

**EXHIBIT “B”**  
**COOPERSBURG #1 & #2 138/69 kV TAP RECONSTRUCTION**  
**STUDY AREA ENVIRONMENT**

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**I. INTRODUCTION**

Exhibit “B” provides an environmental inventory of the Coopersburg #1 & #2 138/69 kV Tap Project Study Area. The information contained in this report was gathered from several sources, including Geographic Information Systems (GIS), field reconnaissance surveys, meetings and discussions with environmental specialists and planners, information supplied by public agencies, and appropriate publications. References used and contacts made to gather this environmental information are listed in Appendices “B” (Bibliography) and “C” (Governmental Agencies, Municipalities and Other Public Entities Contacted).

**II. STUDY AREA LOCATION AND DESCRIPTION**

The Study Area is located in Bucks and Lehigh Counties in Eastern Pennsylvania. The following municipalities are included in the Study Area, either in whole or in part:

- Milford Township, Bucks County
- Quakertown Borough, Bucks County
- Richland Township, Bucks County
- Richlandtown Borough, Bucks County
- Springfield Township, Bucks County
- Coopersburg Borough, Lehigh County
- Lower Milford Township, Lehigh County
- Upper Saucon Township, Lehigh County



The Study Area contains a variety of natural features and human development patterns. Rural areas tend toward the northeastern quadrant of the Study Area, providing a patchwork of farm fields and woodlands atop the gently rolling terrain. Coopersburg and Quakertown, the namesake boroughs which define the project area, contain traditional downtowns, as pictured at right along Broad Street in Quakertown. The two boroughs are also surrounded by significant areas of suburban development, much of it built in the past 15 years. Intense development also occurs in a “strip” fashion along PA Route 309, the four-lane highway which connects Coopersburg and Quakertown. The City of Philadelphia lies 27 miles south of the Study Area boundary, the City of Allentown, 6 miles north.



### **III. DELINEATION OF THE STUDY AREA**

PPL EU conducted a detailed siting analysis to determine a location for the Coopersburg #1 & #2 138/69 kV Tap that best balances social, environmental, engineering and economic considerations. These studies included the determination of a Study Area, the compilation of an environmental inventory, identification and analysis of alternative line routes and finally, selection of a preferred line route corridor.

The Study Area for the project is shown on Maps 1 through 10 located at the end of Exhibit “B”. 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 potential supply and destination service points viewed with consideration for man-made and natural boundaries beyond which line route alternatives would not be reasonable.

The Study Area boundary is generally defined by a Buckeye Petroleum pipeline on the north, a PPL Interstate Energy hot oil pipeline and the Richland Township boundary with Haycock Township on the east, and the PPL EU Quakertown-Hosensack 138/69 kV Tap Line on the south. The western boundary of the Study Area is a line roughly parallel to and two miles west of PA Route 309. Functional requirements dictate the exact extent of the Study Area, which is between 4¾ and 7¼ miles wide from east to west, nearly 7½ miles tall from north to south, and 42.3 square miles in total land area.

#### **IV. ENVIRONMENTAL INVENTORY GUIDELINES**

An environmental inventory lists environmental factors considered when evaluating and selecting transmission line routes and substation sites. These factors can be either adversely affected by, or compatible with, transmission facilities.

Major environmental factors and the reasons why they are inventoried are listed in Appendix A - Environmental Inventory Guidelines.

#### **V. ENVIRONMENTAL INVENTORY**

This study used several levels of accurate, current geographic data to identify and record environmental data. The maps for the project Study Area were developed by digitally compiling the most recent United States Geologic Survey (USGS) 1:24,000 scale maps of the area, in conjunction with Geographic Information System (GIS) data provided by the Lehigh Valley Planning Commission, Delaware Valley Regional Planning Commission, and Pennsylvania State

University. GIS provides information-linked map data for nearly all of the natural, political, and cultural features mapped in this inventory. In addition, several hard-copy maps, including municipal zoning maps and new development plans, were digitized to supplement the inventory. All of the above data was manipulated in a GIS program to provide the necessary graphic and informational results for this study. Finally, the maps were checked and confirmed by field investigations and meetings with local officials. The environmental data collected include the following subjects:

- Linear Features (Map 1)
- Existing Land Use (Map 2)
- Generalized Municipal Zoning (Map 3)
- Soil Characteristics (Map 4)
- Steep Slopes and Physical Features (Map 5)
- Natural Features (Map 6)
- Geology (Map 7)
- Agricultural Preservation (Map 8)
- Cultural and Historic Features (Map 9)
- Constraints Composite (Map 10)

A. LINEAR FEATURES – MAP 1

Roadways, railroads, pipelines and transmission lines are examples of linear features. In the proper circumstances, paralleling or occupying existing linear features can be less disruptive to the area because any impacts are combined in one location. However, when development adjacent to existing linear features, or conflicts with their function adversely impacts the construction, maintenance, repair and cost of the proposed transmission line, other alternatives are investigated.

The following linear features, which are found within the Study Area, appear on all of the Environmental Inventory Maps:

### ELECTRIC TRANSMISSION LINES AND SUBSTATIONS

Numerous transmission lines traverse the Study Area. The names of the transmission lines are labeled on Maps 1 through 10 and are as follow:

#### *PPL EU Transmission Lines:*

- Alburdis - Branchburg 500 kV
- Buxmont - Quakertown #1 & #2 138/69 kV
- Coopersburg 69 kV Tap
- Quarry #1 – Coopersburg 69 kV
- Hosensack - Steel City 500 kV
- Quakertown – Hosensack 138/69 kV Tap

#### *Met-Ed Transmission Lines:*

- Hosensack – Gilbert 230 kV
- Hosensack – Holland Junction 115 kV

In addition to the transmission line facilities, three substations are located within the Study Area. These substations are located along or in the vicinity of the existing Coopersburg 69 kV Tap transmission line corridor, and appear on Maps 1 through 10. From north to south, the substations are as follows:

- Coopersburg 69-12 kV Substation
- Richland 69-12 kV Substation
- Quakertown Borough 69-12 kV Substation

## HIGHWAYS AND ROADS

The road network of the Study Area is comprised of a major four-lane arterial highway, three two-lane state routes, numerous rural roads and residential streets, and several unpaved roads. Significant roads include the following:

- **PA Route 309**, a major north-south arterial road connecting Philadelphia and Allentown. For most of its course through the Study Area, Route 309 consists of four undivided traffic lanes with a center turn lane. Commercial strip development occurs along most of the length of Route 309, especially in and around Coopersburg and Quakertown. In Richland Township and Quakertown Borough, Route 309 is also known as West End Boulevard. The existing Coopersburg-Quakertown 69 kV circuit parallels Route 309 in portions of Springfield and Richland Townships.
- **PA Route 212**, a two-lane state road. Route 212 traverses the rolling farmland and rural residential areas of Springfield and Richland Townships, and then passes through the Borough of Richlandtown. Two miles farther south, Route 212 enters the Borough of Quakertown as Hellertown Avenue, and terminates at Route 313, East Broad Street.
- **PA Route 313**, originating at Route 309 in Quakertown. Within this Borough, Route 313 is known as Broad Street, and serves as the primary east-west thoroughfare through the central business district. Heading east out of Quakertown, Route 313 is known as Doylestown Pike.

- **PA Route 663**, starting at the above-mentioned Route 309/Route 313 intersection (*below*). Another wide, straight two-lane road, Route 663 leads to the Pennsylvania Turnpike interchange three miles west of Quakertown and outside of the Study Area.



Intersection of Routes 309, 313, and 663 in Quakertown

## RAILROADS

One active railroad exists within the Study Area. The Bethlehem Branch railroad roughly parallels Route 309 to the east. The railroad is owned by the Southeastern Pennsylvania Transit Authority (SEPTA), and operated by the East Penn Railway Company. The line is active from a point between California Road and Pumping Station Road East in Richland Township, southward to Lansdale, Montgomery County, where it switches with other railroads. Originally carrying passenger trains between Bethlehem and Philadelphia, these tandem tracks currently transport freight only. Several industrial companies north of Quakertown in Richland Township use the railroad for transport purposes. North of California Road, the Bethlehem Branch is not active at this time.

## ABANDONED/INACTIVE RAILROADS AND TROLLEY GRADES

Remnants of railroads, trolley lines, and their grades exist in varying stages of abandonment or inactivity throughout the Study Area. The above-mentioned Bethlehem Branch railroad (*right*) remains inactive, having ceased passenger service in 1981. From the northern terminus of the active railroad in Richland Township, the inactive section of the railroad



passes northward through Coopersburg and Center Valley on its way to Hellertown and Bethlehem. Within the Study Area, the railroad grade is generally intact, with rails and ties also remaining. SEPTA presently retains ownership of the right-of-way south of Interstate 78. The Bucks County Transportation Management Association completed a plan in early 2006 calling for the restoration of this railroad for passenger service between the village of Shelly (in Richland Township) and Lansdale Borough in Montgomery County. Some rail proponents wish to see passenger rail service restored all the way to Bethlehem.



The Liberty Bell Trolley Line provided passenger trolley service between West Philadelphia and Allentown until 1951. Evidence of its existence remains in the form of a linear grade. In the Study Area, the grade is visible from Quakertown, northwestward (roughly paralleling Old

Bethlehem Pike) to Coopersburg Borough. In portions of Richland and Milford Townships, PPL EU operates an electric distribution line on the trolley grade (*above*). In Coopersburg, the grade is occupied by alleys and private driveways. The trolley line was investigated as a potential line route for the proposed Coopersburg Tap. However, the right-of-way is too narrow to be considered for a double-circuit, 138 kV transmission line. Widening the right-of-way was not possible due to development in the area.

Another railroad or trolley grade extends northeastward from the Quakertown Borough 69-12 kV Substation to the farmlands of Richland Township. After fading away near Richlandtown, the grade reappears in Springfield Township along the south bank of Cooks Creek.

### PIPELINES

Three petroleum pipeline corridors traverse the Study Area. The Columbia Gas Transmission Corporation operates two parallel natural gas pipelines in a single underground corridor, including the 20" 10110 Line and the 14" 1278 Line. The pipelines originate in Downingtown, Chester County, and enter the Study Area from the southwest, near Allentown Road and Route 663. The lines proceed northeastward, crossing Route 309 just north of the village of Shelly. The Columbia lines leave the Study Area near Ebert Road in Springfield Township.

The Buckeye Pipeline Company operates parallel 16" and 20" liquid petroleum pipelines connecting the Macungie, PA "tank farm" with petroleum facilities in Linden, NJ. These pipelines are buried in a single east-west corridor that traverses the Study Area from Applebutter Hill in Upper Saucon Township to the village of Pleasant Valley in Springfield Township. The pipelines cross Route 309 one half mile north of the

Coopersburg Borough line, and are the basis of the Study Area's northern boundary.

PPL Interstate Energy Transmission Corporation operates an 84-mile hot oil pipeline connecting Marcus Hook, Delaware County, PA to the Martins Creek power generating station in Northampton County. This pipeline crosses the entire eastern portion of the Study Area. The pipeline crosses Route 309 one mile south of Quakertown, then parallels Morgan Creek in a northeastward fashion. North of Route 313, the pipeline roughly parallels Route 212 northward past Pleasant Valley. North of Richland Township, the pipeline defines the eastern boundary of the Study Area.

B. EXISTING LAND USE – MAP 2

Identifying land use is important in the siting of electric transmission lines and related facilities. Each type of land use activity varies in the significance of impact from a transmission line. Land uses are mapped to provide an understanding of the wide variety of land activities found in the Study Area and to evaluate the potential impact of a transmission line upon them.

Existing land use data was obtained from the Delaware Valley Regional Planning Commission (DVRPC) and the Lehigh Valley Planning Commission (LVPC). The DVRPC has assigned land use types to individual areas digitized from aerial photography of the Delaware Valley. Boundaries and sizes of these areas were determined by natural visual breaks in the imagery. The LVPC land use information is based on tax parcel maps, with one land use code assigned to each tax parcel. As a result of the two different data formats, land use information is displayed slightly differently in Bucks County than in Lehigh County. Land use

categories, however, are consistently mapped throughout the Study Area, allowing for a seamless map. Field surveys were undertaken throughout the Study Area to verify and update land use designations for both data sets. The land uses inventoried are described below.

- **Agricultural/Vacant** – includes land used for crop farming and pasture, land occupied primarily by woodlands, wetlands or other natural features, large-lot residential parcels (e.g. a 50-acre parcel containing one house or farmstead), and vacant land with no farming or other activities occurring at present time.
- **Residential** – includes land used for single-family homes, townhomes, apartment complexes, and manufactured home parks.
- **Commercial/Office** – includes shopping centers, restaurants, retail, wholesale, and service and /or related establishments, as well as office/professional parks.
- **Industrial/Warehousing** – includes light manufacturing operations such as machine shops, heavy operations such as steel mills and power plants, warehouse facilities, and all related production facilities and offices.
- **Transportation/Utilities** – includes non-linear features such as highway maintenance facilities, airports, water or sewage treatment plants, telecommunication facilities, petroleum pipeline valve stations, and electric utility substations.
- **Public/Institutional** – includes public and private schools, colleges, churches, cemeteries, assisted living facilities, government offices, police stations, fire stations, and post offices.
- **Recreation/Open Space** – includes public and private outdoor recreational areas including athletic fields, passive recreation areas, golf courses, youth camps, and hunting clubs, as well as areas designated as open space, nature preserves, or watershed land.

## EXISTING LAND USE

The Coopersburg-Quakertown Study Area exhibits diverse land use patterns, from urban centers to suburban developments to significant farmland and woodland acreage. Existing land use is described below, itemized by land use category.

**Agricultural and Vacant Land:** Even with the large amount of suburban development occurring in the Study Area, agricultural and vacant lands are still the most prevalent land use. Nearly all such land is privately owned, in the form of large-lot residential landholdings, farms, and vacant woodland.

In the Lehigh County portion of the Study Area, agricultural and vacant land exists as a patchwork with more intense land uses. These remaining open areas generally have not been developed due to their restrictive natural features, namely the floodplain and associated wetlands of a creek system which drains the area.

Agricultural and vacant land is more prevalent in Bucks County, especially outside of Quakertown Borough and Richland Township. In Milford and Springfield Townships, crop farms, pasture land, and woodlands intermingle, with the tree cover occurring in especially steep, wet or rocky areas. Richland Township contains farmland at its extremities, but is quickly being developed from Quakertown outward.

**Residential Land:** A majority of the residential development seen in the Study Area occurred since World War II, and much of it occurred since 1990. Before these times, most homes were found within the boroughs of Coopersburg and Quakertown, along roads in crossroads villages, or

scattered on large farms. The post-war baby boom brought forth suburbanization of areas adjacent to the boroughs, many of which were annexed by the borough governments. This is seen on the north side of Quakertown and on the west side of Coopersburg.

The recent housing boom (1990 and onward) continues today, fueled by newcomers from Greater Philadelphia and Northern New Jersey. These newer subdivisions are larger and further from major town centers. Major areas of recent residential subdivision include Upper Saucon Township west of Coopersburg (including Deerwood Estates), and areas of Richland Township within two miles of Quakertown (including Brayton Gardens, Hunters Crossing, Spring Meadow Estates, and Walnut Bank Farm).

Residential land use occurs in other formats as well. Quakertown contains several apartment complexes on either side of Route 309 south of Route 663. In northern Richland Township, Melody Lakes Mobile Home Park is the largest of its kind in the Study Area. Mobile home parks are also found in Springfield Township. In the boroughs and villages, many apartments or residences exist on the upper floors of commercial buildings, especially along Broad Street in Quakertown and Main Street in Coopersburg. All of the aforementioned residential developments are labeled on Map 2.

**Commercial and Office Land:**

Commercial land use occurs primarily as retail strip development along Route 309 (*right*), including restaurants, automotive service stations, car dealers, and a wide variety of other stores. In the boroughs, the Route



309 commercial strip expands into shopping centers such as Fairmont Village (Coopersburg), Quakertown Plaza, and Richland Plaza (Quakertown). Major “big-box” chain stores have located in and around Quakertown, including Wal-Mart (between Route 309 and California Road), Kohl’s (on the northwest corner of Routes 309 and 663), Lowe’s (Route 309 at Tollgate Road) and a new recently-opened Target store (Route 309 at Pumping Station Road West).

Office uses in the Study Area are typically small, including banks, real estate offices, and small business offices. One exception is the Lutron office complex on Suter Road in Upper Saucon Township. Mixed retail and office uses occur along the primary thoroughfares of the boroughs, including Main Street in Coopersburg and Broad Street in Quakertown.

**Industrial and Warehouse Land:** The Study Area contains a significant cluster of industrial and warehousing land uses in Richland Township, immediately north of Quakertown. Avery-Dennison, manufacturer of office supplies and computer chips, operates a major facility at this site, on the east side of California Road. Adjacent to their facility is a Raymour & Flanagan Furniture warehouse and distribution facility. On the west side of California Road is Synergis Corporation, producer of CADD software. Other industrial operations in this cluster include GRS Fastening, Atlas Roofing, and Rotoflex International, designer of high performance labeling equipment. Farther to the east, along Pumping Station Road East, are three industrial operations: Ganter Sheet Metal, Frontier Wood Products, and a stone quarry.

Other industrial land uses can be found along Route 309, along the SEPTA Bethlehem Branch railroad, and scattered elsewhere throughout the Study Area. Common uses include quarries, gravel pits, contractor supply companies, and trucking facilities.

**Transportation and Utility Land:** The previously mentioned PPL EU substations are included in this land use category. Other utility operations include pipeline compressor stations (such as one found on Route 313 where the PPL Interstate Energy oil pipeline crosses, east of Quakertown), telephone switch houses, water standpipes, microwave and cell phone towers, and sewer pump stations.

The largest single, non-linear transportation land use in the Study Area is the Quakertown Airport. This public general aviation airport is owned by the Bucks County Airport Authority and sees an average of 81 flights per day.

**Public and Institutional Land:** Public and institutional land uses inventoried in the Study Area include schools, churches, post offices, emergency services, libraries, and other public uses (outside of recreation).

Public and private K-12 Schools occupy significant landholdings in the Study Area. The Quakertown Area School District has completed a new high school southeast of Quakertown, along the Bethlehem Branch Railroad. Immediately to the south, the Quakertown Christian Academy has located its newest facility.

Saint Luke's Hospital in Quakertown is another significant institutional use. Other, smaller public or institutional uses include the area's municipal buildings, police and fire departments, churches, cemeteries, social clubs, and remaining public and private schools.

**Recreation and Open Space Land:** The Study Area includes numerous public and private sites for recreation. On the northeast side of Coopersburg lies a cluster of open space athletic fields owned by Southern

Lehigh School District, cemetery-owned open space, and Upper Saucon Township's Tumblebrook Municipal Golf Course. Southwest of the same borough lies Locust Valley Country Club, a private golf course. A similar cluster of recreational land is located at Memorial Park along the northern fringe of Quakertown Borough. The more southerly recreation area in the Borough is owned by the Quakertown Area School District. Other recreation or open space areas include a small portion of State Game Lane #139 southeast of Quakertown, and the vacant Rosenberger Tract owned by Milford Township.

A complete list of recreation and open space facilities, as well as historic sites and schools, is provided in the section, *Map 9 – Cultural and Historic Features*.

#### PROPOSED LAND USE

Richland Township, Bucks County, is a major growth area, especially those portions near Quakertown Borough. Additional residential and commercial development can be expected to occur throughout this area in coming years. As of 2006, a 504-unit age-restricted housing development is proposed on Old Bethlehem Pike, just south of the Study Area boundary. Along Route 309, nationwide retailers continue to develop stores in this popular commercial strip. A new Target discount retail store has recently opened on the west side of Route 309 at the intersection of Pumping Station Road West, in the direct path of the existing Coopersburg 69 kV Tap. Several other tracts of vacant commercial land are for sale along the busy Route 309 corridor.

## AIRPORTS/LANDING STRIPS

The United States Department of Transportation (Federal Aviation Administration) and State Department of Transportation (Bureau of Aviation) have established structure height guidelines that apply in areas near airports. As mentioned earlier in the report, the Quakertown Airport is situated within the Study Area in Milford Township. PPL EU will contact the appropriate entities to ensure that structures and transmission lines are not a hazard to flight operations.

### C. GENERALIZED MUNICIPAL ZONING – MAP 3

Municipal zoning is often an indicator of the potential type and location of future community development. The townships that lie within the Study Area all enforce zoning regulations of their own design. Zoning is geographically organized into *districts*, but may also occur as *overlays*, special areas or corridors where additional regulations apply. Electric utilities are allowed in nearly all districts as a *special exception use*.

## ZONING DISTRICTS

For the purposes of this study, zoning districts have been generalized into the following categories:

- Agricultural
- Rural Residential
- Suburban Residential
- Urban Residential
- Commercial
- Light Industrial

- Heavy Industrial / Extraction
- Institutional
- Village Center / Mixed Use
- Environmental Protection

General regulations enforced in each district are summarized below.

**Agricultural Zoning** - Portions of Milford, Richland, and Springfield Townships are zoned for *Agricultural Protection*. This designation allows for agricultural activities in conjunction with limited residential use. Areas reserved for agricultural protection often exhibit soil types highly suitable for farming. Typically, a township will allow a new residential lot to be pieced off from an existing agricultural parcel provided that the original parcel meets certain acreage minimums. In the Study Area, Agricultural zoning has allowed for the continued prevalence of farming activity in these zones, along with the addition of several new homes on isolated lots surrounded by farmland. In the case of Milford and Richland Townships, a minimum lot size of 2 acres is established in this district. Agricultural zoning is different from *Agricultural Preservation*, described under *Map 8*.

**Rural Residential Zoning** – These zones are intended for single family homes on medium-sized lots. Lot size minimums are in the 1 to 2 acre range, and actual lot sizes are typically larger. Most of these areas are not served by public sewer and water and are not as valuable for agricultural purposes. The result is a mixture of large lots, some with farmland and/or woodland, along with minimum size lots that were the result of land subdivision. Rural Residential zoning can be found in the eastern portion of Milford Township, various sections of Springfield Township, and portions of Upper and Lower Milford Township. Generally these areas serve as transitions between urbanized areas and truly rural areas.

**Suburban Residential Zoning** - This category of zoning is intended for single-family homes and limited areas of townhome developments, with smaller minimum lot sizes than Rural Residential zones. Minimum lot sizes are typically around 15,000 or 20,000 square feet, and vary based on the availability of public water and sewer. This zoning type is found immediately adjacent to the boroughs of Coopersburg, Quakertown, and Richlandtown, as well as in some of the newer neighborhoods within those boroughs. A majority of Upper Saucon Township is also zoned thusly.

**Urban Residential Zoning** – This zoning type allows for high-density residential land use, including single and multi-family housing in duplexes, townhouses and apartment complexes. Lot sizes are typically 15,000 square feet and smaller. Urban residential zoning is found in Coopersburg and Quakertown, in the older neighborhoods adjacent to the central business districts, and in outlying portions of those boroughs which contain apartment and townhouse developments.

**Commercial Zoning** – Retail, office and service uses are permitted in this zoning category. In the Study Area, a majority of the commercial zoning is intended for highway-oriented land uses. Most of the Route 309 corridor is zoned *Highway Commercial*, allowing for automobile-oriented businesses such as gas stations, fast food restaurants and retail shopping centers. More condensed areas of commercial zoning occur in the central business districts of Coopersburg, Richlandtown, and in the village of Zionhill.

**Light Industrial Zoning** - Less-intense industrial and warehouse uses that are relatively clean and quiet are found in this zoning category. The Bucks County townships in the Study Area have all created *Planned Industrial* zones intended for high-quality industrial, heavy commercial,

office or laboratory uses that are compatible with adjacent residential areas. In Upper Saucon Township, the *Industrial* zone calls for, “modern light industrial uses that are harmonious with surrounding uses.” Many areas of Light Industrial zoning are not yet developed, including land along Pumping Station Road East in Richland Township, Milford Square Road in Milford Township, and Route 309 in Upper Saucon Township.

**Heavy Industrial / Extraction Zoning** – Industrial land uses that are not compatible with residential uses, such as power plants, quarries, and large-scale trucking facilities, are included in this zoning category. The only such district in the Study Area is an *Extraction* District in Richland Township, which contains a gravel pit and some vacant land.

**Institutional Zoning** – The district allows for public parks, playgrounds, public or private schools, hospitals, churches, student or faculty housing, and medical-related office buildings. In Quakertown Borough, Saint Luke’s Hospital is situated in a *Hospital* zone.

**Village Center / Mixed Use Zoning** – In places where mixes of residences and small businesses have predated zoning regulations, *Village Center* or *Mixed Use* zoning has been implemented. In Quakertown Borough, the central business district falls under *Town Center* zoning. In Springfield Township, the rural villages of Pleasant Valley, Passer and Zionhill (*right*) exist under *Village Residential* zoning, which allows for high density residential uses combined with limited retail commercial uses. Village Center zoning can also be found in Milford Square in Milford Township.



**Environmental Protection Zoning** – This zoning type does not exclude development, rather it calls for much larger minimum lot sizes and/or clustering of housing in order to conserve open space. This type of zoning is typically found near sensitive natural features such as floodplains, wetlands, steep slopes, and major woodlands. In Bucks County, these zones are called *Resource Protection* districts, and minimum lot sizes here vary from 2 to 5 acres. Springfield Township allows cluster developments in this District, where smaller lot sizes are permitted in exchange for a specified percentage of permanent open space.

### ZONING OVERLAYS

Additional land use restrictions are found in certain areas with exceptional natural or scenic qualities. On zoning ordinance maps, these areas are delineated as *overlays*, and include the 100-Year Floodplain Overlay, Environmentally Sensitive Overlay, and Scenic Road Overlay.

**100-Year Floodplain Overlay** – All municipal zoning ordinances in the Study Area restrict certain activities in the 100-year floodplain, either in the zoning ordinance, subdivision and land development ordinance (SALDO), or a separate floodplain ordinance. New buildings, improvements to buildings, topsoil removal, on-site sewage removal, sanitary landfills, and other uses are generally prohibited in the Townships. Boroughs and cities, due to their considerable amount of existing structures within floodplains, have fewer restrictions, usually in the form of water-proofing and other construction standards, and the exclusion of facilities such as hospitals, jails, mobile home parks, and nursing homes.

**Environmentally Sensitive Overlay** – Found in Upper Saucon Township, the purpose of this overlay is to protect areas with limestone geology.

Such areas are prone to ground subsidence and ground collapse, also known as sinkholes. Other common features in limestone areas (*karst features*) include caves, ghost lakes, and disappearing streams. Within this overlay district, no new structure is allowed within 100 feet of a known sinkhole. Development of land containing karst features requires a plan identifying the location of the features, and a description of what measures will be taken to control any adverse affects of developing near the features.

**Scenic Road Overlay** – Found in Springfield Township, this overlay is designed to protect the visual character of the landscape as seen from certain roads, especially at the entrances to villages, along tree lines, and at scenic vistas.

D. SOIL CHARACTERISTICS – MAP 4

The characteristics of soils are important factors in transmission line siting. Some soil or rock conditions can pose problems in engineering and construction of foundations. Environmental impacts can also occur with erosive soils and with re-vegetation of the right-of-way if droughty soils are found, especially on steeper slopes.

Using U.S.D.A. Natural Resources Conservation Service (NRCS) soil surveys for Bucks and Lehigh Counties, the Study Area was analyzed and mapped to identify the most significant soil characteristics and potential problem areas. The NRCS indicates that Study Area soils are classified generally as “medium-textured” at the surface layer, with sub-surface layers that vary from “medium-textured,” to “moderately fine,” to “firm and compact.”

Two soil characteristics were identified in the Study Area as significant to transmission line siting, including construction, operation and maintenance, which are as follow:

- High / Seasonally High Water Table Soils
- Shallow Depth to Bedrock Soils

High / Seasonally High Water Table soils, with a water table at a depth of 36 inches or less, are widespread in the Study Area, especially in the flatter terrain of the Quakertown basin. North of the basin, high water table soils are largely confined to stream valleys. It should be noted that some soils mapped as having water table depths of 36 inches or less may actually have deeper water tables, since the NRCS indicates water table depth in a broad range (e.g. 30 to 48 inches).

Shallow Depth to Bedrock soils, with bedrock found at a depth of 36 inches or less, are found in both upland and lowland areas of the Study Area. Particular concentrations of note include the soils underlying Coopersburg and Richlandtown.

Other soils that were identified and mapped within the Study Area include Class I and Class II prime agricultural soils. The United States Department of Agriculture (USDA) defines prime farmland soils as the land best suited to produce food, feed, forage, fiber, and oilseed crops. Prime farmland produces the highest yields with minimal inputs of energy and economic resources, and farming these soils results in the least damage to the environment. Counties also use prime agricultural soils as a determining factor in purchasing agricultural easements (described further under *Map 8*.) Although these soils exhibit few constraints for the construction of transmission lines, it would be preferable, if possible, to avoid excessive structure footprints over these highly farmable areas.

Prime farmland soils tend toward the northwestern and northeastern portions of the Study Area, though much of the prime soils near Coopersburg have been developed into residential subdivisions. The Quakertown basin is relatively devoid of prime soils because of poor drainage.

E. STEEP SLOPES AND PHYSICAL FEATURES – MAP 5

Identification of steep slopes is very important to transmission line siting. The steeper the slope, the more difficult and costly it is to clear vegetation, maneuver construction equipment, handle, haul and erect transmission structures and grade access roads and structure sites. Drainage, erosion control and vegetation management problems generally increase with more severe slopes, especially when a line crosses perpendicular to the slope. Also, steep slopes by nature of geometry are more visually sensitive.

Digital elevation models of the Study Area provided by the U.S. Geological Survey provide the basis for the Steep Slope and Physical Features map. Steep slopes were classified based on commonly-accepted land use planning methods, which are as follow:

- 15 - 25 percent slopes, where development density restrictions are often recommended.
- 25 percent and greater slopes, where development is often prohibited or severely restricted.

Generally, steep slopes in the Study Area become less frequent as one travels south. “The Lookout” in Springfield Township is the most notable topographic feature in the Study Area. Its summit, at an elevation of 911 feet, rises 300 feet above the surrounding terrain.

Throughout the remainder of the Study Area, lesser areas of steep slopes are scattered on hillsides, along stream valleys, and in the sides of ravines.

F. NATURAL FEATURES – MAP 6

The natural features inventory and map represent a compilation of those natural elements in the environment that are considered to be significant to transmission line siting and construction. Map 6 shows major natural features in the Study Area, including natural vegetation, surface waters, floodplains, wetlands, and unique natural areas. Wildlife habitat, both terrestrial and aquatic, is confined largely to these resources.

NATURAL VEGETATION

The Study Area contains a variety of vegetation, ranging from induced cropland, grass and scrublands to naturally-occurring floodplain forests and upland forests. The Study Area is located within the Northern Piedmont Section of the Appalachian Oak Forest Region of Pennsylvania. The major vegetation types depicted on Map 6 are discussed below.

GIS analysis reveals that woodlands cover approximately 28% of the Study Area, or about 7,700 acres. These woodlands are generally scattered throughout rural portions of the Study Area, and often correspond with steep slopes, rocky soils, wet soils, and stream valleys and therefore, are not suitable for development or agriculture. A larger area of contiguous woodland is found in western Springfield Township and northwestern Richland Township. Common trees in floodplain forests include silver maple, red maple, bottomland oak, and sweetgum. Woodlands found near streams (also called *riparian woodland*) help create a natural buffer that enhances stream quality, and also serves as a habitat corridor for wildlife. In the dryer upland forests, common trees include

red oak, shagbark hickory, and tulip poplar. Here, and in other sloped areas, trees help to stabilize soil, and also provide a scenic backdrop to surrounding landscapes. Planted trees are common in residential areas of the Study Area, including weeping willow, flowering trees such as cherry, dogwood and pear, and imported evergreens such as Norway spruce.

Vegetation in non-woodland areas is almost always the result of human activity. This includes crops such as corn and soybean, common grasses in lawns, parks, pastures and roadsides, and taller grasses and shrubs in unmown vacant areas. One exception to this rule is wetland areas. Wetlands such as Quakertown Swamp are naturally free of trees, and host a variety of wetland plants, such as cattails, sedges and buttonbush.

### SURFACE WATERS

The Study Area lies at the convergence of three watersheds: The Middle Delaware, the Lehigh, and the Schuylkill. The Study Area also contains the sources of Cooks Creek, Tohickon Creek, and Unami Creek. From a point near the common corner of Lower Milford, Milford, Springfield, and Upper Saucon Townships, runoff either flows northward into Saucon Creek (which flows into the Lehigh River), southward into Unami Creek (which flows into the Perkiomen Creek, which in turn flows into the Schuylkill River), or eastward into Tohickon Creek (which flows into the Delaware River). Cooks Creek, in Springfield Township, also flows eastward into the Delaware River. The three major streams are each fed by smaller tributary streams in the Study Area, including Hickon Creek, Dry Branch Creek, Beaver Run, Morgan Creek, Bog Creek, and numerous unnamed tributaries.

Pennsylvania's Water Quality Standards designate protection categories for streams, which are the basis of water quality criteria. These

classifications are important in regulating the discharge of wastewater and stormwater into streams. Cold Water Fisheries (CWF) are streams that provide habitat for cold water fish and other fauna and flora indigenous to cold water. Trout Stock Fisheries (TSF) are streams that qualify for trout stocking by the Pennsylvania Fish and Boat Commission. Trout-stocking streams with excellent water quality are dubbed as High Quality Trout Stock Fisheries (HQ-TSF). Exceptional Value (EV) streams have excellent water quality, are important local or regional resources, and commonly flow through a state or national recreation area. The following table shows State designations for streams within the Study Area:

### State Protection Designations for Streams

STREAM	STREAM SEGMENT / AREA	DESIGNATION
Cooks Creek	Basin	EV
Saucon Creek	Basin, Source to Black River	CWF
Unnamed tributaries to Saucon Creek	Basins, Black Creek to Route 412	CWF
Tohickon Creek	Basin, Source to Nockamixon Dam	CWF
Unami Creek	Basin	HQ-TSF

In addition to streams, the Study Area also contains numerous small ponds, labeled as *Surface Water* on Map 6. Most of these ponds are man-made and on private property.

### 100-YEAR FLOODPLAINS

100-year floodplains are areas that would be inundated in a storm severe enough to occur only once in 100 years, according to the Federal Emergency Management Agency (FEMA). The 100-year floodplain boundaries shown on Map 6 were acquired digitally from Penn State University and were originally derived from Flood Insurance Rate Maps (FIRM) and SCS County Soil Surveys. As mentioned in the *Zoning Overlays* section, development in 100-year floodplains is usually restricted or prohibited. The risks to human life, property, and water quality during

flood events are the rationale for imposing these restrictions. Construction of utility facilities is one of the few allowed uses within floodplains. Transmission lines are allowed in floodplains, as long as they are designed, located and constructed to not increase flood damage.



In the Study Area, 100-year floodplains surround Cooks Creek, Tohickon Creek, Unami Creek, and many of their tributaries. In the Quakertown Basin, floodplains tend to be quite wide due to the level topography. Examples of wide floodplains include Tohickon Creek in the vicinity of Pumping Station Road East, as well as Morgan Creek in southeastern Richland Township.

### WETLANDS



Wetlands fulfill an essential role in our environment by filtering impurities in surface runoff, recharging groundwater, mitigating floods and erosion, and providing critical habitat to many plant and animal species. Wetlands can vary considerably in their vegetation makeup, depending on the system and class to which they are identified. Wetlands in the Study Area are all of the *palustrine* variety, meaning they occur in or near shallow ponds, marshes, swamps or sloughs. Palustrine wetlands are further classified into emergent, forested, open-water, and scrub-shrub types.

In the Study Area, extensive wetlands are common in the Quakertown Basin due to its perched water table and level topography. A large complex of wetlands can be found along Tohickon and Hickon Creeks in Richland Township north of Quakertown. South of Quakertown, Morgan Creek is notable because of the significant linear extent of wetlands on both sides of the creek. One mile southeast of Morgan Creek is Quakertown Swamp, a 400-acre wetland along Bog Creek. The swamp is the largest non-tidal wetland in Southeastern Pennsylvania, and home to the largest great blue heron rookery in Eastern Pennsylvania. Other, smaller wetland areas are found near other streams, and alongside man-made ponds. Since the National Wetlands Inventory is compiled using aerial remote sensing, site-specific investigation by a wetlands expert is necessary to exactly delineate wetland areas. PPL EU will retain a wetlands specialist to delineate existing local wetlands inventories as required.

#### UNIQUE NATURAL AREAS

Bucks and Lehigh Counties both contracted nature specialists for the purpose of compiling an inventory of unique and important natural areas. The *Bucks County Natural Areas Inventory* was prepared by the Morris Arboretum of the University of Pennsylvania. The Pennsylvania Science Office of The Nature Conservancy prepared a joint report for Lehigh and Northampton Counties. The basis of the reports is the occurrence of endangered, threatened, rare, or of-concern plant and animal species in the landscape. The official list of such species is the *Pennsylvania Natural Diversity Index* (PNDI). Using PNDI data, aerial photography, and extensive field work, both agencies have identified important sites and prioritized their significance. Their findings are shown as *Unique Natural Areas* on Map 6. The horizontal extents of the natural areas are exaggerated by the nature consultants to avoid deliberate eradication of

plant and animal communities. The unique natural areas of the Study Area are listed in the following table, along with their priority levels and significant features. Priority #1 is the highest priority level.



The Quakertown Swamp, a Priority 1 natural area. (Photo: Society of Wetland Scientists)

### Unique Natural Areas

#	NATURAL AREA	MUNICIPALITY	SIGNIFICANT FEATURE	PRIORITY
1	Beaver Run Woods	Richland	Seasonally wet woods with vernal pond	4
2	Cooks Creek Watershed	Haycock, Lower Saucon, Richland, Springfield, Upper Saucon	Exceptional Value stream supporting native brown trout	1
3	Mill Road Wetlands	Coopersburg, Upper Saucon	Creek-side wetlands, past siting of animal species of special concern	3
4	Morgan Run	Richland	Buttonbush wetland and floodplain forest	3
5	Quakertown Swamp	East Rockhill, Richland	Largest inland wetland in Southeastern Pennsylvania	1
6	Rock Hill	East Rockhill, Richland	Outstanding geologic feature, forested slopes	2
7	Route 309 Woods	Richland	Wet woodland, diabase outcrops, diverse herbaceous flora	4
8	The Lookout	Springfield	Forested hill, vernal pools, headwaters of Cooks and Tohickon Creeks	2
9	Tohickon Creek – Camp Tohikanee	East Rockhill, Haycock	Floodplain forest, forested slopes, beaver activity	3
10	Tohickon Creek – near West Thatcher Road	Richland	Floodplain forest, diverse emergent aquatic flora	3

11	Unami Creek – vicinity of Allentown Road	Milford	High native fish diversity, floodplain forest	3
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G. GEOLOGY – MAP 7

The Study Area falls into two physiographic regions, or areas with similar geology and topography. The Gettysburg-Newark Lowlands Section, constituting a large majority of the Study Area, is a level area underlain by a variety of non-carbonate rocks. The dominant formation, Brunswick, contains sedimentary rocks such as mudstone and siltstone. Quartz Fanglomerate, a conglomerate rock, is also part of this section. Diabase, the other significant rock of this section, is an igneous rock that formed when molten magma intruded on the area 200 million years ago. The diabase cracked and eroded, forming a unique landscape of strewn boulders and “perched” wetlands. These features are evident along Route 313 east of Quakertown.

The Reading Prong Section is found in non-contiguous, elongated areas north of the Bucks County line, and only covers a small area in the northwestern corner of the Study Area. This section consists of sharp hills formed on Precambrian gneiss, a metamorphic rock. The Felsic-to-Mafic Gneiss, Hardyston, and Hornblende Gneiss formations are part of this category. These rocks are more durable, but are also known to contain pockets of radon gas. Most of the major hills and ridges in the southern Lehigh Valley are part of the Reading Prong.

Small pockets of carbonate geology can be found at the northern edge of the Study Area, just north of Coopersburg Borough. Identified as the Epler and Rickenbach Formations, they contain the limestone and dolomite rocks which are known to form sinkholes and caves.

Bedrock formations of the Study Area are summarized in the following table, listing the formation name, map symbol, and the three major lithologies (constituent rocks).

### **Underlying Bedrock Formations**

<b>FORMATION NAME</b>	<b>SYMBOL</b>	<b>AGE</b>	<b>LITHOLOGY 1</b>	<b>LITHOLOGY 2</b>	<b>LITHOLOGY 3</b>
Brunswick	Trb	Triassic	Mudstone	Siltstone	Shale, argillite
Diabase	Jd	Jurassic	Diabase	-	-
Epler	Oe	Ordovician	Limestone	Dolomite	-
Felsic to Mafic Gneiss	gn	Precambrian	Felsic gneiss	Intermediate gneiss	Mafic gneiss
Hardyston	Cha	Cambrian	Quartzite	Feldspathic sandstone	Quartz-pebble conglomerate
Hornblende Gneiss	hg	Precambrian	Mafic gneiss	-	-
Quartz Conglomerate	Trfq	Triassic	Quartz conglomerate	-	-
Rickenbach	Ori	Ordovician	Dolomite	Chert	-

#### **H. AGRICULTURAL PRESERVATION – MAP 8**

As recognized by the American Farmland Trust, Pennsylvania leads the nation in the number of farms and acres of farmland protected. Both Bucks and Lehigh Counties have established Farmland Preservation Boards which administer the creation of Agricultural Security Areas (ASAs) and the purchase of Agricultural Easements. An ASA is an area of 500 or more semi-contiguous acres that is used for agricultural production. Farmers voluntarily form and/or join ASAs as a way of receiving special consideration with regard to regulations, nuisance complaints and conflicting land uses. The Agricultural Easement purchase program allows counties to use the Pennsylvania farmland preservation fund to purchase development rights. Qualifying farms must be part of an existing ASA, and are rated on the basis of soil quality, proximity to other farmland, and other criteria. Once a farm is in easement, agricultural production must continue every year thereafter, with no new structures permitted except farm accessory buildings.

Map 8 shows Agricultural Security Areas, existing Agricultural Easements, and farms that are currently on the application list for the purchase of an Agricultural Easement. Major concentrations of such land occur foremost in Milford Township and adjacent areas of Lower Milford Township, as well as in Springfield Township. The largest contiguous ASA occurs along the east side of Allentown Road in Milford Township. The largest Agricultural Easement in the Study Area is the Keller Farm, situated on 150 acres between Crowthers Road and Richlandtown Pike in Springfield Township.

I. CULTURAL AND HISTORIC FEATURES – MAP 9

As required by the Commission’s siting regulations, Map 9 depicts the location of significant cultural features within two miles of the preferred transmission line route. These resources, identified both within and outside the Study Area, include Historic Sites, Historic Districts, Schools and Recreation Sites. Each category is described below:

HISTORIC SITES

The following is a table of historic sites and structures, found in and around the Study Area, that are listed on the National Register of Historic Places. These include both officially *listed* sites and *eligible* sites. In the latter case, landowners have applied for National Register status, but the site has not yet been formally approved. Site location, municipality and listed/eligible status are listed in the table below. Location descriptions are quoted directly from the Pennsylvania Historic and Museum Commission. Numbers in the far-left column correspond with number labels on Map 9.

### National Register Historic Sites

#	SITE NAME	LOCATION	MUNICIPALITY	STATUS
1	Brookes, Edward & Deborah, House	302 E. State St.	Coopersburg	Eligible
2	Campbell's Bridge	Allentown Rd. L.R. 09107	Milford	Listed
3	Centennial Bridge	Station Ave. L.R. 39009	Upper Saucon	Listed
4	Coopersburg Elementary School	317 State St.	Coopersburg	Eligible
5	Liberty Hall	1237 W. Broad St.	Quakertown	Listed
6	Linden Grove Pavilion	Linden & S. Main Sts.	Coopersburg	Listed
7	Quakertown Passenger & Freight Station	Front St.	Quakertown	Listed
8	Quakertown U.S. Post Office	416 W. Broad St.	Quakertown	Eligible
9	Red Lion Inn	4 Main St.	Quakertown	Eligible
10	Richland Farm	E. Pumping House Station Rd.	Richland	Eligible
11	Riu/Kane House	235-237 Station Ave.	Coopersburg	Eligible
12	Roberts, Enoch, House	1226 W. Broad St.	Quakertown	Listed
13	Shelly School	Cherry Rd.	Richland	Eligible
14	Sholl's Mill House	1920 Allentown Rd.	Milford	Eligible
15	Taylor, Abraham, Farmstead	395 W. Pumping Station Rd	Richland	Eligible
16	Troxel Garage	106 3 <sup>rd</sup> St.	Coopersburg	Eligible

NOTE: The National Register of Historic Places also catalogues important archaeological sites. No such sites are listed in the Study Area.

### HISTORIC DISTRICTS

The Study Area contains several larger areas recognized for their historic value, and usually containing multiple historic structures or sites. One of these historic districts is officially listed in the National Register, while the remaining two are eligible for National Register inclusion. The districts are as follow:

#### Historic Districts

#	DISTRICT NAME	LOCATION	MUNICIPALITY	STATUS
17	Center Valley	Station Ave. & New St.	Upper Saucon	Eligible
18	Coopersburg	Main St. & PA 309	Coopersburg	Listed
19	Pleasant Valley	E. Rte. 212, Peppermint Rd., State Rd., Old Bethlehem Rd.	Springfield	Eligible

## SCHOOL SITES

Schools appear on Map 9, including all public K-12 schools, colleges, and known private and parochial schools. They are as follows:

### **School Sites**

<b>#</b>	<b>SCHOOL NAME</b>	<b>SCHOOL DISTRICT</b>	<b>MUNICIPALITY</b>
1	DeSales University	N/A	Upper Saucon
2	Hopewell Elementary School	Southern Lehigh	Upper Saucon
3	Liberty Bell Elementary School	Southern Lehigh	Coopersburg
4	Milford Middle School	Quakertown Area	Milford
5	Neidig Elementary School	Quakertown Area	Quakertown
6	Quakertown Christian School	N/A	Richland
7	Quakertown Elementary School	Quakertown Area	Quakertown
8	Quakertown High School	Quakertown Area	Quakertown
9	Quakertown High School (new site)	Quakertown Area	Richland
10	Richland Elementary School	Quakertown Area	Richland
11	Southern Lehigh High School	Southern Lehigh	Upper Saucon
12	Southern Lehigh Middle School	Southern Lehigh	Upper Saucon
13	Springfield Elementary School	Palisades	Springfield
14	Strayer Middle School	Quakertown Area	Quakertown
15	Tohickon Valley Elementary School	Quakertown Area	Milford
16	Trumbauersville Elementary School	Quakertown Area	Trumbauersville

## RECREATION AND OPEN SPACE SITES

Many opportunities exist for recreation on public and private grounds within the Study Area. In addition, numerous open space sites have been established for the preservation of natural features. Major recreation sites include the Quakertown Memorial Park, Upper Saucon Township's Tumblebrook Municipal Golf Course, and Locust Valley Country Club. Recreation and open space sites in the Study Area are shown in the following table, including the municipality in which the site is found. Numbers in the far-left column correspond with number labels on Map 9.

### Recreation and Open Space Sites

#	SITE NAME	MUNICIPALITY
1	Benner Memorial Hall	Richland
2	Camp Helena	Upper Saucon
3	Camp Tohikane	Haycock
4	Cedar Grove Park	Richland
5	Cedarfield Open Space	Richland
6	Elim Grove	Upper Saucon
7	Farm (Springfield Township)	Springfield
8	Farm (Springfield Township)	Springfield
9	Fox Hollow Golf Course	Milford
10	Grassroots	Haycock
11	Kurtisan Farm (Future Township Park)	Springfield
12	Lands along Barrell Run Creek	Milford
13	Living Memorial Park	Upper Saucon
14	Locust Valley Country Club	Upper Saucon
15	Main Street Park	Richland
16	Milford Industrial Commons Open Space	Milford
17	Milford Square Estates / Mill Valley Open Space	Milford
18	Milford Township Fish & Game	Milford
19	Molasses Creek Park	Milford
20	Moyer's Lake	Upper Saucon
21	Pennsylvania Turnpike Commission Land	Milford
22	Paletown Rod & Gun Club	Richland
23	Park View Estates	Milford
24	Quakertown Memorial Park	Richland
25	Richland Township Park & Nature Trail	Richland
26	Rosenberger Tract	Milford
27	SEPTA Land	East Rockhill
28	Spinnerstown Area Open Space	Milford
29	Sroka Tract (Milford Township)	Milford
30	State Game Land #139	Richland
31	The Meadowlands Recreation Area	Upper Saucon
32	The Putting University	Upper Saucon
33	Unami Creek Park	Milford
34	Upper Saucon Township Community Park	Upper Saucon
35	Tumblebrook Municipal Golf Course	Upper Saucon
36	Walnut Bank Open Space	Milford
37	Wedgewood Golf Course	Upper Saucon
38	Willow Creek Farm	Upper Saucon
39	Richland Township Open Space	Richland

#### J. MAP 10 – CONSTRAINTS COMPOSITE

Map 10 is a composite of physical and regulatory constraints that may prohibit or restrict the routing of a new transmission line in certain locations. The map is composed of information gathered in the nine

preceding maps, as well as several additional features. The constraints are listed and described below:

### PROHIBITIVE CONSTRAINTS

**FAA-Controlled Airports** - The only airport in the study area is Quakertown Airport, a public general aviation airport in Milford Township, Bucks County. The airport includes one paved 3,200 foot runway with a full taxiway, hangars, an air services facility, and a terminal building. The runway sits at an elevation of 526 feet above mean sea level, with a heading of 111 magnetic (099 true), or 291 magnetic (279 true) from the opposite direction.

**Hazardous Waste Sites** - The U.S. Environmental Protection Agency (EPA) maintains a *National Priorities List* of environmentally contaminated sites, also called *Superfund* sites. The study area contains one such site, the Watson Johnson Landfill on Pumping Station Road East in Richland Township, Bucks County. The landfill operated from 1936 until 1973, during which it received ordinary residential and commercial waste from nearby municipalities. In the 1960's, however, the landfill received a total of 3,200 tons of resins, elastomers, and other hazardous wastes. The 1972 draining of an on-site pond caused a massive fish kill in the Tohickon Creek. A 1999 sampling of soils, water, and wetlands on or near the site included volatile organic compounds, PCBs, TCE, and mercury. The EPA is still considering various alternatives for the site.

**Critical Plant or Animal Habitat** - These sites were extracted from the Natural Areas Inventory for Bucks County, prepared by the Morris Arboretum of the University of Pennsylvania, and the Natural Areas Inventory for Lehigh County, prepared by The Nature Conservancy. These sites also appear on Map 6, with identification numbers keyed to the

legend. On Map 10, however, the extent of the natural areas has been reduced to the core habitat or primary sensitive feature of each site. Removed are the large areas of influence that are included in the Natural Areas Inventory. These periphery areas would not be adversely affected by transmission lines, and are therefore not shown on Map 10.

### RESTRICTIVE CONSTRAINTS

**Wetlands** - The wetland areas shown on Map 10 are from the National Wetland Inventory, prepared by the U.S. Fish and Wildlife Service. These same wetlands appear on Map 6. By federal law it is illegal to build structures within wetlands without rigorous permitting, so the wetlands may restrict transmission line siting. Most wetlands in the study area are small, and could be spanned by transmission wires.

**Slopes 25% or Greater** - Regulation of development on steep slopes varies by municipality. It is preferable to avoid steep slopes due to the difficulty of construction, risk of soil erosion, and visual prominence of slopes. The study area contains very few slopes greater than 25%, and in fact contains some of the flattest terrain in Upper Bucks County. The greatest concentration of steep slopes is found on the Lookout in Springfield Township, which is already covered as a critical plant or animal habitat.

**National Register Historic Districts** - Areas on the National Register of Historic Places, administered by the National Park Service, are found in Coopersburg Borough, Lehigh County, and in the village of Pleasant Valley in Springfield Township, Bucks County. The Coopersburg Historic District is officially listed, while the Pleasant Valley Historic District is only eligible, and in the process of becoming listed. In either case, the districts serve primarily for recognition purposes. Any

regulations affecting new construction within the districts would lie within the jurisdiction of the municipal governments.

**National Register Historic Sites** - Individual properties are listed on the National Register of Historic Places and shown on Map 10. The name and status of each property can be found on Map 9.

#### OTHER CONSTRAINTS

There are few regulations, at any level, against siting transmission lines near certain land uses. However, PPL EU has historically been sensitive to community concerns about power lines. Therefore, the following constraints are shown on Map 10:

- Residential land uses (also shown on Map 2)
- Schools (also shown on Map 9)
- Cemeteries (extracted from USGS topo maps)
- Day Care Centers (compiled from internet search engines)