from various sources and assembled the information into a geographic information system (GIS) database superimposed on aerial photography. Potential Routes were field checked from publically accessible locations to validate the aerial imagery and assess the viability of the Potential Routes based on conditions observed in the field. Based on information gathered in the field, the Routing Team adjusted the Potential Routes as appropriate.

The Routing Team evaluated the advantages and disadvantages of the Potential Routes based on the established routing criteria, an inventory of environmental, land use, and cultural factors along each of the routes, and additional local knowledge and past experience. Less favorable Potential Routes were eliminated, and four potentially viable Alternative Routes were retained for further consideration. The developed Alternative Route Network was presented at public meetings for comment. Following this public input process, the Routing Team conducted

additional field reconnaissance to review comments collected at the public meetings and worked closely with property owners to finalize routing decisions. This iterative process resulted in the identification of the Preferred Route.

Based on an assessment of the advantages and disadvantages of the four Alternative Routes under consideration, the Routing Team selected Alternative Route B as the Preferred Route between the proposed Lauschtown Substation and the existing Brecknock Substation and Alternative Route D as the Preferred Route between the Brecknock Substation and the South Akron – Morgantown #2 Transmission Line. The Routing Team believes that the cumulative environmental, social, and financial impacts associated with constructing Alternative Routes B and D will be less than the Alternative Routes.

1.0 INTRODUCTION

1.1 Project Overview

PPL Electric has identified the need to construct a new, double-circuit 138/69 kV transmission line in Lancaster County, Pennsylvania between the proposed Lauschtown 230/69 kV Substation located in Brecknock Township and the existing South Akron – Morgantown #2 69 kV Transmission Line located in Caernarvon Township. The North Lancaster – Honey Brook 69 kV Transmission Line will provide an alternate source into the area and reduce the line length and loading on the existing South Akron – Morgantown 69 kV lines. The need for the Project is further explained in Attachment 2.

1.2 Project Timeline

PPL Electric initiated a 23-month transmission siting process in November 2010. Initial Potential Routes were developed and refined in 2011, and presented to the public in April 2012 at a public open house meeting. A second public meeting was held in August 2012 to present another Potential Route option developed based on public input between the proposed Lauschtown Substation and the existing Brecknock Substation. Based on the results of the route selection process, PPL Electric announced the selection of the Preferred Route in October 2012 and held a third public meeting. Certain minor adjustments were made to the Preferred Route based on discussions with individual property owners. Construction is expected to begin in January 2015 to meet a May 2016 in-service date.

1.3 Goal of the Route Selection Study

The goal of the Route Selection Study is to gain a detailed understanding of the opportunities and constraints in the Project Study Area to facilitate the development of Alternative Routes, evaluate potential impacts associated with the Alternative Routes, and, ultimately, identify a Proposed Route for the Project. The Proposed Route is defined as the route that minimizes the effect of the transmission line on the natural and human environment, while avoiding unreasonable and circuitous routes**,** extreme costs, and non-standard design requirements. This

document describes the Alternative Route identification, evaluation, and selection process for the proposed North Lancaster – Honey Brook 138/69 kV Transmission Line Project.

1.4 Project Description

PPL Electric proposes to provide a second source of electric power to the region by constructing a new, double-circuit 138/69 kV transmission line between the proposed Lauschtown Substation in Brecknock Township, the Brecknock Substation also located in Brecknock Township, and the South Akron – Morgantown #2 Transmission Line located in Caernarvon Township near the Honey Brook Tap. The line will be constructed for double-circuit 138 kV operation, but will be initially operated as a single 69 kV circuit until load growth in the area increases.

1.4.1 Project Study Area

The Study Area is that territory in which line route alternatives can be sited to feasibly meet the Project's functional requirements and, at the same time, minimize environmental impacts and Project costs. The boundaries of the Study Area were determined by the geographic area encompassing the two end points (the proposed Lauschtown Substation to the north and the South Akron – Morgantown #2 Transmission Line near the Honey Brook Tap to the south) and the Project mid-point (the Brecknock Substation). As discussed in Section 1.1, the goal of the Project is to provide another 138/69 kV transmission source to reinforce the region's transmission system and provide a second source of power to the distribution substations that service homes and businesses in Brecknock and Caernarvon townships. The Study Area was intended to encompass all reasonable Potential Routes between these connection points.

Given these considerations, the Routing Team identified a Study Area encompassing approximately 14,582 acres (23 square miles) in Lancaster County, Pennsylvania (see Figure 3-1). The project Study Area is bounded generally by the intersection of Routes 222 and 568 to the north; State Game Land No. 52 and Interstate 176 to the east; the intersection of Routes 322 and 10 to the south; and the intersection of Dry Tavern Road and Black Creek to the west. Using this established Study Area, the Routing Team began its efforts to determine Potential Routes for the line.

1.4.2 Line Characteristics and Right-Of-Way Requirements

The proposed double-circuit 138/69 kV line will require a 100-foot-wide ROW. The proposed double-circuit design will consist of single-shaft steel poles equipped with steel conductor support arms. Angle structures, where required, will consist of two-pole and/or guyed steel structures. Altogether, this Project requires the installation of approximately 74 structures with an average height of approximately 105 feet. Average span lengths will be approximately 590 feet. Additional detail on the engineering considerations for this project is included in Attachment 5.

2.0 ROUTING PROCESS

The Routing Team conducted a Route Selection Study to identify a Proposed Route for a new 138/69 kV transmission line between the proposed Lauschtown Substation, the existing Brecknock Substation and the existing South Akron – Morgantown #2 Transmission Line. This section describes the Alternative Route identification, evaluation, and selection process.

2.1 Routing Team Members

A multi-disciplinary Routing Team performed the routing study. Team members were selected to bring wide experience to the routing study to achieve a thorough review of all aspects of developing the route. Members of the Routing Team have experience in transmission line routing, impact assessment for a wide variety of natural resources and the human environment, impact mitigation, engineering, and construction management. The team's objective was to identify a route that provided a reasonable balance between impacts on local communities and the natural environment, as determined through application of appropriate siting criteria and subject to technical guidelines, as addressed in detail below.

The team worked together during the Route Selection Study to define the study area, develop routing criteria, identify routing constraints and opportunities, collect and analyze environmental and design data, solicit public input and concerns, consult with natural resource and permitting agencies, develop and revise the siting alternatives, and analyze and report on the selection of a Proposed Route.

2.2 Data Collection

Multiple sources of information were consulted to develop data for the Route Selection Study.

2.2.1 Aerial Photography

The following sources for aerial photography were used:

- Imagery from the National Agricultural Inventory Project (NAIP) was obtained from the United States Department of Agriculture that covered the entire Study Area in Pennsylvania (dated 2011)
- Environmental Systems Research Institute (ESRI) imagery, which is provided through Aerials Express (dated 2011)
- Imagery from the PAMAP Program was obtained for the entire Study Area (dated 2008). The PAMAP program is a statewide Department of Conservation and Natural Resources program run by the Bureau of Topographic and Geologic Survey.
- Bing Maps imagery, which ranges in date depending on location.

The PAMAP photography was formatted electronically at a scale of 1 inch to 500 feet as a set of 22-inch by 34-inch map sheets covering the Study Area. Updated information such as the location of residences and other buildings was annotated on the photography or electronically as database notes, as discovered and verified during field inspections.

2.2.2 GIS Data Sources

Extensive use was made during the Route Selection Study of information from existing GIS data. This information was obtained from many sources, including federal, state, and county governments. Much of this information was obtained through official agency GIS data access websites, some was provided directly by government agencies, and some was created by the Routing Team by either digitizing information from paper-based maps or through aerial photo interpretation.

The use of GIS data allows for the consideration and efficient use of a wide variety of information that would otherwise be unavailable or impractical to consider for a planning effort of this scope. GIS information is a highly effective tool when utilized for broad level planning studies, identifying and characterizing landscape level constraints and features, and developing environmental inventory information useful for comparisons between planning alternatives.

However, GIS data sources vary widely with respect to their accuracy and precision, and presentation, analysis, and calculations derived from these data sources require careful consideration when used for planning purposes. Therefore, GIS-based calculations and maps presented in this Application should be considered reasonable approximations of the resource or geographic feature they represent, and not absolute measures or counts. A list of the major GIS data sources gathered, used, or otherwise considered in this routing study is presented in Table 4-1.

2.2.3 Ancillary Data Sources

Maps reviewed for the Route Selection Study include U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle maps, existing County-level and park-level natural resource maps, state and county road maps, transmission line map information and land ownership maps.

2.2.4 Route Reconnaissance

Routing Team members conducted field inspections throughout the Study Area. The team members examined potential routes by automobile from points of public access and correlated observed features to information shown on aerial photography, USGS 7.5 minute topographic maps, road maps, locally available development sketch maps, and other information. Relevant features were viewed, verified, and recorded on laptop computers displaying aerial photography using GIS software supported by real-time Global Positioning System (GPS) tracking for positional information in each vehicle. A preliminary field review was conducted in March 2011 to identify major constraints and to familiarize the Routing Team with the Study Area. Detailed field reconnaissance was conducted in May 2011 to review the Potential Routes and identify constraints. Subsequent field visits were conducted in April and December 2012. After selecting the Preferred Route, the ROW was reviewed in detail in February and March 2013 and wetland delineation activities were conducted between January and December 2013. In addition, PPL Electric met with various property owners following the first open house meeting conducted in April 2012.

Table 4-1. GIS Data Sources	
Category	**Data Source**
Aerial Imagery	
Aerial Imagery	Imagery was obtained from the following sources: the NAIP was obtained from the U.S. Department of Agriculture (USDA) covering the entire Study Area (dated 2011); ESRI imagery, which is provided through Aerials Express (dated 2011); and Bing Maps imagery, which ranges in date depending on location.
Administrative	
County Boundaries	2012 ESRI file containing boundaries and census data for all counties in the United States.
Municipality Boundaries	This dataset consists of county and municipal boundaries aggregated by the PAMAP Program from data supplied by various Pennsylvania county governments.
Hydrology	
Rivers and Lakes	National Hydrography Dataset (NHD) - The NHD is a comprehensive set of digital spatial data prepared by the USGS and USEPA that contains information about surface water features such as lakes, ponds, streams, rivers, springs and wells.
Water Quality Standards	The Pennsylvania Department of Environmental Protection (PADEP) has designated water quality use designations, high and exceptional value quality waters and recreation waters. This information was obtained from PADEP (2013).
Wetlands	The National Wetlands Inventory (NWI) of the U.S. Fish & Wildlife Service (USFWS). The NWI produces information on the characteristics, extent, and status of the Nation's wetlands and deepwater habitats. The National Wetlands Inventory information is used by federal, state, and local agencies, academic institutions, U.S. Congress, and the private sector for reviewing general wetland distribution for planning purposes.
100-Year Flood Hazard	Data on 100-year flood hazard areas was acquired from the Office of Remote Sensing for Earth Resources, Penn State University (1996).
Watershed Boundaries	Hydrologic Unit Code (HUC)-8 boundaries were obtained from the U.S. Department of Agriculture Natural Resource Conservation Service (USDA-NRCS).

Table 4-1. GIS Data Sources	
Category	**Data Source**
Conservation Lands	
Public Lands	A combination of data sources was used to determine lands owned by federal, state, and local governments; non-government agencies (NGOs); and private conservation easements. The Protected Areas Database of the United States (PAD-US) (2011) forms the majority of the data. Additional data representing federal lands, public parks, and landmark areas were incorporated from ESRI (2012), Redlands, California.
State Parks, Forests, and Game Lands	Data for State Parks (2011), Forests (2010) and Game Lands (2009) located within Pennsylvania prepared by the PA DCNR and the PA Game Commission.
Easements	Private conservation easements from the National Conservation Easement Database which is comprised of voluntarily reported conservation easement information from land trusts and public agencies. Agricultural easements and assessment areas were also obtained from Lancaster County.
Human Environment	
Points of Interest	The locations of various points of interest were derived from the Institutions layer from ESRI (2012), Redlands, California, and the U.S. Geological Survey's GNIS. This dataset includes the locations of cemeteries, churches, hospitals, parks, and schools.
Residences and Commercial Buildings	Residential and other buildings were identified through a combination of aerial imagery and field observations.
Parcel Boundaries, Ownership Information and Subdivisions	Parcel boundaries and property ownership information was obtained from Lancaster County GIS or Assessor's office (2012).
Airfields and Heliports	Airfields and heliports were identified through the U.S. Geological Survey's GNIS and ESRI (2012) and the Federal Aviation Administration (FAA) database (2012).
Transportation	U.S. road and railroad data prepared by ESRI (2012), Redlands, California.
Existing Transmission Lines and Substations	Existing transmission line and substation information provided by PPL and adjusted based on aerial photography.

Table 4-1. GIS Data Sources	
Category	**Data Source**
Historic Resources	
Historic Sites and Districts	Sites and districts listed or eligible on the National Register of Historic Places (NRHP) acquired through the database maintained by the Pennsylvania Historical & Museum Commission (PHMC) (2012 and 2013).
Land Use	
Land Use/Land Cover	The National Land Cover Database 2006 (NLCD 2006) compiled by the Multi-Resolution Land Characteristics (MRLC) Consortium (including the U.S. Geological Survey, Environmental Protection Agency, U.S. Forest Service, National Oceanographic and Atmospheric Association, National Aeronautics and Space Administration, Bureau of Land Management, National Park Service, Natural Resource Conservation Service, and the USFWS). NLCD 2006 products include 20 classes of land cover from Landsat satellite imagery.
Sensitive Species	
Sensitive Species identified by the Natural Heritage Inventory	The County Natural Heritage Inventory effort within PA is a cooperative program undertaken by the Pennsylvania Natural Heritage Program (PNHP) partnership. The County Natural Heritage Inventories (CNHI) have been systematic studies of the critical biological resources of the state, county by county (2013)
Geology and Soils	
Geology	Identification and descriptions of physiographic regions and bedrock were obtained from the PA Department of Natural Resources, Division of Geological Survey.
Topographic Contours	U.S. Geologic Survey 7.5 24:000 topographic quadrangle maps (various dates).
Soils	Soil associations crossed by the routes were extracted from the United States Department of Agriculture, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Database (2002).

2.3 Process Steps and Terminology

The Route development process is inherently iterative with frequent modifications as new constraints, opportunities, and inputs are received. Because of the evolutionary nature of the route development process, the Routing Team uses specific vocabulary to describe the routes at different stages of development.

Initial route development efforts start with the identification of large area constraints and opportunity features within the **Study Area**, which encompasses the endpoints of the Project and areas in between. These areas are typically identified using a combination of readily available public data sources.

The Routing Team uses this information to develop **Potential Routes** adhering to a series of general routing and technical guidelines. Efforts are made to develop Potential Routes throughout the Study Area to ensure that all reasonable alignments are considered. As the Routing Team continues to collect and review information, Potential Routes are refined.

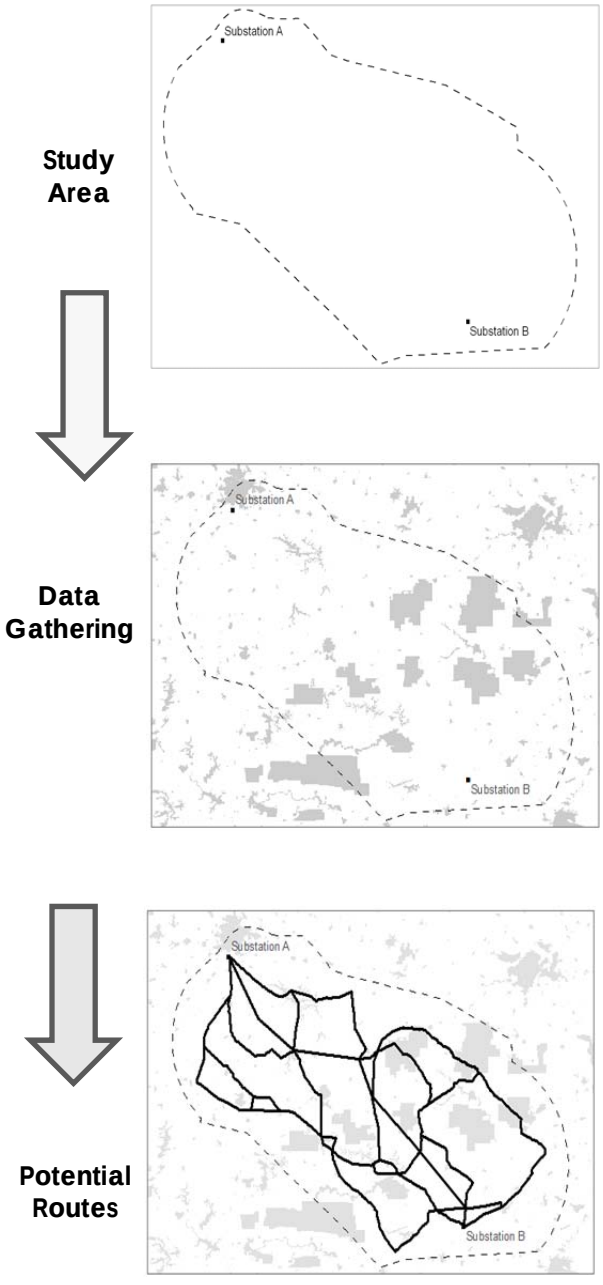


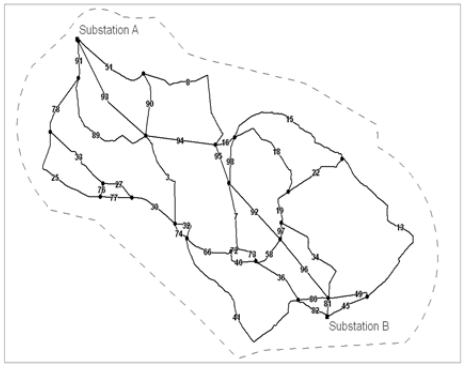
Figure 4-1. Routing Steps

Where two or more Potential Routes intersect, a **node** is created, and between two nodes, a **link** is formed. Together, the Potential Routes and their interconnected links are referred to as the **Potential Route Network**. The links are independently and collectively evaluated for refinements.

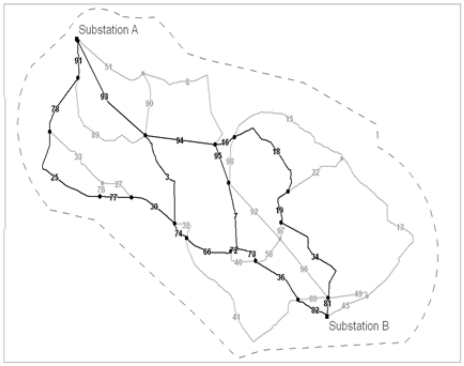
As the Routing Team continues to gather information and review the links of the Potential Route Network, links are modified, removed, or added, resulting in a **Refined Potential Route Network**.

The links of the Potential Route Network are further refined and compared by the Routing Team, and a selection of the most suitable links is assembled into **Alternative Routes**. Alternative Routes are routes that begin and end at similar locations for direct comparison. Potential impacts are assessed and compared with land uses, natural and cultural resources, and engineering and construction concerns. Ultimately, through analysis and comparison of the Alternative Routes, a **Preferred Route** is identified. The Preferred Route minimizes the overall effect of the Project on the natural and human environment, avoids unreasonable and circuitous routes and unreasonable costs, and minimizes special design requirements.

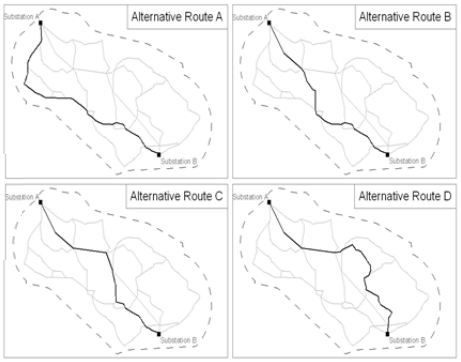
Potential Route Network



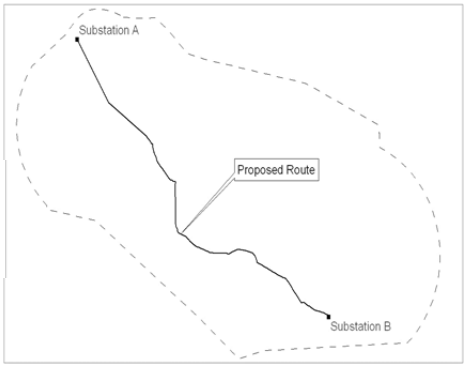
Refined Potential Route Network



Alternative Routes



Preferred Route



2.4 Routing Guidelines

As described in Section 1.3, the overall goal of the Route Selection Study is to identify a Preferred Route that minimizes the overall effect of the transmission line on the natural and human environments, avoids unreasonable and circuitous routes and unreasonable costs, and minimizes special design requirements. Identifying a route that optimizes all constraints and opportunities requires a balancing and consideration of many and often competing factors and can therefore be challenging. For example, a route with minimal impacts on wildlife habitat may have greater impacts on residential resources than other alternatives, and vice versa. In addition, federal and state laws and input from federal, state, and sometimes local regulatory agencies may affect siting decisions.

The use of routing guidelines helps to reach that goal by setting forth general principles that guide the development of alignments considered in the study. The Routing Team considered two types of Routing Guidelines: General Guidelines and Technical Guidelines. General Guidelines establish a set of principles that guide the development of alignments with respect to area land uses, sensitive features, and considerations of economic reasonableness. Technical Guidelines provide the Routing Team with technical limitations related to the physical limitations, design, ROW requirements, or reliability concerns of the Project infrastructure. Each of these types of guidelines is discussed in the following sections.

2.4.1 General Guidelines

Once the Study Area was identified, the Routing Team met in November 2010 to develop basic route selection criteria that would be used to select and analyze potential Alternative Routes. The recommendations for Project siting contained in this Application are based on the primary objective stated above and the following criteria and technical guidelines (the listed criteria are not in order of importance or weight). The Routing Team developed basic route selection criteria to select and analyze Potential Routes during the routing study.

The Routing Team attempted to minimize:

- The removal or substantial interference with the use of existing residences.
- The removal of existing barns, garages, commercial buildings, and other nonresidential structures.
- Substantial interference with the use and operation of existing schools, recognized places of worship, cemeteries, and facilities used for cultural, historical, and recreational purposes.
- Substantial interference with economic activities, including agricultural activities.
- Crossing of designated public resource lands such as large camps and other recreation lands, designated battlefields, and other designated historic resources and sites.
- Impacts to natural environment, including crossing national and state forests and parks, nature preserves, conservation areas, large lakes and large wetland complexes, critical habitat, and other unique or distinct natural resources.
- Substantial visual impact on residential areas and public resources.
- Route length, circuity, cost, and special design requirements.

2.4.2 Technical Requirements

The proposed line generally requires a 100-foot ROW to meet North American Electric Reliability Corporation (NERC) safety guidelines and PPL Electric's design criteria. As indicated previously, the line will be designed for future double-circuit 138 kV operation. Based on system planning requirements, one 138/69 kV circuit will terminate at the existing Brecknock Substation and the second 138/69 kV circuit will connect to the existing South Akron – Morgantown #2 Transmission Line.

2.5 Routing Constraints

The Routing Team identified and mapped routing constraints in the Study Area. Constraints were defined as specific areas that should be avoided to the extent feasible during the route selection process. Constraints are generally divided into two groups based on the size of the geographic area encompassed by the constraint: large area constraints and small area constraints.

The first group (large area constraints) includes constraints that cover large areas of land in the study area. Large area constraints are avoided to the extent practicable and are considered unfavorable by the Routing Team for developing Potential Routes.

The final list of large area constraints consisted of:

- Urban areas, including towns, small villages, and other high concentrations of residential, commercial and industrial development areas, including Churchtown and Bowmansville
- National Register Historic Districts and adjacent areas
- U.S. Department of Defense related sites
- Recreational areas such as parks and large recreational reservoirs
- Large streams, wetlands, or unique natural resource features
- Large mining areas, including Silver Hill Quarry
- Critical habitat areas
- Designated State Forests, State Parks, State Game Lands, and other natural and conservation areas, including State Game Land 52.

After the Potential Routes were initially developed to avoid large area constraints to the extent practicable, the alignments were adjusted where feasible to avoid and maximize distance from small area constraints. Small area constraints encompass other features that are found within smaller geographic areas, or site-specific locations. Small area constraints generally consist of:

- Individual residences (including houses, anchored mobile homes, and multi-family buildings) and residential curtilage, which is interpreted in Pennsylvania as the area up to 100 meters (328 feet) immediately surrounding a residence, and used for domestic purposes. Curtilage does not extend beyond the individual's parcel boundaries and may also be "broken" by road or railroad ROWs or changes in land use.
- Commercial and industrial buildings
- Tree farms
- Cemeteries
- Places of worship

- Schools
- Hospitals
- Recorded sites of designated historic buildings and sites, including any specified buffer zone around each site
- Small wetlands
- Critical habitat and other unique natural resource features
- Specific recreational sites, facilities, and trails
- Communications towers
- Designated scenic vista points.

The Routing Team attempted to keep the routes and all areas of the required ROW from passing over these point-specific constraints. However, in some instances complete avoidance of small area constraints (e.g., small wetlands) was not possible because of the large numbers or location of these constraints in some areas of the Project. The Routing Team also considers alignments parallel to parcel boundaries and tree lines where practical to avoid bisecting properties and significant interference with agricultural activities.

2.6 Routing Opportunities

The Routing Team defined routing opportunities as locations where the proposed transmission line might be located with the least or minimal impact. Routing opportunities were identified and evaluated by:

- Reviews of aerial photography and other available mapping data
- Incorporation and consideration of available GIS data
- Field investigation of the Project area
- Public and individual meetings with landowners and other stakeholders
- Federal, state, and local agency consultations
- Project input from PPL Electric staff
- Routing Team experience with similar projects.

Practical routing opportunities considered in the Study Area included sharing and/or paralleling existing rights-of-way and linear features, including:

- 69 and 138 kV transmission circuits
- Gas pipelines
- Railroads
- Major roads.

Existing transmission infrastructure did not provide significant routing opportunities. The few existing transmission lines located within the Study Area traverse east to west. However, the proposed North Lancaster – Honey Brook 138/69 kV Project requires a north to south route. The Pennsylvania Turnpike traverses the Study Area northwest to southeast. The Routing Team evaluated opportunities to parallel the Turnpike north of the Brecknock Substation.

3.0 ROUTE DEVELOPMENT

System planning considerations dictated the location of the proposed Lauschtown Substation and the associated transmission interconnections. The system planning process is described in Attachment 2. Once the endpoints were determined, the Routing Team developed Potential Routes based on the routing process and criteria identified in Section 2.0.

3.1 Substation Identification

As discussed in Attachment 2, the purpose of the Project is to resolve projected violations of PPL Electric's Reliability Principles and Practices (RP&P) criteria and reinforce the 138/69 kV systems in eastern Lancaster County, southwestern Berks County and western Chester County areas by bringing a new source of supply source closer to the growing load centers. The first step in addressing the reliability issues with the existing system is to identify a new source of supply.

The Lauschtown 500-230-69 kV Substation is a new substation that will be constructed as part of a separate project required by and approved by PJM to resolve violations of the mandatory federally-approved NERC reliability violations. The Lauschtown 500-230-69 kV Substation is located at the intersection of an existing 500 kV transmission line, which will supply the Substation, and three existing 230 kV lines, which will interconnected with and be supplied by the Substation. The substation site is ideal for a substation given the proximity to the existing 500 kV and 230 kV transmission lines, as well as the fact that property is largely undeveloped, cleared of trees, not bordered by dense residential development, and easily accessible from State Route 625.

The new Lauschtown 500-230-69 kV Substation has sufficient capacity and room to accommodate a new 138/69 kV switchyard to interconnect the proposed North Lancaster – Honey Brook #1 & #2 138/69 kV Transmission with the existing transmission system. Use of the new Lauschtown 500-230-69 kV Substation as the source of supply for the proposed North Lancaster – Honey Brook Project avoids the need to locate and construct a separate new substation where one does not presently exist.

The Lauschtown 500-230-69 kV Substation will interconnect and receive supply from the existing 500 and 230 kV systems, which, in turn, will be interconnected with the new 138/69 kV switchyard to supply North Lancaster – Honey Brook #1 & #2 138/69 kV Transmission. The Lauschtown 500-230-69 kV Substation will bring a new source of supply closer to the growing load centers.

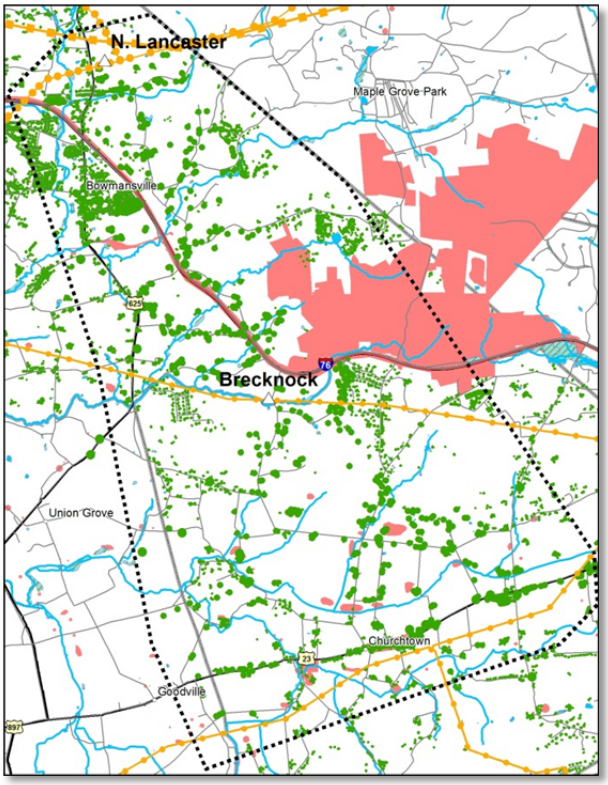
3.2 Potential Route Development

The Routing Team developed an array of Potential Routes. Potential Routes are an early iteration of the routing process that involves the development of conceptually based routes and general consideration of these routes with respect to constraints and opportunity features in the Study Area. Because one circuit must terminate at the existing Brecknock Substation while the second circuit will continue south, potential routes were developed in the "northern" portion of the Study Area between the proposed Lauschtown Substation and the Brecknock Substation and in the "southern" portion of the Study Area between the Brecknock Substation and the existing South Akron – Morgantown #2 69 kV Transmission Line.

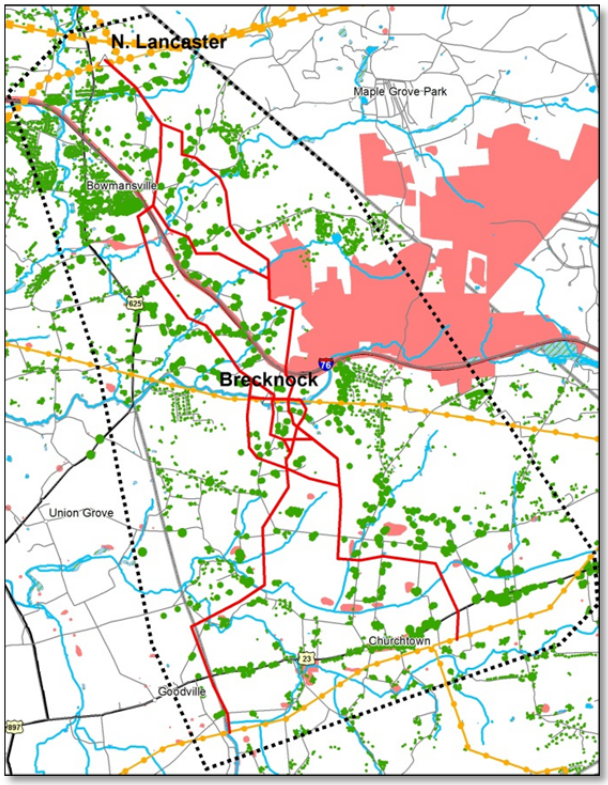
Once the initial Potential Route network was developed, the Routing Team reviewed each route in the field. Field efforts included reviewing the Potential Routes from public points of access and documenting locations of residences and other small area constraints. The Routing Team digitally recorded photographs, comments, and routing notes on laptops over aerial photography using GIS software supported by real-time GPS tracking for positional information.

The Potential Route identification effort resulted in a network of approximately 17 potential links that could be considered to route the new line from the proposed Lauschtown Substation to the existing Brecknock Substation and approximately 20 potential links between the Brecknock Substation and the South Akron – Morgantown #2 69 kV Transmission Line. As the process continued, the route network was modified as routes were adjusted, links were removed, and new links were added. Figure 4-2 illustrates the potential route development process and Figure 4-3 shows the resulting network of Potential Routes evaluated by the Routing Team.

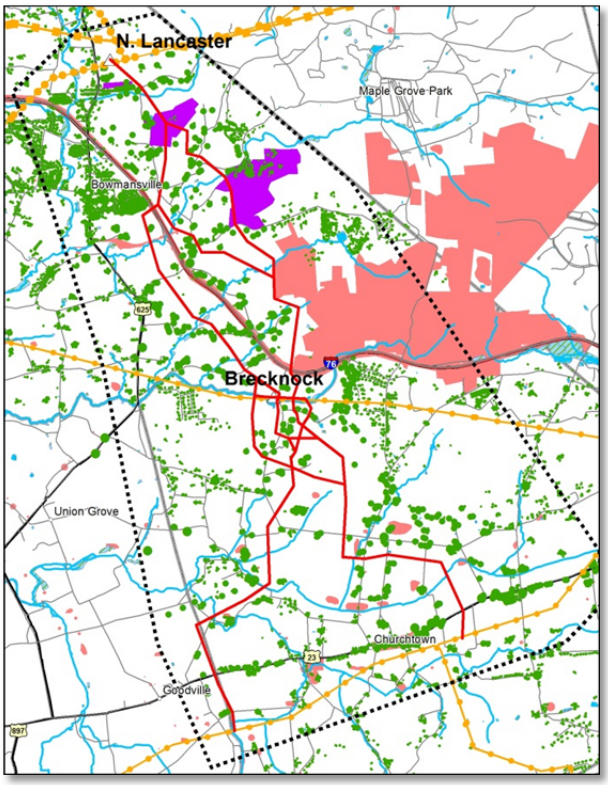
Figure 4-2. Potential Route Development



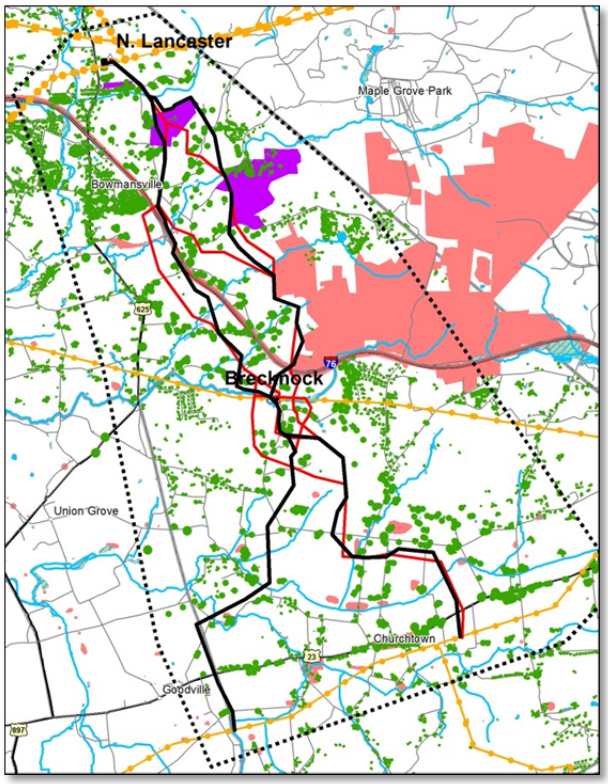
A. Identified large constraints (pink) and small constraints (green)



B. Identified potential routes (red) to avoid large and small constraints to the extent practical



C. Identified new constraints (purple) based on field reconnaissance



D. Adjusted potential routes (black) to avoid all constraints to the extent practical

Lauschtown (Proposed)

Brecknock

BERKS COUNTY

LANCASTER COUNTY

BRECKNOCK BRECKNOCK

BRECKNOCK CAERNARVON

CAERNARVON CAERNARVON

CAERNARVON EAST EARL

Muddy Creek

Black Creek

Cedar Creek

Conestoga River

Little Conestoga

Bowmansville Rd
Panorama Dr
Meadowlark Ln
Hoffman Rd
Boulder Hill Rd
Camp Rd
Schlouch Rd
Penn Sylvan Dr
Hilltop Rd
Cedar Rd
Fuzer Rd
Alleghenyville Rd
Sr6205
Speck Rd
Beam Ln
Schnader Rd
Diehl Rd
Stauffer Park Ln
Dawson Dr
Kachel Rd
Woodsorrel Ln
Maple Grove Rd
E Maple Grove Rd
Spruce St
T959
Douglas Dr
Perry Dr
Elsie Ln
Horning Rd
Lauschtown Rd
Mountain Ln
Wheatland Dr
Masters Dr
Fairway Dr
Eagle Cir
Granite Pl
Harvest Dr
Oakmont Ct
W Maple Grove Rd
Olde School Ln
Abbey Ln
N Church St
Millrace Run
Raybil Dr
Church St
Mill St
Dogwood Dr
El Gra Ct
Oak Leaf Ct
Cedar St
Oaklyn Dr
Spotts Ln
Yellow Hill Rd
Aspen Dr
Poplar Dr
Von Neida St
Good Rd
Pleasant Valley Rd
Reading Rd
Sunset Dr
Spook Ln
625
176 W
176 E
Silver Hill Rd
Bridge Rd
Laurel Rd
T888
Service Road
76
Leid Rd
Black Creek Rd
E Black Creek Rd
Center Church Rd
Maple St
Birchwood St
Elm St
Barnett St
Echo Valley Rd
Poplar St
Laurel Top Cir
Echo Dr
Farm Ln
Azalea Ct
Cherry Ct
Zerbe Rd
Violet Ln
Edwards Rd
Trego Rd
School House Ln
Wentzel Rd
Sawmill Rd
Old Rd
Lambert Rd
T886
Hoover Dr
Hammertown Rd
California Rd
Turkey Hill Rd
T807
Spring Hollow Rd
Union Grove Rd
Browns Rd
Smoketown Rd
Ironstone Dr
Iron Bridge Rd
Valley View Rd
T924
Glick Rd
Agape Ct
T773
Turkey Farm Rd
Weaverland Rd
Spring Grove Rd
Mill Rd
Pennytown Ln
N Churchtown Rd
Water St
Longview Dr
Pool Forge Rd
Conestoga Rd
Main St
Churchtown
Shiktown Rd
Brendle Rd
23
Valley View Dr
State Hwy 23
Ramp
Windsor Rd
Little Hill Rd
Nolt Rd
T679
S Pool Forge Rd
S Churchtown Rd
Boot Jack Rd
Silver Vly
Bridgeville Rd
Frogtown Rd
Fetterville Rd
Ligalaw Rd
Gehman Rd

Legend

- Populated Place
- Substation
- Potential Route
- Municipality
- County
- PA State Game Lands
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-3: Potential Routes

N W E S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

The Routing Team developed initial Potential Routes to avoid large area constraints and maximize the distance between small area constraints while avoiding circuitous routes and sharp angles. Where feasible, Potential Routes were sited to parallel property boundaries and tree lines rather than bisect these areas.

A preliminary field review was conducted in March 2011 to identify major constraints and to familiarize the Routing Team with the Study Area. After the initial Potential Routes were identified, key members of the Routing Team conducted field inspections of the routes. These inspections involved the visual examination of the Potential Routes from road crossings and other points of public access. The team utilized a GPS unit, along with the mapped coordinates of the potential routes superimposed on road/street mapping software, to track precise locations and record the path of the field work. Residences (single family, multi-family, modular homes, and mobile homes), outbuildings (garages, sheds, barns, etc.), commercial buildings, and other potentially sensitive receptors (e.g., cemeteries, churches, and schools) within 500 or 1,000 feet of each Potential Route center line were identified and recorded using database software. At various points, e.g., in locations where homes or structures are near the existing or proposed ROW, areas of environmental concern were noted, and various other routing challenges were identified. Photographs were taken at selected or representative locations throughout the Potential Route network. The following paragraphs discuss potential routes developed in the northern and southern portions of the Study Area.

3.2.1 Northern Routes

The Routing Team developed routes within the northern portion of the Study Area that would exit the proposed Lauschtown Substation to the south and east and enter the existing Brecknock Substation from the north, east and west. The presence of residential development along Bowmansville Road prohibited exiting the proposed Lauschtown Substation to the west. Potential Routes in the northern portion of the Study Area were generally developed to avoid crossing the active Silver Hill Quarry, State Game Land 52, and higher density residential areas. All Potential Routes into Brecknock require crossing the Pennsylvania Turnpike.

The proposed Lauschtown Substation is located at the intersection of several existing transmission lines (the South Akron – Berks 230 kV, the South Akron – South Reading 230 kV and the Met-Ed [FirstEnergy] 500 kV lines). When transmission lines cross, PPL Electric's general practice is to site the lower voltage line beneath the higher voltage line because higher voltage lines are typically constructed with taller structures. The proposed Lauschtown Substation is also constrained by residential development along Boulder Hill Road. Based on the presence of existing development, only one feasible option was identified to exit the Lauschtown Substation to the south. A second option was identified to exit the proposed Lauschtown Substation parallel to the existing South Akron – South Reading 230 kV Transmission Line to the east. However, based on further engineering review, paralleling this existing transmission line would require raising the existing 230 kV line to accommodate the new 138/69 kV line, and an outage would be required to conduct this work. Nevertheless, the second option was retained for further consideration. Upon exiting the proposed Lauschtown Substation, the Routing Team identified feasible "eastern" and "western" alternatives into the existing Brecknock Substation that minimized potential impacts to the natural and built environment. These conceptual routes had various links created to identify options in particularly challenging areas.

The existing South Akron – Morgantown #1 69 kV Transmission Line traverses east to west south of the Brecknock Substation. Engineering requirements would permit the proposed North Lancaster – Honey Brook #1 138/69 kV Transmission Line to connect to the existing line from the east or west.

3.2.2 Southern Routes

The Routing Team developed routes within the southern portion of the Study Area that would terminate at the existing South Akron – Morgantown #2 69 kV Transmission Line on either side of the community of Churchtown. Potential Routes in the southern portion of the Study Area were generally developed to avoid the developed Churchtown area. All Potential Routes that connect to the South Akron – Morgantown #2 69 kV Transmission Line require crossing State Route 23.

The existing Brecknock Substation is constrained by the presence of Black Creek and associated wetlands located parallel to the existing transmission line to the north. In addition, several non-condemnable residential properties are located immediately south of the existing Brecknock Substation. Therefore, the Routing Team identified several short links through this area to present to property owners for further discussion. South of this congested area, the Routing Team identified feasible alternatives to connect to the existing South Akron – Morgantown #2 69 kV Transmission Line to the east or west of Churchtown that minimized potential impacts to the built and natural environment. Because of existing development in Churchtown and Goodville to the west, limited options were available to cross State Route 23 to connect to the existing transmission line.

3.2.3 Potential Route Review

The initial link network was examined in the field in May 2011. Subsequent field inspections were conducted in April 2012. After selecting the Preferred Route (northern and southern), the ROW was reviewed in detail in February and March 2013. The field investigations resulted in changes to the Potential Route alignments. Additional changes resulted from efforts to avoid residences and other buildings, such as garages, barns, and commercial structures, or other similar constraints discovered in the field that were not identifiable on the aerial imagery, such as new residences. Based upon these field investigations, some links were dropped altogether as they did not conform to the routing objectives or criteria. The Routing Team identified these changes and updated the Potential Route Network accordingly.

The Routing Team subsequently discussed the remaining Potential Routes in June 2011 and again in March 2012. During these meetings, comparative data, aerial photos, and notes taken during the field reconnaissance were reviewed. The major environmental and land use factors considered in this evaluation were: threatened and endangered species sites, wetlands and other stream crossings, tree clearing requirements, unique or sensitive habitat, length of new ROW required, proximity of residences and other buildings, known or suspected historic sites, and incremental aesthetic impact. Engineering factors were also considered during the link evaluation, including extent of ROW overlapping opportunities, identification of areas

where rebuilding existing transmission structures to accommodate a new 138/69 kV line may be feasible, and areas that presented engineering and construction challenges (e.g., the number of angle structures required and the need to "thread" the route through developed or otherwise difficult areas). The remaining links were assembled into Potential Routes and presented to the public for comment during an open house meeting held in April 2012. Letters were simultaneously sent to federal and state agencies for comment. Potential Routes in the northern portion of the Study Area were labeled A through E, Potential Links through the congested Brecknock Substation area were numbered 1 through 17 and Potential Routes in the southern portion of the Study Area were labeled G and H. The format and content of the open house meeting is described in Section 3.4. Another open house meeting was held in August 2012 to present additional routing options. The Potential Routes presented at the April and August open house meeting are shown in Figures 4-4 and 4-5.

3.3 Agency Consultation

As part of the route development process, the Routing Team contacted various federal, state, and local agencies to inform them of the Project and request data to be used during route analysis. The agencies contacted are identified in the following sections. Copies of correspondence with federal and state agencies are provided in Attachment 14.

3.3.1 Federal Agencies

Following the identification of the Potential Route Network, a preliminary Pennsylvania Natural Diversity Inventory (PNDI) request was submitted to the U.S. Fish and Wildlife Service (USFWS) on April 27, 2012 requesting information pertaining to the presence of any federally endangered, threatened, or rare species located in the vicinity of the Potential Routes. The USFWS' June 5, 2012 response indicated that the Project is located within the range of the federally threatened bog turtle (*Clemmys muhlenbergii*). No specific locations of recorded bog turtle habitat were identified in the June 2012 letter.

Lauschtown (Proposed)

Brecknock

BERKS COUNTY

LANCASTER COUNTY

BRECKNOCK
BRECKNOCK

BRECKNOCK
CAERNARVON
CAERNARVON

CAERNARVON
EAST EARL

Churchtown

Black Creek

Muddy Creek

Conestoga River

Little Conestoga

Cedar Creek

Hoffman Rd
Boulder Hill Rd
Meadowlark Ln
Panorama Dr
Lauschtown Rd
Mountain Ln
W Maple Grove Rd
Maple Grove Rd
Olde School Ln
Abbey Ln
Millrace Rd
Church St
Dogwood Dr
Raybil Dr
Oak Leaf Ct
Cedar St
Fairway Dr
Whitetail Dr
Spruce St
Horning Rd
Perry Dr
Douglas Dr
Oakmont Ct
Grants Pl
Harvest Dr
Mill St
Cedar Rd
Hilltop Rd
Spotts Ln
Yellow Hill Rd
Von Neida St
Pleasant Valley Rd
Good Rd
Creek
Sunset Dr
Spook Ln
Oaklyn Dr
Silver Hill Rd
Laurel Rd
Bridge St
Black Creek Rd
E Black Creek Rd
Maple St
Birchwood St
Elm St
Barnett St
Echo Valley Rd
Center Church Rd
Wentzel Rd
Sawmill Rd
Old Rd
Union Grove Rd
Spring Hollow Rd
Iron Bridge Rd
Ironstone Dr
Browns Rd
N Churchtown Rd
Smoketown Rd
Turkey Hill Rd
Valley View Rd
Bowmansville Rd
Camp Rd
Penn Sylvan Dr
Schlouch Rd
Stauffer Rd
Lambert Rd
Laurel Ridge Rd
Violet Ln
Poplar St
Laurel Top Cir
Echo Dr
Azalea Ct
Cherry Ct
Farm Ln
Zerbe Rd
School House Ln
Edwards Rd
Hammertown Rd
California Rd
Hoover Dr
Service Road
I 76 E
I 76 W
Water St
Glick Rd
Longview Dr
Shiktown Rd
Little Hill Rd
Windsor Rd
Ramp
Nolt Rd
Ligalaw Rd
Valley View Dr
State Hwy 23
Main St
Reading Rd
Goods Store Rd
Turkey Farm Rd
Mill Rd
Pennytown Ln
Pool Forge Rd
S Pool Forge Rd
Gehman Rd
S Churchtown Rd
Boot Jack Rd
Brendle Rd
Spring Grove Rd
Fetterville Rd
Frogtown Rd
Bridgeville Rd
Silver Vly
Agape Ct
Meaverland Rd
Leid Rd
Oakryn Dr
Barnett St
Center Church Rd
Hoover Dr
Lambert Rd
Black Creek
Laurel Ridge Rd
Conestoga Riv
T959
T886
T888
T807
T773
T679
T924
052
76
625
23
A
B
C
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16
17

Legend

- Populated Place
- Substation
- Link
- PA State Game Lands
- Municipality
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-4. Potential Routes from April 2012 Open House

N
W E
S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

Lauschtown (Proposed)

Brecknock

A

B

C

D

BERKS COUNTY

LANCASTER COUNTY

BRECKNOCK BRECKNOCK

BRECKNOCK CAERNARVON

CAERNARVON CAERNARVON

CAERNARVON EAST EARL

Muddy Creek

Black Creek

Cedar Creek

Little Conestoga

Conestoga River

Churchtown

625

23

052

I 76 W

I 76 E

Service Road

Hoffman Rd

Camp Rd

Penn Sylvan Dr

Schlouch Rd

Bowmansville Rd

Steuffer Park Ln

Fuzer Rd

Schnader Rd

Allegheny ville Rd

Beam Ln

Shea Dr

Diehl Rd

Dawson Dr

Woodsorrel Ln

Kachel Rd

Maple Grove Rd

Aspen Dr

Poplar Dr

Yellow Hill Rd

Hilltop Rd

Cedar Rd

Meadowlark Ln

Boulder Hill Rd

Douglas Dr

Perry Dr

Spruce St

T959

Lauschtown Rd

Mountain Ln

Horning Rd

Wheatland Dr

Fairway Dr

Olde School Ln

Abbey Ln

Oakmont Ct

Grants Pl

Harvest Dr

Mill St

Millrace Run

W Maple Grove Rd

Church St

Dogwood Dr

Raybil Dr

Oak Leaf Ct

Cedar St

E Maple Grove Rd

Sports Ln

Von Neida St

Pleasant Valley Rd

Good Rd

Sunset Dr

Oaklyn Dr

Spook Ln

Silver Hill Rd

Laurel Rd

Bridge St

T888

E Black Creek Rd

Leid Rd

Black Creek Rd

Maple St

Birchwood St

Elm St

Barnett St

Echo Valley Rd

Lambert Rd

Poplar St

Laurel Top Cir

Echo Dr

Violet Ln

Laurel Ridge Rd

Farm Ln

Azalea Ct

Cherry Ct

Zerbe Rd

School House Ln

Center Church Rd

Wentzel Rd

Sawmill Rd

Old Rd

T886

Edwards Rd

Hammertown Rd

Hoover Dr

California Rd

Union Grove Rd

Spring Hollow Rd

T807

Browns Rd

N Churchtown Rd

Smoketown Rd

Turkey Hill Rd

Valley View Rd

T924

Ironstone Dr

Iron Bridge Rd

T773

Weaverland Rd

Agape Ct

Water St

Glick Rd

Longview Dr

Shiktown Rd

Turkey Farm Rd

Pennytown Ln

Mill Rd

Pool Forge Rd

Goods Store Rd

Spring Grove Rd

Brendle Rd

Conestoga Riv

Ramp

Windsor Rd

Little Hill Rd

Main St

Valley View Dr

State Hwy 23

Reading Rd

Noll Rd

T679

Ligalaw Rd

Silver Vly

Bridgeville Rd

S Pool Forge Rd

Gehman Rd

S Churchtown Rd

Boot Jack Rd

Frogtown Rd

Fetterville Rd

Legend

- Populated Place
- Substation
- Route
- PA State Game Lands
- Municipality
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

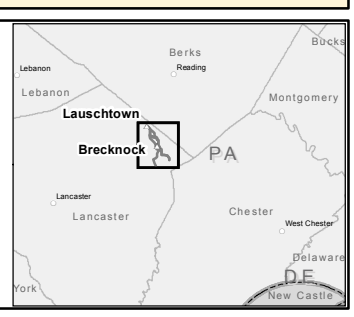
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-5. Potential Routes from August 2012 Open House

N W E S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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



3.3.2 State

A similar initial PNDI request was submitted to the Pennsylvania Department of Conservation and Natural Resources (DCNR), Pennsylvania Game Commission (PGC), and Pennsylvania Fish and Boat Commission (PFBC) on April 27, 2012. The PFBC's May 29, 2012 letter indicated that no adverse impacts to state rare, candidate, threatened or endangered fish, reptiles, amphibians or aquatic invertebrates are anticipated. The PGC's July 13, 2012 response indicated that the Project is located in the vicinity of a state bat species of special concern, the northern myotis (*Myotis septentrionalis*). No specific locations of recorded northern myotis habitat were identified in the letter. DCNR's May 18, 2012 response indicated that portions of the Project are located in the vicinity of two plant species of concern. Links B, F, the southeast portion of Link D and Links 3, 4, 6 and 8 are located within the vicinity of nodding trillium (*Trillium cernuum)*, which currently has an undetermined status in Pennsylvania. Links B, F, the southeast portion of Link D and Links 3, 4, 6, 7, 8, 16 and 17 are located within the vicinity of puttyroot (*Aplectrum hyemale*), a Pennsylvania rare plant species. DCNR also recommended maintaining a buffer between wetlands and the Project Area. DCNR requested surveys for the two species identified if the Preferred Route would cross potential habitat.

PPL Electric submitted an initial consultation letter to the Pennsylvania Historical and Museum Commission (PHMC) on February 21, 2013. PHMC's March 15, 2013 response indicated that National Register-listed or eligible historic architectural resources are located in the vicinity of the Potential Routes, and that there may be additional resources in the area. Therefore, the PHMC recommended surveys to identify these resources. The PHMC response also indicated that known archaeological resources are located within the Project Area. Therefore, the PHMC recommended a Phase I archaeological survey of the Project Area to verify the extent of known sites and to locate any other potentially significant archaeological resources that may exist.

3.3.3 Local

PPL Electric met with representatives from the following local agencies on April 2, 2012 to introduce the North Lancaster – Honey Brook Project:

- Lancaster County Board of Supervisors
- Lancaster County Farmland Trust
- Caernarvon Township
- East Cocalico Township
- Penn Township
- PA Representative Gordon Denlinger's Office (99th District)
- PA Senator Michael Brubaker's Office (36th District)
- U.S. Representative Joseph Pitts' Office (16th District).

Prior to each open house meeting, PPL Electric notified the townships crossed by the Potential Routes (Caernarvon and Brecknock townships) of the potential, alternative and proposed routes. In addition, a meeting was held with Brecknock Township on June 22, 2012. PPL Electric will continue to coordinate with each municipality throughout the course of the Project.

3.4 Public Outreach

Public outreach is a significant component of the siting process. PPL Electric conducted extensive public outreach throughout the siting process, including regulatory agency consultation, public notification and open house meetings, and meetings with property owners. Following field reconnaissance, the Routing Team further evaluated the initial Potential Route Network and presented a revised Potential Route Network (see Section 3.2) to the public for comment at an open house meeting on April 19, 2012. A second public open house meeting was held on August 1, 2012 to present the updated Potential Route Network to the public and a final open house meeting was held on October 18, 2012 to announce the Preferred Route and answer additional questions from the public.

3.4.1 Outreach Media

Prior to conducting public open house meetings, PPL's Regional Community Relations Director contacted local officials to discuss the Project, as described in Section 3.3.3. On April 3, 2012, PPL Electric mailed public notices to all property owners located within 500 feet of the Potential Route Network to notify them about the April 19, 2012 open house

meeting. During this time, PPL Electric published a Project website[1] to provide information regarding the project need, the siting process, frequently asked questions (FAQs), as well as an interactive public input map depicting the potential routes. On April 10, 2012, PPL Electric placed an advertisement in the Reading Eagle and the Lancaster Intelligencer/New Era newspapers to notify the public of the scheduled open house. Similarly, PPL mailed public notices to all property owners located within 500 feet of the revised Potential Route Network to notify them about the August 1, 2012 open house meeting.

On or around October 8, 2012, PPL Electric mailed public notices to all property owners located within 500 feet of the Preferred and Alternate routes, as well as to other property owners that were mailed letters during the April and August mailings and/or that attended the previous open house meetings, to notify them about the October 18, 2012 open house meeting to announce the Preferred Route. PPL Electric also notified local officials of the announcement and open house meeting via email. On October 10, 2012, PPL Electric placed an advertisement in the Reading Eagle and Lancaster Intelligencer/New Era newspapers to notify the public of the scheduled open house.

3.4.2 Public Open Houses

A public meeting was held on April 19, 2012 at the Caernarvon Fire Company Social Hall in Narvon to present the refined Potential Route Network and provide information about the North Lancaster – Honey Brook 138/69 kV Transmission Project. At the meeting, attendees received a Project fact sheet, information on the Pennsylvania Public Utility Commission (PUC) Process, comment cards, a siting input survey, and Project Area map. The public information meetings provided an opportunity for residents and other interested parties to review project information displays and discuss the Project with PPL Electric and Louis Berger representatives. The fact sheet contained a brief statement on Project need, a description of the siting process, and a preliminary Project timeline. The public meeting was

[1] Project Website: http://lan.pplreliablepower.com/Default.aspx

organized in an open house format and consisted of several stations that identified the Project processes. These stations included the following:

1. Welcome station located at the entrance for attendees to sign-in;
2. Project Need station providing an overall summary and explaining the planning process;
3. Project Summary station providing information about several ongoing projects located in the North Lancaster Region;
4. Route Selection station detailing the siting process and including aerial maps showing the potential route network and parcel boundaries;
5. Participating in the Siting Process station explaining how PPL Electric uses public input in the routing process;
6. Engineering station detailing the specifications for the new transmission line;
7. Right-of-Way station explaining the easement process;
8. Next Steps station explaining the project schedule and how to stay informed; and
9. The Big Picture station explaining reliability and PPL Electric's commitment to safe, dependable service.

About 106 people attended the April open house meeting. Fifty-one comment cards and 49 siting input surveys were completed during this meeting. Comments at the meeting and on the comments cards varied, but generally fell into one of the following categories: Potential Routes (comments about or opposing specific routes, suggested new alignments, or comments about the routing process), natural resources (impacts to forested land, wildlife, habitat, and water resources), real estate (impacts to property value, operating business and property use), viewshed (visual impacts), farmland (impacts to farm operation), health and safety, vegetation management, trespassing and security, or identification of new features.

PPL Electric reviewed these comments and followed up with the commenters to answer any outstanding questions. In addition, PPL Electric provided the commenters with the Project website and a phone number to obtain additional information about the Project or provide comments.

The siting survey asked attendees to rank from 1 to 10 (with 1 being the factor most important to avoid when building a power line, and 10 being the least important factor to avoid) the importance of avoiding residential areas; industrial/commercial areas and buildings; historic places and archeological sites; undeveloped areas; wetlands, floodplains, lakes, and rivers; conservation or natural areas; forests and wooded areas; open space and local parks; roads, railroads, other power lines or rights of way; and agricultural areas/ croplands or tree and fruit farming areas. Based on the surveys collected, the respondents identified residential and agricultural areas as the most important areas to avoid during siting.

Following the April open house, PPL Electric siting and real estate representatives held in-person meetings with numerous property owners located along the Potential Routes. The Routing Team used information from these meetings along with online comments and comments from the April public open house to refine the Potential Routes. Most of the alignments suggested by the landowners would result in minor changes through individual properties and were considered by the Routing Team on a case-by-case basis.

As a result of re-evaluating a Potential Route exiting the Lauschtown Substation to the east, several property owners within 500 feet of the alignment were not notified about the first open house meeting. Therefore, PPL Electric held a second meeting to gather public input on the revisions to the Potential Route Network. About 86 people attended the August 1, 2012 open house meeting and 35 comment cards were completed. Landowners expressed differing opinions on the Potential Routes, concerns or questions about impacts to residential properties, farmland and forested land.

As described in Section 2.0, the routing process strives to balance impacts on local communities and the natural environment. Public input is a significant factor considered during this process. Detailed information about the Alternative Route evaluation process is presented in Section 4.0. After the Routing Team identified the Preferred and Alternate routes, a third open house meeting was held on October 18, 2012 to present information on the Preferred Route. About 40 people attended the October open house meeting and ten comment cards were completed. Comments during the October open house primarily

focused on the ROW acquisition process and routing adjustments. The Routing Team finalized the Preferred Route alignment based on this information and additional meetings with property owners.

3.5 Development of Alternative Routes

Once the Potential Routes were developed, the Routing Team considered additional information provided by agency outreach, field review, data analysis, and public comment. A qualitative and quantitative screening process was employed to eliminate or modify route links from the Potential Route network that were not considered suitable for additional study to narrow down the network and focus on refining the more preferable links to establish Alternative Routes. In some cases, these eliminations or adjustments were based on the likelihood of impacts on residential developments, natural resources, or other developed infrastructure. Further adjustments were considered based on public input. The route adjustments largely consisted of refinements based on public outreach and discussions with individual property owners. PPL Electric held a second public meeting in August 2012 to present the revised Potential Routes to the public for additional comments. The revised Potential Route Network is identified in Figure 4-5.

The Routing Team developed four Alternative Routes (two in the northern portion of the Study Area and two in the southern portion of the Study Area) from the remaining Potential Route network and relabeled them as Routes A through D. The Alternative Routes are summarized below and shown on Figure 4-6.

Lauschtown (Proposed)

BERKS COUNTY

LANCASTER COUNTY

BRECKNOCK
BRECKNOCK

BRECKNOCK
CAERNARVON

CAERNARVON
CAERNARVON

CAERNARVON
EAST EARL

Brecknock

Churchtown

Panorama Dr
Bowmansville Rd
Meadowlark Ln
Boulder Hill Rd
Hoffman Rd
Schlouch Rd
Camp Rd
Penn Sylvan Dr
Hilltop Rd
Cedar Rd
Fuzer Rd
Sr6205
Alleghenyville Rd
Speck Rd
Schrader Rd
Beam Ln
Diehl Rd
Stauffer Park Ln
Dawson Dr
Maple Grove Rd
Kachel Rd
Woodsorrel Ln
Douglas Dr
Perry Dr
Spruce St
T959
Elsie Ln
Horning Rd
Lauschtown Rd
Mudd Creek
Mountain Ln
Masters Dr
Fairway Dr
Eagle Cir
Oakmont Ct
Granite Pl
Harvest Dr
Wheatland Dr
W Maple Grove Rd
Olde School Ln
Abbey Ln
N Church St
Raybil Dr
Church St
Mill St
Dogwood Dr
El Gra Ct
Oak Leaf Ct
Cedar St
Hillsdale Run
E Maple Grove Rd
Oaklyn Dr
Spotts Ln
Yellow Hill Rd
Aspen Dr
Poplar Dr
Von Neida St
Good Rd
Pleasant Valley Rd
Reading Rd
Sunset Dr
625
Spook Ln
I 76 W
I 76 E
Silver Hill Rd
Bridge Rd
Laurel Run
052
T888
Service Road
76
Leid Rd
Black Creek Rd
E Black Creek Rd
Black Creek
Center Church Rd
Maple St
Birchwood St
Elm St
Barnett St
Echo Valley Rd
Poplar St
Laurel Top Cir
Echo Dr
Farm Ln
Azalea Ct
Cherry Ct
Zerbe Rd
Trego Rd
School House Ln
Laurel Ridge Rd
Violet Ln
Edwards Rd
Wentzel Rd
Sawmill Rd
Old Rd
Lambert Rd
T886
Hoover Dr
Hammertown Rd
California Rd
Spring Hollow Rd
T807
Browns Rd
Turkey Hill Rd
Union Grove Rd
Smoketown Rd
Valley View Rd
T924
Ironstone Dr
Iron Bridge Rd
T713
Agape Ct
N Churchtown Rd
Glick Rd
Turkey Farm Rd
Weaverland Rd
Spring Grove Rd
Pennylown Ln
Water St
Little Conestoga
Longview Dr
Mill Rd
Conestoga River
Conestoga Rv
Pool Forge Rd
Shirktown Rd
Brendle Rd
Main St
23
Ramp
Windsor Rd
Little Hill Rd
Cedar Creek
Valley View Dr
State Hwy 23
Nolt Rd
T679
S Pool Forge Rd
S Churchtown Rd
Boot Jack Rd
Silver Vly
Bridgeville Rd
Frogtown Rd
Fetterville Rd
Ligelaw Rd
Gehman Rd

Legend

- Populated Place
- Substation
- Route
- Municipality
- County
- PA State Game Lands
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-6: Alternative Routes

N W E S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

Lauschtown Substation to Brecknock Substation (Northern Study Area)

Alternative Route A (Alternate Route)

Route A would exit the Lauschtown Substation and proceed southeast for 2,100 feet crossing Boulder Hill Road (SR 10) near its intersection with Oaklyn Drive. At a point approximately 600 feet south of its crossing of Boulder Hill Road, the line turns southeast then immediately south for approximately 1,100 feet to parallel existing property lines. From here the route turns east and parallels existing property lines before turning sharply southeast and crossing Hill Top Road. Approximately 450 feet south of Hill Top Road, the line turns slightly south and crosses East Maple Grove Road. After approximately 3,000 feet, the route turns south and parallels existing property lines, crossing Yellow Hill Road. At this point the route turns southeast towards Silver Hill Quarry and makes several short turns to avoid constraints and generally follow property lines until the route crosses the Pennsylvania Turnpike. After crossing the Turnpike, the route proceeds south and enters the Brecknock Substation to the west.

Alternative Route B (Preferred Route) [2]

Route B would exit the Lauschtown Substation along the same path as Route A, crossing Boulder Hill Road (SR 10) near its intersection with Oaklyn Drive. At a point 1,600 feet southeast of its crossing with Boulder Hill Road, the line would turn to the south and proceed for 4,800 feet roughly parallel to Oaklyn Road crossing Maple Grove Road and Oaklyn Drive. At a point 500 feet south of its intersection with Oaklyn Drive, the route would turn to the southeast and parallel I-76 (i.e., the Pennsylvania Turnpike) for 2,200 feet. The route would then turn sharply to the southwest for 500 feet to cross I-76 and then turn to the southeast and parallel I-76 for an additional 1,200 feet crossing Oaklyn Drive. From here, the route proceeds to the southeast for 3,700 feet crossing Laurel Road. From Laurel Road, the route would travel to the southeast for 5,100 feet to the Brecknock Substation, crossing Black Creek Road along the way.

[2] Following the October 2012 open house meeting, minor adjustments were made to the Alternative Routes based on parcel survey information, discussions with landowners, and engineering refinements. The Alternative Routes described in this document refer to the final route alignments, and therefore, differ slightly from the information presented at the October open house.

Brecknock Substation to South Akron – Honey Brook 69 kV Transmission Line (Southern Study Area)

Alternative Route C (Alternate Route)

From the Brecknock Substation, the route would head south roughly parallel to Lambert Road for 2,000 feet. At this point, the route would continue south adjacent to property lines before turning southwest and crossing Lambert Road. Approximately 700 feet after crossing Lambert Road the route turns south, crossing Smoketown School Road. Just north of Little Conestoga Creek the route turns southwest, crossing North Churchtown Road and Mill Road. Approximately 750 feet west of Mill Road the route turns south and parallels the Caernarvon-East Earl township border for 5,800 feet, crossing Main Street (SR 23) and connecting to the South Akron – Morgantown #2 transmission line west of Churchtown.

Alternative Route D (Preferred Route)[3]

From the Brecknock Substation, the route would head south roughly parallel to Lambert Road for 2,000 feet along the same alignment as Route C. At this point, the route would turn to the east crossing Lambert Road and continue for 2,000 feet. From this point, the route would turn to the south for 5,700 feet crossing Turkey Hill Road. The route would head to the southeast for 1,500 feet and then turn to the east for 4,300 feet, crossing Hammertown Road and Water Street, to a point 2,500 feet east of its crossing with Water Street. From this point, the route would turn to the southeast for 2,750 feet to a point 500 feet northwest of Main Street (SR 23). From here, the route would turn to the south for 1,900 feet and cross Main Street and connect with the South Akron – Morgantown #2 transmission line east of Churchtown.

[3] See footnote 2.

4.0 ALTERNATIVE ROUTE EVALUATION

This section further discusses the Alternative Routes, and provides a quantitative and qualitative analysis of potential impacts to local communities, the environment and cultural resources. The Alternative Routes were reviewed in detail and compared using a combination of information collected in the field, GIS data sources, public input, supporting documents, and the collective knowledge and experience of the Routing Team.

4.1 Natural Environment Impacts

Natural environment impacts include potential impacts to vegetation and habitat, surface waters, and conservation and recreation lands. Potential impacts discussed in this section are based on publically available maps and data as well as consultation with federal and state agencies. A comparison of the natural environment considerations for the four Alternative Routes is presented in Table 4-2.

Table 4-2. Environmental Inventory: Natural Environment

Alternative Route	North		South	
	A	B	C	D
Wetlands/Streams				
Stream Crossings (#)	6	4	5	3
Black Creek (HQ-WWF)	0	0	1	1
Conestoga River (WWF)	0	0	1	0
Little Conestoga (WWF)	0	0	1	1
UNT Conestoga River (WWF)	0	0	1	0
UNT to Muddy Creek (WWF)	1	1	0	0
UNT to Muddy Creek (HQ-TSF)	1	1	0	0
UNT to Little Conestoga (WWF)	0	0	1	1
UNT to Black Creek (HQ-WWF)	4	2	0	0
Waterbody Crossings	0	0	0	0
NWI Wetland Length Crossed (miles)	0.0	0.0	0.0	0.0
FEMA Floodplain				
100 Year Floodplain (acres)	0.1	0.1	0.1	0.1
Forest Clearing				
Forest clearing based on imagery (miles)	3.2	1.0	0.4	0.9
Open Space/Conservation				
Protected Lands (miles)	0.0	0.0	0.0	0.0

Table 4-2. Environmental Inventory: Natural Environment				
Alternative Route	**North**		**South**	
	A	**B**	**C**	**D**
Sensitive Species BDA-Core Habitat Area within 0.5 mile (acres)[4]	20	0	0	0
State Game Land #52 (acres)	20	0	0	0
Soils				
Prime Farmland (percent)	21%	49%	76%	60%
Farmland of Statewide Importance (percent)	13%	32%	16%	13%
Hydric Soils (percent)	4%	7%	1%	1%
Partially Hydric Soils (percent)	25%	20%	24%	26%
Non-Hydric Soils (percent)	71%	73%	75%	73%
Topography/Slope				
Slopes >20% (miles)	0.4	0.2	0.1	0.1
Slopes 10 – 20% (miles)	0.5	0.0	0.0	0.0

4.1.1 Soils

Prime farmland and farmland of statewide importance are special categories of highly productive cropland that is recognized and described by the National Resources Conservation Service (NRCS). Prime farmland is land that has the best combination of physical and chemical characteristics for producing crops. Soils that do not meet the prime farmland category but are still recognized for their productivity may qualify as farmland of statewide importance. Farmland in the vicinity of the Alternative Routes includes croplands, and grasslands that could be used for grazing or hay production.

The soil surveys and digital soils data were used to locate areas with soils typically found in wetlands. NRCS soil surveys group areas into soil map units, which consist of one or more soil types. For this analysis, soils were grouped into three categories based on soil survey information: hydric soils, hydric inclusion soils (partially hydric soils), and non-hydric soils. Soil map units that consist of over 50 percent hydric soil types were classified as hydric soils, soil map units that consist of up to 50 percent hydric soil types were classified as hydric inclusion soils, and soil map units that consist only of non-hydric soil types were classified as

[4] No BDA areas are crossed by the Alternative Routes. One BDA area, State Game Land #52, is located within 0.5 mile of Route A.

non-hydric soils. The majority of soils crossed by the Alternative Routes are characterized as non-hydric. Soil types through which the Alternative Routes cross are shown on Figure 4-7.

Transmission construction activities such as vegetation clearing, access road construction, grading, and foundation construction can impact soils by disturbing the native structure of the soil and thereby creating areas of higher erosion potential, compaction, and lower soil permeability/fertility. The severity of soil impacts depends on several variables including vegetation cover, the slope of the land, soil particle size, thickness of the soil profile, depth to a restrictive layer, and soil moisture content. During construction of the Project's ROW and access roads, prime farmland and/or farmland of statewide importance may be removed temporarily from productivity; permanent structures such as transmission towers would remove only a small portion of the right-of-way for the transmission tower footprint (foundation diameter of 6 to 10 feet) from further productivity. Access roads are normally temporary impacts so cropping and grazing can resume after construction is completed. Furthermore, once transmission structure construction is completed, normal agricultural uses will continue to be permitted within the right-of-way.

Unvegetated soil surfaces are more susceptible to erosion and loss of soil productivity. Removing stumps during tree clearing increases the potential for soil erosion, and leaving topsoil exposed increases the potential of loss by wind and water. Best management practices (BMPs) to minimize erosion impacts may include leaving stumps in the ground, covering exposed soil, and reseeding after construction. PPL Electric will obtain all necessary permits and employ specified BMPs to minimize soil erosion during construction activities. In agricultural areas, farming activities will continue to occur within the ROW following construction. In forested areas, the ROW will be revegetated with compatible species and maintained in accordance with PPL Electric's Vegetation Management Program (see Attachment 12).

Lauschtown
(Proposed)

BERKS
COUNTY

BRECKNOCK
BRECKNOCK

LANCASTER
COUNTY

BRECKNOCK
CAERNARVON

CAERNARVON
CAERNARVON

Muddy Creek

625

76

Black Creek

Brecknock

CAERNARVON
EAST EARL

Little Conestoga

Conestoga River

Churchtown

23

625

Cedar Creek

Legend

Populated Place	**Existing Transmission**	**Soil Association**	
Substation	500kV	Hagerstown-Duffield-Clarksburg	
Route	230kV	Manor-Glenelg-Chester	
Municipality	138kV	Neshaminy-Lehigh-Glenelg	
Stream	69kV	Ungers-Penn	

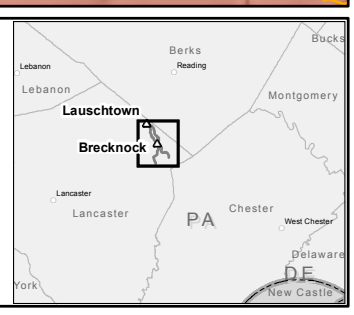
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-7: Soil Associations

N
W E
S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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



Areas with hydric and hydric inclusion soils have a greater probability of supporting wetlands than areas with non-hydric soils. PPL Electric seeks to minimize impacts to wetlands by spanning these features to the extent practical. Where wetland impacts cannot be avoided, PPL Electric will obtain the necessary permits and employ specified BMPs to minimize impacts.

Alternative Route Comparison

As a result of implementing mitigation measures similar to those discussed above and the limited footprint of permanent impacts on soil productivity created by the structures themselves, any impacts to soils are likely minor for all Alternative Routes. The following discussion compares factors that may contribute to the Project's impact on soils.

Northern Alternative Routes

As shown in Table 4-2, Route B traverses more than twice as many areas identified as prime farmland compared to Route A. Permanent impacts to farmlands are anticipated to be minimal due to the use of the monopole tower structures for this Project, which have smaller footprints compared to lattice or H-frame structures.

Route A would require approximately 3.2 miles of vegetation clearing, while Route B would require only approximately 1.0 mile. The vegetation clearing required for Route A would have a greater impact soils by disturbing the native structure of the soil and thereby creating areas of higher erosion potential, compaction, and lower soil permeability/fertility.

Route A traverses noticeably steeper terrain, as shown in Table 4-2. Steeper terrain results in both additional environmental and engineering considerations (see Section 4.3). Route A has a greater potential for increased soil erosion associated with construction and operation of a new transmission line as a result of vegetation clearing and additional grading necessary through steep areas. In all cases, erosion and sediment control measures would be employed to minimize and mitigate potential soil erosion.

Routes A and B traverse a similar percent of hydric and partially hydric soils, with Route B crossing slightly more soil series characterized as hydric. While neither route traverses NWI mapped wetlands, it is expected that a similar number of wetland areas would be identified along either route. Wetland impacts are discussed further in Section 4.1.2.

Southern Alternative Routes

The southern portion of the Study Area traverses a greater amount of prime farmland. Route C traverses slightly more areas identified as prime farmland compared to Route D. Both southern alternatives would traverse the same distance of steep slopes. Routes C and D traverse a similar percentage of hydric and partially hydric soils. Both Routes C and D would require minimal vegetation clearing, with Route D requiring only slightly more vegetation clearing than Route C (0.4 miles compared to 0.9 miles). In all cases, erosion and sediment control measures would be employed to minimize and mitigate potential soil erosion.

4.1.2 Water Resources

Direct impacts on hydrologic features are often minimized or avoided by spanning wetlands, rivers, or drainages, when feasible. In the absence of other constraints, engineers typically seek to place structures at high points in topography, inherently resulting in the avoidance of structure placement that impacts water or wetland features in low-lying areas. However, in a few rare instances, such as at crossings of large wetland areas or complexes, a structure may need to be placed within a wetland. In these instances, the area of wetland loss is limited to the area of the footprint of the structure foundation. Other impacts may include conversion of a forested wetland to a scrub/shrub or herbaceous wetland.

Regardless of the type of impact, PPL Electric will coordinate with the U.S. Army Corps of Engineers (USACE) concerning potential impacts on jurisdictional wetlands and will attempt to minimize permanent impacts when feasible and practical. To this end, PPL Electric will implement a range of BMPs during the design, construction, and operational phases to avoid or minimize impacts on wetlands. These practices may include the consideration of designs

that limit clearing forests near drainages and in areas of steep topography, requiring the use of wetland mats to minimize impacts of construction traffic, and avoiding construction during seasonally wet periods in certain areas.

Other indirect impacts to surface waters, such as sedimentation and erosion of surrounding soils can also result from ground disturbing activities. Typically, sedimentation is easily controlled with proper perimeter controls around the transmission line construction area. BMPs may include the implementation of sediment control measures such as silt fencing, access road drainage management measures, and rapid reseeding of disturbed soil areas. PPL Electric will coordinate with the PADEP and obtain and comply with the necessary storm water permits for construction of the Project.

Alternative Route Comparison

Alternative Routes were analyzed for number of stream crossings (including streams, rivers, or drainages that can be perennial, seasonal, intermittent, or ephemeral), number of waterbodies (lakes or ponds) crossed, and acres of NWI wetlands within the ROW.

Northern Alternative Routes

As shown in Table 4-2, Route B would require fewer NHD stream crossings compared to Route A. Both northern routes would cross unnamed tributaries (UNTs) of Muddy Creek and Black Creek, which are designated by the Pennsylvania Department of Environmental Protection (PADEP) as high quality (HQ) waters. Route A would involve two additional crossings of UNTs to Black Creek compared to Route B. Routes A and B would traverse approximately 0.1 mile of 100-year floodplain associated with the various stream crossings. Route B also crosses one freshwater pond. Neither of the northern Alternative Routes crosses mapped NWI wetlands. As discussed in Section 4.1.1, the presence of hydric and partially hydric soils is a good indicator for potential wetlands. PPL Electric will minimize in-stream and wetland impacts, regardless of the route selected, by spanning or avoiding them to the extent practical. Streams, wetlands, waterbodies, and floodplains in the vicinity of the four Alternative Routes are shown on Figure 4-8.

Lauschtown
(Proposed)

BERKS
COUNTY

BRECKNOCK
BRECKNOCK

Muddy Creek

LANCASTER
COUNTY

West Branch Conestog

052

State
Game
Lands #52

Conestoga
River
Headwaters

CAERNARVON
CAERNARVON

625

76

Black Creek

Brecknock

CAERNARVON
EAST EARL

Little Conestoga

Conestoga River

Churchtown

23

625

Cedar Creek

Legend

- Populated Place
- Substation
- Route

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

- Stream
- Waterbody
- Wetland (NWI)
- 100-Year Floodplain
- BDA-Core Area
- PA State Game Lands
- Municipality

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-8: Natural Features

N
W E
S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Pennsylvania Natural Heritage Program (PNHP)>

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

Southern Alternative Routes

Both southern routes would cross the same number of NHD streams, including some named streams. South of the Brecknock Substation, both Routes C and D would cross Black Creek, which is designated as a High Quality Warm Water Fishery (HQ-WWF). Both routes would also cross the Little Conestoga Creek, which is designated as a WWF. Route C would also cross the Conestoga River, which is also designated as a WWF. Routes C and D would both traverse approximately 0.1 mile of 100-year floodplain associated with the various stream crossings. Neither of the southern Alternative Routes crosses mapped NWI wetlands.

4.1.3 Vegetation and Habitat

During construction, trees and other tall growing vegetation within the ROW would be removed to maintain appropriate clearances for the conductors. Upon completion of construction, compatible species would be permitted to regrow and would be maintained in accordance with PPL Electric's Vegetation Management Program (see Attachment 12). In pasture/grassland areas, little vegetation clearing would be required and permanent impacts would be limited to the foundations of the structures and any areas requiring permanent access roads. The proposed steel monopoles typically range from 3.5 to 7 feet in diameter with a foundation of 6 to 10 feet. In forested areas, a 100-foot-wide ROW will be cleared and maintained in accordance with PPL Electric's Vegetation Management Program.

After construction, access roads can be re-vegetated with native grasses or agricultural crops. For areas where an access road was cut into the landscape, the access road can either be reclaimed back to the original grade or the road bed left in place and re-vegetated for future maintenance needs. Whether or not an access road is reclaimed would depend on several factors, including landowner negotiations and need to access that particular section of the transmission line in the future.

Impacts to wildlife would vary depending on the type of impact and nature of the species impacted. Short-term impacts may include temporary displacement from an area due to construction-related noise or temporary modifications in habitat. Longer-term impacts occur

if the habitat for the species is permanently removed, such as with the conversion of forested habitat to shrub-scrub or emergent vegetation, or less obviously, when the Project introduces a new feature that degrades the overall quality of the habitat for certain species.

It should be noted that impacts on habitat need to be considered with respect to the current status of habitat and the nature of its current wildlife assemblage. Much of the land within the Study Area has long been cleared and is tilled yearly for farming. Species that are currently associated with these converted habitats are typically tolerant of farming operations. Forest dwelling species located adjacent to agriculture settings are either endemic to or tolerant of edge-type habitats. Therefore, for many of the species now present, additional permanent impacts will be either unlikely or negligible as a result of the construction of the Project.

Alternative Route Comparison

The potential for impacts to vegetation and wildlife habitats can be generally assessed by comparing each Alternative Route with respect to the type of vegetation crossed, the anticipated acreage of tree clearing, and potential impact to conservation areas.

Northern Alternative Routes

As shown in Table 4-2 (see Section 4.2), about 23 percent of land crossed by Route A and close to 55 percent of land crossed by Route B consists of grassland/pasture and cultivated crops. In these areas, permanent vegetation loss will be limited to the transmission structure footprint and construction of the Project would not result in permanent changes to habitat.

Based on a review of aerial imagery, Route A would require more than three times the tree clearing as Route B (3.2 miles compared to 1.0 miles). PPL Electric held a meeting with PADEP on September 6, 2012, to present information on the Alternative Routes.

During this meeting, PADEP stated a preference for Route B based on the significant amount of additional tree clearing that would be required for Route A.[5]

Neither of the northern Alternative Routes traverses any Natural Area Inventory (NAI) areas identified by The Natural Conservancy. Route B is located within 0.5 mile of one biological diversity area (BDA) associated with State Game Land #52 (see Figure 4-9). As discussed in Attachment 3, the State Game Land #52 NAI consists of a small portion of a larger forest that contains a small population of an unidentified plant species of concern. Route B does not cross the NAI and there will be a significant tree buffer between the route and the closest point of the NAI area. Therefore, no impacts to the NAI area are anticipated.

Southern Alternative Routes

Routes C and D cross about 85 percent and 68 percent of grassland/pasture or cultivated crops, respectively. In these areas, permanent vegetation loss will be limited to the transmission structure footprint and construction of the Project would not result in permanent changes to habitat.

Both Routes C and D would require minimal vegetation clearing (0.4 miles and 0.9 miles respectively), with Route D requiring only slightly more vegetation clearing than Route C. During PPL Electric's meeting with PADEP, PADEP did not state a preference for the southern routes.

Neither of the southern Alternative Routes traverses any Natural Area Inventory (NAI) areas identified by The Natural Conservancy.

[5] Although the southern routes, Routes C and D, also were presented for PADEP's consideration, PADEP did not state a preference for one of the southern routes over the other.

4.1.4 Special Status Species

As stated in Section 3.3.1 and Attachment 3, USFWS indicated that the entire Project is located within the range of the state and federally threatened bog turtle. Potential impacts to the federally threatened bog turtle pose the greatest potential risk to known threatened and endangered species located within the Project Area. The bog turtle is found in specific wetland habitats, as described in Attachment 3. Therefore, the USFWS has requested wetland delineations within the Project area and that all wetlands identified within this area should be evaluated for potential suitability as bog turtle habitat. The PGC indicated that the entire Project is located within the range of the northern myotis, a state species of special concern. PGC suggests that, in these portions of these routes, clearing of trees greater than 5-inch diameter at breast height (DBH) be conducted between November 1 and March 31. No other species of concern were identified by federal or state agencies.

Alternative Route Comparison

Northern Alternative Routes

Neither of the northern Alternative Routes cross NWI wetlands, and both traverse a similar percentage of soils characterized as hydric or partially hydric. However, both northern Alternative Routes are located in the range of the bog turtle as confirmed by the USFWS. Information regarding further consultation with the USFWS is discussed in Section 4.5 and in Attachment 14. Once the Preferred Route was identified, PPL Electric retained a qualified surveyor to conduct Phase I bog turtle surveys and subsequent Phase II surveys where necessary. Section 4.5 describes the results of these surveys.

As stated in Section 3.2, DCNR indicated that certain Links shown at the April 2012 open house meeting (B, F, southeast portion of D, 3, 4, 6 and 8) are located within the vicinity of nodding trillium, which currently has an undetermined status in Pennsylvania, and these same Links along with Links 7, 16 and 17 are located within the vicinity of puttyroot, which is a Pennsylvania rare plant species. These Links generally correspond to Route A, the common portion of Routes C and D immediately south of the Brecknock Substation, and a small, forested portion of Route D. Based on this response, Route B

would not be expected to potentially impact either plant species. Route A has the greatest potential to impact either species; therefore, plant surveys would likely be required if Route A were selected. An online PNDI review was subsequently conducted for the Preferred Routes (Routes B and D). Based on this review, no potential impacts to plant species of concern were identified. However, PPL Electric will continue to consult with DCNR.

As identified in Table 4-2, Route A would require significantly more tree clearing compared to Route B. Therefore, Route A has a greater potential to impact northern myotis habitat.

Southern Alternative Routes

As state above, DCNR indicated that certain Links shown at the April 2012 open house meeting are located within the vicinity of nodding trillium, which currently has an undetermined status in Pennsylvania, and the puttyroot, which is a Pennsylvania rare plant species. These Links generally correspond to the common portion of Routes C and D immediately south of the Brecknock Substation, and a small, forested portion of Route D. An online PNDI review conducted for Route D did not identify any plant species as a potential concern.

4.1.5 Natural Environment Summary

Northern Alternative Routes

Route B is preferred over Route A as the northern route from a natural environment perspective. Route B crosses fewer areas of steep slopes and, therefore, would avoid more significant trenching and grading through steep areas in the vicinity of Yellow Hill and Silver Hill. Route B would result in fewer impacts to vegetation and associated forest habitat and wildlife, including potential impacts to two plant species of concern. The PADEP has stated a preference for Route B based on the significant increase in tree clearing that would be associated with Route A (3.2 miles as compared to 1.0 miles). Route B is also located farther away from State Game Land #52 and the associated BDA area.

Field wetland delineations were conducted for the Preferred Route and engineered access roads to determine the exact location of any wetlands or waterways. PPL Electric anticipates that project engineering can minimize wetland and stream impacts through spanning and avoidance. However, if impacts are unavoidable, PPL Electric will obtain and adhere to all required state and federal permits, as well as any conditions imposed on those permits.

Southern Alternative Routes

Route C and Route D would have substantially similar impacts as the southern route from a natural environment perspective. Both southern routes would traverse the same amount of area with steep slopes and traverse a similar percentage of hydric and partially hydric soils. The common portion of Routes C and D could potentially require surveys for two plant species of concern. The forested portion of Route D was also identified by DCNR as containing potential habitat for both species. However, an online PNDI review conducted for Route D did not identify any plant species as a potential concern. Both Routes C and D would require minimal vegetation clearing (0.4 miles and 0.9 miles respectively). Although both Routes C and D were presented for PADEP's consideration, PADEP did not state a preference for one of the southern routes over the other.

4.2 Built Environment Impacts

Built environment impacts include direct and indirect impacts to residential, commercial and industrial development, institutional uses (e.g., schools, places of worship, cemeteries, and hospitals), cultural resources, and land use. Construction of a new transmission line can result in changes in land use and aesthetic impacts to residents, commuters and travelers, employees, and recreational users. A comparison of the built environment considerations for the four Alternative Routes is presented in Table 4-3. Topographic maps identifying known built environment elements and constraints within established distances of the Alternative Routes as specified in the PA PUC siting regulations are included as Figures 4-9a and 4-9b.

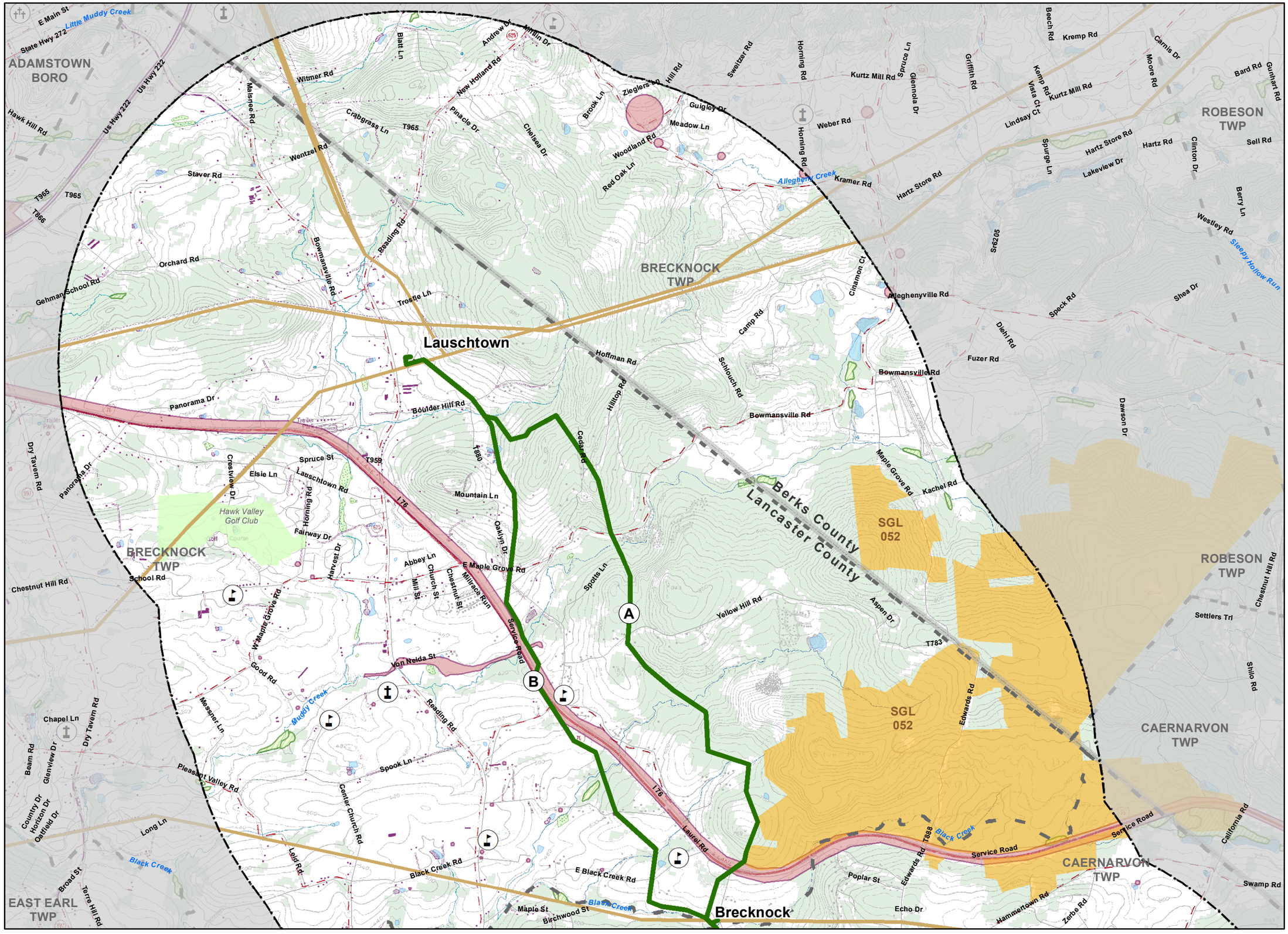


Figure 4-9A Constraints/ Topography

Legend

- Alternative Route
- Alternative Route 2 Mile Buffer
- Existing Transmission
- Substation
- Airport
- Cemetery
- Church
- School
- Historic Sites
- Local Park or Recreational Area
- Golf Course
- PA State Game Lands
- Municipality

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested
- Freshwater Forested/Shrub Wetland
- Freshwater Pond; Lake

N W E S

0 1,000 2,000 3,000 Feet

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

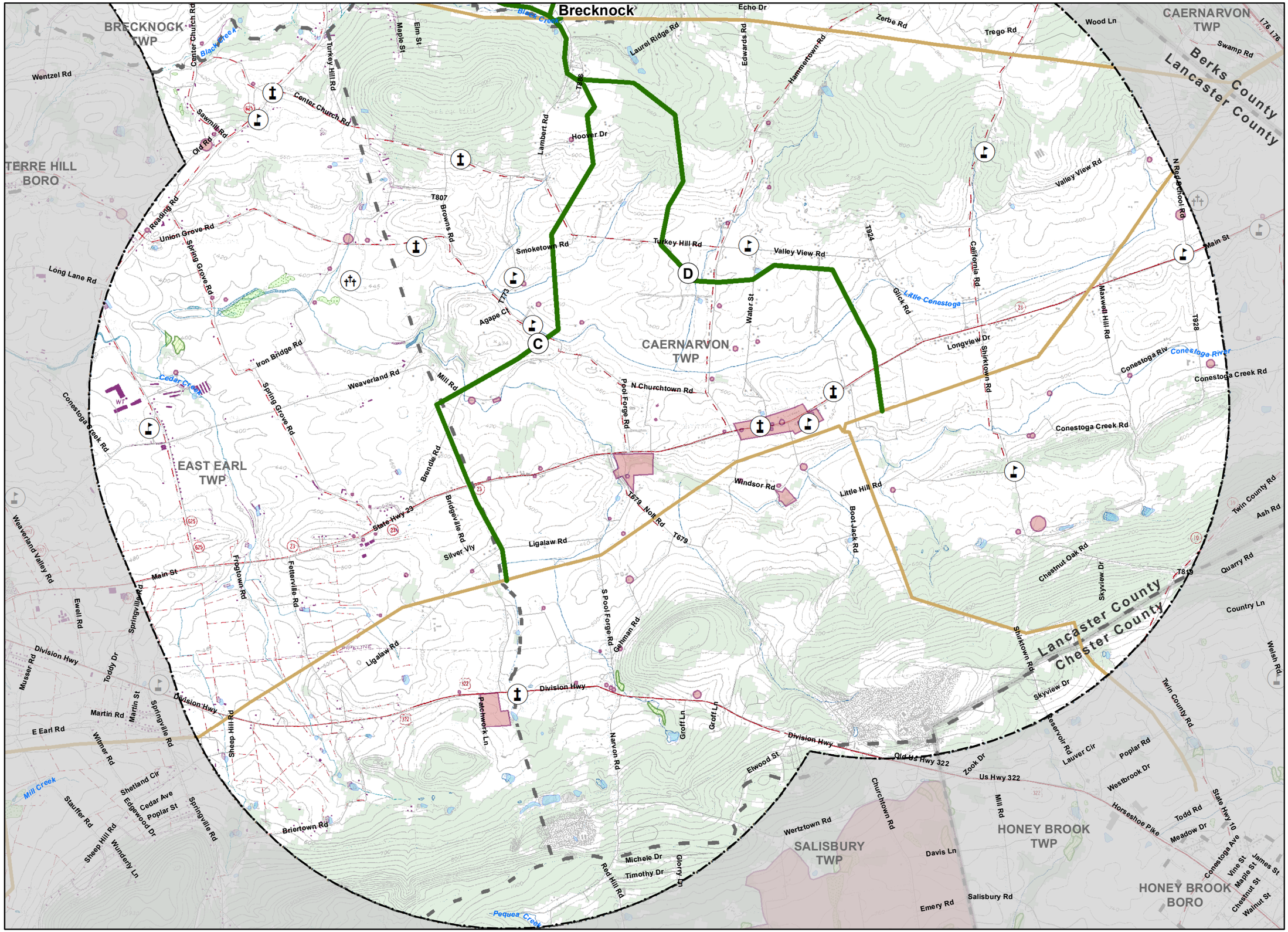


Figure 4-9B Constraints/ Topography

Legend

- Alternative Route
- Alternative Route 2 Mile Buffer
- Existing Transmission
- Substation
- Airport
- Cemetery
- Church
- School
- Historic Sites
- Local Park or Recreational Area
- Golf Course
- PA State Game Lands
- Municipality

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested
- Freshwater Forested/Shrub Wetland
- Freshwater Pond; Lake

N W E S

0 1,000 2,000 3,000 Feet

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

Table 4-3. Environmental Inventory: Built Environment				
Alternative Route	North		South	
	A	B	C	D
Municipalities Crossed (miles)				
Caernarvon Township	0.0	0.0	3.1	3.7
Brecknock Township	4.7	4.2	< 0.1	< 0.1
East Earl Township	0.0	0.0	0.7	0.0
Human Environment				
Residences within 75 feet of centerline	0	0	0	0
Residences within 100 feet of centerline	0	0	0	0
Residences within 250 feet of centerline	4	3	4	2
Residences within 500 feet of centerline	18	18	11	12
Schools within 1,000 feet of centerline	0	2	1	1
Churches within 1,000 feet of centerline	0	0	0	0
Cemeteries within 1,000 feet of centerline	0	0	0	0
Parcels within ROW	33	29	27	16
Cultural Resources				
Architectural Resources within 0.25 mile of centerline	1	3	8	2
Architectural Resources within 1 mile of centerline	11	28	44	37
Archaeological Sites within ROW	0	1	0	0
Archaeological Sites within 0.25 mile of centerline	1	2	7	6
Land Use (Length of Line in miles)[6]				
Water/wetlands	0.0	0.0	0.0	0.0
Developed (Low, Medium, High)[7]	0.4	1.1	0.3	0.2
Barren Land	0.0	0.0	0.0	0.0
Forest Cover[8]	3.2	1.0	0.4	0.9
Grassland/Pasture	0.8	1.9	1.9	1.4
Cultivated Crops	0.3	0.4	1.4	1.2
Agricultural Easement and Security Areas				
Security Areas (miles)	1.6	2.7	2.8	2.9
Easements (miles)	0.0	0.0	1.3	0.0

[6] Land Use calculations are based on the 2006 National Land Cover Database (NLCD). NLCD is a 16-class land cover classification that has been applied consistently across the conterminous United States at a spatial resolution of 30 meters. NLCD is an industry standard, but due to its large resolution it should be used as a rough approximation of land use.

[7] Developed Areas include high, medium and low density areas of residential, commercial and industrial development as well as developed open space (i.e., areas with a mixture of some constructed materials, including paved roads, but mostly vegetation in the form of lawn grasses).

[8] The forest cover calculation is based on a review of aerial imagery, not on 2006 NLCD data.

4.2.1 Land Use

All four Alternative Routes are located entirely within Lancaster County, Pennsylvania and traverse within portions of Brecknock, Caernarvon or East Earl townships. General land use within the vicinity of the Alternative Routes is shown on Figure 4-10. The Routing Team worked to develop routes that minimized impacts to residential, commercial, and developed property to the extent possible. As a result, no residences are located within the ROW for any Alternative Routes. However, it should be noted that the complete avoidance of all residential and commercial areas was not possible. As discussed in Section 3.4, public meeting attendees were asked to rank factors important to avoid when routing transmission lines. Their averaged responses were generally consistent with the established routing guidelines with existing infrastructure and rights-of-way and industrial and commercial areas identified as the least important areas to avoid and residential areas as the most important to avoid. Additional land uses (agriculture, forested land, open space and cultural resources) were ranked in between. The Routing Team has to balance impacts to all land uses when routing a new transmission line.

Impacts to agricultural land (crops and pasture/grassland) would be primarily confined to the construction phase of the Project. In cropland, access into fields may be required during the growing season, which could damage crops or temporarily take an area out of production while the line is being constructed. Landowners would be compensated for crop damage as it relates to the construction of the transmission line. In grassland or pastureland, access across land may be required and could temporarily remove some area from grazing activities, but there would be no loss of cattle or livestock during construction. In addition, soil compaction and erosion may be possible during construction. Best management practices (BMPs) would be used to mitigate impacts resulting from soil erosion or compaction.

Further, compensation would be part of the easement compensation terms and would account for any damage to crops or pasture. Specific to cropland areas, once the transmission line is constructed, farmers would have to farm around the transmission structures. These impacts are not expected in grassland or pasture areas since large cultivation equipment is not typically used and livestock could move freely under the transmission line.

Lauschtown
(Proposed)

BERKS
COUNTY

Muddy Creek

BRECKNOCK
BRECKNOCK

LANCASTER
COUNTY

BRECKNOCK
CAERNARVON

CAERNARVON
CAERNARVON

625

76

Black Creek

Brecknock

CAERNARVON
EAST EARL

Little Conestoga

Conestoga River

Churchtown

23

625

Cedar Creek

Legend

- Populated Place
- Substation
- Route
- Municipality

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

- Open Water
- Developed Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-10: Land Use

N
W E
S

0 1,000 2,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS). National Land Cover Dataset (NLCD).

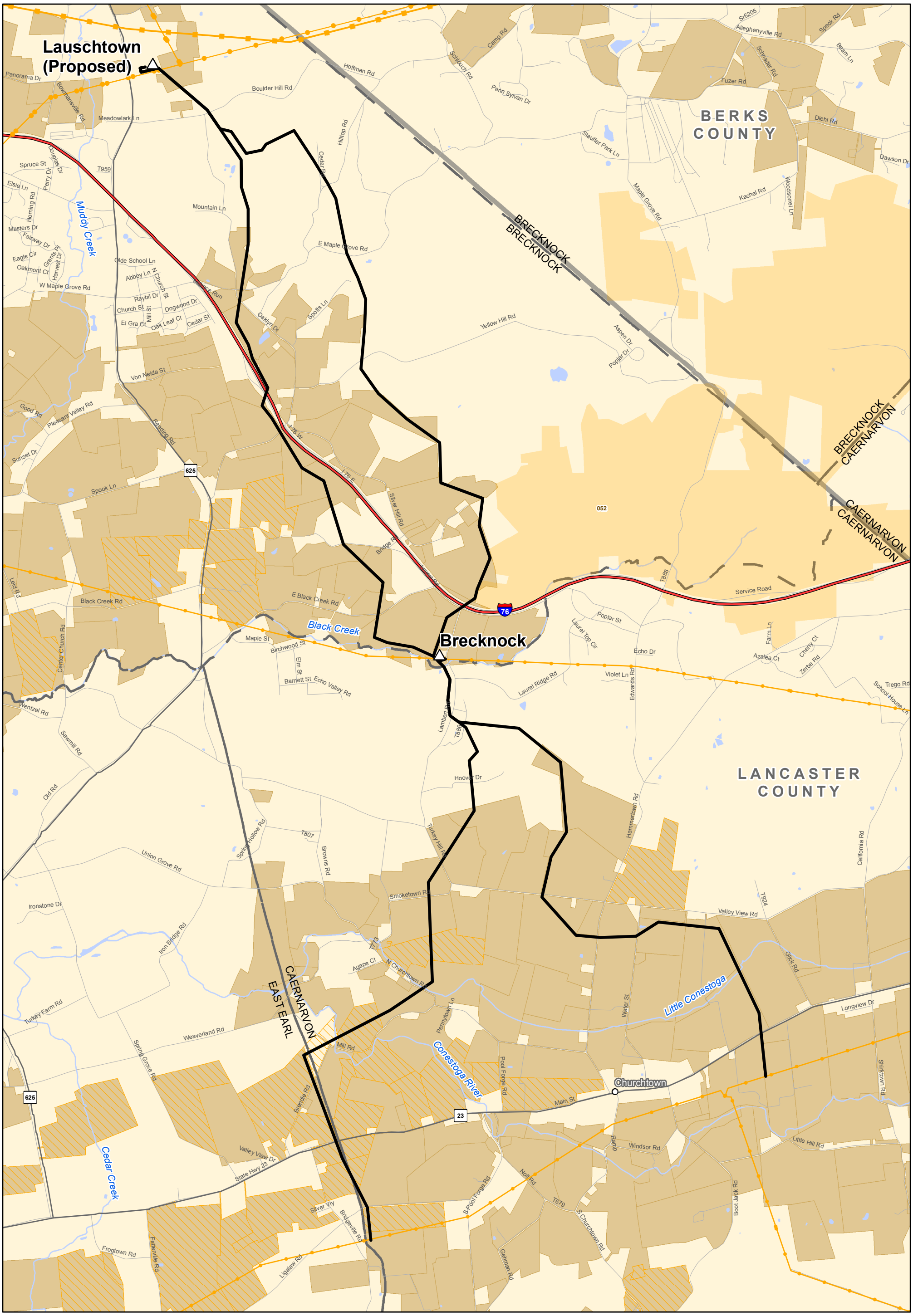
Projected Coordinate System: PA State Plane, South.
Datum: North American Datum of 1983 (NAD83).
Projection: Lambert Conformal Conic.
Linear Unit: Feet.
Ellipsoid: Geodetic Reference System 80.

As mentioned previously, the footprint of each structure location (foundations approximately 6 to 10 feet in diameter) would be permanently taken out of agricultural production and could no longer be used for grazing.

Alternative Route Comparison

Northern Alternative Routes

Both northern routes (Routes A and B) traverse Brecknock Township. Route A traverses through a primarily forested area while Route B traverses through an area dominated by agricultural uses (grassland/pasture and cultivated crops). Based on data from the National Land Cover Dataset (NLCD), developed open space and low-to high-density development represents approximately 9 percent of land crossed by Route A and 26 percent of land crossed by Route B. More than half of the developed areas consist of developed open space, which includes roadways. As described in Attachment 3, a significant portion of Brecknock Township within the Study Area is part of the agricultural security program. Because Route B crosses more farmland, Route B crosses more agricultural security areas. Neither of the northern alternatives crosses agricultural easements. Figure 4-11 identifies the location of agricultural easements and security areas located in the vicinity of the Alternative Routes. Electric transmission lines are permitted in agricultural security and/or easement areas and do not have a significant impact on the use of the property as agricultural land. PPL Electric has worked with farmers to minimize the impact of the alternative route alignments on farming practices. Paralleling the Pennsylvania Turnpike along Route B represents one such alignment that minimizes impacts to agricultural land.



Legend

- Populated Place
- Substation
- Route
- Agricultural Easements
- Agricultural Security Areas
- PA State Game Lands
- Municipality
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 11: Agricultural Security Areas and Easements

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS).

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

As shown in Table 4-3, Route B would traverse fewer parcels than Route A. No residences are located within 100 feet of either route. Route A is located within 250 feet of four residences and Route B is located within 250 feet of three residences. Both northern alternatives are located within 500 feet of 18 residences. Both northern Alternative Routes traverse within the curtilage area of one or more properties as a result of limited options to avoid small area constraints within the Study Area, or at the request of the individual property owners.

Route A traverses two non-condemnable properties, due to the presence of a dynamite storage facility that requires limited site access and the Silver Hill Quarry operation. Route B traverses three non-condemnable properties, which were developed in coordination with the property owners.

No schools are crossed by the northern Alternative Routes. The Routing Team attempted to maximize the distance from these facilities while considering other constraints.

No airports are located within a 2-mile radius of the northern Alternative Routes.

Southern Alternative Routes

The majority of the southern routes (Routes C and D) traverse Caernarvon Township; however, both traverse a small portion of Brecknock Township and Route C traverses a portion of East Earl Township. Routes C and D both traverse predominately agricultural areas. Based on the NLCD, Route C traverses within 1,000 feet of slightly more low- to high-density development areas compared to Route D. Routes C and D traverse a similar length of agricultural security areas, and both require minimal vegetation clearing. Route C also traverses just over 1 mile of agricultural easements (some of which are also in the agricultural program).

Route D would traverse fewer parcels than Route C. No residences are located within 100 feet of any of the Alternative Routes. Route C crosses within 250 feet of two additional residences compared to Route D, but Route D crosses within 500 feet of one

additional residence. Each Alternative Route traverses within the curtilage area of one or more properties as a result of limited options to avoid small area constraints within the Study Area, or at the request of the individual property owners.

Routes C and D traverse the same non-condemnable property located south of the Brecknock Substation. The crossing of the non-condemnable property was developed in coordination with the property owner.

No schools are crossed by the southern Alternative Routes. The Routing Team attempted to maximize the distance from these facilities while considering other constraints.

No airports are located within a 2-mile radius of the southern Alternative Routes. The Morgantown Airport is located approximately 4.5 miles east of Route D. Construction and operation of any of the routes are not expected to interfere with airport operations or flight plans. If necessary, however, PPL Electric will file the appropriate documentation with both the Federal Aviation Administration and the PennDOT Bureau of Aviation to ensure the proposed line will not be a hazard to the airport's flight operations.

4.2.2 Recreation

Construction could potentially negatively affect access to recreational areas by temporarily: (1) blocking access roads, trails, or other facility entrances; (2) closing roads during specific construction activities; (3) disrupting traffic; and (4) creating detours, possibly making access more difficult. Construction could also temporarily impact the rural setting and the scenic integrity of the area due to increased construction-related traffic, noise, dust, brightly colored signage, and number of people coming to the area. Large cranes and/or helicopters are typically used during the construction of the line, creating an increased temporary disturbance in both the visual, aesthetic, and peaceful nature of some areas. The Project would mitigate or reduce these impacts by entering into a road or transportation agreement with the local county government, which will take into consideration local traffic patterns and local scenic resources.

Alternative Route Comparison

Northern Alternative Routes

As described in Section 4.2.1, land use along Route B is dominated by agricultural uses while land use along Route A is dominated by forested uses. No federal, state or designated local recreation areas are crossed by the northern Alternative Routes.

Southern Alternative Routes

Both southern alternatives primarily traverse agricultural land. No federal, state or designated local recreation areas are crossed by the southern Alternative Routes. The closest recreation area, State Game Land 52, is adjacent to Route A and located primarily on the northern side of the Pennsylvania Turnpike. No impacts to recreational users of State Game Land 52 would be anticipated.

4.2.3 Cultural Resources

Transmission lines tend not to have significant indirect impacts on archaeological resources, which are usually located entirely below the ground surface. However, some sites have surface expression (e.g., foundations, walls, and cemeteries). Where practical, adverse impacts on identified sites would be mitigated by strategically locating access roads, staging areas, and structures.

Impacts on architectural historic properties would be primarily visual, created by the construction of new structures where none exist, the addition of a second transmission line next to an existing transmission line corridor (generally a lesser impact), and clearing of forested land. Impacts would vary based on local relief, height of existing vegetation, and any intervening recent development. Physical impacts on architectural historic properties would be mitigated, where practical, by strategically locating access roads, staging areas, and structures.

Reasonable efforts will be made to avoid affecting archaeological resources. Where practical, archaeological resources identified in the transmission line corridor, in the direct

path of any needed access roads, or at the locations of proposed work areas will be avoided by spanning any such resources or, if necessary, shifting tower positions, rerouting roads, and reconfiguring or relocating work areas as deemed necessary. PPL Electric will continue to consult with the PHMC throughout the planning, design, and construction process and conduct field work and surveys as necessary during the project permitting process to minimize potential impacts to cultural resources. Therefore, impacts on archaeological resources are expected to be minimal.

Alternative Route Comparison

As stated in Attachment 3, initial analysis of the Project's potential to affect cultural resources involved a review of the Pennsylvania Historical and Museum Commission (PHMC)/Bureau of Historic Preservation (BHP) Cultural Resource Geographic Information System (CRGIS) on-line inventory of cultural resources. The number of known architectural resources within 0.25 mile and 1 mile of the line, and known archaeological sites within the ROW and 0.25 mile of the line, are identified in Table 4-3. None of the previously identified historic archaeological resources have been determined to be NRHP-listed or eligible at this time. Previously identified historic architectural resources listed or eligible for inclusion in the National Register of Historic Places (NRHP) are presented in Table 4-4.

Table 4-4. NRHP Listed and Eligible Historic Architectural Resources within 1 mile of the Alternative Routes

Resource Key No.	Name	Type	Within 0.25 mile of Alternative Route(s)	Within 1 mile of Alternative Route(s)
NRHP-Listed Resources				
036772	Bowmansville Roller Mill; Von Neida Mill	District	B	A, B
001092	John B. Good House	Site	-	B
050792	Pool Forge Covered Bridge	Structure	-	C
070891	Ann Evans House	Building	-	C
070877	Bangor Episcopal Church	Building	-	D
070901	Windsor Forge Mansion; Windsor Place	District	-	D
096375	Edward Davies House	Building	-	D
NRHP-Eligible Resources				
122695	Pennsylvania Turnpike: Philadelphia [Eastern]	Structure	A, B	A, B, C, D

Table 4-4. NRHP Listed and Eligible Historic Architectural Resources within 1 mile of the Alternative Routes				
Resource Key No.	**Name**	**Type**	**Within 0.25 mile of Alternative Route(s)**	**Within 1 mile of Alternative Route(s)**
	Extension (Carlisle to Valley Forge)			
036779	Christian and Judi H. Musselman	Building	-	A, B
036776	Samuel Bowman House/Store	Building	-	B
070934	Joseph Stauffer Farm	Building	-	C
070935	George Stauffer House; 99 Breaker Lane Farm; Henry S. Martin Farm	Building	-	C
106058	Churchtown Historic District	District	-	D

Known architectural resources (i.e., historic buildings, structures, districts, and roads) in the vicinity of the Alternative Routes are shown on Figure 4-12. Known archaeological resources are not shown on the figures in this Application to protect any such sites.

Northern Alternatives

Route B is generally closer to historic resources compared to Route A, which is primarily wooded. Route B crosses a portion of the NRHP-listed Bowmansville Roller Mill/Von Neida Mill District, but the majority of this resource is located on the opposite side of the Pennsylvania Turnpike. Only a small segment of the millrace extends to the eastern side of the Turnpike; in this location Route B parallels the turnpike. Routes A and B must cross the Pennsylvania Turnpike, which is considered eligible, but is not currently listed. As shown in Table 4-3, no previously identified archaeological sites are located within 0.25 mile of Route A. Route B crosses one previously identified archaeological site, which is identified as an open prehistoric site of unknown function. The site has insufficient data available to make a determination of NRHP-eligibility. PPL will continue to consult with the PHMC-BHP regarding the nature of the identified prehistoric archaeological site.

Lauschtown (Proposed)

Brecknock

Churchtown

BERKS COUNTY

LANCASTER COUNTY

BRECKNOCK
BRECKNOCK

BRECKNOCK
CAERNARVON
CAERNARVON

CAERNARVON
EAST EARL

122695
093626
036741
036747
036769
036772
036739
036761
036762
036740
036760
036780
036759
036775
036744
036743
036725
036728
036770
036729
036727
036730
070946
070955
070945
070921
070967
070963
070896
070915
070958
070914
070961
070960
070855
070868
070957
070959
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070934
070919
070935
070832
070835
070846
070836
070898
070847
070872
070856
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070882
070903
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070887
070841
070859
070861
070867
070881
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070843
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070855
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070836
070898
070847
070872
070856
106058
070869
070866
070882
070903
070900
070901
070850
070887
070841
070859
070861
070867
070881
050792
070849
070843
070844
070848
070845
070888

Panorama Dr
Bowmansville Rd
Meadowlark Ln
Boulder Hill Rd
Hoffman Rd
Schlouch Rd
Camp Rd
Penn Sylvan Dr
Fuzer Rd
Sr6205
Alleghenyville Rd
Speck Rd
Schrader Rd
Beam Ln
Diehl Rd
Stauffer Park Ln
Dawson Dr
Kachel Rd
Woodsorrel Ln
Maple Grove Rd
Hilltop Rd
Cedar Rd
Mountain Ln
E Maple Grove Rd
Spruce St
Perry Dr
Elsie Ln
T959
Muddy Creek
Masters Dr
Fairway Dr
Horning Rd
Olde School Ln
Abbey Ln
N Church St
W Maple Grove Rd
Raybil Dr
Church St
Mill St
Dogwood Dr
El Gra Ct
Oak Leaf Ct
Cedar St
Millcreek Run
Oaklyn Dr
Spotts Ln
Yellow Hill Rd
Aspen Dr
Poplar Dr
052
Good Rd
Pleasant Valley Rd
Spook Ln
Reading Rd
625
176 W
176 E
Silver Hill Rd
Bridge Rd
Laurel Rd
T888
Service Road
76
Poplar St
Laurel Top Cir
Echo Dr
Farm Ln
Azalea Ct
Cherry Ct
Zerbe Rd
Trego Rd
School House Ln
Violet Ln
Edwards Rd
Laurel Ridge Rd
Lambert Rd
T886
Hoover Dr
Hammertown Rd
California Rd
Glick Rd
Longview Dr
Valley View Rd
T924
Smoketown Rd
Turkey Hill Rd
T807
Spring Hollow Rd
Browns Rd
Union Grove Rd
Ironstone Dr
Laid Rd
Center Church Rd
Black Creek Rd
E Black Creek Rd
Black Creek
Maple St
Birchwood St
Elm St
Barnett St
Echo Valley Rd
Wentzel Rd
Sawmill Rd
Old Rd
Iron Bridge Rd
Agape Ct
N Churchtown Rd
Pennytown Ln
Little Conestoga
Water St
Weaverland Rd
Spring Grove Rd
Mill Rd
Conestoga River
Pool Forge Rd
Brendle Rd
Main St
Shirktown Rd
23
Cedar Creek
Valley View Dr
State Hwy 23
Ramp
Little Hill Rd
Nolt Rd
S Pool Forge Rd
Silver Vly
Bridgeville Rd
T679
S Churchtown Rd
Boot Jack Rd
Frogtown Rd
Fetterville Rd
Ligalaw Rd
Gehman Rd

Legend

- Populated Place
- Substation
- Route
- Architectural Site (Resource No.)
- Municipality
- Waterbody
- Stream

Existing Transmission

- 500kV
- 230kV
- 138kV
- 69kV

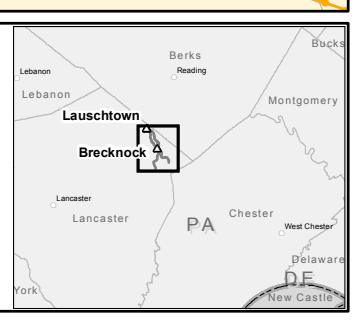
North Lancaster – Honey Brook 138/69 kV Transmission Line
Figure 4-12: Cultural Resources

N W E S

0 1,500 3,000 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), Pennsylvania Historical & Museum Commission (PHMC), United States Fish and Wildlife Service (USFWS).

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



Southern Alternatives

As shown in Table 4-4, both southern alternatives traverse a similar number of cultural resources. As identified in Table 4-3, neither of the southern routes traverses a previously identified archeological site. A similar number of sites are located within 0.25 mile of the southern alternative routes.

4.2.4 Built Environment Summary

Northern Alternative Routes

In conclusion, after analyzing and comparing the two northern Alternative Routes, neither stands out as being noticeably better or worse with respect to the built environment. Both routes have advantages and disadvantages. Routes A and B would traverse within 500 feet of almost the same number of residences. While the transmission structure footprint would be permanently impacted and property owners would be restricted from constructing buildings within the ROW, in most cases construction of the transmission line will not result in changes in land use and property owners can continue to use land within the ROW for farming, residential, recreational and other purposes.

Route A is expected to result in greater land use impacts (i.e., conversion of forested land within the 100-foot-wide ROW). Compatible vegetation, including agricultural crops, can continue to be farmed within the ROW. Route A crosses two non-condemnable properties, which increases risks to the Project. Although Route B crosses three non-condemnable properties, all three are crossed within the curtilage area at the request of the individual property owners. Route B would cross four fewer properties compared to Route A. Route B is expected to have a greater potential impact on cultural resources as it is located closer to historic areas compared to Route A, which is primarily wooded.

Southern Alternative Routes

After evaluating the two southern Alternative Routes, Route D is slightly preferred over Route C. Route D would cross eleven fewer parcels and within 250 feet of two fewer residences. Route D would avoid traversing any existing agricultural easements. Both Routes C and D would require minimal vegetation clearing, and land use impacts would

generally be similar for both Routes. Potential cultural resource impacts are also expected to be similar.

4.3 Engineering and Constructability Impacts

Constructability is a term used to discuss the feasibility of a proposed transmission line, as it relates to engineering and construction concerns. Constructability evaluates the use of existing transmission corridors, engineering challenges, and accessibility issues of a proposed route. Major factors that affect constructability include, but are not limited to, steep topography, condensed ROWs, high angles, proximity to major highways, accessibility, and cost. Additional issues to consider when evaluating constructability are: ease of moving equipment, materials, and workers to the construction sites; relative ease of ensuring public and worker safety; logistical difficulties associated with obtaining the required easements for the transmission line; and the actual amount of time and materials needed for construction, which can correlate to the total length of the corridor (i.e., longer lines require more materials and, often, a longer construction period). A comparison of the engineering and construction considerations for the four Alternative Routes is presented in Table 4-5.

Table 4-5. Environmental Inventory: Engineering and Constructability [9]

Alternate Route	North		South	
	A	B	C	D
Length (Miles)	4.7	4.2	3.9	3.8
Acres of ROW Required (100' corridor)	57.2	51.3	47.6	46.4
Parcels within ROW	33	29	27	16
Length Parallel to PA Turnpike (Miles)	0.0	0.6	0.0	0.0
Number of Angled Structures	37	25	18	18
Road Crossings				
Interstates	1	1	0	0
State Roads	0	0	1	1
Local Roads	7	6	9	6
Topography/Slope				

[9] Following the selection of Routes B and D as the Preferred Routes in November 2012, PPL Electric refined the route alignments through preliminary engineering and discussions with individual property owners. In addition, both northern routes were adjusted to begin at the new Lauschtown 69 kV yard location. The calculations in Tables 4-2, 4-3 and 4-5 reflect these changes. The calculations did not significantly change as a result of these refinements. For example, the previous route lengths were 4.6, 4.2, 3.9 and 3.8 miles respectively for Routes A, B, C and D.

Table 4-5. Environmental Inventory: Engineering and Constructability [9]				
Alternate Route	North		South	
	A	B	C	D
Slopes >20% (miles)	0.4	0.2	0.1	0.1
Slopes 10 – 20% (miles)	0.5	0.0	0.0	0.0

4.3.1 Transmission Right-of-Way

PPL Electric attempted to minimize route length and ROW acquisition. Where possible, PPL Electric considers using existing transmission ROW, paralleling existing transmission lines, or paralleling other infrastructure (i.e., roadways, railways or gas lines). However, as described in Section 3.0, few ROW sharing or parallel opportunities existed within the Study Area.

Alternative Route Comparison

Northern Alternatives

As shown in Table 4-5, the difference between the two northern alternatives is approximately 0.5 mile. Both routes would require completely new 100-foot-wide ROW. The first 0.7 mile of the routes exiting the Lauschtown Substation would use the same ROW. Due to its shorter length, Route B would require slightly fewer acres of new ROW compared to Route A. A 0.6-mile portion of Route B would parallel the Pennsylvania Turnpike, with approximately 2,200 feet of the ROW directly abutting the Turnpike and another 1,200 feet parallel to, but up to 250 feet from, the edge of the ROW. Based on consultation with the Pennsylvania Turnpike Commission (PTC), the transmission ROW must be located outside of the Turnpike ROW as this limited access highway cannot be encumbered. Although ROW overlap is prohibited, paralleling the Turnpike reduces the incremental aesthetic impacts compared to routes that do not parallel existing infrastructure.

Southern Alternatives

As shown in Table 4-7, the difference in length between the two southern alternatives is only 0.1 mile. Both routes would require completely new 100-foot-wide ROW.

Therefore, the difference in ROW acreage is negligible. The first 0.4 mile of the routes exiting Brecknock would use the same ROW.

4.3.2 Engineering Considerations

Potential engineering challenges or difficulties are important to consider when routing a transmission line. Sharp angles, excessive road and stream crossings, double-circuit structures, narrow ROW alignments, steep topography, and unnecessary length are all elements that could ultimately require extensive engineering and can lead to increases in impacts and overall cost. For example, every turn in the line requires a different, and often more expensive and generally larger, type of structure. Avoiding circuitous routes can reduce later challenges in the engineering and environmental permitting phases of the Project. PPL Electric considered and attempted to minimize engineering challenges during the conceptual design phase.

Alternative Route Comparison

Northern Alternatives

Based on preliminary engineering, Route A would be expected to require several additional angled structures compared to Route B due to the steeper terrain. As shown in Table 4-5, Route A would traverse almost 1 mile through areas of steep slopes, primarily through the Yellow Hill and Silver Hill areas, while Route B would traverse only about 0.2 mile of steep slopes. Steep slopes typically require additional grading and structure foundations compared to flatter areas. Route A in particular would likely require trenching through the steep, boulder area in the vicinity of Yellow Hill and Silver Hill in order to achieve the required ground resistance (25 ohms minimum) for counterpoise. This would involve burying a ground wire 18 to 24 inches below ground. Route A would also require more extensive access road construction through these areas compared to Route B, which is largely located in open agricultural areas that more accessible.

Both northern routes must cross the Pennsylvania Turnpike. Crossing and paralleling the Turnpike is permitted; however, the PTC prohibits longitudinal occupation of the

highway ROW. PPL Electric has discussed the Turnpike crossing with the PTC to ensure the alignment will not impact future road widening and construction access requirements. As shown in Table 4-7, the only other road crossings consist of local roads. No active railways are crossed by the northern Alternative Routes.

Southern Alternatives

Both southern routes are anticipated to require the same number of angled structures and would traverse the same amount of steep slopes. Access is expected to be similar for either route. Both routes must cross one state road, State Route 23, in order to connect to the existing tap line. As shown in Table 4-4, the only other road crossings consist of local roads. No active railways are crossed by the southern Alternative Routes.

4.3.3 Project Cost

PPL Electric evaluated the Alternative Routes from a cost perspective based on preliminary estimates from siting, real estate, engineering, procurement, and construction. It is important to note that estimated costs change throughout the process as the project moves from siting to the design, permitting and construction phases of the Project.[10] The costs discussed below represent reasonable preliminary estimates developed during the siting process to compare order of magnitude costs.

Alternative Route Comparison

Northern Alternatives

At the time PPL Electric initially evaluated the costs for each Alternative Route, the preliminary cost estimate to design and construct Route A was approximately $14.3 million and the preliminary cost estimate for Route B was approximately $10.3 million. Based on this analysis, costs for Route A would be approximately 40 percent higher than

[10] The estimated costs are order-of-magnitude estimates developed using averages of recent costs for similar projects and without an in-depth analysis of filed investigation. The estimated cost is subject to change as the constructability of the Project, sequence of construction, and other factors that may affect cost are identified and analyzed as the Project progresses. As of the date of this filling, the updated cost estimate for the Preferred Route is $18 million.

costs for Route B. The primary differences include costs associated with materials and construction followed by real estate acquisition. Material and construction costs are expected to be considerably higher for Route A as a result of the steep slopes and the anticipated amount of foundation work in rock (as opposed to soil) and the associated access road requirements through these areas. Real estate acquisition costs are expected to be higher for Route A based on the additional acreage required for the ROW and access roads.

Southern Alternatives

At the time PPL Electric initially evaluated the costs for each Alternative Route, the preliminary cost estimate for Route C was approximately $8.4 million and the preliminary cost estimate for Route D was approximately $8.3 million. Based on this analysis, the estimated costs for Routes C and D would be similar, with a difference of less than 2 percent. The primary differences include costs associated with materials and construction. Real estate acquisition costs were estimated to be less for Route D compared to Route C based on the fewer number of parcels crossed by the ROW (see Table 4-7). Both Routes C and D would require minimal vegetation clearing and, therefore,

4.3.4 Engineering and Constructability Summary

Northern Alternatives

From an engineering and constructability perspective, Route B is the preferred northern route because it is shorter, crosses fewer parcels, has fewer areas of steep slope, would require fewer angled structures, and would require significantly less vegetation clearing compared to Route A. The shorter length and less severe terrain will result in less ROW acquisition and vegetation clearing (including ongoing periodic tree trimming) and earth disturbance, thereby reducing the overall Project cost and environmental impact.

Southern Alternatives

Route D is slightly preferred over Route C as the southern alternative because Route D is slightly shorter and crosses eleven fewer parcels. Both Routes traverse predominately agricultural areas and would require only minimal vegetation clearing. Route D is expected to cost less to design and construct, but the difference is insignificant.

4.4 Selection of the Preferred Route

Based on a qualitative and quantitative review of information obtained from GIS data, existing easements, field reconnaissance, and extensive public outreach as well as engineering and financial estimates for this Project, the Routing Team selected Alternative Route B as the Preferred Northern Route and Alternative Route D as the Preferred Southern Route. The Routing Team believes that the cumulative environmental, social and financial impacts associated with constructing Alternative Routes B and D will be less than any other Alternative Route.

Alternative Route B is the shorter of the two final northern routes considered and, therefore, requires fewer acres of ROW. Alternative Route B also traverses fewer properties compared to Route A. Route B is generally located closer to previously identified cultural resources; however, the route will be adjacent to the Pennsylvania Turnpike where it crosses the only NRHP-listed resource identified within 0.25 mile. From an environmental perspective, Route B will require significantly less tree clearing and earth disturbance (1.0 miles compare to the 3.2 miles required for Route C), and therefore, will result in fewer impacts to vegetation and wildlife. Construction of Route B will result in minimal changes to land use, as agricultural and farming activities can continue within the transmission ROW. In addition, 0.6 mile of Route B will parallel the Pennsylvania Turnpike, which will minimize the overall impact in this area by paralleling an existing linear feature. Route B will also result in fewer impacts during construction and operation of the transmission line, as the route crosses fewer areas with steep slopes, is more accessible compared to Route A, and will require less vegetation maintenance during operation of the line.

Alternative Route D is slightly shorter than Route C, but crosses eleven fewer properties and crosses within 250 feet of fewer residences. Both southern alternatives would cross about the same amount of agricultural security land, but Route D avoids crossing land in the agricultural easement program. Agricultural easements are only eligible to higher quality farmland. Both Routes primarily cross agricultural land and both Routes would require only minimal vegetation clearing.

After announcing the selection of the Preferred Route in October 2012, PPL Electric initiated real estate discussions with property owners. Based on these meetings, several property owners requested route alignment modifications through their property. Where the re-alignment request did not result in impacts to other property owners, PPL Electric accommodated individual property owners' requests to the maximum extent practical. In cases where a re-alignment would impact adjacent property owners, PPL Electric considered accommodating the request if reasonable and mutually agreed upon by all affected parties. These discussions resulted in a number of minor changes to the final Preferred Route. Additional alignment changes were considered in consultation with property owners following wetland delineation of the Preferred Route in order to further minimize wetland and stream impacts. The resulting changes are reflected in all figures and calculations included in this Attachment.

A set of four 8.5 x 11 aerial photographs detailing the Preferred Route are included at the end of this Attachment. The aerial photographs show the Preferred Route centerline, proposed edge of ROW, property boundaries, property owners along the ROW with property ID numbers corresponding to each owner, and other information required under 52 Pa. Code § 57.72(c)(13)(i).

4.5 Compliance with Potential Permit and Mitigation Requirements

This section describes the subsequent investigation and agency consultation activities that have been conducted for the Preferred Route. Additional information on the anticipated permits required for this Project are identified in Attachment 7 and agency consultation letters are included in Attachment 14.

Wetlands and Waterways

Between January 2013 and December 2013, field wetland delineations were conducted along the Preferred Route and preliminary access roads using USACE approved methodologies to determine the exact location of any wetlands or waterways. PPL Electric adjusted structure locations and access roads where feasible to minimize wetland and stream impacts through spanning and avoidance. Based on preliminary engineering, no structures are located in streams or wetlands. It is possible that some access roads may require temporary crossings of wetlands and streams. If permanent or temporary impacts are unavoidable, PPL Electric will obtain and adhere to all required state and federal permits.

Federally Threatened and Endangered Species Consultation

In April, May and December 2013, PPL Electric retained a qualified bog turtle surveyor to conduct Phase I bog turtle surveys for each delineated wetland identified along the Preferred Route. Based on the results of the survey, seven wetlands located within the Project Area were identified as potential bog turtle habitat. PPL Electric submitted a formal Phase I bog turtle survey report in September 2013. In accordance with USFWS guidelines, six of these wetlands were subsequently subjected to a Phase II presence/absence analysis, which concluded that bog turtles are not present in the wetlands. The USFWS concurred with this conclusion in a letter dated February 4, 2014. PPL Electric will retain a qualified surveyor to conduct Phase II presence/absence surveys in the remaining wetland, which was identified in December 2013. Based on the results of the Phase I and II surveys for these six wetlands, no impacts to the bog turtle are anticipated. PPL Electric will submit a revised Phase II bog turtle report to the USFWS following Phase II surveys for the remaining wetland, which was delineated in December 2013 following minor route adjustments. PPL Electric will adhere to any resulting USFWS Phase II or III surveying or permitting requirements.

State Threatened and Endangered Species Consultation

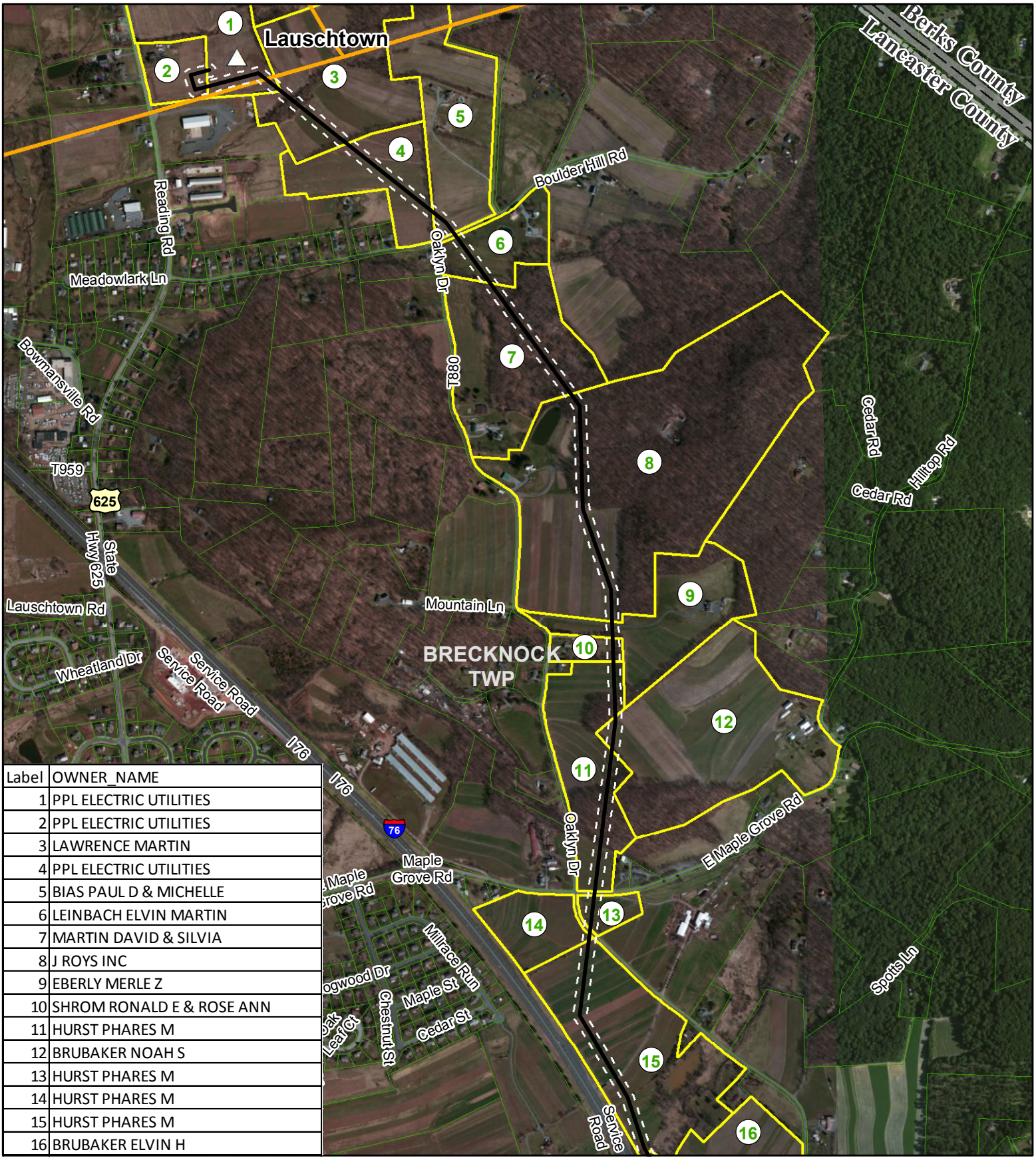
The PGC's July 2012 response indicated that the Project is located in the vicinity of a state bat species of special concern, the northern myotis. However, based on the online PNDI review[11]

[11] PNDI Search Nos. 20130502402521 and 20140206437250

conducted for the Preferred Route on May 2, 2012 and a subsequent review conducted on February 6, 2014, no impacts are anticipated from PGC. In addition, no impacts were identified by FBC or DCNR. PPL Electric will continue to consult with these state agencies if changes are made during the permitting and construction phases of the Project.

Cultural Resource Consultation

PPL Electric will continue to consult with the PHMC throughout the planning, design, and construction process and conduct field work and surveys as necessary during the project permitting process to minimize potential impacts to cultural resources.



Label	OWNER_NAME
1	PPL ELECTRIC UTILITIES
2	PPL ELECTRIC UTILITIES
3	LAWRENCE MARTIN
4	PPL ELECTRIC UTILITIES
5	BIAS PAUL D & MICHELLE
6	LEINBACH ELVIN MARTIN
7	MARTIN DAVID & SILVIA
8	J ROYS INC
9	EBERLY MERLE Z
10	SHROM RONALD E & ROSE ANN
11	HURST PHARES M
12	BRUBAKER NOAH S
13	HURST PHARES M
14	HURST PHARES M
15	HURST PHARES M
16	BRUBAKER ELVIN H

Legend

- Substation
- Route
- ROW
- Parcel within ROW
- Parcel Boundary
- Municipality Boundary
- Existing Transmission

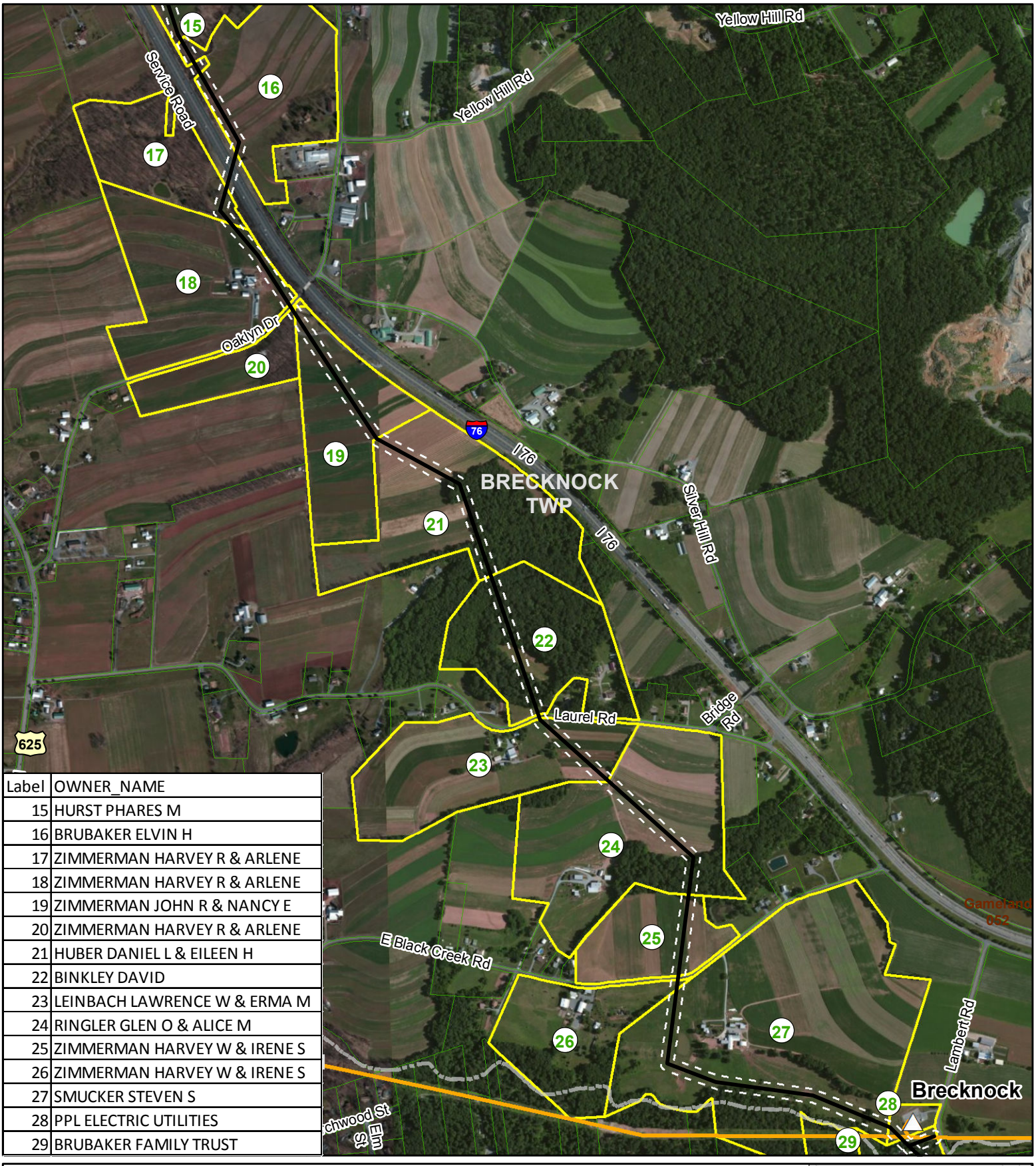
North Lancaster- Honey Brook Aerial Exhibit
Tile 1 of 4

N W E S

0 500 1,000 1,500 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Lancaster County.

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



Label	OWNER_NAME
15	HURST PHARES M
16	BRUBAKER ELVIN H
17	ZIMMERMAN HARVEY R & ARLENE
18	ZIMMERMAN HARVEY R & ARLENE
19	ZIMMERMAN JOHN R & NANCY E
20	ZIMMERMAN HARVEY R & ARLENE
21	HUBER DANIEL L & EILEEN H
22	BINKLEY DAVID
23	LEINBACH LAWRENCE W & ERMA M
24	RINGLER GLEN O & ALICE M
25	ZIMMERMAN HARVEY W & IRENE S
26	ZIMMERMAN HARVEY W & IRENE S
27	SMUCKER STEVEN S
28	PPL ELECTRIC UTILITIES
29	BRUBAKER FAMILY TRUST

Legend

- Substation
- Route
- ROW
- Parcel within ROW
- Parcel Boundary
- Municipality Boundary
- Existing Transmission

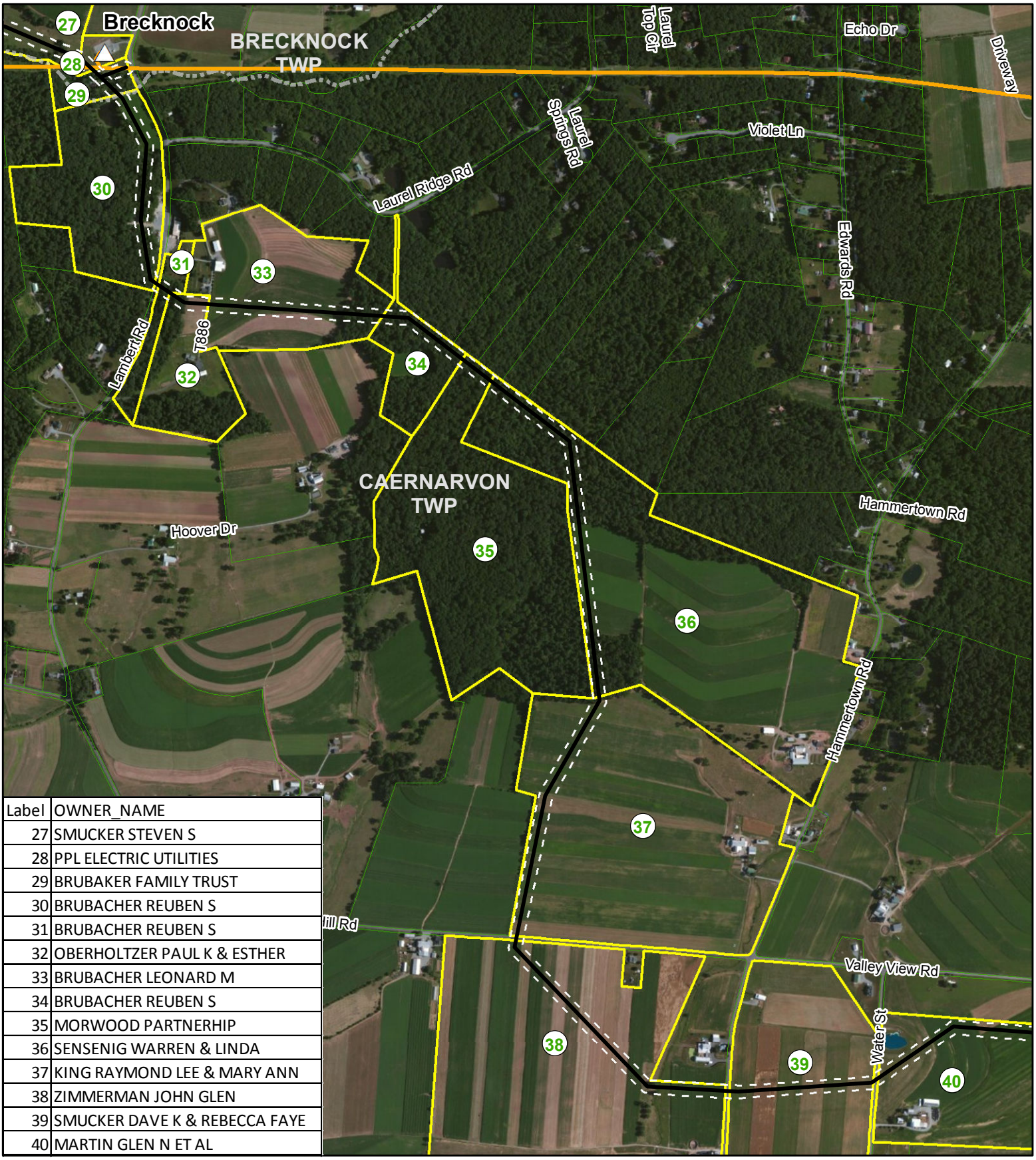
North Lancaster- Honey Brook Aerial Exhibit
Tile 2 of 4

N W E S

0 500 1,000 1,500 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Lancaster County.

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



Label	OWNER_NAME
27	SMUCKER STEVEN S
28	PPL ELECTRIC UTILITIES
29	BRUBAKER FAMILY TRUST
30	BRUBACHER REUBEN S
31	BRUBACHER REUBEN S
32	OBERHOLTZER PAUL K & ESTHER
33	BRUBACHER LEONARD M
34	BRUBACHER REUBEN S
35	MORWOOD PARTNERHIP
36	SENSENIG WARREN & LINDA
37	KING RAYMOND LEE & MARY ANN
38	ZIMMERMAN JOHN GLEN
39	SMUCKER DAVE K & REBECCA FAYE
40	MARTIN GLEN N ET AL

Legend

- Substation
- Route
- ROW
- Parcel within ROW
- Parcel Boundary
- Municipality Boundary
- Existing Transmission

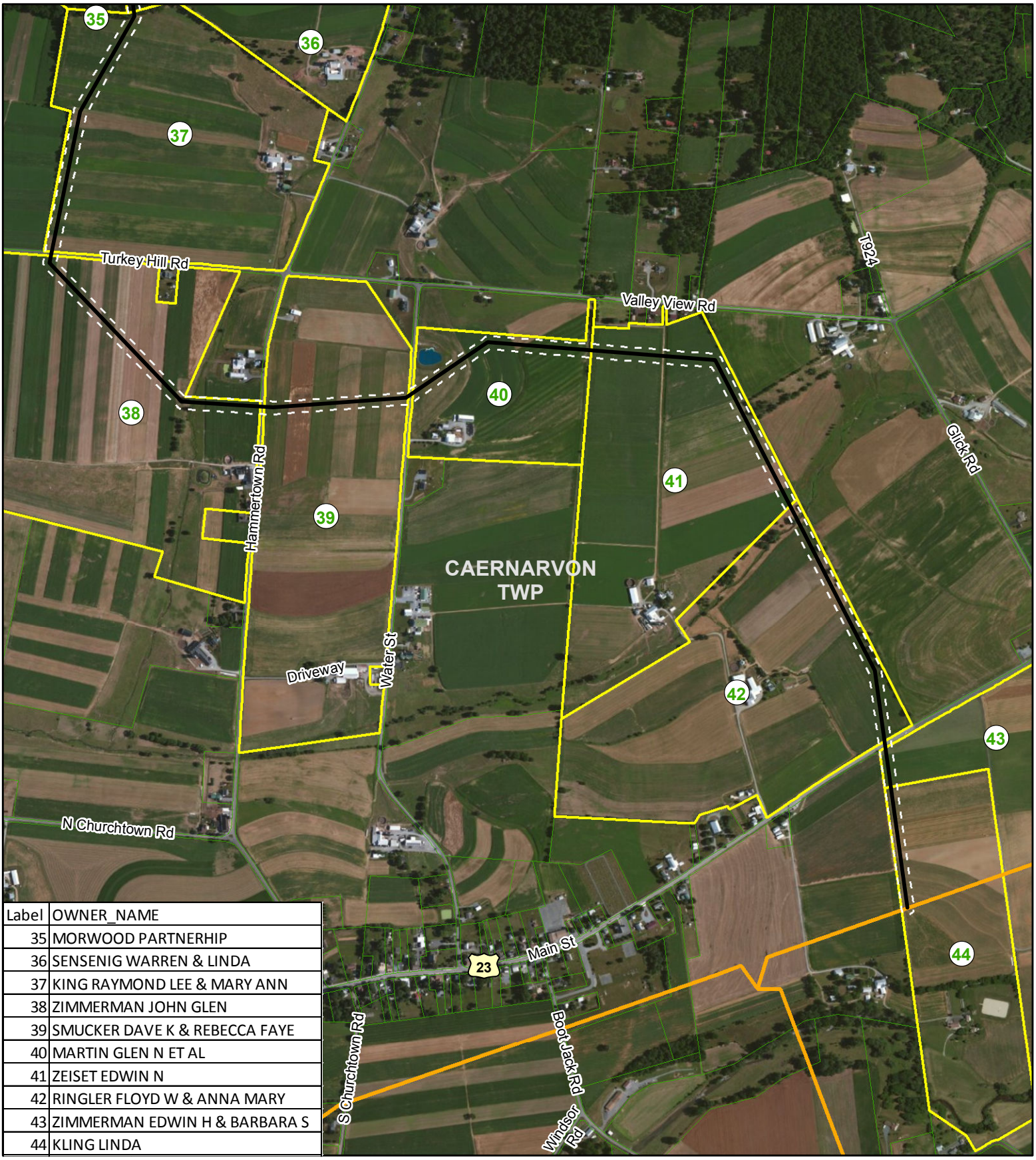
North Lancaster- Honey Brook Aerial Exhibit
Tile 3 of 4

N W E S

0 500 1,000 1,500 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Lancaster County.

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



Label	OWNER_NAME
35	MORWOOD PARTNERHIP
36	SENSENIG WARREN & LINDA
37	KING RAYMOND LEE & MARY ANN
38	ZIMMERMAN JOHN GLEN
39	SMUCKER DAVE K & REBECCA FAYE
40	MARTIN GLEN N ET AL
41	ZEISET EDWIN N
42	RINGLER FLOYD W & ANNA MARY
43	ZIMMERMAN EDWIN H & BARBARA S
44	KLING LINDA

Legend

- Substation
- Route
- ROW
- Parcel within ROW
- Parcel Boundary
- Municipality Boundary
- Existing Transmission

North Lancaster- Honey Brook Aerial Exhibit Tile 4 of 4

N W E S

0 500 1,000 1,500 Feet

Sources: Pennsylvania Spatial Data Access (PASDA), Environmental Systems Research Institute (ESRI), United States Geological Survey (USGS), United States Fish and Wildlife Service (USFWS), Lancaster County.

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

ATTACHMENT 5

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Table of Contents

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1.0 INTRODUCTION

PPL Electric Utilities Corporation (PPL Electric) proposes to construct approximately 8.0 miles of a new double-circuit 138/69 kV transmission line, the North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Lines (the North Lancaster-Honey Brook Project). The proposed North Lancaster-Honey Brook Project is required to improve reliability of service for approximately 32,000 customers in Honey Brook and Caernarvon Townships in Chester, Berks, and Lancaster Counties. The North Lancaster-Honey Brook Project will bring a new alternate source of supply closer to the growing load centers and reduce the line length and loading on the existing 138/69 kV lines serving the area. The new transmission lines also will allow for improved operating flexibility to restore customer load more quickly after a facility outage. The need for the Project is further explained in Attachment 2.

The total estimated cost to site, design, and construct the North Lancaster-Honey Brook Project is approximately $18 million.[1] Subject to the Commission's approval, construction of this Project is scheduled to begin in January 2015 to meet a required in-service date of May 2016.

2.0 PROPOSED LINE DESIGN

The proposed North Lancaster-Honey Brook Project involves the construction of approximately 8.0 miles of new double-circuit 138/69 kV transmission line. The proposed transmission line will extend approximately 4.2 miles between the Lauschtown 500-230-69 kV Substation in Brecknock Township and the Brecknock 69-12 kV Substation in Brecknock Township, and then proceed approximately 3.8 miles to the South Akron-Morgantown #2 Transmission Line located in Caernarvon Township. The preferred route for the new transmission line will generally travel in a southeasterly direction from the new Lauschtown Substation through Brecknock and Caernarvon townships in Lancaster County. The selection of the preferred route for the North Lancaster-Honey Brook Project is further explained in Attachment 4.

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

The 4.2 mile segment of the proposed transmission line extending between the Lauschtown 500-230-69 kV Substation and the Brecknock 69-12 kV Substation will be constructed as a double-circuit 138 kV transmission line that initially will operate at 69 kV until load growth in the area makes it appropriate to increase the operating voltage. The 3.8 mile segment of the proposed transmission line extending from the Brecknock 69-12 kV Substation to the South Akron-Morgantown #2 circuit line will be constructed as a double-circuit 138 kV transmission line, but initially will operate as a single-circuit 69 kV transmission line until load growth in the area makes it appropriate to increase the operating voltage and add the second circuit.

The transmission line will be installed on new single-shaft steel poles. The proposed transmission line will require the installation of approximately 74 structures ranging in height from 75 to 120 feet, with an average height of approximately 105 feet. The spans between the structures will be approximately 590 feet.

The North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Line will consist of approximately 74 self-weathering tubular steel tangent structures[2] These tangent structures will be equipped with steel arms and will be installed on concrete foundations.[3] There also will be approximately 41 angle structures, which will consist of two-pole and/or guyed steel structures. In agricultural areas, PPL Electric will avoid using guy wires to the greatest extent practical to minimize interference with existing and future farming and other agricultural operations.

The North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Line also will require the installation of four (4) direct embedded line sectionalizing switch poles. These sectionalizing switch poles will be installed where the proposed transmission line interconnects with the South Akron Morgantown #1 and South Akron Morgantown #2 (two line sectionalizing switch poles required for each interconnection).

The proposed structure types are shown in Figures 5-1 through 5-4.

[2] A tangent structure is a pole with no line angle.
[3] Some tangent structures may be direct embedded in order to reduce costs and meet engineering requirements.

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 (NESC) minimum standards. Design specifications and safety rules practiced by PPL Electric are included in Attachment 13. The proposed North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Line will consist of six power conductors and two overhead ground wires.[4] Each conductor will be 556.5 kcmil,[5] 24/7 stranding aluminum conductor steel reinforced (ACSR). The overhead ground wires will be a 48 fiber 0.752-inch diameter Optical Ground Wire (OPGW). The overhead ground wires will provide both lightning protection of the proposed line and also for telecommunication purposes.

The minimum conductor to ground clearance for the proposed 138/69 kV line will be 30 feet, which occurs at a maximum conductor temperature of 257°F (125°C). Table 5-1 and Table 5-2 identify the designed minimum conductor clearances and the conductor thermal ratings of the conductors, respectively.

[4] Initially, the 3.8 mile segment of the proposed transmission line between the Brecknock 69-12 kV Substation to the South Akron-Morgantown #2 circuit line will operate as a single-circuit until load growth in the area makes it appropriate to add the second circuit. As a result, three power conductors and one overhead grounds wire will initially be installed on this segment until the second circuit is added.

[5] A circular mil is the cross-sectional area of a wire one mil in diameter, where 1 kcmil = 0.5067 mm².

Table 5-1.Design Minimum Conductor Clearances for 556.5 kcmil 24/7 stranding acsr*	
Condition	**Double Circuit Design Clearance-to-Ground**
Normal load average weather 60°F (16°C) ambient temperature.	36.4 feet
Predicted extreme thermal load @ 257°F (125°C) conductor temperature.	30.0 feet
NESC (Rule 250C) Extreme wind load, 60°F (16°C).	33.5 feet
Extreme weather condition NESC (Rule 250D) 1 inch ice, 4 lbs. wind, 15°F (-9°C)	32.7 feet

* Clearances based on a maximum tension of 9,900 pounds at 1 inch ice, 15°F, 4 lbs. wind and a average span of 650 feet.

Table 5-2.Conductor Thermal Rating556.5 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	1,041
Winter Emergency	10	1.5	1,163

4.0 MAGNETIC FIELD MANAGEMENT PLAN

PPL Electric's Magnetic Field Management Program is summarized in Attachment 11 and is applied to new and reconstructed transmission line projects. The Company does not believe that the current scientific evidence demonstrates that magnetic fields cause any adverse health effects or pose a health or safety danger to the public. Nevertheless, PPL Electric has determined, as a matter of policy, to design its new and rebuilt transmission lines to reduce magnetic fields when that can be done at low or no cost and consistent with functional requirements. PPL Electric's Magnetic Field Management Program has been developed to implement that policy decision. In order to reduce the potential for exposure to magnetic fields, the program generally prescribes the use of a 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 and are consistent with functional requirements.

Consistent with the program, the conductors for this Project will have ground clearances that are approximately nine feet higher than the required NESC minimum ground clearance for 138/69 kV lines. As explained above, the segment of the proposed transmission line extending between the Lauschtown 500-230-69 kV Substation and Brecknock 69-12 kV Substation will be constructed as a double-circuit transmission line. PPL Electric will reverse phase this segment of the North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Line to minimize the potential for exposure to electric and magnetic fields. From the Brecknock 69-12 kV Substation to the South Akron-Morgantown #2 Transmission circuit, the proposed transmission line will operate as a single-circuit transmission line until load growth in the area makes it appropriate to add the second circuit. Since this segment of the proposed transmission line initially will operate as a single-circuit, reverse phasing is not feasible at this time. Where it is feasible to do so at low or no cost, PPL Electric will select a phasing arrangement for this segment of the proposed transmission line that lowers the magnetic field. In the future, when a second circuit is added, PPL Electric will select the best circuit/phase arrangement to reduce the potential exposure to electric magnetic fields where it is feasible to do so at low or no cost.

5.0 RIGHT-OF-WAY REQUIREMENTS

PPL Electric's current standard ROW width for a double-circuit 138/69 kV transmission line is 100 feet. The ROW width 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 ROW 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 the proposed ROW.

Status of Right-of-Way Negotiations

Along the route selected for the proposed North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Line, there are a total of 42 deed properties that are owned by a total of 33 property owners. At the time of this filing, formal easement and right-of-way agreements have been executed by 30 of the 33 property owners. Although negotiations continue with the remaining three property owners, PPL Electric is separately filing for approval of the condemnation of rights-of-way and easements across a certain portion of the lands owned by these three property owners pursuant to Section 1511(c) of the Business Corporation Law of 1988, 15 Pa.C.S. § 1511(c).

6.0 CONSTRUCTION TECHNIQUES AND EXECUTION FOR TYPICAL SINGLE POLE 138 KV TRANSMISSION STRUCTURES

The following is a summary, non-technical explanation of the typical construction activity that is associated with new transmission line construction for single poles, which are either directly embedded into the ground or installed on a concrete foundation. This is not to be misconstrued as all-encompassing and may vary based on specific site/service conditions at each project. Actual construction steps may not necessarily occur in this particular order:

- The project manager will review the construction plans with PPL Electric personnel that will be constructing the line, including all permits and conditions that apply (such as erosion and sediment control, wetland encroachments, and storm water management), as well as any agreements made with specific property owners for work done on their lands.
- Professional land surveyors will stake the locations of all poles to be constructed, as well as the edge of ROWs and locate any wetland or streams previously sited during field work.

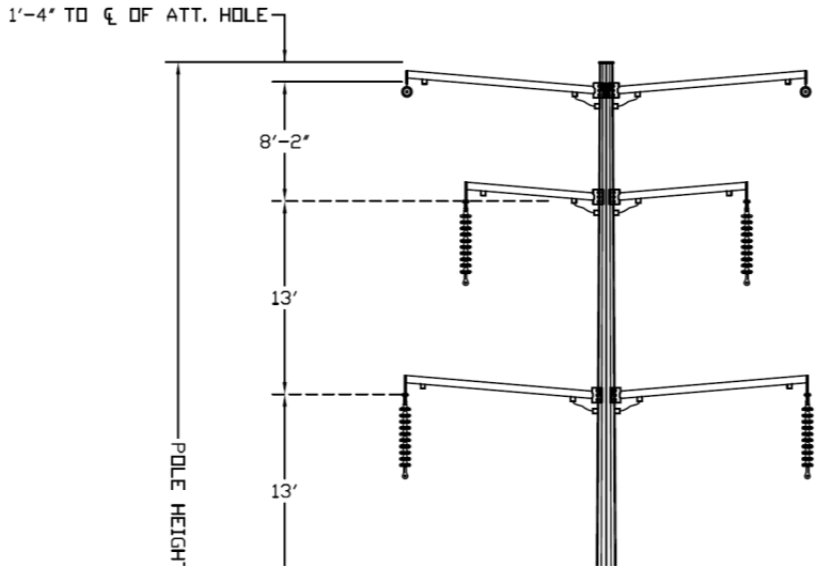
- All wetlands/waters are delineated in the field, located by land surveyors, and specifically shown to the construction manager prior to work commencing.
- During the installation of access roads, poles, and hanging of the wire, approved "best management practices" are implemented to assure that the soil will be stabilized and not erode during storm events while the Project is under construction. Any temporary wetland encroachments (usually roads) will be removed according to the permit conditions. Whenever practical, PPL Electric will utilize timber matting in wetland areas to minimize disturbance to the wetland vegetation and topography.
- Construction roads will be constructed, approximately 14 to 16 feet in width, with a stone surface to support the equipment that will be transporting materials to the pole sites. Those vehicles are usually cranes, concrete trucks (if foundations are involved), boom trucks, and pickups. The roads will be built as provided for in the construction drawings as per the erosion and sediment control plan, the NPDES permit plan, and/or the wetland encroachment permit plan. The plan may require these roads to be temporary in nature, returning to vegetative cover when the work is complete. Landowners may wish to have the roads remain intact for shared use between PPL Electric for line inspection and maintenance and property owner use. Much of the routine maintenance to the line, once built, will be by helicopter or 4 wheel drive pickup truck.
- The direct embedded poles will be installed by the use of auger and then a crane. After the hole is drilled, usually 4 to 6 feet in diameter, the bottom section of pole is placed directly into the hole and backfilled with a coarse aggregate or engineered material, and then the remaining sections are installed along with any cross arms. A pole that is at an angle in the line, or for another specialized reason, may be required to have a concrete foundation. These foundations are seldom more than 12 feet in diameter and are filled with reinforced concrete. The top of the foundation may extend an average of 1 foot above the ground.
- Once the poles are in place along the line route, the wires will be installed using utility trucks to attach the wires to each pole and equipment and manpower will be used to pull the wires along from pole to pole. Helicopter stringing/pulling may be utilized in restricted access or environmental sensitive areas.

- The project manager will oversee the stabilization of the site including the successful establishment of vegetation on all previously disturbed areas during construction.

Typical examples of the proposed structures are depicted in Figures 5-1 through 5-4.

FIGURE 5-1

Double-Circuit 138/69 kV Tangent Structure. New tangent structure will have two arms at the top of the pole to support two overhead wires.



POLE STATISTICS

Height Range: 90-120 feet
Arm Length (Middle): 13 feet
Arm Length (Top & Bottom): 9 feet
Conductor Spacing: 13 feet
Overhead Ground Wire to Top Phase: 13 feet
Phase to Phase: 13

FIGURE 5-2

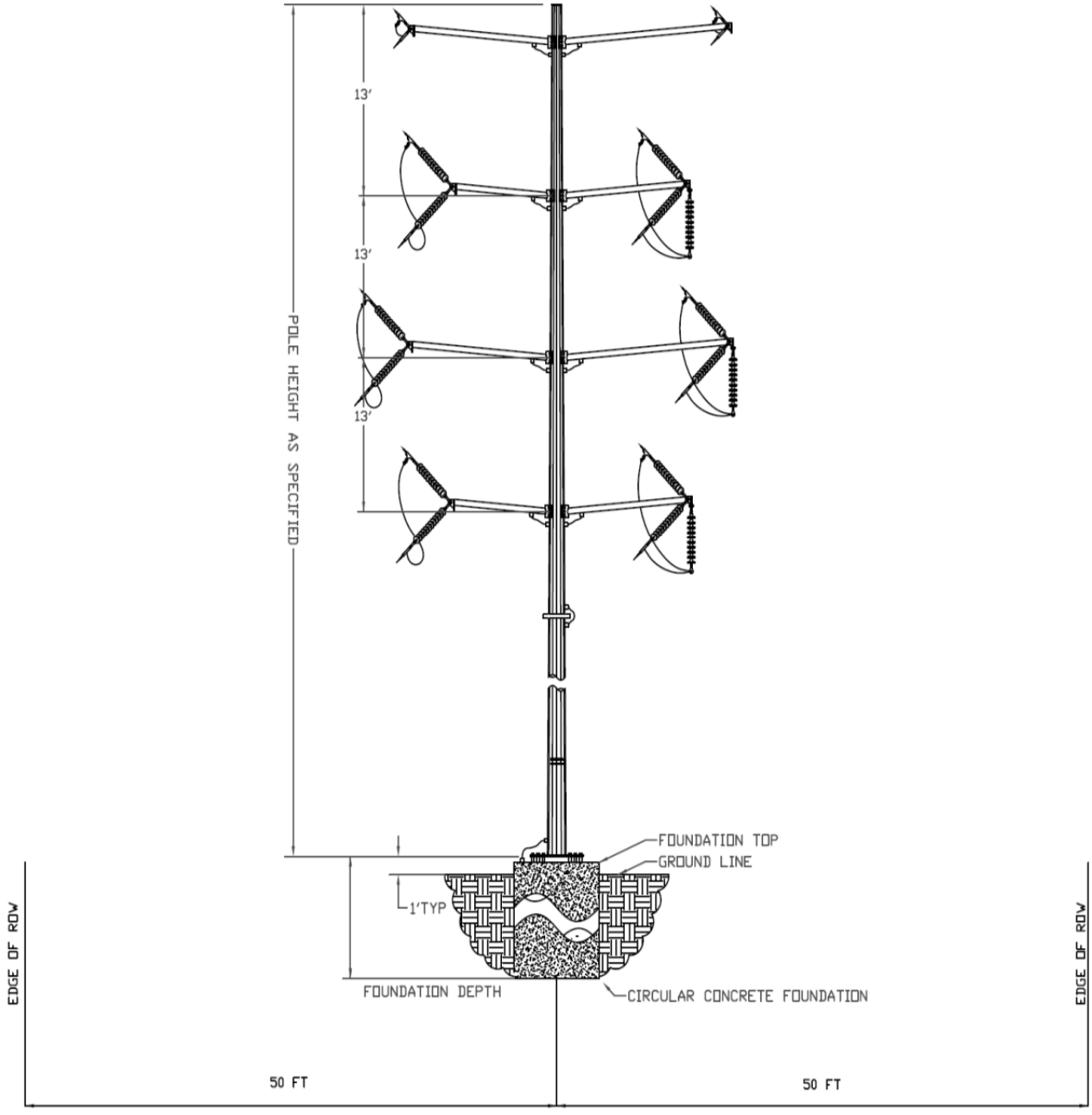
Double-Circuit 138/69 kV Two-Pole Angle Structure

POLE STATISTICS

Height Range: 90 - 110 feet
Arm Length:

Conductor Spacing: 13 feet
Overhead Ground Wire to Top Phase: 13 feet
Phase to Phase: 13 feet

FIGURE 5-3
Double-Circuit 138/69 kV Cross Section – This figure shows a typical tension angle structure on a concrete foundation. Also depicted is our typical right of way width of 100'.



POLE STATISTICS

Height Range: 100 - 115 feet
Arm Length:

Conductor Spacing: 13 feet
Overhead Ground Wire to Top Phase: 13 feet
Phase to Phase: 13 feet

FIGURE 5-4
Single-Circuit 138/69 kV Cross Section – This figure shows a typical direct embedded switch structures.

Height Range: 90-100 feet
Arm Length:

Conductor Spacing: 9 feet
wOverhead Ground Wire to Top Phase: 10 feet
Phase to Phase: 9 feet

ATTACHMENT 6

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ATTACHMENT 6
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
LIST OF OWNERS OF PROPERTY WITHIN THE RIGHT-OF-WAY

Property Owner/Address	Parcel Number
PPL Electric Utilities C/O PPL Re Tax 2 N Ninth Street (GENTW2) Allentown, PA 18101	1
PPL Electric Utilities C/O PPL Re Tax 2 N Ninth Street (GENTW2) Allentown, PA 18101	2
Martin Lawrence 1400 Reading Rd Mohnton, PA 19540	3
PPL Electric Utilities C/O PPL Re Tax 2 N Ninth Street (GENTW2) Allentown, PA 18101	4
Paul D. & Michelle Bias 215 Boulder Hill Road Mohnton, PA 19540	5
Elvin Martin Leinbach and Susanne Hoover Leinbach 218 Boulder Hill Road Mohnton, PA 19540	6
David and Sylvia Martin 1394 Oaklyn Drive Mohnton, PA 19540	7
J Roys Inc. P.O. Box 125 Bowmansville, PA 17507 Or J Roys Inc. 935 Stone Hill Road, Denver, PA 19517	8
Merle Z. and Sharon Eberly 1328 Oaklyn Drive Narvon, PA 17555	9

Property Owner/Address	Parcel Number
Ronald E. & Rose Ann Shrom P.O. Box 100 Bowmansville, PA 17507	10
Phares M. and Marion M. Hurst 290 E Maple Grove Road Narvon, PA 17555	11
Noah S. and Martha W. Brubaker 1311 Hilltop Road Narvon, PA 17555	12
Phares M. and Marion M. Hurst 290 E Maple Grove Road Narvon, PA 17555	13
Phares M. and Marion M. Hurst 290 E Maple Grove Road Narvon, PA 17555	14
Phares M. and Marion M. Hurst 290 East Maple Grove Road Narvon, PA 17555	15
Elvin H. and Roseanne N. Brubaker 1917 Birchwood Street East Earl, PA 17519	16
Harvey R. & Arlene Zimmerman 1081 Oaklyn Drive Narvon, PA 17555	17
Harvey R. & Arlene Zimmerman 1081 Oaklyn Drive Narvon, PA 17555	18
John R. & Nancy E. Zimmerman 1087 Silver Hill Road Narvon, PA 17555	19
Harvey R. & Arlene Zimmerman 1081 Oaklyn Drive Narvon, PA 17555	20
Daniel L. & Eileen H. Huber 1050 Silver Hill Road Narvon, PA 17555	21

Property Owner/Address	Parcel Number
Norman Zimmerman 884 Center Church Road East Earl, PA 17519	22
Lawrence W. & Erma M. Leinbach 258 Laurel Road East Earl, PA 17519	23
Glen O. & Alice M. Ringler 279 E Black Creek Road East Earl, PA 17519	24
Harvey W. & Irene S. Zimmerman 211 E Black Creek Road East Earl, PA 17519	25
Harvey W. & Irene S. Zimmerman 211 E Black Creek Road East Earl, PA 17519	26
Steven S. and Amanda K. Smucker 342 E Black Creek Road East Earl, PA 17519	27
PPL Electric Utilities C/O PPL Re Tax 2 N Ninth Street (GENTW2) Allentown, PA 18101	28
Brubaker Family Trust C/O Irvin Z. Brubaker 834 Lambert Road Narvon, PA 17555	29
Reuben S. and Mabel W. Brubacher 592 Lambert Road Narvon, PA 17555	30
Reuben S. and Mabel W. Brubacher 592 Lambert Road Narvon, PA 17555	31
Paul K. & Esther Oberholtzer 540 Lambert Road Narvon, PA 17555	32

Property Owner/Address	Parcel Number
Leonard M. and Mary Ann. Brubacher 582 Lambert Road Narvon, PA 17555	33
Reuben S. and Mabel W. Brubacher 592 Lambert Road Narvon, PA 17555	34
Morwood Partnership 433 S Kinzer Avenue Apt 363 New Holland, PA 17557	35
Warren & Linda Sensenig 355 Hammertown Road Narvon, PA 17555	36
Raymond Lee & Mary Ann King 319 Hammertown Rd Narvon, PA 17555	37
John Glen and Kathy M. Zimmerman 229 Hammertown Road Narvon, PA 17555	38
Dave K. & Rebecca Faye Smucker 167 Water Street Narvon, PA 17555	39
Glen N. Martin et al 222 Water Street Narvon, PA 17555	40
Edwin N. and Louella M. Zeiset 2223 Main Street Narvon, PA 17555	41
Floyd W. & Anna Mary Ringler 2221 Main Street Narvon, PA 17555	42
Edwin H. & Barbara S Zimmerman 2300 Main Street Narvon, PA 17555	43
Linda Kling 2226 Main Street Narvon, PA 17555	44

ATTACHMENT 7

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ATTACHMENT 7
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
AGENCY PERMIT REQUIREMENTS

Agency	Permits, Approvals, or Documentation	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
Local Agencies				
County Conservation Districts (CCDs) • Lancaster	Erosion & Sedimentation Control (E&SC) and Post-Construction Stormwater Management Plan (PCSM) sets approvals (coordinated through the PADEP)	CCD Approval anticipated by 12/29/14	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 Conservation & Natural Resources (DCNR) – Bureau of Forestry (plants)	State rare threatened & endangered species (T&E) consultation and approvals	Online PNDI review conducted on 2/6/14; DCNR clearance received for entire project extents	DCNR clearance received for entire project extents	Determination of potential impact to state listed and candidate threatened and endangered species and habitat if present and impacted
PA Fish & Boat Commission (PFBC) (fish, reptiles, amphibians)	State rare, threatened and endangered species consultation and approvals	Online PNDI review conducted on 2/6/14; PFBC clearance received for entire project extents	PFBC clearance received for entire project extents	Determination of potential impact to state listed and candidate threatened and endangered species and habitat if present and impacted
PA Game Commission (PGC) (birds and mammals)	State rare, threatened and endangered species consultation and approvals; tree clearing conservation measure recommended for state species of concern, northern myotis (bat)	Online PNDI review conducted on 2/6/14; PGC clearance received for entire project extents	PNDI run on 2/6/14; PGC clearance received for entire project extents; Suggested seasonal construction restriction for the northern myotis.	Determination of potential impact to state listed and candidate threatened and endangered species and habitat if present and impacted.
PA Department of Environmental Protection (PADEP)	Waters/wetland obstruction and encroachment permits or waivers (Chapter 105) • §105.12(a)(3) waivers for clear span aerial crossings of wetland and streams	Approval anticipated by 1/5/15	Not yet submitted	• Activities in watercourses, floodways, bodies of water (incl. wetlands) (25 Pa. Code §105)

Agency	Permits, Approvals, or Documentation	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
	using monopole structures on either side; • §105.12(a)(3) waivers for monopole structure placement in wetlands; • General Permit-8 for construction of temporary access roads in streams (such as new culvert placement); • General Permit-7 for construction of minor road crossings Approval of Coverage Under National Pollutant Discharge Elimination System (NPDES) Permit for Stormwater Discharges Associated with Construction Activities (Chapter 102) (Individual NPDES due to HQ watershed)			• 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)
PA Historical and Museum Commission (PHMC)	Consultation, cultural resources (archaeology and historic structures) investigations and associated approvals as part of federal and state permits; compliance with Section 106 of National Historic Preservation Act; Federal and state listed or eligible cultural resource consultation and approvals; PHMC recommended a historic architectural survey and Phase I archeological surveys.	PHMC clearance anticipated by 11/3/14	PHMC consultation on-going for historic architecture and archeological surveys	Historic and cultural resources listed or eligible for listing on the State and/or Federal National Register of Historic Places
PA Department of Transportation (PennDOT)	State Route 23 highway occupancy permit	PennDOT permits anticipated by 11/10/14	Not yet submitted	Road crossings by utilities
PA Turnpike Commission	I-76 occupancy permit	PA Turnpike permits anticipated by 12/1/14	Not yet submitted	
PA Public Utility Commission (PUC)	Application for permission to site and construct transmission line	PUC approval anticipated by Spring 2015	To be submitted February 2014	Construction of new transmission line

Agency	Permits, Approvals, or Documentation	Anticipated Approval Date	Status of Permit or Approval	Regulated Activity
Federal Agencies				
U.S. Army Corps of Engineers (USACE) – Baltimore District	Clean Water Act Section 404/401 permits for regulated waters/wetlands encroachments (State Programmatic General Permits [PASPGP-4] from PADEP and USACE) Bog turtle screening required in Lancaster County.	USACE permits anticipated by 1/5/15	Not yet submitted	Discharge of dredged or fill material into waters of the US
Federal Aviation Administration (FAA)	FAA notice of proposed construction or alternation, 14 CFR Part 77 compliance (FAA Form 7460-1), if necessary	FAA approval anticipated by 10/3/14	Not yet submitted	Notify FAA of transmission towers greater than 200 feet or within 20,000 feet of airport
U.S. Fish & Wildlife Service (USFWS)	Consultation ongoing – Federal threatened & endangered species reporting and compliance with Section 7 of Endangered Species Act for federal permits; Phase I bog turtle habitat surveys; Phase II bog turtle surveys required in some areas;	USFWS clearance anticipated by 6/23/14	Initial PNDI response received requesting Phase I bog turtle surveys; Phase I surveys complete in May 2013, April 2013 and December 2013; Most Phase II surveys conducted in April, May and June 2013, additional Phase II surveys scheduled for Spring 2014	Determination of potential impact to Federal listed and candidate threatened and endangered species and habitat if present and impacted

ATTACHMENT 8

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ATTACHMENT 8
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
LIST OF GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES RECEIVING THE APPLICATION

Copy Recipients

State Agencies

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

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

The Honorable Barry J. Schoch, PE
Secretary, Pennsylvania Department of Transportation
Commonwealth Keystone Building
400 North Street, 8th Floor
Harrisburg, PA 17120
Attn: William J. Cressler, Chief Counsel

Bureau of Investigation and Enforcement
Pennsylvania Public Utility Commission
P.O. Box 3265
Commonwealth Keystone Building
400 North Street
Harrisburg, PA 17105-3265

Office of Consumer Advocate
555 Walnut Street
5th Floor, Forum Place
Harrisburg, PA 17101-1925

Office of Small Business Advocate
Commerce Building
300 North Street, Suite 1102
Harrisburg, PA 17101

Counties

Lancaster County

Lancaster County Board of Commissioners
Lancaster County Government Center
150 North Queen Street
7th Floor, Suite 715
Lancaster, PA 17603
Attn: Scott Martin, Chairman

Lancaster County Planning Commission
150 North Queen Street
Suite 320
Lancaster, PA 17603
Attn: James Cowhey, AICP, Executive Director

Municipalities

Lancaster County

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

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

Caernarvon Township Board of Supervisors
2112 Main Street
Narvon, PA 17555
Attn: Gary Van Dyke, Chairman

Caernarvon Township Planning Commission
2147 Main Street
Narvon, PA 17555
Attn: Frank Diem, Chairman

East Earl Township Board of Supervisors
4610 Division Highway
East Earl, PA 17519
Attn: David Zimmerman, Chairman

East Earl Township Planning Commission
4610 Division Highway
East Earl, PA 17519
Attn: Adam Zimmerman, Chairman

Public Utilities

Metropolitan Edison Company
Attn. Mr. Donald Brennan, President
2800 Pottsville Pike
P.O. Box 16001
Reading, PA 19612-6001

Federal Agencies

U.S. Army Corps of Engineers
Baltimore District
State College Field Office
1631 South Atherton Street, Suite 102
State College, PA 16801
Attn: Amy Elliott

US Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, PA 16801-4850
Attn: Bonnie Dershem

State Agencies

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

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
Attn: Olivia Mowery

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823-9620
Attn: Christopher A. Urban

County Agencies

Lancaster County Conservation District
1383 Arcadia Road, Room 200
Lancaster, PA 17601
Attn: Rebecca Buchanan – E&S Project
Manager

Elected Officials

Pennsylvania State Senate

Senator Mike Brubaker
36th District
301 East Main Street
Lititz, PA 17543

Pennsylvania House of Representatives

Hon. Gordon Denlinger
99th District
607 East Main Street
Ephrata, PA 17522

Property Owners

See list in Attachment 6

ATTACHMENT 9

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ATTACHMENT 9
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
LIST OF GOVERNMENTAL AGENCIES, MUNICIPALITIES AND OTHER PUBLIC ENTITIES CONTACTED

Federal Agencies

US Fish and Wildlife Service
315 South Allen Street, Suite 322
State College, PA 16801-4850
USFWS Project # 2012-0789
Contact: Clinton Riley

State Agencies

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

Pennsylvania Game Commission
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
Contact: Olivia Mowery

Pennsylvania Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823-9620
Contact: Christopher A. Urban

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

PA Department of Environmental Protection – Lancaster District Office
1661 Old Philadelphia Pike
Lancaster, PA 17602
Contact: Lynn Scheetz, Manager

County/Municipal Agencies

Lancaster County Board of Commissioners
Lancaster County Government Center
150 North Queen Street, 7th Floor, Suite 715
Lancaster, PA 17603
Contact: Scott Martin – Chairman

Lancaster County Planning Commission
150 North Queen Street, Suite 320
Lancaster, PA 17603
Contact: James Cowhey, AICP – Executive Director

Lancaster County Conservation District
1383 Arcadia Road, Room 200
Lancaster, PA 17601
Contact: Rebecca Buchanan – E&S Project Manager

Elected Officials

In early 2012, PPL contacted the following local, State and Federal officials about the project through phone calls, letters and in-person meetings:

<u>Federal Representatives</u>

<u>U.S. House of Representatives</u>

U.S. Representative Joseph Pitts
150 N. Queen St. Suite 716
Lancaster, PA 17603

<u>U.S. Senate</u>

U.S. Senator Robert Casey, Jr.
Harrisburg Office
22 S. Third Street, Suite 6A
Harrisburg, PA 17101

U.S. Senator Pat Toomey
Harrisburg Office
United States Federal Building
228 Walnut St.
Suite 1104
Harrisburg, PA 17101

State Representatives

Pennsylvania House of Representatives

State Representative Gordon Denlinger
99th District
390 East Main Street
Suite 301
Ephrata, PA 17522

Pennsylvania Senate

Senator Mike Brubaker
36th District
301 East Main Street
Lititz, PA 17543

Municipal Officials

Lancaster County

Gary Van Dyke, Chairman
Caernarvon Township Board of Supervisors
2112 Main Street
Narvon, PA 17555

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

Frank Diem, Chairman
Caernarvon Township Planning Commission
2147 Main Street
Narvon, PA 17555

Matt Knepper, Director
Lancaster County Agricultural Preserve Board
150 N. Queen Street, Suite 325
Lancaster, PA 17603

Thomas Baldridge, President
Lancaster Chamber of Commerce & Industries
100 South Queen Street
Lancaster, PA 17603

OTHER ENTITIES

Lancaster County

Ralph Goodno, President and CEO
Lancaster County Conservancy
117 South West End Avenue
P.O. Box 716
Lancaster, PA 17608

Matthew W. Kofroth, Watershed Specialist
Lancaster County Conservation District's
Watershed Program
1383 Arcadia Road, Rm. 200
Lancaster, PA 17601

Karen Martynick, Executive Director
Lancaster Farmland Trust
125 Lancaster Avenue
Strasburg, PA 17579

Additional Contacts

Additionally, PPL Electric Utilities held a constituent meeting at the Leola Inn located at 38 Deborah Drive in Leola, Lancaster, Pennsylvania on April 2, 2012 to inform officials about the project.

State Elected Officials in Attendance

- Jeremy Kiehl on behalf of PA Representative Gordon Denlinger's Office (99th District)
- Jenn Frees on behalf of PA Senator Michael Brubaker's Office (36th District)
- Nicholas Cammauf and John Bortle on behalf of U.S. Representative Joseph Pitts Office (16th District)

County/Municipal Officials in Attendance

- Lancaster County Board of Supervisors
- Kyle Guie on behalf of Karen Martynick, Executive Director, Lancaster County Farmland Trust
- Kathy Norris, Secretary, Caernarvon Township (Lancaster County)
- Mark Hiester, Manager, East Cocalico Township
- Carol Martin, Secretary, Brecknock Township
- David Sarley, Board of Supervisors Chairman, Penn Township

ATTACHMENT 10

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ATTACHMENT 10
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
LIST OF LOCATIONS APPLICATION CAN BE VIEWED BY THE PUBLIC

Caernarvon Township
2147 Main Street
Narvon, Lancaster County, PA 17555

Brecknock Township
1026 Dry Tavern Rd
Denver, Lancaster County, PA 17517

East Earl Township
4610 Division Highway
East Earl, PA 17519

ATTACHMENT 11

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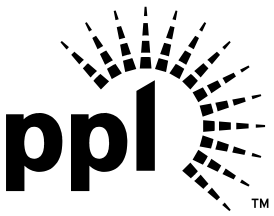
ATTACHMENT 11
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
PPL ELECTRIC MAGNETIC FIELD MANAGEMENT PROGRAM



MAGNETIC FIELD MANAGEMENT

PPL Electric Utilities Corporation

DECEMBER 2004

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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

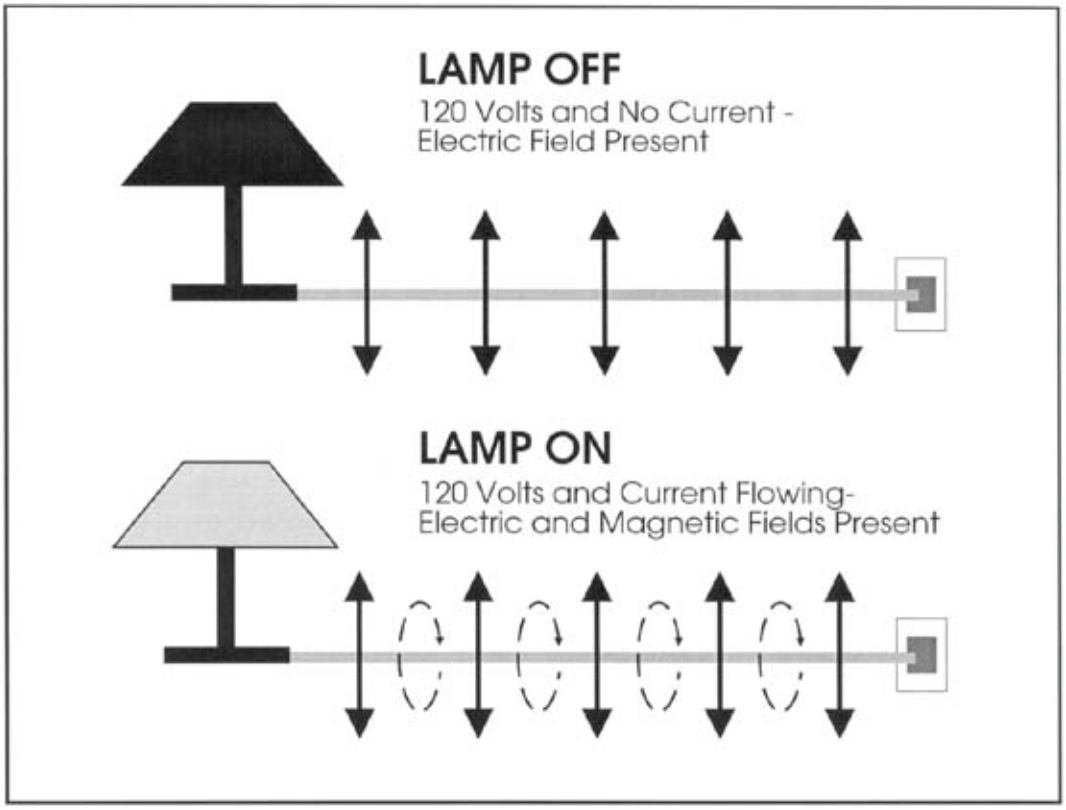

LAMP OFF
120 Volts and No Current -
Electric Field Present
LAMP ON
120 Volts and Current Flowing-
Electric and Magnetic Fields Present

Figure 2

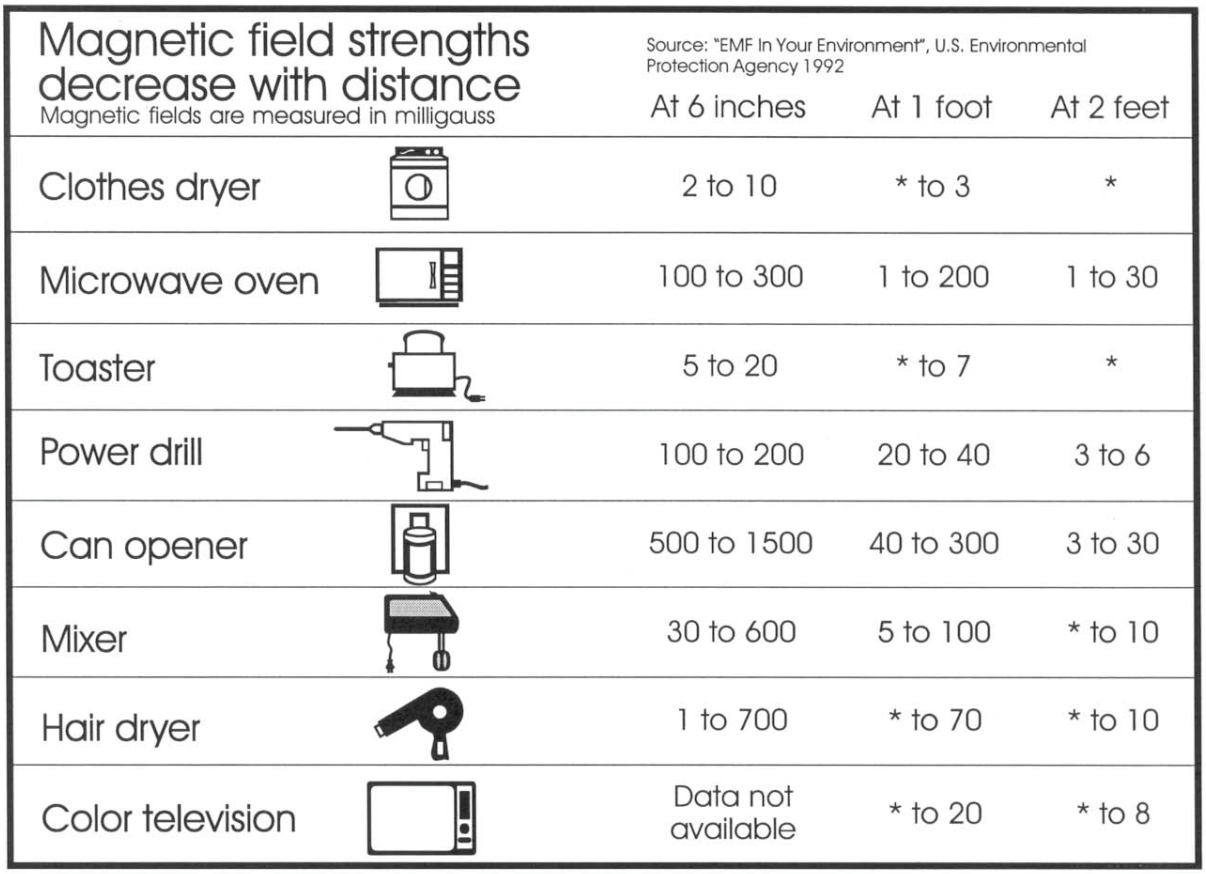


FIGURE 2 * The magnetic field measurement at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

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.

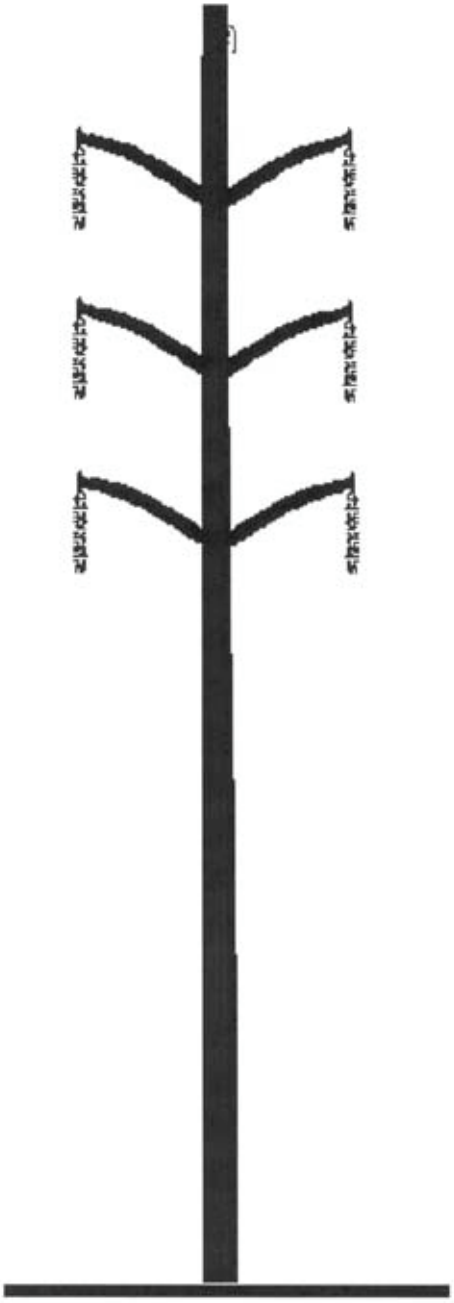
- Main lines are the most heavily loaded sections of a distribution line and therefore have the highest magnetic fields associated with them.
- Increasing the ground clearance by five feet reduces the magnetic field under the line from 14 mG to 11 mG using the standard eight-foot crossarm design. These 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:**

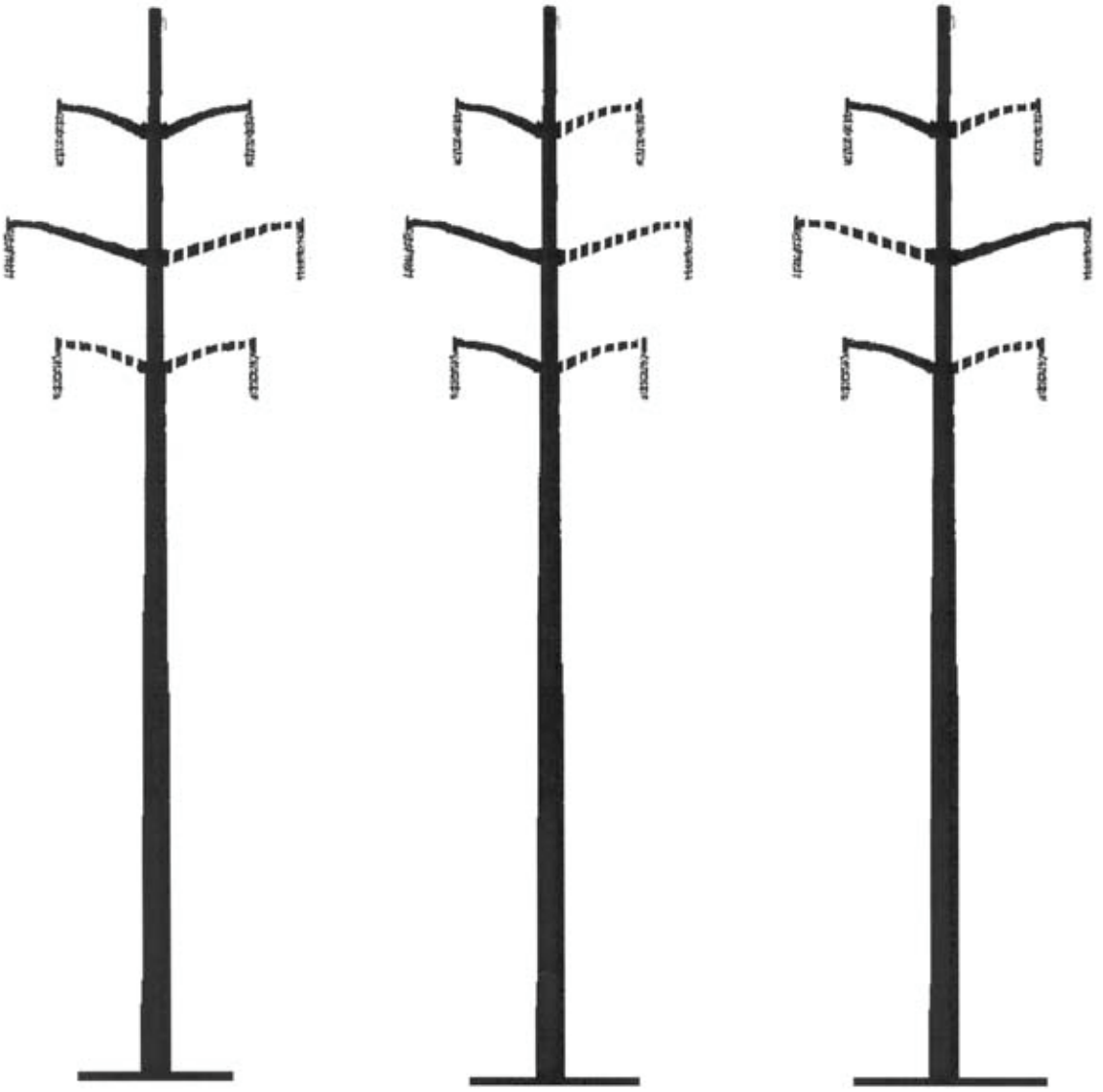
  1 3/8" HS steel overhead ground wire - 17.3 feet sag
  6-556.5 KCMIL 24/7 ACSR power conductors - (PARAKEET) 23.0 feet sag
  Average span - 600 feet

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

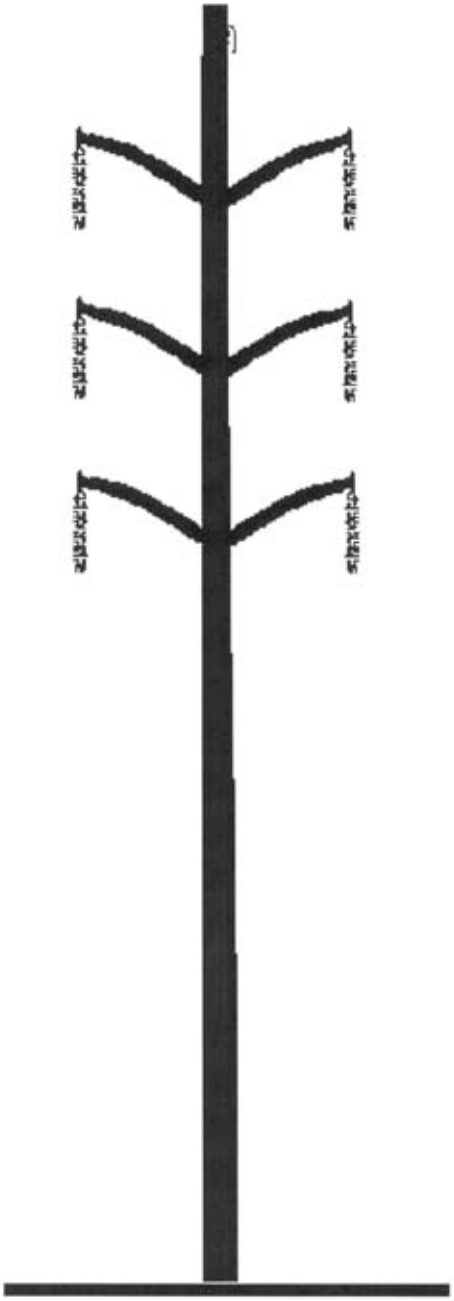


138/69 kV SINGLE CIRCUIT TRANSMISSION LINES
CALCULATED MAGNETIC FIELDS AT 400 AMPERES

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.

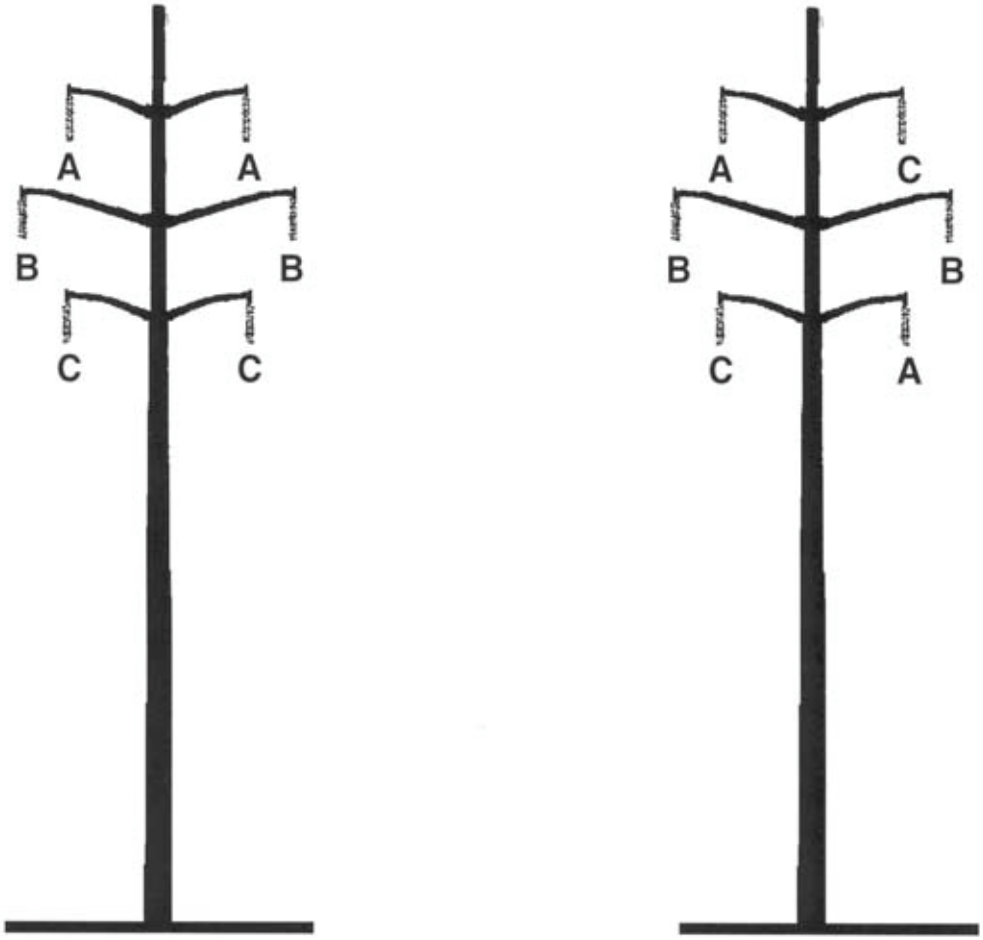
Compact Design Structure



- **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.

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.

Siting/Magnetic Field Management.doc/mlt

ATTACHMENT 12

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ATTACHMENT 12
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
PPL ELECTRIC VEGETATION MANAGEMENT PROGRAM

Specification For
Transmission Vegetation Management

LA-79827-9

PPL ELECTRIC UTILITIES CORPORATION
Allentown, Pennsylvania

Prepared: Stephen J. Dahl — 9/23/13
Stephen J. Dahl — **Date**
Regional Forester

Approved: William P. Klokis — 9/23/13
William P. Klokis — **Date**
Manager – Vegetation Management

Revision 4	Date: 12/31/1993
Writer	Unknown
Approver	PPL Division Ops
Reason Written	• Update specification to more current vegetation management practices and materials.

Revision 5	Date: 05-01-2007 – 3-01-2008
Writer	William Taylor, Earl Burnside
Approver	Gerald R. Diehl – Manager System Maintenance
Reason Written	• Update specification for NERC FAC-003-1 compliance requirements of defined clearance 1 and 2 as applicable to lines operated at 200kV or above. • Updated acceptable use herbicides, adjuvants and mixture alternatives. • Added additional contractor requirement in event of work related interruption or identification of imminent threat. • Remove references to PP&L throughout and replace with PPL Electric Utilities.

Revision 6	Date: 03-2009
Writer	Earl V. Burnside – System Forester
Approver	Kenneth L. Armstrong – Manager Vegetation Management
Reason Written	• Specification update to add clarification footnotes to Section II – Clearing Requirements, Section III Clearing Procedures, and Table 1 Right-of-Way Clearing Widths and Conductor-to Vegetation Clearances to note: "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-79827-6 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead."

Revision 7	Date: July-2009
Writer	Earl V. Burnside – System Forester
Approver	Kenneth L. Armstrong – Manager Vegetation Management
Reason Written	• Section III updated to add Wire Zone-Border Zone Management technique to be used where applicable. • Herbicide Alternative 6 amended to remove Oust and Replace with Escort into mix. • Amended applicable footnotes to reference current Specification, LA-79827-7, for species acceptability.

Revision 8	Date: December 2010
Writer	Earl V. Burnside – System Forester
Approver	Phil Walnock – Manager Vegetation Management
Reason Written	• Section III, Part A updated to add Wire Zone-Border Zone management technique to be used where applicable and not sole management technique. • Section III, Part A, sections 2 and 3 updated to clarify acceptable/noncompatible. species and possible exceptions to WZ-BZ. • Acceptable Species Table 3 specified as to not include horticultural plant varieties. • Section III, Part A, section 4 amended to reflect pruning is not preferred for trees under wires. All pruning to be completed with PPL authorization • Section V, parts A & B amended to reflect new herbicide application techniques (cut-stubble). • Table 4 Amended to reflect updates to approved herbicide mix alternatives. • Section IV, remove reference to PPL Specification A-118231 as it no longer exists. • Amended applicable footnotes to reference current Specification, LA-79827-8, for species acceptability.

Revision 9	Date: September 2013
Writer	Stephen J. Dahl – Regional Forester
Approver	William P. Klokis – Manager Vegetation Management
Reason Written	• Simplified Document Title • Section I, Updated scope to include compliance with all permits and • Section II, Added "Initial Clearing of a New Right of Way" spec. • Section II, Added specific definition of a Danger Tree. • Section III, Updated verbiage. • Table 3, Removed American Chestnut as a Compatible Species • Section IV, Added Drop and Lop as the preferred debris disposal method in wet areas. • Section IV, Removed references to burning brush as an acceptable method of debris disposal. • Section V, Non-Aquatic use herbicide buffer from water bodies decreased from 50' to 35' in accordance with NPDES. • Table 4, Updated list of Approved Herbicides and Spray Mixtures • Section VI, Removed references to burning brush. • Section VI, Updated instructions for reporting Electrical System Events and on the job injuries.

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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.

Vegetation Management Contractors shall ensure compliance with all federal, state, and local permits including but not limited to National Pollutant Discharge Elimination System (NPDES) permits and Erosion and Sedimentation (E&S) Control Plans.

II. CLEARING REQUIREMENTS

A. Initial Clearing of a New Right of Way

For initial clearing of new transmission rights-of-way (69kV and above), all vegetation shall be removed from the limits of the right of way with the exception of grasses and herbaceous or non-woody plants. This is necessary to both establish the extent of the new right-of-way and to accommodate the many construction activities that will occur within the right-of-way to install new foundations, tower structures, and conductors. After the initial clearing of a new right-of-way, PPL Electric then maintains the right-of-way through the removal of non-compatible species as well as the application of herbicides. All work shall be completed in accordance with all applicable federal, state, and local laws and regulations. All work will conform to all regulatory permitting requirements

Initial clearing of a new right of way must adhere to these requirements:

1. All vegetation shall be removed from the limits of the right of way with the exception of herbaceous or non-woody plants. Exceptions for ravine crossings can be found on page 15 of this document. Instructions for disposition of brush can be found in chapter IV of this document.

2. The edge of the right of way shall be trimmed “Ground to Sky”. Ground to sky means that all branches overhanging into the easement area shall

be removed. All required tree pruning shall conform to the latest approved edition of ANSI Z133 Safety Standards, ANSI A-300 Plant Maintenance, and OSHA 1910.269 as a minimum to assure safety and industry standards are maintained.

3. All off corridor danger trees shall be removed including edge trees which cannot be properly pruned to the standards outlined above.

4. All stumps and hardwood brush which have not been mechanically removed shall be treated with herbicides to prevent the growth and regrowth of non-compatible vegetation. All applications shall be made under the direction of PA Certified Commercial Pesticide Applicators and done in accordance with product labels and all applicable laws.

5. When required, vegetated off Right of Way access roads and structure pad sites shall be cleared of all vegetation. This clearing shall be specified by project management personnel.

6. The contractor shall ensure compliance with all federal, state, and local permits including but not limited to National Pollutant Discharge Elimination System (NPDES) permits and Erosion and Sedimentation Control Plans (E&S).

B. Conductor-to-Vegetation Clearances and Right-of-Way Widths

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 Table1), 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.

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

C. 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 conductor or pass within the minimum conductor clearances noted in Table 2 and shown on Figure 2. Danger trees should be removed as specified at the time of treatment. The PPL Electric representative will work with vegetation contractors to approve the removal of danger trees during line clearing/maintenance operations.

A danger tree is defined as a tree having one or more of the following characteristics:

A. Decay, cankers, hollows-present in the main trunk of the tree and must show visible signs of decay.

B. Animal and mechanical damage-Present in the main trunk of the tree showing visible signs of decay to the extent that it affects its structural integrity.

[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-79827-9 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

C. Disease and insect damage-Has affected the tree to such an extent that the tree's survival to the next tree maintenance cycle is in doubt.

D. Root system-Is exposed to such an extent that the support system of the tree is reduced.

E. Leaning trees-Trees that have such a lean toward the right-of-way that they cannot be pruned without removing their tops and slanting the tree back.

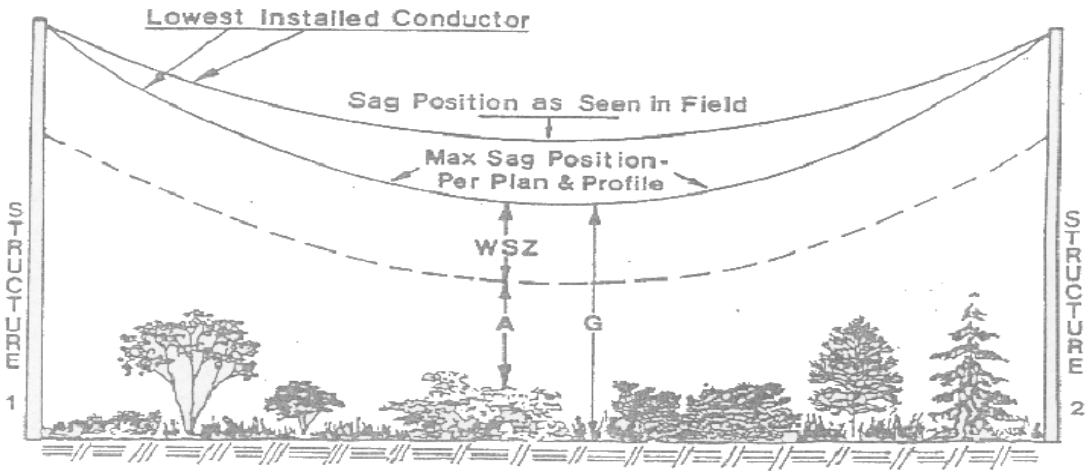
F. Splits-That are to such an extent that the splitting is affecting the stability of the tree.

G. Overcrowned trees-Trees that are overcrowned to such an extent that their growth is toward the right-of-way.

H. Dead or dying trees-All dead or dying trees that can hit the conductor or pass within the minimum conductor clearances shall be removed.

I. All co-dominant stems should be considered for removal.

TRANSMISSION LINE PROFILE
WIRE SECURITY ZONE AND VEGETATION CLEARING

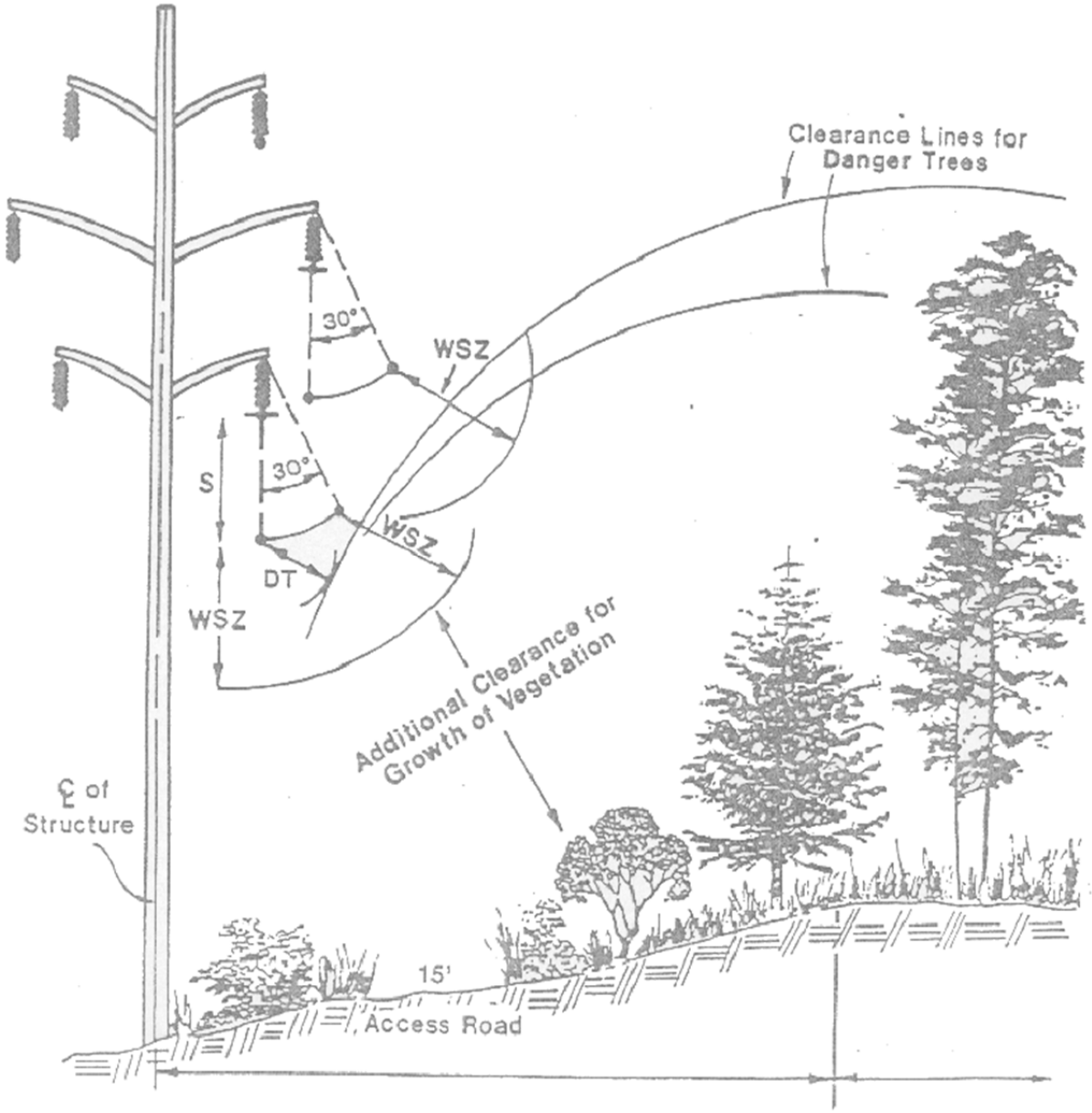


G = Max Sag Ground Clearance – Determined from Line Plan & Profile
WSZ = Wire Security Zone (Table 1)
A = Additional Clearance to allow for Growth of Vegetation
A = 5’ per year apical (Under), 2’ per year lateral (Around)
(WSZ + A) = Minimal Acceptable Clearance from Vegetation to Conductor at Time of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

Figure 1

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

Figure 2

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-79827-9 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

1. Wire Zone/Border Zone

The Wire Zone/ Border Zone (WZ/BZ) method of managing transmission rights of way is the preferred vegetation management method of PPL Electric Utilities. 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.

I. 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.

II. 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. Native Grasses, Ferns, and Herbaceous Plants shall be preserved to the greatest extent possible in the Wire Zone.

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

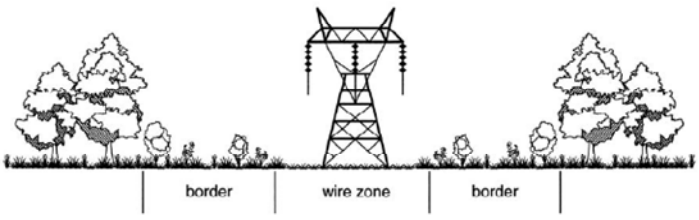
Wire Zone-Border Zone Vegetation Management

- 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 cannot be applied due to existing documented easement restrictions or other limitations such as documented site or environmental concerns, the following procedures may be utilized as appropriate to the site conditions present:

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].

- 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.

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).

[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-79827-9 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

- 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 may be retained when approved by PPL Vegetation Management.

- 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-79827-9 confirmed, and vegetation growth has been determined to be maximized or vegetation is dead.

Table 3

Compatible Species List[1] (does not include Horticultural plant varieties)

I. SMALL TREES

a) Flowering Dogwood *(Cornus florida)*

b) Redbud *(Cercis canadensis)*

c) Hawthorn *(Crataegus spp.)*

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

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

f) Eastern Red Cedar *(Juniperus virginia)**

g) Northern White Cedar *(Thuja occidentalis)**

h) Dwarf Willow *(Salix spp.)*

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

* These species shall be evaluated on an individual basis. Over mature specimens have the ability to exceed 40' in height and must be removed if they become a clearance threat.

II. LARGE SHRUBS

a) Alder (Alnus spp.)

b) Witch-hazel *(Hamamelis virginiana)*

c) Spicebush *(Lindera benzoin)*

[1] This list is not all inclusive and is meant to be a guideline. These species are to be preserved as appropriate in accordance with LA-79827-9. Some of the taller trees and shrubs may be removed 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).

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)*

III. 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 or Filbert *(Corylus spp.)*

n) Scrub Oak *(Quercus spp*.)

IV. ALL NATIVE GRASSES, FERNS AND HERBACEOUS PLANTS

4. Tree Pruning

Tree pruning for apical clearance is only considered when specified within the language of pre-existing right of way agreements. 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 gaffs or hooks will not be permitted in any maintained yard tree to be pruned. They will, however, be permitted in any tree to be removed or in forest trees to be pruned, unless objected to by the property owner.

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

- 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:

- Trees shall be felled in a manner to minimize damage to those trees and/or shrubs, which are to be preserved. This is particularly essential when performing Restricted Clearing.

- All stumps shall be cut as low to the ground as possible. Stump heights should not exceed 3" for smaller trees (less than 12" 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 removed, as previously described under "Clearing Requirements".

IV. DISPOSAL OF CLEARED VEGETATION

All work in wetlands shall be completed in accordance with state and federal environmental regulations and policies.

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.

In wet areas “drop and lop” shall be the preferred method for the disposal of woody debris. The intention of drop and lop is to minimize earth disturbance by leaving woody debris where it falls. Special care will be made to ensure that felled trees, logs, slash, brush, and chips do not impede any running water or seasonally dry waterways or drainage culverts. Slash will be compacted in such a manner that it will not be carried away by high water

A. Specific Procedures for Each Disposal Method

1. Piling (Wind Rowing)

(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, and 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, 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.

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.

- 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, Foliage Application, and Cut –Stubble application.

B. Procedures

1. Specific Procedures and Precautionary Measures for Each Treatment Method

I. 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.

II. Foliage Treatment

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 nozzle 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 appropriate nozzle type and pressure to produce a coarse spray.

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

III. Basal Treatment

The lower 12" to 15” of the stem and all the root crowns of non-compatible 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

IV. 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.

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

- 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 shall 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 35' of any water body, except for 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. National 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 (MSDS)[1] for all herbicides and surfactants being used at the job site at all times.

[1] The term MSDS will be replaced by "Safety Data Sheet" (SDS) as outlined in OSHA's HAZCOM revision of 2012.

- Contractor shall be responsible for maintaining a current copy of and adhering to the requirements of the Commonwealth of Pennsylvania Department of Agriculture Pesticide Hypersensitivity Registry.

- 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.

Table 4

Approved Herbicides and Spray Mixtures

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	RTU
Escort XP	Metsulfuron	Water
	Methyl	
Streamline	Metsulfuron	Water
	Methyl	
	Aminocyclopyrachlor	
Krenite	Fosamine	
	Ammonium	Water
Rodeo	Glyphosate	Water
Accord XRT II	Glyphosate	Water
Arsenal Powerline	Imazapyr	Water
Polaris	Imazapyr	Water
		or Arborchem Basal oil
Stalker	Imazapyr	Water
		or Arborchem Basal oil
Pathfinder	Triclopyr	RTU
Milestone	Aminopyralid	Water
Viewpoint	Metsulfuron	
	Methyl	
	Aminocyclopyrachlor	
	Imazapyr	Water

II. SPRAY MIXTURE ALTERNATIVES

Alternative 1

Hydraulic (High Volume stem foliar) Application - Selective

AL#1a	Garlon 3A	1/2% (2 qts)
	Tordon 101	1/2% (2 qts)
	Arborchem Clean Cut	1/4% (1 qt.)
	Water	98 3/4 gallons
	Drift Control	
Remember Tordon 101 is a Restricted Use Herbicide and notification is very important.		

AL#1b	Garlon 3A	1/2% (2 qts)
	Streamline	7 1/2 oz. per 100 gal.
	Arborchem Clean Cut	1/2% (2 qt.)
	Water	99 gallons
	Drift Control	
This mix can be used up to water's edge but not into water.		

AL#1c	Garlon 3A	1/2% (2 qts)
	Streamline	4.25 oz. per 100 gal
	Milestone	5 oz. per 100 gal
	Arborchem Clean Cut	1/2% (2 qt.)
	Water	99 gallons
	Drift Control	
The best mix is the third one (1c) for all species and for use after grasses have been established. This would work BEST for a second application. If for some reason the first cut stubble and treatment was poor, you may want to re-cut and treat again. The application would have to be selective if you have grasses established.		

Backpack (Low Volume) Application – Selective

AL#1d	Garlon 3A	3%
	Tordon 101	3%
	Arborchem Clean Cut	1%
	Water	93%

AL#1e	Garlon 3A	2%
	Streamline	40 oz. per 100 gal
	Arborchem Clean Cut	1%
	Water	98%
The second treatment (AL#1e) is a better low volume mix. This application can be used up to water's edge, very selective (non-restricted). More to come on a (Buffer Law), NPDS (National Pollution Discharge System) was talking about a state reg. for 30 feet set back.		

Alternative 2

Hydraulic (High Volume foliar) Application – Non Selective

AL#2a	Krenite S	1.5% (6 qts)
	Arsenal Powerline	4 oz./100 gal
	Arborchem Clean Cut	1/4% (1 qtr.)
	Water	98 1/4 gal.
	Drift Control Agent	
Good application for heavy pine.		

Backpack (Low Volume) Application – Non Selective/Selective

AL#2b	Krenite S	5% (5 gallons)
	Arsenal Powerline	1/2 % (2 qts)
	Arborchem Clean Cut	1% (4 qts)
	Water	93 1/2 gallons

AL#2c	Krenite S	4% (4 gallons)
	Viewpoint	52 oz. per 100 gallons
	Arborchem Clean Cut	1% (4 qts)
	Water	95 gallons
Good for all species: Ex. ailanthus, sassafras, birch, locust.		

Ultra Low Volume Thinvert Backpack Application – Non Selective/Selective

AL#2d	Krenite S	7% (7 gallons)
	Arsenal - Polaris	1 % (4 qts)
	Escort XP	4 oz./ 100 gal
	Thinvert RTU	92 gallons

AL#2e	Krenite S	7% (7 gallons)
	Viewpoint	100 oz./ 100 gal
	Thinvert RTU	93 gallons
Good for all species: Ex. ailanthus, sassafras, birch, locust.		

Alternative 3

Low Volume Basal

AL#3a	Garlon 4 Ultra	25% (25 gallons)
	Stalker	1% (1 Gallon)
	Arborchem Basal oil	74 Gallons
Just remember that Stalker is Arsenal, beware along the ROW edge.		

Alternative 4

Hydraulic (High Volume) Application – Non Selective - Aquatic approved

AL#4a	Rodeo	1% (4 Quarts)
	Polaris	4 oz./100 gal
	Chemsurf 90 (aquatic surfactant)	1/2% (2 Quarts)
	Water	98 1/2 Gallons
	Drift Control Agent	
This is approved for aquatic use, but may require a permit from DEP. This will kill all species. Not good to do High Volume.		

Backpack (Low Volume) Application – Non Selective/Selective - Aquatic approved

AL#4b	Rodeo	5% (5 Gallons)
	Polaris	1/2% (2 Quarts)
	Chemsurf 90 (aquatic surfactant)	1% (4 Quarts)
	Water	93 1/2 Gallons

Backpack (Ultra Low Volume) Thinvert Application – Non Selective/Selective - Wetland approved

AL#4c	Rodeo	7% (7 Gallons)
	Polaris	1% (4 Quarts)
	Escort XP	4 oz./100 gal
	Thinvert RTU	92 Gallons
With the Escort XP the mix, it will pick up most species; again with a Thinvert mixture you must be selective. This is wetland approved not aquatic approved. (Do not apply to standing water) PPL does not want any herbicide applied directly into water.		

Alternative 5

Thinvert Application – (Applied at 5 GPA) – Non Selective

AL#5a	Tordon K	2 Quarts
	Arsenal – Polaris	1 pint
	Milestone	7 oz.
	Thinvert RTU	4.3 Gallons

AL#5b	Viewpoint	12 oz.
	Streamline	4.25 oz.
	Milestone	7 oz.
	Thinvert RTU	99.8%

Thinvert Application – (Applied at 5 GPA) – Selective

AL#5c	Tordon K	2 Quarts
	Milestone	7 oz.
	Streamline	4.25 oz.
	Thinvert RTU	4.7Gallons
After cut stubble treatment, this application should not be required again, except: If right-of-way needs to be mowed again or if results were poor due to application too late after mowing. Make sure the application is done with the Thinvert wide-cast nozzle mounted on an ATV vehicle. All applications must be completed soon after mowing and before any significant regrowth occurs.		
If your cut-stubble was successful, the subsequent herbicide treatments can be made by selective treatment of AL#1c.		

Hydraulic (High Volume) Application

AL#5d	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	

Back Pack – Power/Hand Operated (Low Volume)

AL#5e	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	
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 – Non Selective

AL#6	Viewpoint	4.5 oz.
	Streamline	4.0 oz.
	Attach	0.125%
	Drift Control (Sharpshooter)	0.039%

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.

- 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 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 approved 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 most recent revision of Pennsylvania Department of Transportation's "Temporary Traffic Control Guidelines" Publication 213.

- 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.

- Re-grade and seed 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.

Clearing

- Remove all danger trees as directed by a Company representative.

- Take precautions to preserve all survey stakes, hubs, and property corners. 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 (3 P. S. § § 111.21—111.61)

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

- Mix herbicide solutions 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 re-treat at their 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.

Line Access

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

- 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.

- 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 in the event of an on the job injury, the contractor shall follow the procedures outlined in the most recent version of the following documents:

    - Vegetation Management Contractor Reporting Requirements for Safety Incidents or Property Damage

    or

    - Vegetation Management Contractor Reporting Requirements for Electrical System Events

ATTACHMENT 13

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ATTACHMENT 13
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
PPL ELECTRIC 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 Electric) has developed design specifications and safety rules which meet or surpass all provisions 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 Electric transmission line design standards meet or surpass the NESC standards. For example, the relative order of grades of construction for conductors and supporting structures is B, C, and N; Grade B being the highest. According to the NESC standards, construction Grades B, C, or N may be used for transmission lines (except at crossings of railroad tracks and limited access highways where Grade B construction is specified). However, PPL Electric designs all of its transmission lines for Grade B construction. The use of Grade B design and construction specifies such things 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 Electric 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 Electric 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 Electric lines are designed to operate safely and reliably during inclement weather even more severe than assumed by the NESC. In addition, PPL Electric transmission lines are designed with more clearance to the ground than required by the NESC. The tables below compare PPL Electric and NESC ground clearances for lines of various voltages.

138 kV

Surface Underneath Conductors	Vertical Clearance to Ground	
	NESC Standard	PPL Electric 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 Electric 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 Electric 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 Electric 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 14

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ATTACHMENT 14
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
AGENCY COORDINATION

On April 27, 2012, initial information identifying several alternative links for the North Lancaster – Honey Brook #1 & #2 138/69 kV Transmission Line 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. Based on the results of the Route Selection Study (see Attachment 4), a follow-up request was submitted on May 2, 2013 through the online PNDI review database and final online PNDI request was submitted on February 6, 2014 for the Preferred Route. PPL Electric also submitted an initial consultation letter to the Pennsylvania Historical and Museum Commission (PHMC) on February 21, 2013. Correspondence from these agencies regarding the potential presence of these ecological resources within the project area are provided in this attachment. The identification of cultural resources on site is considered a Category III activity under the US Army Corps of Engineers (USACE) State Programmatic General Permit-4 (SPGP-4); as a result, USACE would review the permit application package and issue the SPGP-4 themselves.

As required by Pennsylvania Title 25, Chapter 102, a NPDES Permit for Construction Activities is required, and coordination with PADEP has begun. Due to the presence of High-Quality waters, an Individual Permit is being obtained as opposed to a General Permit. Coordination of the NPDES Permit has also begun with the Lancaster County Conservation District (LCCD) since they have been delegated with handling review and compliance of the NPDES Permitting process. Wetlands and waterways within the right-of-way of the Lauschtown – Honey Brook 138/69 kV Transmission Line Project have been delineated using PADEP and USACE approved methodologies. The findings from the delineation are being developed into a Wetland Delineation Report that will be filed with the Permit Application required for the construction of this Project. Information on the location of these features has been used by project engineers in

the placement of transmission poles and alignment of access roads. Through the use of this information, no proposed poles will be located in a wetland area. Evaluation of the development of temporary versus permanent access roads through wetlands and across waterways is being conducted by project engineers. Unavoidable impacts to these features will be reviewed with LCCD, PADEP and USACE to determine the form and level of mitigation that will be required. Pre-application meetings with these agencies have been coordinated and discussions regarding the project are on-going.

Highway Occupancy Permits (HOPs) are required through the Pennsylvania Department of Transportation (PADOT), for limited access at two locations for the project. The HOP Permits are routine in nature and should be easily obtainable through coordination with the PADOT.

Approval is required from the Pennsylvania Turnpike Commission (PATC) for the proposed aerial crossing of Interstate-76/Pennsylvania Turnpike. PPL has had correspondence with PATC and the requirements for approval are understood and will be complied with.

A Notice of Proposed Construction must be reviewed by the Federal Aviation Administration (FAA) for any structures greater than 200 feet in height or located within 20,000 feet of an airport, or for those structures whose filing is requested after running the Notice Criteria Tool. PPL has been in correspondence with the Administration and have prepared all items pertaining to the Notice required.

Initial Agency Consultation Letters

THE Louis Berger Group, INC.

February 21, 2013

Mr. Steven R. McDougal, Archaeologist
Division of Archaeology & Protection
Pennsylvania Historical & Museum Commission
Bureau of Historic Preservation
Commonwealth Keystone Building, 2nd Floor
400 North Street
Harrisburg, PA 17120-0093

NORTH LANCASTER – HONEY BROOK 138/69 kV TRANSMISSION LINE

Dear Steven:

PPL Electric Utilities Corp. (PPL Electric) proposes to construct a new, double-circuit 138/69 kV transmission line beginning at the proposed North Lancaster Substation located in Brecknock Township. One circuit will terminate at the existing Brecknock Substation in Brecknock Township, Lancaster and the second circuit will continue south and connect to an existing line south of Churchtown located in Caernarvon Township. The entire North Lancaster – Honey Brook 138/69 kV Transmission Line Project (the "Project") is located within Lancaster County, Pennsylvania. The Project may traverse portions of Brecknock, Caernarvon, and East Earl townships. PPL Electric has selected a Preferred Route (Links B and D) and an Alternate Route (Links A and C) for this Project. The new line will be designed and built to operate at 138 kV to accommodate future growth in electricity demand. Initially it will operate at 69 kV. The Project will provide another source of electricity to the regions.

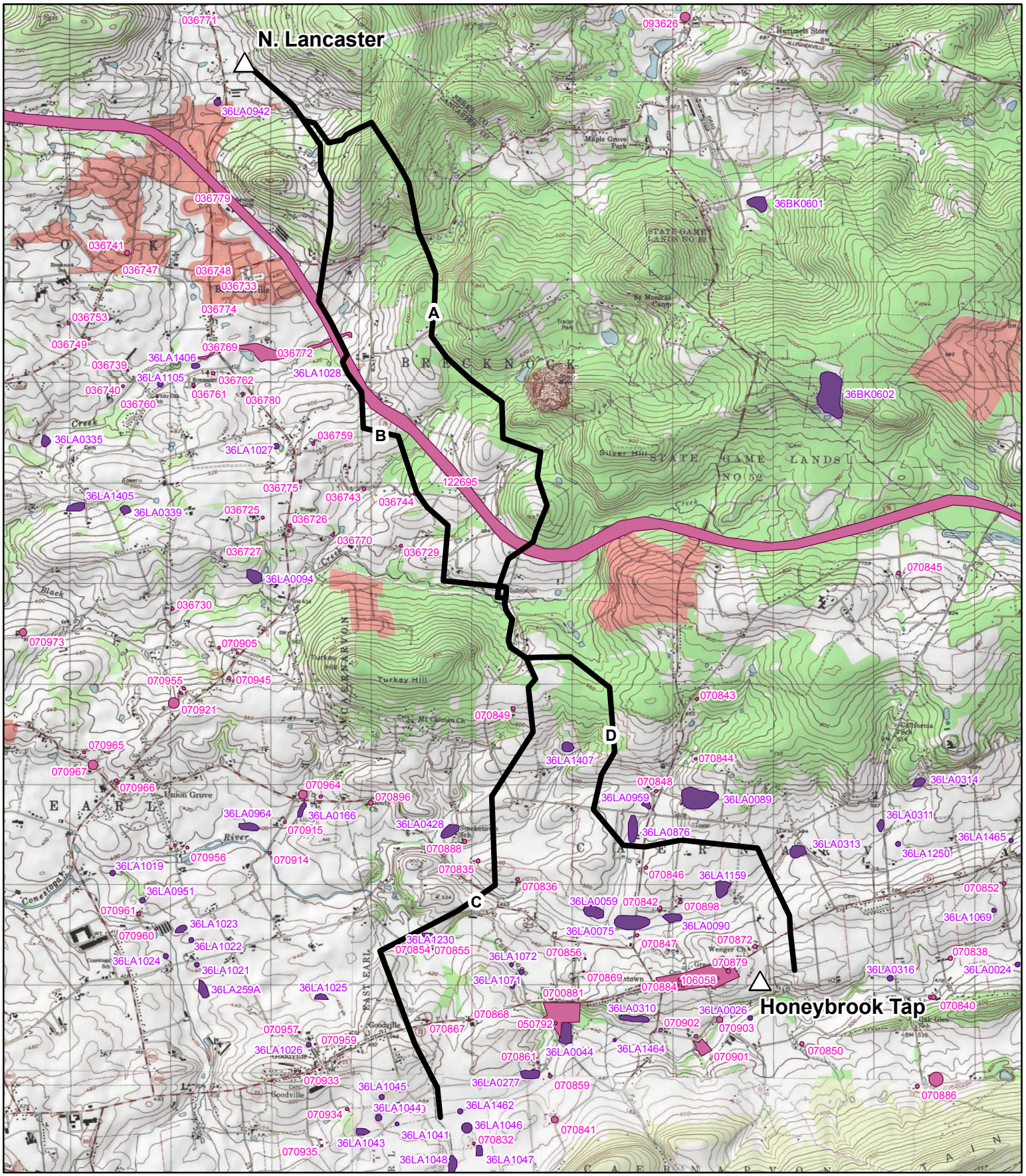
The new structures will consist of single steel poles with an average height of approximately 100 feet. The Project includes the acquisition of a new, 100-foot wide right-of-way (ROW). The attached map (Terre Hill, Morgantown, and Honey Brook USGS quadrangles) shows the location of the subject transmission line. Previously identified cultural resources are identified on the attached map. We respectfully request information on any additional archaeological or historic architectural resources located in the Project vicinity as well as direction on any cultural resource investigation that may need to be completed for this Project.

Please contact me at (610) 280-4028 or via email at hunger@louisberger.com should you need additional information or have any questions. Thank you for your assistance.

Sincerely,

Heather Unger, LEED AP
Project Scientist

350 Eagleview Boulevard | Suite 250 | Exton, PA 19341–1178 USA
Tel 610.280.4000 | Fax 610.363.5390 | www.louisberger.com



Legend

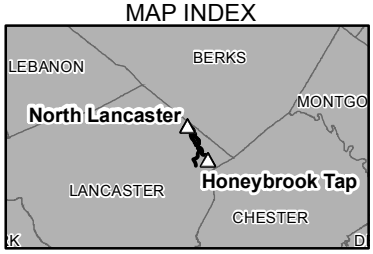
- Substations
- Links
- Architectural Site (Resource No.)
- Archeological Site (Resource No.)

PPL Honey Brook – North Lancaster 138/69 kV

N W E S

0 0.5 1 Miles

MAP INDEX



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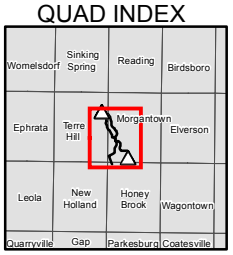

THE Louis Berger Group, INC.

April 27, 2012

United States Fish and Wildlife Service
Endangered Species Biologist
315 South Allen Street, Suite 322
State College, PA 16801

Re: North Lancaster – Honey Brook 138/69 kV Transmission Line Project
Request for Project Review for Pennsylvania Natural Diversity Inventory
Large Project

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The alternative routes under consideration are identified on the attached overview map. Information received from your agency will be used as part of the route evaluation process. As shown on the attached map, the alternative routes are located in Lancaster County and may traverse the townships of Brecknock, Caernarvon and East Earl. The alternatives traverse the following USGS 7.5-minute quadrangle maps: Terre Hill, Morgantown, and Honey Brook.

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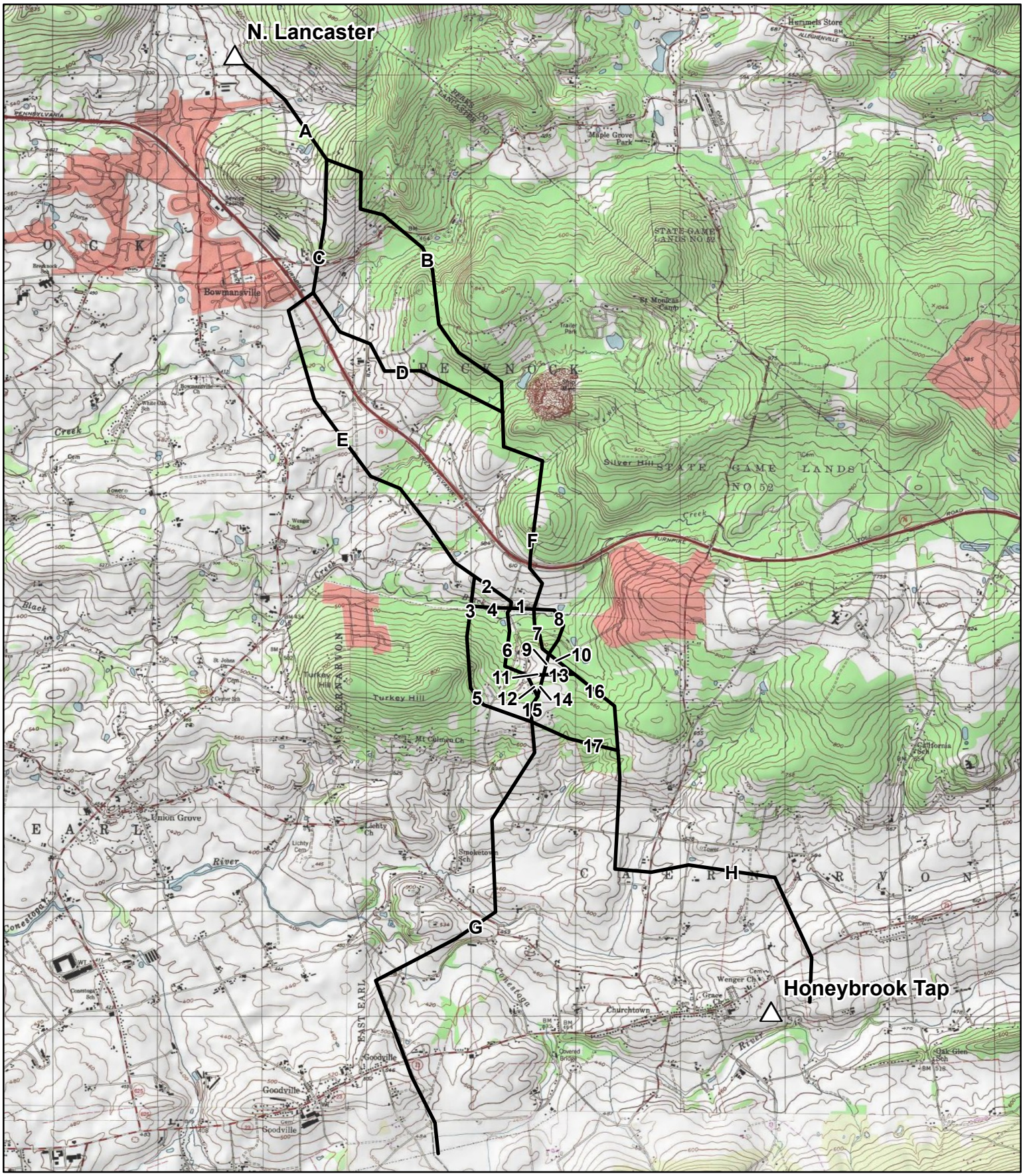
Sincerely,

Sue Sutter
Senior Environmental Scientist
The Louis Berger Group, Inc.



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- Substations
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North Lancaster – Honey Brook 138/69 kV

N
W E
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0 0.5 1 1.5 Miles

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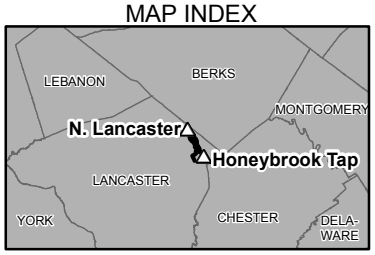

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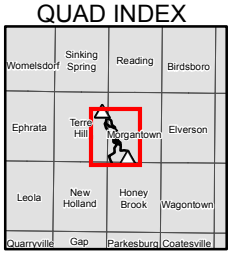

Pennsylvania Natural Diversity Inventory

Project Planning & Environmental Review Form

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Ppl Electric Utilities, Ken Kuhns
Address: Two North Ninth St (Genn4) Allentown, Pa 18101
Phone Number: 610.774.2540 Fax Number: 610.774.6239

Contact Person Information - if different from applicant

Name: Sue Sutter The Louis Berger Group, Inc.
Address: 100 Commercial St, 2nd Floor N, Manchester, NH 03101
Phone Number: 781-707-7445 Fax Number: 603-644-5220

Project Information

Project Name: North Lancaster - Honey Brook 138/69 Kv Transmission
Project Location: Lancaster County, Pa
Municipality: Multiple County: Lancaster
☒ Attach a copy of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.
U.S.G.S. Quad Name: Multiple, See Letter

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions)

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1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes ☐ No ☒
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If you have a "PNDI Project Environmental Review Receipt" with potential impacts, please send a receipt copy, this completed form, and a USGS Quad Map to the agency/agencies noted on the receipt. If you are unable to generate a PNDI Receipt because you do not have Internet access, complete this form, attach a USGS Quad Map, and send them to your local DEP or County Conservation District. For review of a "Large Project," please send form and map to all the agencies listed below. See page 2 for more information.

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Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
fax: 717-772-0271

PA Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
fax 814-359-5175

PA Game Commission
Bureau of Land Management
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
fax: 717-787-6957

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Endangered Species Biologist
315 South Allen St., Suite 322
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When do I use this form?

1. ***Before conducting the PNDI online search***

The Applicant can complete the PNDI Form and submit it to the person conducting the online PNDI Project Planning and Environmental Review Tool search. This person performing the search could be someone from DEP, the County Conservation Districts, or a consultant. Alternatively, if the Applicant plans to conduct the PNDI online search his or herself—a search form is not needed prior to the PNDI online search.

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THE Louis Berger Group, INC.

April 27, 2012

Pennsylvania Game Commission
Bureau of Land Management
2001 Elmerton Avenue
Harrisburg, Pennsylvania 17110-9797

Re: North Lancaster – Honey Brook 138/69 kV Transmission Line Project
Request for Project Review for Pennsylvania Natural Diversity Inventory
Large Project

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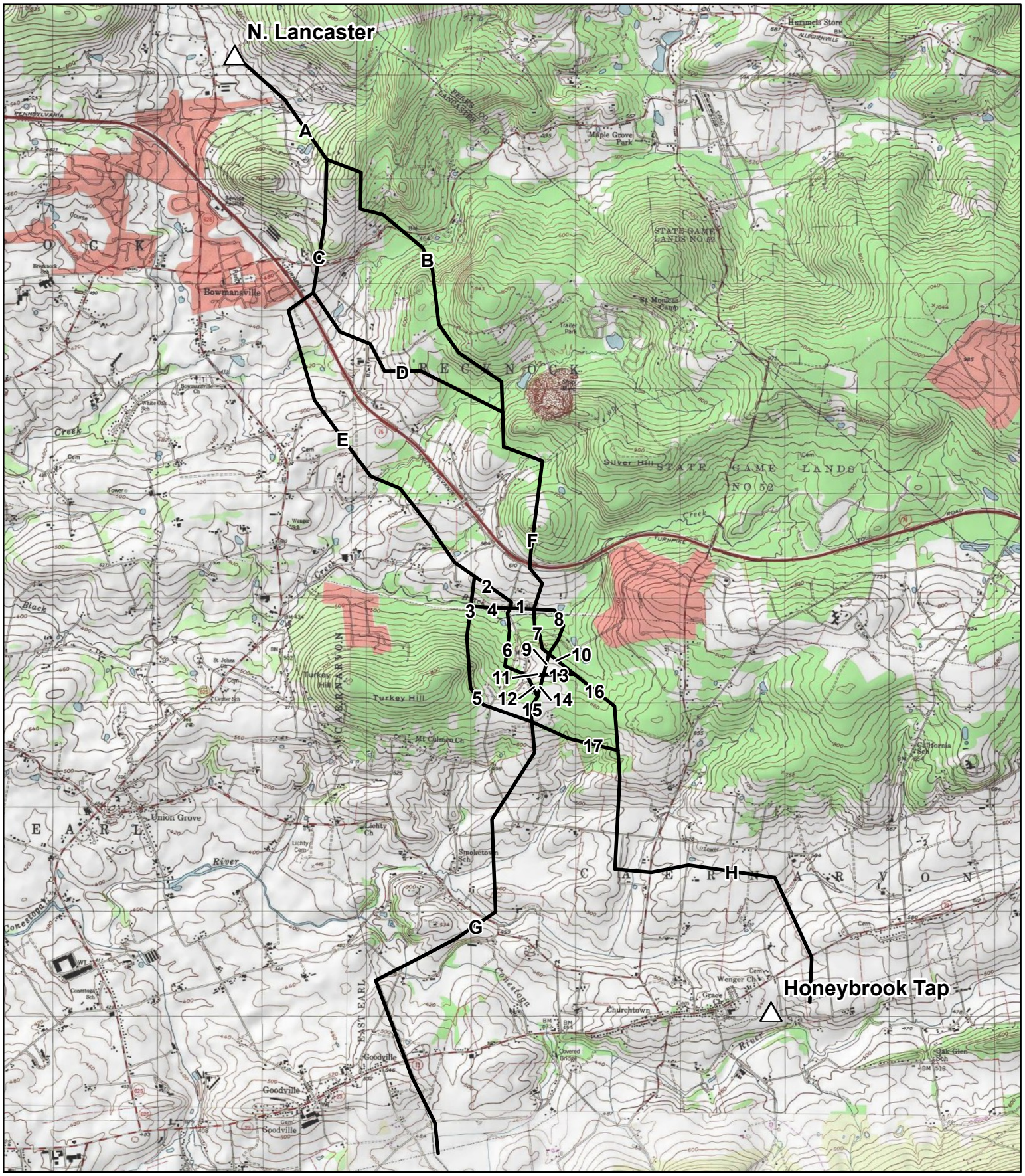

Legend

- Substations
- Links

North Lancaster – Honey Brook 138/69 kV

N
W E
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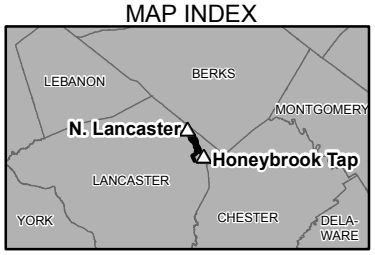
0 0.5 1 1.5 Miles

MAP INDEX



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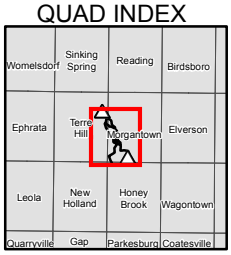

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April 27, 2012

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Bellefonte, Pennsylvania 16823

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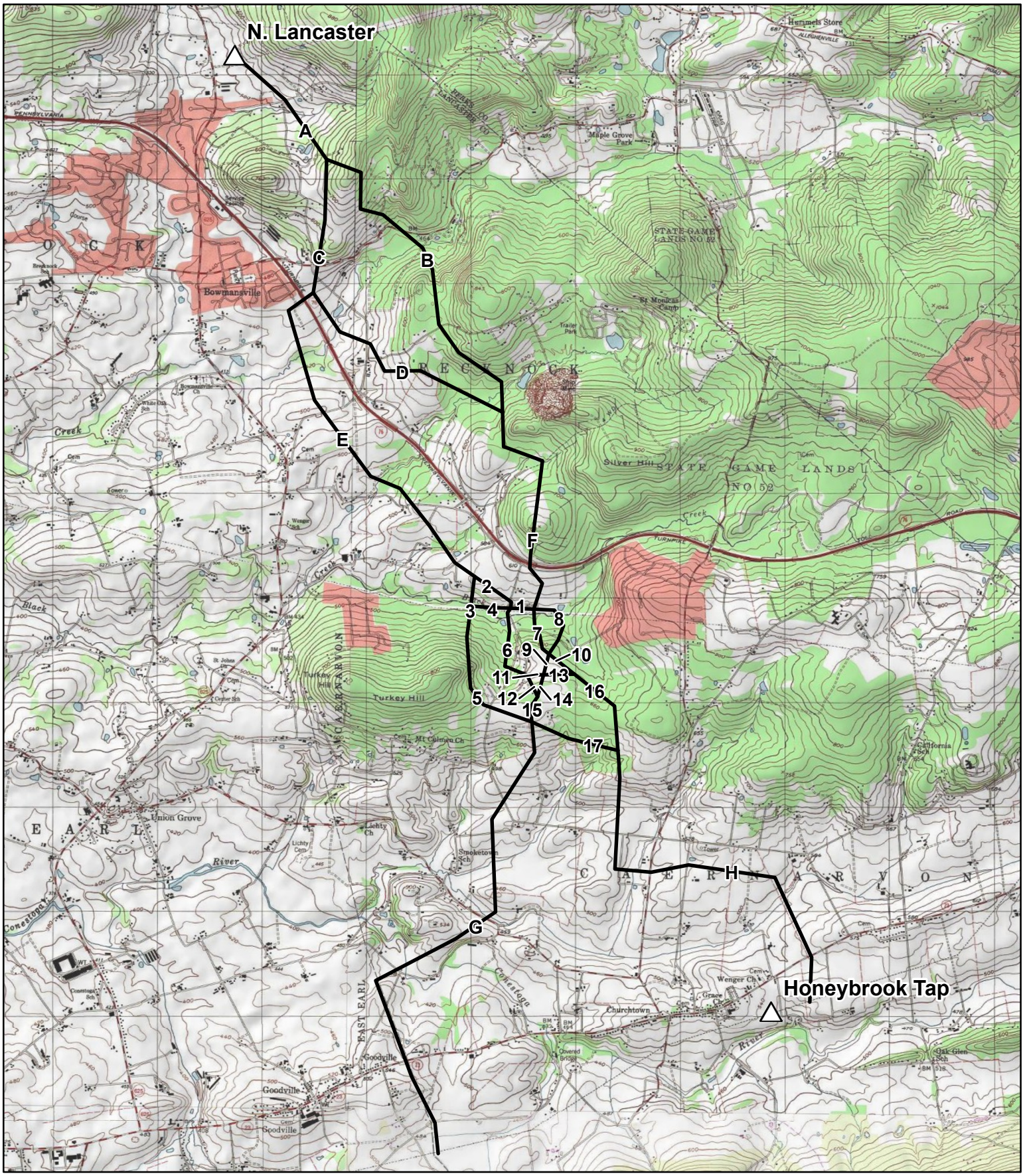

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North Lancaster – Honey Brook 138/69 kV

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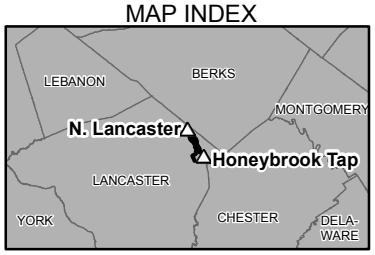

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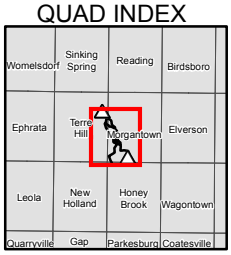

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   Yes ☒ Aerial xin Feet No ☐
3. Are wetlands located in or within 300 feet of the project area? Yes ☒ No ☐ If No, is this the result of a wetland delineation?

If you have a "PNDI Project Environmental Review Receipt" with potential impacts, please send a receipt copy, this completed form, and a USGS Quad Map to the agency/agencies noted on the receipt. If you are unable to generate a PNDI Receipt because you do not have Internet access, complete this form, attach a USGS Quad Map, and send them to your local DEP or County Conservation District. For review of a "Large Project," please send form and map to all the agencies listed below. See page 2 for more information.

Dept. of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
fax: 717-772-0271

PA Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
fax 814-359-5175

PA Game Commission
Bureau of Land Management
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
fax: 717-787-6957

US Fish and Wildlife Service
Endangered Species Biologist
315 South Allen St., Suite 322
State College, PA 16801
no faxes please

How to Use the PNDI Project Planning & Environmental Review Form

How do I access the PNDI Environmental Review Tool?

Visit www.naturalheritage.state.pa.us. Click on "PNDI Project Planning and Environmental Review" on the bottom left corner of the homepage to access the tool. Follow this link to access the ER Tool and for step-by-step instructions on using the ER Tool, FAQ's and access to an electronic version of the PNDI Form.

When do I use this form?

1. ***Before conducting the PNDI online search***

The Applicant can complete the PNDI Form and submit it to the person conducting the online PNDI Project Planning and Environmental Review Tool search. This person performing the search could be someone from DEP, the County Conservation Districts, or a consultant. Alternatively, if the Applicant plans to conduct the PNDI online search his or herself—a search form is not needed prior to the PNDI online search.

2. ***After conducting the PNDI online search***

If your PNDI Project Environmental Review Receipt has "Potential Impacts," DEP and the jurisdictional agencies require that you submit additional information to the agencies noted on the Receipt for further review. Please send a copy of the PNDI Receipt, a completed PNDI Form, and a USGS 7.5 minute quadrangle map with project boundaries delineated on the map to the agencies referenced on your PNDI Receipt.

3. ***If your Project is a "Large Project"***— too large/long to search on the online system

Projects are considered "Large Projects" when the ENTIRE project is:

- Linear/Large Projects that exceed map limits: approximately 2-2.84 miles depending on browser size
- Projects that will not fit on 1:24,000 scale map. Project Maximums: 1024 x 768 browsers: 2625 acres; 15,000 feet long x 7600 feet wide; approximately 2.84 miles 800 x 600 browsers: 1050 acres; 11,000 feet long x 4000 feet wide; approximately 2 miles
- Township-wide, Countywide or Statewide Projects. Examples: Act 537 Sewage Plans, Wind Farms, Roadway Improvements exceeding map limits above.

For "Large Project" review, please forward a completed PNDI Form and a USGS 7.5 minute quadrangle with project boundaries and quad name marked on the map to DCNR, PFBC, PGC, and USFWS (contact information on page 1 of form). Due to system limitations and agency requirements, projects should not be submitted piecemeal. The entire project area including roads and infrastructure should be submitted as a single unit.

PNDI Form Definitions

***Applicant*:** Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Project Location: Description of actual location (e.g. Intersection of Smith and Clay Rd., Latitude & Longitude)

***Proposed Activity*:** Include ALL earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities

PFBC-DES-NDS-1 (5/2/03)

COMMONWEALTH OF PENNSYLVANIA

FISH AND BOAT COMMISSION

NATURAL DIVERSITY SECTION

SPECIES IMPACT REVIEW (SIR) REQUEST FORM

A. This form provides the site information necessary to perform a computer database search for species of special concern listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat Code or the Wildlife Code.

B. Use only ***one form*** for each proposed project or location. Complete the information below and **mail** form to:

Natural Diversity Section
Division of Environmental Services
PA Fish and Boat Commission
450 Robinson Lane
Bellefonte, PA 16823
Fax: (814) 359-5175

C. This form, a cover letter including a project narrative, and accompanying maps should be sent to the above address for environmental reviews that ***only*** concern ***reptiles, amphibians, fishes and aquatic invertebrates.*** Reviews for other natural resources must be submitted to other appropriate agencies.

D. The absence of recorded information from our databases and files does not necessarily imply actual conditions on site. Future field investigations could alter this determination. The information contained in our files is routinely updated. A review is valid for one year.

E. ***Please send us only one (1) copy of your request*** – either by fax or by mail – not both. Mail is preferred to improve legibility of maps. Facsimile submission will not improve our response turn-around time.

F. ***Allow 30 days for completion of the review from the date of PFBC receipt.*** Large projects and workload may extend this review timeframe.

G. ***In any future correspondence with us following your receipt of the SIR response, please refer to the assigned SIR number at the top left of our cover letter.***

H. **FORMS THAT ARE NOT COMPLETED IN FULL WILL NOT BE REVIEWED.**

PLEASE PRINT OR TYPE: If available, provide the potential conflict **PNDI Search Number:** _____

PFBC response should be sent to:

Company/Agency: The Louis Berger Group, Inc. Form Preparer: Sue Sutter

Address: 100 Commercial St, 2nd Floor North, Manchester, NH 03101

Phone (8:00 AM to 4:00 PM): 781-707-7445

Project Description: PPL Electric plans to site and construct a new 138/69 kV transmission line between the proposed North Lancaster substation and the vicinity of the Honey Brook Tap substation.

Indicate if the project is: Transportation ☐ or Non-transportation ☒ (check one)

Will the proposed project encroach directly or indirectly (e.g., runoff) upon wetlands or waterways? Circle one for each:

Wetlands: (Yes) No Unknown Waterways: (Yes) No Unknown

County: Lancaster Township/Municipality: Brecknock, Caernarvon, East Earl

Name of the United States Geological Survey (U.S.G.S.) 7.5 Minute Quadrangle Map where project is located:

Terre Hill, Morgantown, Honey Brook Project size (in acres): Unknown

Attach an 8.5" by 11" photocopy (**DO NOT REDUCE**) of the section of the U.S.G.S. Quadrangle Map which identifies the project location. On this map, indicate the location of the project center (if linear, depict both ends) and outline the approximate boundaries of the project area.

Specify latitude/longitude of the project center. **Latitude:** 40 ° / 10 ’ 06.32” N

Indicate latitude/longitude in degrees-minutes-seconds format only. **Longitude:** 75 ° / 58 ’ 58.52 W

Three steps are needed to convert from decimal degrees to degrees-minutes-seconds: (1) Degrees will be the whole number. (2) To get minutes, multiply the decimal degree portion by 60. (3) Multiply the decimal minute portion by 60 to get seconds.

Example: (Latitude) 40.93748 = **40°**; 0.93748 x 60 = 56.2488’= **56**’; 0.2488 x 60 = 14.928 = **15**” = **40°56’15” N**

(Longitude) 75.94740 = **75°**; 0.94740 x 60 = 56.844’ = **56**’; 0.844 x 60 = 50.64 = **51**” = **75°56’51” W**

FOR PFBC USE ONLY

SIR#	Quad Name	Data Source	Search Result-Potential Species Conflict	Action

THE Louis Berger Group, INC.

April 27, 2012

Department of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552
Harrisburg, Pennsylvania 17105

Re: North Lancaster – Honey Brook 138/69 kV Transmission Line Project
Request for Project Review for Pennsylvania Natural Diversity Inventory
Large Project

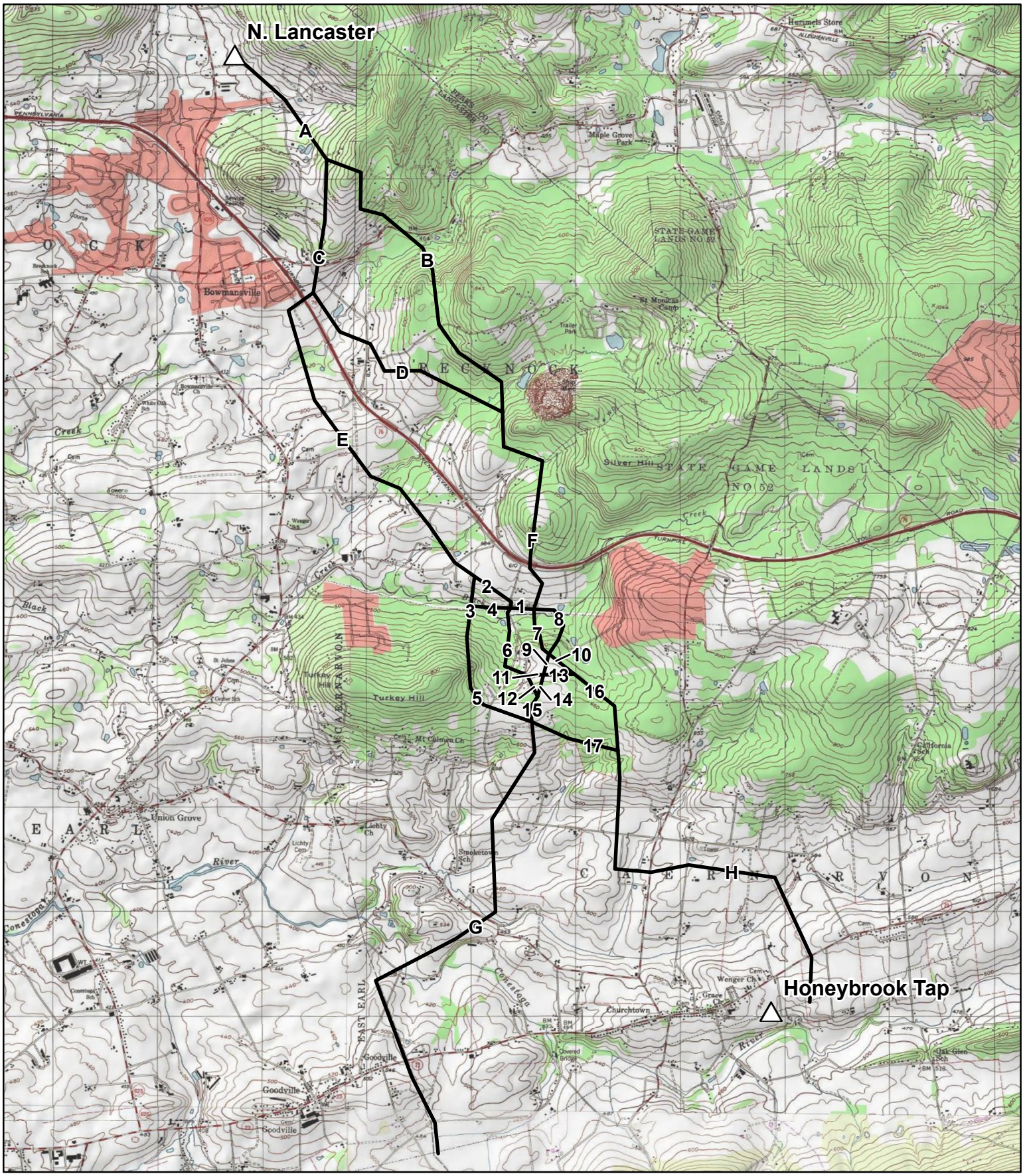
The Louis Berger Group, Inc. (LBG) has been contracted by PPL Electric Utilities (PPL Electric) to conduct a siting study for the proposed North Lancaster – Honey Brook 138/69 kV Transmission Line Project (Project). The Project will begin at PPL Electric's proposed North Lancaster substation in Brecknock Township, Lancaster County, PA, tap an existing line near PPL Electric's Brecknock substation in Brecknock Township, Lancaster County, PA and terminate with a connection to an existing PPL Electric transmission line at a point in either Caernarvon or East Earl Township, Lancaster County, PA. This project is proposed to increase electric reliability within the region. PPL Electric and its consultants have identified several alternative links for further consideration (labeled A through H and 1 through 16 on the attached maps). PPL Electric respectfully requests that your agency provide a preliminary Pennsylvania Natural Diversity Inventory (PNDI) review for current state listed rare, threatened, and endangered species and habitats that are known to occur, or that could potentially occur, in the vicinity of the alternative routes.

The alternative routes under consideration are identified on the attached overview map. Information received from your agency will be used as part of the route evaluation process. As shown on the attached map, the alternative routes are located in Lancaster County and may traverse the townships of Brecknock, Caernarvon and East Earl. The alternatives traverse the following USGS 7.5-minute quadrangle maps: Terre Hill, Morgantown and Honey Brook.

We have attached the completed PNDI Form. Please email Sue Sutter at ssutter@louisberger.com if you would like a copy of the project GIS shapefile. If you are able to provide the locations of any records you find during your PNDI search on a GIS shapefile for us, we would appreciate that as well. Please provide the requested information in writing and by email or fax at your earliest convenience to me at ssutter@louisberger.com or 1001 Elm Street, Suite 203, Manchester, NH 03101. If you have any questions please do not hesitate to contact me at this email address, by phone at 781-707-7445, or by fax at 603-644-5220.

Sincerely,

Sue Sutter
Senior Environmental Scientist
The Louis Berger Group, Inc.



Legend

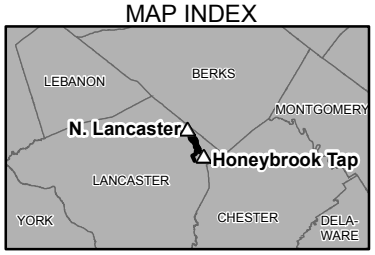
- Substations
- Links

North Lancaster – Honey Brook 138/69 kV

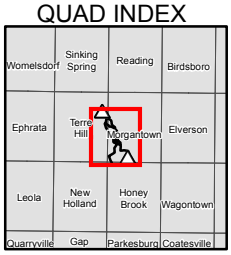
N
W E
S

0 0.5 1 1.5 Miles

MAP INDEX



QUAD INDEX



Pennsylvania Natural Diversity Inventory

Project Planning & Environmental Review Form

This form provides site information necessary to perform an Environmental Review for special concern species and resources listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat code or the Pennsylvania Game and Wildlife Code.

Applicant Information

Name: Ppl Electric Utilities, Ken Kuhns
Address: Two North Ninth St (Genn4) Allentown, Pa 18101
Phone Number: 610.774.2540 Fax Number: 610.774.6239

Contact Person Information - if different from applicant

Name: Sue Sutter The Louis Berger Group, Inc.
Address: 100 Commercial St, 2nd Floor N, Manchester, NH 03101
Phone Number: 781-707-7445 Fax Number: 603-644-5220

Project Information

Project Name: North Lancaster - Honey Brook 138/69 Kv Transmission
Project Location: Lancaster County, Pa
Municipality: Multiple County: Lancaster
☒ Attach a copy of a U.S.G.S. 7 ½ Minute Quadrangle Map with Project Boundaries clearly marked.
U.S.G.S. Quad Name: Multiple, See Letter

Project Description

Proposed Project Activity (including ALL earth disturbance areas and current conditions)

To increase electric reliability in the region, PPL Electric intends to site and construct a new 138/69 kV transmission line between the proposed North Lancaster substation in Brecknock Township and the vicinity of the Honey Brook Tap substation in Caernarvon Township. PPL Electric has identified several alternative links for further consideration (see attached maps). The routes under consideration may traverse the Brecknock, Caervarvon and East Earl townships in Lancaster County, PA.

Total Acres of Property: Unknown Acreage to be Impacted: Unknown

1. Will the entire project occur in or on an existing building, parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes ☐ No ☒
2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project?
   Yes ☒ Aerial xin Feet No ☐
3. Are wetlands located in or within 300 feet of the project area? Yes ☒ No ☐ If No, is this the result of a wetland delineation?

If you have a "PNDI Project Environmental Review Receipt" with potential impacts, please send a receipt copy, this completed form, and a USGS Quad Map to the agency/agencies noted on the receipt. If you are unable to generate a PNDI Receipt because you do not have Internet access, complete this form, attach a USGS Quad Map, and send them to your local DEP or County Conservation District. For review of a "Large Project," please send form and map to all the agencies listed below. See page 2 for more information.

Dept. of Conservation and Natural Resources
Bureau of Forestry, Ecological Services Section
400 Market St., PO Box 8552
Harrisburg, PA 17105
fax: 717-772-0271

PA Fish and Boat Commission
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823
fax 814-359-5175

PA Game Commission
Bureau of Land Management
2001 Elmerton Avenue
Harrisburg, PA 17110-9797
fax: 717-787-6957

US Fish and Wildlife Service
Endangered Species Biologist
315 South Allen St., Suite 322
State College, PA 16801
no faxes please

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PNDI Form Definitions

***Applicant*:** Person that owns the property or is proposing the project or activity

Contact Person: Person to receive response if different than applicant (e.g. Consultant)

Project Name: Descriptive title of project (e.g. Twin Pines Subdivision, Miller Bridge Replacement)

Project Location: Description of actual location (e.g. Intersection of Smith and Clay Rd., Latitude & Longitude)

***Proposed Activity*:** Include ALL earth disturbance activities for project (e.g. for a timber sale—include stream crossings, cutting areas and new roadway accesses). Also include Current Conditions (e.g. housing, farmland, current land cover), and how Construction/Maintenance Activity is to be accomplished

Total Acres of Property: Entire site acreage (e.g. timber sale property—including road access (200 acres)

Acreage to be Impacted: Disturbance acreage (e.g. timber sale—if the property is 200 acres, but only 100 acres will be disturbed, for example: cutting on 90 acres, a road impacting 10 acres); include all temporary and permanent activities

Initial Agency Consultation Responses

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

TO EXPEDITE REVIEW USE
BHP REFERENCE NUMBER

March 15, 2013

Heather Unger, LEED AP
The Louis Berger Group, Inc.
350 Eagleview Boulevard, suite 250
Exton, PA 19341-1178

RE: BHP ER 2013-0973-071-A
North Lancaster Honey Brook 138/69kV Transmission Line
Brecknock, Caernarvon, East Earl Townships, Lancaster County

Dear Ms. Unger:

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

Archaeological Resources
Known archaeological resources are located in your project area and others are likely to exist. The P.A.S.S. numbers for these archaeological resources are listed below. A Phase I archaeological survey of the project area to verify the extent of known sites and to locate any other potentially significant archaeological resources that may exist is recommended but not required. Guidelines and instructions for conducting Phase I archaeological surveys are available on our web site or from our office upon request.

P.A.S.S. 36LA0876 and 36LA1230

FOR YOUR INFORMATION

The Pennsylvania Historical and Museum Commission will keep the Determination Notice and the materials you submitted in its files. Please attach this letter to your copy of the Notice and materials then submit the entire package of materials to DEP.

If this project will require any federal permits or will receive federal funding, the federal agency, under the National Historic Preservation Act of 1966, may require the appropriate

surveys to be conducted. If the project will need a U.S. Army Corps of Engineers permit, this would be a **Category III** activity. We suggest that you consider conducting the survey early in the development or planning process to avoid delays in the future.

Above Ground Resources

A preliminary review of this project indicates that there are National Register-listed or eligible historic resources in the project area as documented on the submitted USGS map.

A preliminary review of this project indicates that there may be National Register eligible historic buildings, structures, districts, and objects in the project area. In order to facilitate the review process, project planners should conduct surveys to identify these resources before final plans are developed. For more information on survey strategies and methodologies, please contact the staff referenced below.

If you need further information regarding archaeological resources, please contact Steven McDougal at (717) 772-0923. If you need further information concerning historic structures, please contact Cheryl Nagle at (717) 772-4519.
or chnagle@pa.gov.

Sincerely,

Douglas C. McLearen, Chief
Division of Archaeology & Protection

DCM/cln

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

June 5, 2012

Sue Sutter
The Louis Berger Group, Inc.
100 Commercial Street
2nd Floor North
Manchester, NH 03101

RE: USFWS Project #2012-0790

Dear Ms. Sutter:

This responds to your letter of April 27, 2012, requesting information about federally listed and proposed endangered and threatened species within the area affected by PPL Electric Utilities proposed North Lancaster to Honey Brook 138/69 kV transmission line project located in Brecknock and Caernarvon or East Earl Townships, Lancaster 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.

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.

In cases where adverse effects to federally listed species cannot be avoided, further consultation with the Service would be necessary to avoid potential violations of section 9 (prohibiting "take" of listed species) and/or section 7 (requiring federal agencies to consult) of the Endangered Species Act. Information about the section 7 and section 10 consultation processes (for federal and non-federal actions, respectively) can be obtained by contacting this office or accessing the Service's Endangered Species Home Page (http://endangered.fws.gov).

This response relates only to endangered and threatened species under our jurisdiction, based on an office and/or field review of the proposed project. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities. A compilation of certain federal status species in Pennsylvania is enclosed for your information.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

Please contact Bonnie Dershem of my staff at 814-234-4090 if you have any questions regarding this matter.

Sincerely,

Clinton Riley
Field Office Supervisor

Enclosures

Pennsylvania Fish & Boat Commission

FAX to: 603-644-5220

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

May 29, 2012

IN REPLY REFER TO
SIR # 38667

SUE SUTTER
THE LOUIS BERGER GROUP
100 COMMERCIAL STREET
SECOND FLOOR
MANCHESTER, NH 03101

RE: Species Impact Review (SIR) - Rare, Candidate, Threatened and Endangered Species
NORTH LANCASTER - HONEY BROOK 138/69 Kv TRANSMISSION
PNDI Search Number (if available): LARGE PROJECT REVIEW
MULTIPLE MUNICIPALTIES, LANCASTER County, Pennsylvania

This responds to your inquiry about a Pennsylvania Natural Diversity Inventory (PNDI) Internet Database search "potential conflict" or a threatened and endangered species impact review. These projects are screened for potential conflicts with rare, candidate, threatened or endangered species under Pennsylvania Fish & Boat Commission jurisdiction (fish, reptiles, amphibians, aquatic invertebrates only) using the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files. These species of special concern are listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, and the Pennsylvania Fish & Boat Code (Chapter 75), or the Wildlife Code. The absence of recorded information from our files does not necessarily imply actual conditions on site. Future field investigations could alter this determination. The information contained in our files is routinely updated. A Species Impact Review is valid for one year only.

_X_ ***NO ADVERSE IMPACTS EXPECTED FROM THE PROPOSED PROJECT***

_X_ Except for occasional transient species, rare, candidate, threatened or endangered species under our jurisdiction are not known to exist in the vicinity of the project area. Therefore, no biological assessment or further consultation regarding rare species is needed with the Commission. Should project plans change, or if additional information on listed or proposed species becomes available, this determination may be reconsidered.

___ An element occurrence of a rare, candidate, threatened, or endangered species under our jurisdiction is known from the vicinity of the proposed project. However, given the nature of the proposed project, the immediate location, or the current status of the nearby element occurrence(s), no adverse impacts are expected to the species of special concern.

If you have any questions regarding this review, please contact the biologist indicated below:

___	Chris Urban	814-359-5113	_X_	Kathy Gipe	814-359-5186
___	Douglas Fischer	814-359-5195	___	Bob Morgan	814-359-5129

Thank you in advance for your cooperation and attention to this important matter of species conservation and habitat protection.

SIGNATURE: _____ DATE: May 29, 2012

Christopher A. Urban
Chief, Natural Diversity Section

pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES

BUREAU OF FORESTRY

May 18, 2012 **PNDI Number: 021836**

Sue Sutter
The Louis Berger Group, Inc.
1001 Elm Street, Suite 203
Manchester, NH 03101
Email: ssutter@louisberger.com (hard copy not to follow)

Re: North Lancaster – Honey Brook 138/kV Transmission Line Project
Brecknock and/or Caernarvon/East Earl Townships, Lancaster County

Dear Ms. Sutter,

Thank you for the submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number **021836** 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 in the project vicinity. Based on a detailed PNDI review, DCNR determined potential impacts to the following threatened or endangered species or species of special concern. Please note our new survey protocols are available at http://www.gis.dcnr.state.pa.us/hgis-er/Login.aspx.

Scientific Name	Common Name	PA Current Status	PA Proposed Status
Trillium cernuum	Nodding trillium	Undetermined	Threatened
Aplectrum hyemale	puttyroot	Rare	Rare

Survey Request
DCNR requests a targeted area survey for the following species:

- *Trillium cernuum* (nodding trillium) – habitat is moist woods, especially near streams – flowers in April – May – (early in 2012)-The target alternative line (according to your map) is Lines B, F, and SE portion of D, and Lines 3, 4, 6 and 8-
- *Aplectrum hyemale* (puttyroot) – habitat is moist, rich woods, slopes and bottomlands – flowers in May – August, leaf is visible in fall and winter up to very early spring only– The target alternative line (according to your map) is Lines B, F, and SE portion of D, and 3, 4, 6, 7, 8, 16 and 17-
- 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.**
- Your botanist should *fill out the field survey form while performing their survey*: http://www.gis.dcnr.state.pa.us/hgis-er/hgis/Internet%20Field%20Survey%20Form_2007.pdf. 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.

- **Please note: If additional details regarding this project are revealed, and impacts to wetlands and/or target areas are avoided, please contact me and a "no impact" letter with avoidance measures can be issued.**
- 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.

Conservation Measure—Voluntary Action
Please provide a vegetated buffer between the wetland and the project area in order to protect the ecological integrity of the wetlands in the area. In addition, if at all possible, please clean all construction equipment and vehicles thoroughly (especially the undercarriage and wheels) before they are brought on site; this will remove invasive plant seeds from the equipment and undercarriage of the vehicles that have been picked up from other sites.

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,

Frederick Sechler Jr, Environmental Review Specialist FOR Chris Firestone, Wild Plant Program Mgr.
Ph: 717-705-2819 ~ c-frsechle@ pa.gov

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."

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

Division of Environmental Planning and Habitat Protection
717-783-5957

July 13, 2012

Large Project PNDI Review

Ms. Sue Davis
The Louis Berger Group
100 Commercial Drive, 2nd Floor North
Manchester, New Hampshire 03101

Re: North Lancaster-Honey Brook 138/69 kV Transmission Line – Proposed Transmission Line
Brecknock, Caervarvon, and East Earl Townships, Lancaster County, Pennsylvania

Dear Ms. Davis,

Thank you for submitting your Pennsylvania Natural Diversity Inventory (PNDI) Large Project Environmental Review request. 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. The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and has determined that there are no known occurrences of state listed **threatened or endangered** bird or mammal species associated with your project. However, potential impacts to **species of special concern** may be associated with your project, and as a result, additional measures are recommended to avoid potential impacts to the species listed below.

Conservation Measure

The following is a mammal species that was also identified within the vicinity of the project. This species is of special concern, and therefore, are not a target species for a survey:

Scientific Name	Common Name
Myotis septentrionalis	Northern myotis

However, because of their ecological significance, the following seasonal restriction is suggested for all alternatives (identified as A through H) to avoid potential impacts to *Myotis septentrionalis* and other tree roosting bats within the area:

- *To the best extent practicable, all trees or dead snags greater than 5 inches in diameter at breast height that need to be harvested to facilitate the project shall be cut between November 1 and March 31.*

In addition, portions of the Alternative F alignment are located on or adjacent to State Game Lands #052. Please contact the Southeast Regional Office at (610) 926-3136 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 two (2) years 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 two additional years.

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. Mowery

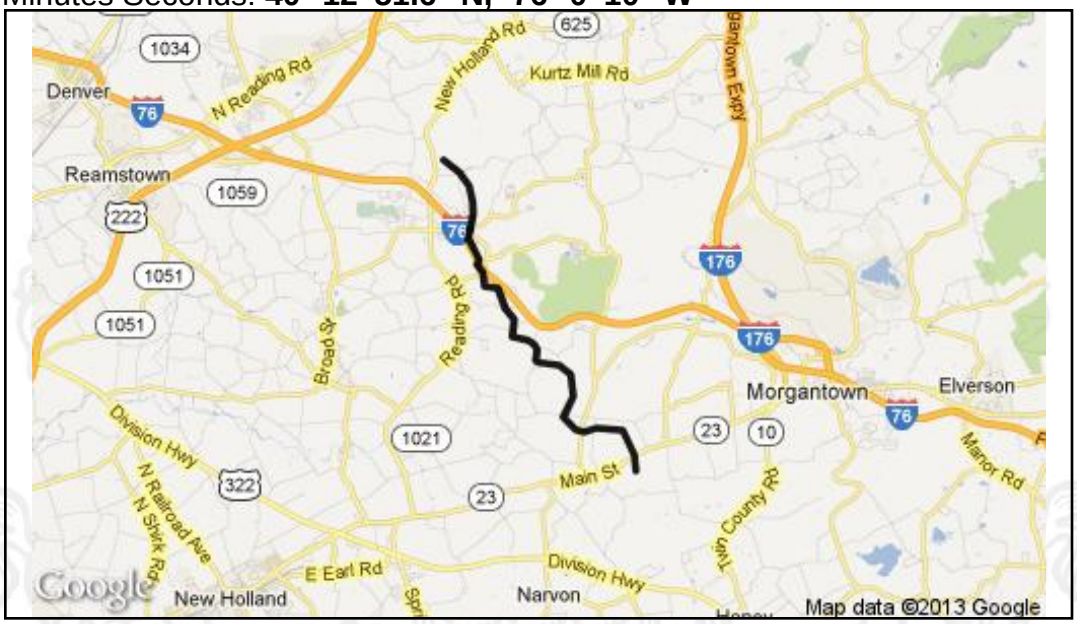
Olivia A. Mowery
Environmental Planner
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3128
Fax: 717-787-6957
E-mail:OMowery@pa.gov

A PNHP Partner

OAM/oam

1. PROJECT INFORMATION

Project Name: **North Lancaster – Honey Brook PNDI Review Receipt 05-02-13**
Date of review: **5/2/2013 1:58:16 PM**
Project Category: **Energy Storage, Production, and Transfer,Energy Transfer,Power/electric line - New (new location for above/under-ground line)**
Project Area: **120.2** acres
County: **Lancaster** Township/Municipality: **Brecknock,Caernarvon**
Quadrangle Name: **MORGANTOWN** ~ ZIP Code: **17555,17519,19540**
Decimal Degrees: **40.214341 N, -76.002774 W**
Degrees Minutes Seconds: **40° 12' 51.6" N, -76° 0' 10" W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	**Potential Impact**	**MORE INFORMATION REQURIED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

RESPONSE TO QUESTION(S) ASKED

Q1: Will this project or any project-related activities require any in-stream work, or a permanent or temporary crossing of a waterway (stream, river, creek, tributary)?
Your answer is: **1. Yes**

Q2: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: **4. Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)**

3. AGENCY COMMENTS

Regardless of whether a DEP permit is necessary for this proposed project, any potential impacts to threatened and endangered species and/or special concern species and resources must be resolved with the appropriate jurisdictional agency. In some cases, a permit or authorization from the jurisdictional agency may be needed if adverse impacts to these species and habitats cannot be avoided.

These agency determinations and responses are **valid for two years** (from the date of the review), and are based on the project information that was provided, including the exact project location; the project type, description, and features; and any responses to questions that were generated during this search. If any of the following change: 1) project location, 2) project size or configuration, 3) project type, or 4) responses to the questions that were asked during the online review, the results of this review are not valid, and the review must be searched again via the PNDI Environmental Review Tool and resubmitted to the jurisdictional agencies. The PNDI tool is a primary screening tool, and a desktop review may reveal more or fewer impacts than what is listed on this PNDI receipt. The jursidictional agencies **strongly advise against** conducting surveys for the species listed on the receipt prior to consultation with the agencies.

PA Game Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Department of Conservation and Natural Resources

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern species and resources.

PA Fish and Boat Commission

RESPONSE: No Impact is anticipated to threatened and endangered species and/or special concern

species and resources.

U.S. Fish and Wildlife Service

RESPONSE: Information Request: Conduct a "Bog Turtle Habitat Survey" (Phase 1 survey) in accordance with the U.S. Fish and Wildlife Service's (USFWS) Guidelines for Bog Turtle Surveys (April 2006 revision). The Phase 1 survey should evaluate all wetlands on the land parcel or within the project area (whichever is greater). The project area includes all areas that will be impacted by earth disturbance or project-associated features, including but not limited to, roads, water and sewer lines, utility lines, stormwater and sedimentation basins, buildings and other structures, driveways, parking lots, staging areas, yards, lawns, trails, wells, and ponds PLUS at least a 300-foot buffer around these features. Due to the skill required to correctly identify potential bog turtle habitat, the Phase 1 survey should be done by a qualified bog turtle surveyor (list available from the USFWS upon request). Send Phase 1 survey results to the USFWS for review and concurrence, and if potential bog turtle habitat is found, also send 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, further coordination/consultation with the USFWS will be necessary.

WHAT TO SEND TO JURISDICTIONAL AGENCIES

If project information was requested by one or more of the agencies above, send the following information to the agency(s) seeking this information (see AGENCY CONTACT INFORMATION).

Check-list of *Minimum* Materials to be submitted:

____**SIGNED** copy of this Project Environmental Review Receipt
____Project narrative with a description of the overall project, the work to be performed, current physical characteristics of the site and acreage to be impacted.
____Project location information (name of USGS Quadrangle, Township/Municipality, and County)
____USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

4. DEP INFORMATION

The Pa Department of Environmental Protection (DEP) requires that a signed copy of this receipt, along with any required documentation from jurisdictional agencies concerning resolution of potential impacts, be submitted with applications for permits requiring PNDI review. For cases where a "Potential Impact" to threatened and endangered species has been identified before the application has been submitted to DEP, the application should not be submitted until the impact has been resolved. For cases where "Potential Impact" to special concern species and resources has been identified before the application has been submitted, the application

should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name:_____
Company/Business Name:_____
Address:_____
City, State, Zip:_____
Phone:(_____)_____Fax:(_____)_____
Email:_____

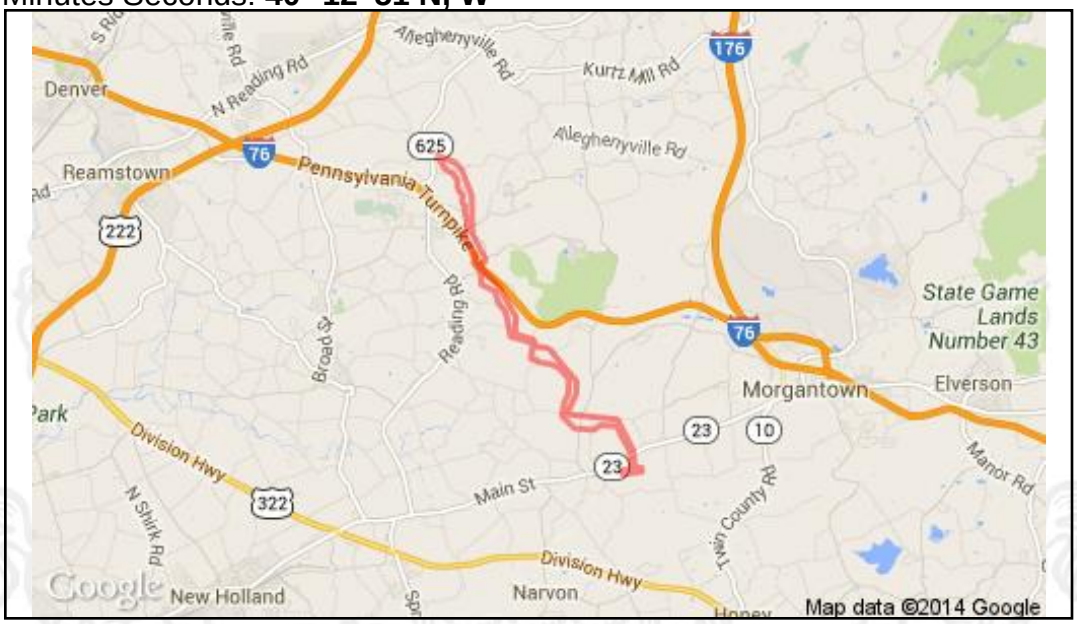
8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

_____ _____
applicant/project proponent signature date

1. PROJECT INFORMATION

Project Name: **lauschtown-honeybrook**
Date of review: **2/6/2014 4:00:10 PM**
Project Category: **Energy Storage, Production, and Transfer,Energy Transfer,Power/electric line - New (new location for above/under-ground line)**
Project Area: **642.5** acres
County: **Lancaster** Township/Municipality: **Caernarvon,Brecknock**
Quadrangle Name: **MORGANTOWN** ~ ZIP Code: **17555,17519,19540**
Decimal Degrees: **40.214423 N, -76.009078 W**
Degrees Minutes Seconds: **40° 12' 51 N, W**



2. SEARCH RESULTS

Agency	Results	Response
PA Game Commission	No Known Impact	No Further Review Required
PA Department of Conservation and Natural Resources	No Known Impact	No Further Review Required
PA Fish and Boat Commission	No Known Impact	No Further Review Required
U.S. Fish and Wildlife Service	**Potential Impact**	**MORE INFORMATION REQURIED, See Agency Response**

As summarized above, Pennsylvania Natural Diversity Inventory (PNDI) records indicate there may be potential impacts to threatened and endangered and/or special concern species and resources within the project area. If the response above indicates "No Further Review Required" no additional communication with the respective agency is required. If the response is "Further Review Required" or "See Agency Response," refer to the appropriate agency comments below. Please see the DEP Information Section of this receipt if a PA Department of Environmental Protection Permit is required.

Note that regardless of PNDI search results, projects requiring a Chapter 105 DEP individual permit or GP 5, 6, 7, 8, 9 or 11 in certain counties (Adams, Berks, Bucks, Carbon, Chester, Cumberland, Delaware, Lancaster, Lebanon, Lehigh, Monroe, Montgomery, Northampton, Schuylkill and York) must comply with the bog turtle habitat screening requirements of the PASPGP.

RESPONSE TO QUESTION(S) ASKED

Q1: Will this project or any project-related activities require any in-stream work, or a permanent or temporary crossing of a waterway (stream, river, creek, tributary)?
Your answer is: **1. Yes**

Q2: Accurately describe what is known about wetland presence in the project area or on the land parcel by selecting ONE of the following. "Project" includes all features of the project (including buildings, roads, utility lines, outfall and intake structures, wells, stormwater retention/detention basins, parking lots, driveways, lawns, etc.), as well as all associated impacts (e.g., temporary staging areas, work areas, temporary road crossings, areas subject to grading or clearing, etc.). Include all areas that will be permanently or temporarily affected -- either directly or indirectly -- by any type of disturbance (e.g., land clearing, grading, tree removal, flooding, etc.). Land parcel = the lot(s) on which some type of project(s) or activity(s) are proposed to occur.
Your answer is: **4. Someone qualified to identify and delineate wetlands has investigated the site, and determined that wetlands ARE located in or within 300 feet of the project area. (A written report from the wetland specialist, and detailed project maps should document this.)**

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PA Department of Conservation and Natural Resources

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____Project location information (name of USGS Quadrangle, Township/Mu?icipality, and County)
____USGS 7.5-minute Quadrangle with project boundary clearly indicated, and quad name on the map

The inclusion of the following information may expedite the review process.
____A basic site plan(particularly showing the relationship of the project to the physical features such as wetlands, streams, ponds, rock outcrops, etc.)
____Color photos keyed to the basic site plan (i.e. showing on the site plan where and in what direction each photo was taken and the date of the photos)
____Information about the presence and location of wetlands in the project area, and how this was determined (e.g., by a qualified wetlands biologist), if wetlands are present in the project area, provide project plans showing the location of all project features, as well as wetlands and streams

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should be submitted to DEP along with the PNDI receipt. The PNDI Receipt should also be submitted to the appropriate agency according to directions on the PNDI Receipt. DEP and the jurisdictional agency will work together to resolve the potential impact(s). See the DEP PNDI policy at http://www.naturalheritage.state.pa.us.

5. ADDITIONAL INFORMATION

The PNDI environmental review website is a **preliminary** screening tool. There are often delays in updating species status classifications. Because the proposed status represents the best available information regarding the conservation status of the species, state jurisdictional agency staff give the proposed statuses at least the same consideration as the current legal status. If surveys or further information reveal that a threatened and endangered and/or special concern species and resources exist in your project area, contact the appropriate jurisdictional agency/agencies immediately to identify and resolve any impacts.

For a list of species known to occur in the county where your project is located, please see the species lists by county found on the PA Natural Heritage Program (PNHP) home page (www.naturalheritage.state.pa.us). Also note that the PNDI Environmental Review Tool only contains information about species occurrences that have actually been reported to the PNHP.

6. AGENCY CONTACT INFORMATION

PA Department of Conservation and Natural Resources

Bureau of Forestry, Ecological Services Section
400 Market Street, PO Box 8552, Harrisburg, PA. 17105-8552
Fax:(717) 772-0271

U.S. Fish and Wildlife Service

Endangered Species Section
315 South Allen Street, Suite 322, State College, PA. 16801-4851
NO Faxes Please.

PA Fish and Boat Commission

Division of Environmental Services
450 Robinson Lane, Bellefonte, PA. 16823-7437
NO Faxes Please

PA Game Commission

Bureau of Wildlife Habitat Management
Division of Environmental Planning and Habitat Protection
2001 Elmerton Avenue, Harrisburg, PA. 17110-9797
Fax:(717) 787-6957

7. PROJECT CONTACT INFORMATION

Name:_____
Company/Business Name:_____
Address:_____
City, State, Zip:_____
Phone:(_____)_____Fax:(_____)_____
Email:_____

8. CERTIFICATION

I certify that ALL of the project information contained in this receipt (including project location, project size/configuration, project type, answers to questions) is true, accurate and complete. In addition, if the project type, location, size or configuration changes, or if the answers to any questions that were asked during this online review change, I agree to re-do the online environmental review.

_____ _____
applicant/project proponent signature date

ATTACHMENT 15

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ATTACHMENT 15
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
CULTURAL RESOURCES REPORT

The following tables identify National Register of Historic Places (NRHP) listed, eligible and potentially eligible or unevaluated cultural resources located within 2 miles of the Alternative Routes. Ineligible resources are not included in this Attachment. Previously identified cultural resources located within the Study Area are discussed in Attachment 3, Section 2.3 and resources located within 1 mile of the Alternative Routes are discussed in Attachment 4, Section 5.2.3.

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
036734	Isaac Beam House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036733	Saint Paul's Lutheran Reformed Church	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036748	Peter B. Good Tavern/Hotel	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036776	Samuel Bowman House/Store	Lancaster	Brecknock Township	Building	Eligible	1/8/1993	Yes
001092	John B. Good House	Lancaster	Brecknock Township	Site	Listed	2/8/1980	Yes
036774	John Boehm House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036779	Christian & Judi H. Musselman	Lancaster	Brecknock Township	Building	Eligible	4/2/1998	Yes
036771	John & Mary Ann Frees House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036747	Daniel Musser House	Lancaster	Brecknock Township	Building	Undetermined	N/A	No
036749	Brossman House	Lancaster	Brecknock Township	Building	Undetermined	N/A	No
036739	John Becker House	Lancaster	Brecknock Township	Building	Undetermined	N/A	No
036740	Jonas Good House	Lancaster	Brecknock Township	Building	Undetermined	N/A	No

[1] Some previously identified cultural resources are located outside of the project Study Area, but within 2 miles of the Alternative Routes.

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
036777	John Adam Vonneida House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036769	Henry Vonneida House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036762	Bowmansville Mennonite Church	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036780	Peter Mauser	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036760	White Oak School	Lancaster	Brecknock Township	Building	Undetermined	N/A	No
036730	Christian Schneder House	Lancaster	Brecknock Township	Building	Eligible	7/1/1993	No
070905	Jacob Schneder House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070946	Saint John's Reformed-Lutheran Church	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070922	Schneder-Schweitzer House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070921	Jonas Renninger House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
036727	Henry Good House	Lancaster	Brecknock Township	Building	Undetermined	N/A	No
036728	Anthony Good Barn	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036725	Peter Boehm House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036770	Reifsnyder-Baker House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036743	Samuel Good House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036744	Jacob Burgett House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
036729	Christian Miller House	Lancaster	Brecknock Township	Building	Undetermined	N/A	Yes
070849	Kreider House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070845	John Adam Styer House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
093626	Ziemer's Public House	Berks	Brecknock Township	Building	Undetermined	N/A	No

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
093617	Christian Bowman, Homestead	Berks	Brecknock Township	Building	Undetermined	N/A	No
093614	Widow Hoover's Farm	Berks	Brecknock Township	Building	Undetermined	N/A	No
093613	Horning Farm	Berks	Brecknock Township	Building	Undetermined	N/A	No
093612	Allegheny Church School	Berks	Brecknock Township	Building	Undetermined	N/A	No
093611	Allegheny Church	Berks	Brecknock Township	Building	Undetermined	N/A	No
093610	Village of Alleghenyville	Berks	Brecknock Township	Building	Undetermined	N/A	No
070895	Beartown Inn	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070891	Ann Evans, House	Lancaster	Caernarvon Township	Building	Listed	5/9/2002	No
070860	James Evans House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070857	W. Benner House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070832	Nathan Evans House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070938	Catherine Sensenig House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070935	George Stauffer, House; 99 Breaker Lane Farm; Henry S. Martin, Farm	Lancaster	East Earl Township	Building	Eligible	7/1/1993	No
070934	Joseph Stauffer Farm	Lancaster	East Earl Township	Building	Eligible	12/2/2004	No
070919	Lichty House	Lancaster	East Earl Township	Building	Undetermined	N/A	Yes
070841	Weber Property	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070859	William Witman House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070861	John Zimmerman, House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070931	Red Lion Tavern	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070936	Peter Good Store	Lancaster	East Earl Township	Building	Undetermined	N/A	No

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
070959	Henry Shirk, House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070957	Abraham Martin House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070867	Henry Shirk House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070880	M. Ringwalt House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
050792	Pool Forge Covered Bridge	Lancaster	Caernarvon Township	Bridge	Listed	12/10/1980	Yes
070855	Caernarvon Mill	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070869	Wheatland Mansion	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070856	Henry Martin House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070960	Martin Shirk House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070956	Oberholtzer Mill	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070958	Cyrus Jacob House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070915	Weaver-Stauffer House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070964	Shirk-High House	Lancaster	East Earl Township	Building	Undetermined	N/A	Yes
070966	Kinzer Tenant House	Lancaster	East Earl Township	Building	Undetermined	N/A	No
070835	David Hurst House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070848	Bingham, S.G. House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070846	Cyrus Jacobs House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070839	Fairview Roller Mill	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070838	Isaac Jenkins House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070901	Windsor Forge Mansion; Windsor Place	Lancaster	Caernarvon Township	District	Listed	1/4/1990	Yes

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
106058	Churchtown Historic District	Lancaster	Caernarvon Township	District	Eligible	4/3/1997	Yes
070885	Ellmaker House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070874	Wm & Elizabeth Jenkins, House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070884	Alfred Nevin House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070877	Bangor Episcopal Church	Lancaster	Caernarvon Township	Building	Listed	4/30/1987	Yes
096375	Edward Davies House	Lancaster	Caernarvon Township	Building	Listed	9/6/1991	Yes
070871	Ann Shay Evans House (Mrs. Wm.)	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070878	Caernarvon Presbyterian Church	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070879	Methodist	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070847	Cyrus Jacobs House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070842	Cyrus Jacobs House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070898	Cyrus Jacobs House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	Yes
070840	John Jr. Jenkins House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070851	John Jr. Jenkins House	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070862	Grube's Mill	Lancaster	Caernarvon Township	N/A	Undetermined	N/A	No
070876	Shirk's School	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
070863	David Mast Farmstead	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No
036772	Bowmansville Roller Mill; Von Neida Mill	Lancaster	Brecknock Township	District	Listed	1/19/1990	Yes

Table 15-1
Historic Architectural Sites Within 2 Miles of the Alternative Routes

Key #	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
122695	Eastern Pennsylvania Turnpike: Philadelphia Extension (Carlisle to Valley Forge)	Multi-Counties	Multi-Municipalities	Structure	Eligible	10/25/2002	Yes
070893	New Zion Church of United Evangelical Assoc.	Lancaster	Caernarvon Township	Building	Undetermined	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA0942	Kings Potato Chip	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1406	LaBk-15	Lancaster	Brecknock Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1105	N/A	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0165	LABK-6	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0392	Hartranft	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0882	LABK-8	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0335	Clarence Messner Number 1	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA0344	Weaver's Bridge	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Considered Not Eligible by Submitter	N/A	No
36LA1405	LaBk-14	Lancaster	Brecknock Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	No
36LA0339	LABK-4	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1027	Unit 269, Site A	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0094	Hurst	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1407	LaCn-18	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36BK0602	N/A	Berks	Brecknock Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	No
36BK0601	N/A	Berks	Brecknock Township	N/A	Insufficient Data Available to Make a Decision	N/A	No
36LA0164	LABK-5	Lancaster	Brecknock Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0091	Price	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36CH0068	CHHB-20	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1047	Unit 359, Site B	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0071	Boley Site	Lancaster	East Earl Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1048	Unit 359, Site C	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1046	Unit 359, Site A	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1462	Ligalaw	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1041	Unit 319, Site A	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1043	Unit 319, Site C	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No
36LA1042	Unit 319, Site B	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1044	Unit 319, Site D	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA1045	Unit 319, Site E	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0277	LACN-10	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1026	Unit 298, Site B	Lancaster	East Earl Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1025	Unit 298, Site A	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0044	Pool Forge	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1071	Unit 356, Site A	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1072	Unit 356, Site B	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1073	Unit 356, Site C	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA259A	N/A	Lancaster	East Earl Township	N/A	Insufficient Data Available to Make a Decision	N/A	No
36LA1021	Unit 259, Site A1	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA1024	Unit 259, Site B	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No
36LA1022	Unit 259, Site A3	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No
36LA1023	Unit 259, Site A4	Lancaster	East Earl Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No
36LA0951	Horst	Lancaster	East Earl Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1019	Unit 222, Site C	Lancaster	East Earl Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	No
36LA0964	LAEE-8	Lancaster	East Earl Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0166	LAEE-6	Lancaster	East Earl Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1230	LACN-14	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0428	LACN-11	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0959	LACN-13	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA0876	LACN-12	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0089	Yohn	Lancaster	N/A	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0313	LACN-5	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1464	Nolt	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Considered Not Eligible by Submitter	N/A	Yes
36LA0310	LACN-1	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0075	Smucker Number 1	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0059	Smucker Number 2	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0090	Hurst	Lancaster	Bart Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1159	LACA - 4	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0026		Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA0316	LACN-8	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1250	LACA-6	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0311	LACN-3	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0314	LACN-6	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	Yes
36LA1069	Unit 466, Site A	Lancaster	Caernarvon Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	Yes
36LA0024	N/A	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1070	Unit 466, Site B	Lancaster	Caernarvon Township	Lithic Reduction	Insufficient Data Available to Make a Decision	N/A	No
36LA0315	LACN-7	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA0025		Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1330	LACA-1	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36LA1465	Red School	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Considered Not Eligible by Submitter	N/A	Yes
36LA1467	A. Stoltzfus 1	Lancaster	Caernarvon Township	Open Prehistoric Site, Unknown Function	Considered Not Eligible by Submitter	N/A	No
36LA0312	LACN-4	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Considered Not Eligible by Submitter	N/A	No
36LA0317	LACN-9	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1461	A. Stoltzfus 2	Lancaster	Caernarvon Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0742	ChHb-32	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0274	Dutt #18	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0266	Dutt #19	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0064	CHHB-15	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0140	CHHB-12	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No

Table 15-2
Archaeological Sites Within 2 Miles of the Alternative Routes

Site Number	Name	County	Municipality	Type	NRHP Status	Evaluation or Listing Date	Within Study Area[1]
36CH0139	CHHB-10	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0752	ChHb-36	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0751	ChHb-35	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0267	Dutt #21	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36CH0547	N/A	Chester	Honey Brook Borough	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	No
36CH0131	Clyde Kiefer Site	Chester	Honey Brook Township	Open Habitation, Prehistoric	Insufficient Data Available to Make a Decision	N/A	No
36LA1028	Unit 287, Site A	Lancaster	Brecknock Township	Open Prehistoric Site, Unknown Function	Insufficient Data Available to Make a Decision	N/A	Yes

ATTACHMENT 16

REMOVE THIS PAGE

ATTACHMENT 16
NORTH LANCASTER – HONEY BROOK 138/69 KV LINE
PUBLIC NOTICE REQUIREMENTS

PPL Electric Utilities Corporation (PPL Electric) proposes to construct the North Lancaster-Honey Brook #1 & #2 138/69 kV Transmission Lines in Lancaster County, Pennsylvania (the "North Lancaster-Honey Brook Project"). The proposed North Lancaster-Honey Brook Project is required to improve reliability of service for approximately 32,000 customers in Honey Brook and Caernarvon Townships in Chester, Berks, and Lancaster Counties. The North Lancaster-Honey Brook Project will bring a new alternate source of supply closer to the growing load centers and reduce the line length and loading on the existing 138/69 kV lines serving the area. The new transmission lines also will allow for improved operating flexibility to restore customer load more quickly after a facility outage.

The estimated cost to site, design, and construct this project is approximately $18 million. Construction of this project is scheduled to begin in January 2015 to meet an in-service date of May 2016.

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 who will be subject to the rights-of-way and easements for the proposed Project. These packets of information 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 Project 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.
- A Request for Survey Permission

Following this Attachment are the forms of the information that were sent to all landowners that will be subject to the rights-of-way and easements for the Project. In addition, copies of the Application and supporting Attachments or Notice of Filing are being served in accordance with the provisions of Section 57.74 of the Commission's regulations, 52 Pa. Code 57.74.

INFORMATION PACKET

Date

Property Owner Information

Dear Property Owners:

PPL Electric Utilities Corporation (PPL) is planning to build an electric transmission line, North Lancaster to Honey Brook 138/69 KV, in Brecknock and Caernarvon townships, Lancaster County, Pennsylvania. The new transmission line is needed to meet increased demands 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.

PPL plans to negotiate with the applicable landowners to acquire right-of-way to accommodate the new transmission line. Where the new line is proposed, 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
- Glossary of Real Estate Terms

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 new, double-circuit 138/69 kV transmission line between PPL's proposed North Lancaster substation in Brecknock Township, Lancaster County and an existing transmission line in either Caernarvon Township or East Earl Township, Lancaster 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 Utilities Corporation'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 meters 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 138/69 kV 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

PPL Corporation has a long-standing commitment to conducting business in an honest and ethical manner. Consistent with the expectations for our employees and representatives laid out in the PPL Standards of Conduct and Integrity, and in the Standards of Conduct and Integrity for Suppliers, PPL Electric Utilities Corporation's employees, contractors and agents who interact with members of the public (including landowners along proposed rights of way) in activities such as planning; real estate and right-of-way transactions; siting; and construction of power lines and other facilities will:

- 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.
- Seek to avoid conflicts of interest.
- Accept responsibility for actions and decisions.
- Be responsible stewards of the environment.
- Place a high priority on the safety of the public and our representatives and employees.

NOTICE
LAND AGENT PRACTICES

PPL Electric Utilities Corporation is presently planning to construct a 138/69kv electric transmission line to be known as the North Lancaster to Honey Brook 138/69kv line through Brecknock and Caernarvon Earl Townships, Lancaster County, Pennsylvania. Since the route could affect your property, a representative from PPL Electric Utilities Corporation will contact you in the near future to discuss the utility's plans as they may affect your property.

The Pennsylvania Public Utility Commission requires that PPL Electric Utilities Corporation provide you the following contact information for concerns regarding the practices of the land agents acting on behalf of PPL Electric Utilities Corporation in connection with the proposed construction of the proposed North Lancaster to Honey Brook 138/69kv line:

James P. Melia
Pennsylvania Public Utility Commission
400 North Street
Harrisburg PA 17105
717-787-1859
jmelia@state.pa.us

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.

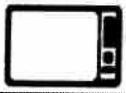
Q. What is PPL doing about EMF?
A. PPL has a magnetic field management program to design and build new lines when practicable in ways that allow us to reduce magnetic fields at low cost to our customers. For instance, we reverse the phases of new overhead double-circuit transmission lines, which results 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?

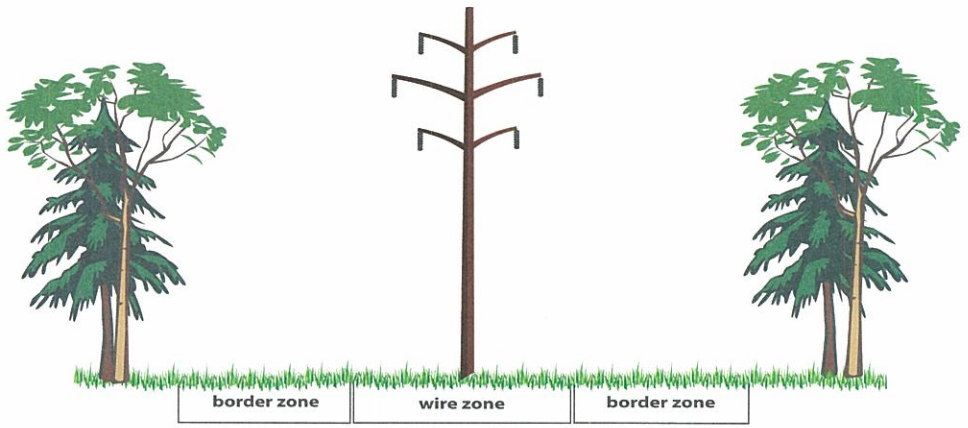
The wire zone is the area directly under the power lines. Trees are typically removed from the wire zone because they are incompatible with high-voltage wires. Over time, low-growing grasses and other species native to the area will be permitted.

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.

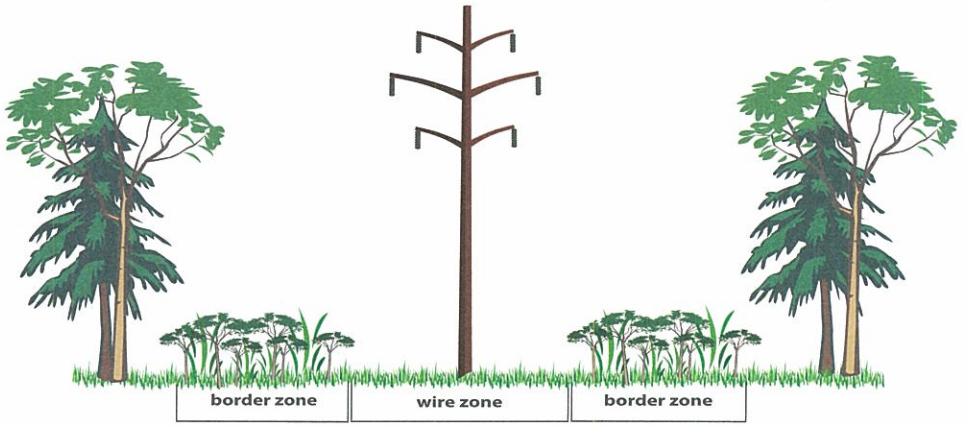
In some areas, we use herbicides to effectively manage undesirable vegetation conditions along our power lines. We only use herbicide products that have been approved for use by the U.S. Environmental Protection Agency. Some of the materials our contractors will use are the same as those commonly used 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

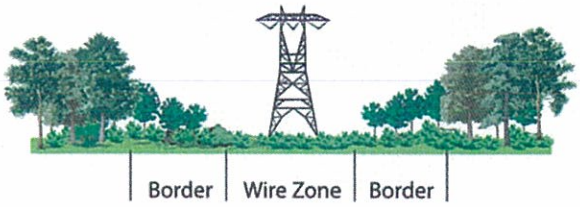
Keeping electricity reliability strong

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.

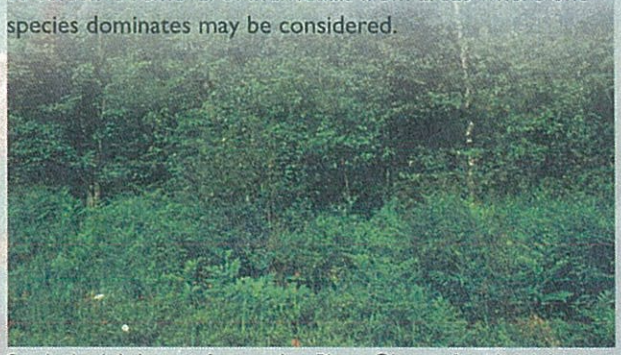


Scrub-Shrub Habitat

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 REAL ESTATE TERMS

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.

Agent Information

RE: SURVEY PERMISSION
NORTH LANCASTER – HONEY BROOK PROJECT

Dear Property Owner:

In order for PPL Electric Utilities Corporation [PPL] to design its transmission line various surveys need to be performed. These land surveys include; but are not limited to, property boundary locations, Utility easement location and centerline Environmental and Archeological surveys.

Please sign in the space provided below to indicate the granting of your permission for PPL or its agents or contractors to perform surveys on your property.

If you have any questions I can be contacted at xxx-xxx-xxxx.

Sincerely,

Agent Name
Senior Real Estate Specialist
Agent for PPL Electric Utilities Corporation

I hereby grant PPL or its agents or contractors permission to enter onto my property for the purpose of performing the above various surveys.

Name: _____

Telephone Number: _____

Date: _____