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October 20, 2010

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Washington, DC 20555-0001

BELL BEND NUCLEAR POWER PLANT
BBNPP PLOT PLAN CHANGE COLA
SUPPLEMENT, PART 3 (ER); SECTION 3.7
BNP-2010-272 Docket No. 52-039

References: 1) BNP-2010-175, T. L. Harpster (PPL Bell Bend, LLC) to U.S. NRC, "July 2010 BBNPP Schedule Update", dated July 16, 2010

2) BNP-2010-155, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "Submittal of BBNPP RAI Schedule Information," dated August 4, 2010

3) BNP-2010-246, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "BBNPP Plot Plan Change Supplement Schedule Update," dated September 28, 2010

In References 1 and 2, PPL Bell Bend, LLC (PPL) provided the NRC with schedule information related to the intended revision of the Bell Bend Nuclear Power Plant (BBNPP) footprint within the existing project boundary which has been characterized as the Plot Plan Change (PPC). As the NRC staff is aware, the plant footprint relocation will result in changes to the Combined License Application (COLA) and potentially to new and previously responded to Requests for Additional Information (RAIs). PPL declassified this docketed schedule information from regulatory commitment status in Reference 3, with an agreement to update the staff via weekly teleconferences as the project moves forward.

Accordingly, PPL has committed to provide the NRC with COLA supplements, consisting of revised COLA Sections and associated RAI responses/revisions, as they are developed. These COLA supplements will only include the changes related to that particular section of the COLA and will not include all conforming COLA changes. Conforming changes for each supplement necessary for other COLA sections will be integrated into the respective COLA supplements and provided in accordance with the schedule, unless the supplement has already been submitted. In the latter case, the COLA will be updated through the normal internal change process. The revised COLA supplements will also include all other approved changes since the submittal of Revision 2. All COLA supplements and other approved changes will ultimately be incorporated into the next full COLA revision.

The enclosure provides the revised BBNPP COLA Supplement, Part 3 (Environmental Report), Section 3.7, Revision 2a. The revised BBNPP COLA section supersedes previously submitted information in its entirety. No departures and/or exemptions to this BBNPP COLA section have been revised as a result of the PPC.

The only new regulatory commitment is to include the revised COLA section (Enclosure) in the next COLA revision.

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NRO

If you have any questions, please contact the undersigned at 570.802.8102.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 20, 2010

Respectfully,

Rocco R. Sgarro

RRS/kw

Enclosure: Revised BBNPP COLA Part 3 (ER); Section 3.7, Revision 2a

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Enclosure

Revised BBNPP COLA Part 3 (ER), Section 3.7, Revision 2a

3.7 POWER TRANSMISSION SYSTEM

The NRC criteria for review of power transmission systems are presented in Section 3.7 of NUREG-1555 (NRC, 1999) To address these criteria, this section of the Environmental Report describes the transmission system from the BBNPP substation to its connections with the existing PPL Electric Utilities Corporation (PPL EU) transmission systems, including lines, corridors, towers, substations, and communication stations. BBNPP, with an additional 1,600 MWe rating, would require the following new facilities and upgrades to connect to the existing transmission system:

- One new BBNPP 500 kV Switchyard, which is located in close proximity of the Turbine Building, to transmit power from the BBNPP,
- One new Susquehanna 500 kV Yard 2,
- The expansion of the existing Susquehanna 500 kV Yard,
- Two new 500 kV, 4,260 MVA (normal rating) circuits connecting the new BBNPP switchyard to the expansion of the existing Susquehanna 500 kV Yard, and the new Susquehanna 500 kV Yard 2:
- A switchyard control building ~~is~~ located near the new BBNPP 500 kV Switchyard.

The BBNPP will be located within the operational jurisdiction of the PJM Regional Transmission Organization (RTO). As the RTO, PJM provides non-discriminatory access to the transmission network in accordance with its Federal Energy Regulatory Commission approved Open Access Transmission Tariff. PJM operates and manages the bulk power transmission network in order to facilitate competition among wholesale generators. PJM directly manages the interconnection of new generation and transmission projects, and monitors various energy product markets to ensure fairness and neutrality for all market participants. PJM is the registered entity Transmission Operator (TOP) for all bulk power transmission facilities (100 kV and above) in the proximity of BBNPP.

Within the PJM system, various transmission owners own segments of the transmission system. In the proximity of the BBNPP, PPL EU owns the transmission network and is the Transmission Owner (TO). PJM delegates to PPL EU, in their role as TO, certain specified activities for the physical operation of transmission facilities at the direction of PJM.

The BBNPP is located adjacent to the existing Susquehanna Steam Electric Station (SSES). As such, significant transmission infrastructure exists within close proximity to the BBNPP ~~site.~~ site (Figure 3.7-1). In addition to existing transmission infrastructure, PPL EU is developing a new 500 kV transmission line from Susquehanna to the Roseland Substation (New Jersey). This expansion effort is a PJM Regional Transmission Expansion Plan (RTEP) initiative. PJM has determined that this new 500 kV line is required for grid reliability in the region without considering whether BBNPP is constructed. The in-service date of the Susquehanna-Roseland RTEP project is planned for 2012 and is expected to precede the completion of construction of the Bell Bend Nuclear Power Plant.

Design of new transmission facilities (to include transmission tie-lines) is governed by PJM and PPL EU design standards. BBNPP will interconnect to the transmission system at a single voltage of 500 kV.

The existing transmission system, constructed and operated for the region, including SSES Units 1 and 2, was addressed in the Environmental Report submitted with the original SSES

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plant license application (SSES, 1978) and re-evaluated in the Environmental Report submitted with the SSES license renewal application (SSES, 2006).

The existing 500 kV transmission system consists of the Susquehanna 500 kV Yard adjacent to the SSES plant, and two 500 kV circuits (Sunbury, Wescosville). Additionally the Susquehanna 500 kV Yard is connected to the Susquehanna 230 kV Yard by a 500kV/230kV transformer.

The existing transmission system was not, and the PJM planned expansion project being pursued by PPL EU will not be, constructed for the specific purpose of connecting BBNPP to the transmission system. They are not within the scope of interest and will not be addressed in this section, except where they impact or are impacted by, the transmission facilities of the BBNPP. The routes for the existing and PJM planned circuits from the SSES are presented in Figure 3.7-2.

3.7.1 Substation and Connecting Circuits

3.7.1.1 BBNPP Substation

The 500 kV switchyard design for BBNPP will consist of a 500 kV gas insulated, six bay, breaker and a half/double breaker scheme. The switchyard will have fourteen 500 kV circuit breakers and associated disconnect switches, bus work, and equipment. The switchyard will provide for connections to the BBNPP generator main step-up transformer, the three Normal Auxiliary Transformers, the two Emergency Auxiliary Transformers, the 500 kV transmission lines to the new Susquehanna 500 kV Yard 2, and the expansion of the existing Susquehanna Yard. A Control Building will be located along the southern side of the BBNPP Switchyard.

The BBNPP Switchyard will occupy a tract of land of approximately 300 ft (91.4 m) by 846 ft (257.9 m), or 5.8 acres (2.4 hectares). The switchyard is located approximately ~~300~~1400 ft ~~(91.4~~(426.7 m) east of ~~the plant transformer bay, 1250~~ BBNPP containment, 2400 ft ~~(381.0 m)~~ (731.5m) from the south plant boundary and ~~1300~~1800 ft ~~(396.2~~(548.6 m) from the ~~northwest~~north plant boundary, and can be seen on Figure 3.7-2.

The BBNPP Switchyard will be electrically integrated with the existing 500 kV transmission network by installing two 500 kV 4,260 MVA circuits on individual towers.

The BBNPP Switchyard area, as detailed in Figure 3.7-2, will be graded level with removal of any vegetation which might be present. Areas under the transmission lines will be cleared of any vegetation that could pose a safety risk to the transmission system, either through arcing or reducing the structural integrity of towers.

Clearing vegetation and maintaining the corridors and right-of-ways are to be conducted in accordance with the existing PPL EU procedure.

3.7.1.2 Connecting Circuits

The BBNPP substation will be electrically integrated with the existing 500 kV Susquehanna Yard, and the 500 kV Susquehanna Yard 2 by constructing two 500 kV 4,260 MVA lines on individual towers. A topographic map showing the location of the connecting circuits between the two substations is presented in Figure 3.7-2.

No new offsite transmission corridors will be required. The only new corridor required is from the BBNPP Switchyard until it reaches the corridor for the planned Susquehanna-Roseland line, which will be utilized to the extent possible.

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The detailed design of the new transmission lines has not begun, but the layout of the new lines will not have any impact on the existing offsite transmission corridor, and all new line construction will be under PJM jurisdiction.

The interconnection process in PJM is outlined in PJM's Open Access Transmission Tariff. To summarize, a merchant generation facility developer is responsible to provide a proposed interconnection design to PJM. The interconnection design will be subjected to PJM and Transmission Owner (PPL EU) studies. Actual physical placement of transmission lines, towers, etc., is worked out between the developer and the PPL EU to meet the needs of each party. NRC guidelines for physical separation of BBNPP transmission lines will be incorporated into the physical placement.

PPL EU will construct the necessary transmission network infrastructure. PPL Bell Bend, LLC will own the BBNPP Switchyard, and PPL EU will own the interconnecting transmission lines. Via delegation to PPL EU, PJM will operate the transmission lines connecting to the BBNPP Switchyard. Transmission lines interconnecting the BBNPP Switchyard to the transmission network will be sited according to PPL EU and PJM procedures and guidelines. Operation of the transmission system is governed by PJM and PPL EU procedures.

The design features consist of the following clearances and ratings:

Minimum phase-to-phase (metal to metal); 18 ft (5.5 m),

Minimum phase-to-ground; 12 ft 2 in (3.7 m),

Voltage; 500 kV,

Phases; 3,

Frequency; 60 Hertz

All new transmission lines in the PJM system require approval and authorization of PJM Interconnection. The permitting authority for transmission line routing is the PA Public Utility Commission, under Title 52 PA Code Section 57.71 (ER Section 1.0) (PA CODE, 2008).

Line routing would be conducted to avoid or minimize impact on wetlands, or threatened and endangered species identified in the local area. Regular inspections and maintenance of the transmission system and right-of-ways will be performed. These inspections and maintenance include patrols and maintenance of transmission line hardware on a periodic and as-needed basis. Vegetation maintenance may include tree trimming and minimal application of herbicide. Maintenance of the proposed onsite corridors including vegetation management will be implemented under the existing PPL EU procedure.

3.7.1.3 CORRIDORS

No new offsite transmission corridors are required to directly connect BBNPP to the transmission system. Corridor construction will be conducted to avoid or minimize impact on wetlands, or threatened and endangered species identified in the local area. Clearing vegetation and maintaining the corridors and right-of-ways are to be conducted in accordance with the existing PPL EU procedure.

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Environmental species and habitat, cultural and historic resources that may be affected by the design of transmission corridors on the BBNPP site are addressed in ER Sections 2.4.1, 2.4.2, and 2.5.3.

3.7.2 Electrical Design Parameters

3.7.2.1 Circuit Design

The detailed design of the transmission lines has not begun but would include selection of the conductor and conductor configuration and the other design parameters specified by NUREG-1555 (NRC, 1999). Design and construction of transmission lines would be based on the guidance provided by the National Electric Safety Code (NESC) (ANSI/IEEE, applicable version), State and Local regulations , PPL EU, and PJM standards. While the detailed design of the transmission circuits has not begun, the conductors would be selected to meet the power delivery requirements of BBNPP. The two 500 kV lines connecting the BBNPP Switchyard to the existing 500 kV Susquehanna Yard, and the new 500 kV Susquehanna Yard 2, will be rated at 4,260 MVA (normal rating). Each proposed phase would use the same three sub-conductor bundles comprised of three 1,590 circular mills, 45/7 aluminum conductor, steel reinforced conductors with 18 in (0.5 m) separation. There would typically be two overhead ground wires of 19#9 Alumoweld® or 7#8 Alumoweld®, but the final design could specify optical ground wire fiber optic cable in place of the Alumoweld® ground wire. The new lines would be designed to preclude crossing of lines wherever possible.

3.7.2.2 Induced Current Analysis

The design of the new transmission circuits would consider the potential for induced current as a design criterion. The NESC has a provision that describes how to establish minimum vertical clearances to the ground for electric lines having voltages exceeding 98 kV alternating current to ground. The clearance must limit the induced current due to electrostatic effects to 5 mA if the largest anticipated truck, vehicle, or equipment were short-circuited to ground. For this determination, the NESC specifies that the lines be evaluated assuming a final unloaded sag at 120°F (49°C). The calculation is a two-step process in which the analyst first calculates the average field strength at 3.3 ft (1.0 m) above the ground beneath the minimum line clearance, and second calculates the steady-state current value. The design and construction of the BBNPP substation and transmission circuits would comply with this NESC provision. At a minimum, conductor clearances over the ground would equal or exceed 29 ft (8.8 m) phase-to-ground over surfaces that could support a large truck or farm machinery, while clearance over railroad lines would equal or exceed 37 ft (11.3 m) phase-to-ground.

3.7.3 Noise Levels

The noise impacts associated with the transmission system would be from three major sources: (1) corona from the transmission lines (a crackling or hissing noise); (2) operation of the substation transformers; and (3) maintenance work and vehicles.

3.7.3.1 Corona

Corona discharge is the electrical breakdown of air into charged particles caused by the electrical field at the surface of the conductors, and is increased by ambient weather conditions such as humidity, air density, wind, and precipitation and by irregularities on the energized surfaces. During wet conditions audible noise from the corona effect can exceed 50 dBA for a 500 kV line may range between 59 and 64 dBA. Corona noise for a 500 kV line has been estimated to be 59.3 dBA during a worst-case rain with heavy electrical loads (SCE, 2006). For reference, normal speech has a sound level of approximately 60 dB and a bulldozer idles at approximately 85 dB.

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As shown in Figure 3.7-2, the proposed BBNPP 500 kV Switchyard and the transmission lines connecting the BBNPP Switchyard to the two Susquehanna 500 kV Switchyards will be constructed entirely within the BBNPP project area. The corona noise would be reduced at the project boundary from approximately 60 dBA near the conductors.

3.7.3.2 Substation Noise

Substations include transformer banks and circuit breakers that create "hum," normally around 60 dBA, and occasional instantaneous sounds in the range of 70 to 90 dBA during activation of circuit breakers (SCE, 2006). The new Switchyards will introduce new noise sources (transformers and circuit breakers) at their locations. The noise levels surrounding the Switchyards will likely be close to 60 dBA near the substation fence, but would be reduced near the project area boundary.

3.7.3.3 Maintenance Noise

Regular inspections and maintenance of the transmission system and right-of-ways are performed. A patrol is performed twice annually of all transmission corridors, while more comprehensive inspections are performed on a rotating 4-year schedule for the transmission system, and a rotating 3-year schedule for vegetation management. Maintenance is performed on an as-needed basis as dictated by the results of the line inspections and are generally performed on a 4-year schedule for the transmission system, and a rotating 3-year schedule for vegetation management. The noise levels for maintenance activities would typically be those associated with tree trimming, spraying, mowing and vehicle driving. Noise levels for maintenance in the new onsite corridor are expected to be similar to those currently generated by maintenance activities.

3.7.4 Structural Design

The existing 500 kV transmission towers are designed and constructed to NESC and current PPL EU standards. New towers added to support BBNPP which will be located on site, will also conform to these criteria. The new towers will be steel tubular or lattice designs, and will provide minimum clearances in accordance with the aforementioned standards. The two circuits connecting the BBNPP switchyard to the two 500 kV Switchyards will be carried on separate towers. All structures would be grounded with a combination of ground rods and a ring counterpoise system. If any transmission structures exceed a height of 200 ft (61 m) above ground surface Federal Aviation Administration permits will be required.

3.7.5 Inspection and Maintenance

Regular inspections and maintenance of the transmission system and right-of-ways will be performed. These inspections and maintenance include patrols and maintenance of transmission line hardware on a periodic and as-needed basis. Vegetation maintenance may include tree trimming and minimal application of herbicide. Maintenance of the proposed onsite corridors including vegetation management will be implemented under the existing PPL EU procedure.

3.7.6 Compliance and Siting

All new transmission lines in the PJM system require approval and authorization of PJM Interconnection. Additionally, the PA Public Utility Commission under 52 PA Code Section 57.71 is the state permitting agency for transmission lines. Construction, operation, and maintenance, including the mitigation of electric shock hazards, for the power transmission system will be in accordance with the Institure of Electrical and Electronic Engineers, Inc. NESC. Transmission line design and construction will be in compliance with all state and local

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standards and regulations as well as 18 CFR 35, Code of Federal Regulations, Title 18, Conservation of Power and Water Resources, "Filing of Rate Schedules and Tariffs."

In addition to existing transmission infrastructure, PPL EU is developing a new 500 kV transmission line from Susquehanna to the Roseland Substation (New Jersey), a distance of approximately 130 miles. This expansion effort is a PJM Regional Transmission Expansion Program (RTEP) initiative. The new PPL EU owned 500 kV substation No. 2 will be constructed on the SSES to facilitate interconnection of the Susquehanna-Roseland line. Commercial in service date of the Susquehanna-Roseland RTEP project is expected to precede the construction of the Bell Bend Nuclear Power Plant.

For the purpose of completing the PJM Interconnection studies, a conceptual design is utilized that meets the needs of the developer, transmission owner, and RTO. Detailed design of transmission infrastructure required to interconnect the BBNPP to the transmission network will take place after an Interconnection Service Agreement is executed between PJM Interconnection and BBNPP. The two (2) 500 kV tie lines to SSES 500 kV switchyards No. 1 and No. 2 will be designed in accordance with PJM Interconnection and PPL EU transmission line design standards. Any BBNPP specific design requirements (such as physical separation of structures) will also be incorporated into the final design.

Since no new off-site transmission corridors are required to facilitate the interconnection of BBNPP, no specific siting procedures are required specifically for the construction of the BBNPP transmission lines.

3.7.7 References

ANSI/IEEE, applicable version. National Electric Safety Code, ANSI/IEEE C2, version in effect at time of design, American National Standards Institute/Institute of Electrical and Electronics Engineers.

NRC, 1999. Environmental Standard Review Plan, NUREG-1555, Nuclear Regulatory Commission, October 1999.

PA CODE, 2008. Title 52, Pennsylvania Code, Section 57.71, Electric Service - Commission Review of Siting and Construction of Electric Transmission Lines, 2008.

SCE, 2006. Devers-Palo Verde 500 kV No. Project (Application No. A.05-04-015), Final Environmental Impact Report/ Environmental Impact Statement, State of California Public Utilities Commission, Southern California Edison, October 2006.

SSES, 1978. Susquehanna Steam Electric Station Units 1 & 2, Environmental Report, PPL Susquehanna, LLC, May 1978.

SSES, 2006. Susquehanna Steam Electric Station Units 1 & 2, License Renewal Environmental Report, Appendix E, PPL Susquehanna, LLC, September 2006.

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Figure 3.7-1— BBNPP Site 500 kV and 230 kV Regional Circuit Corridors

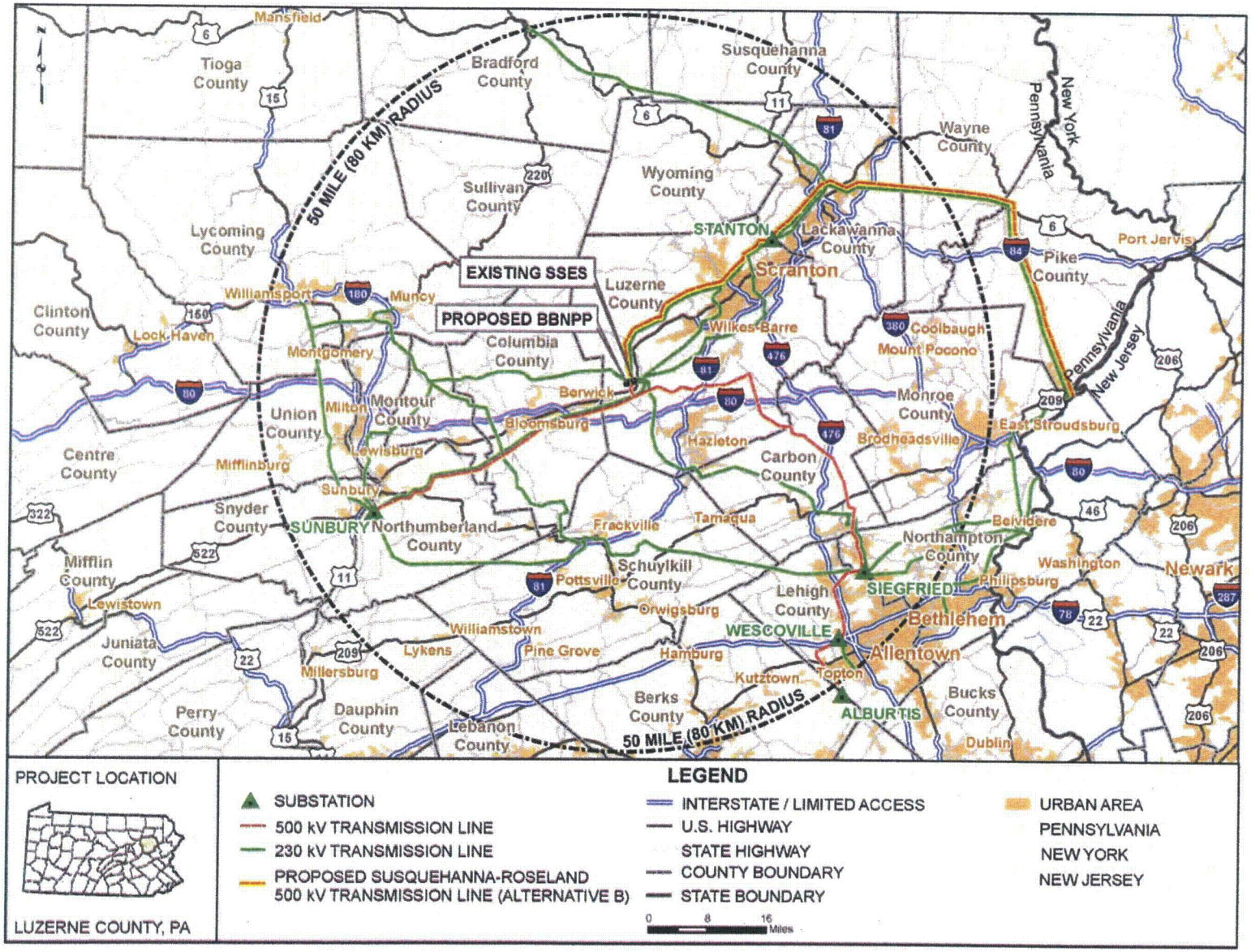

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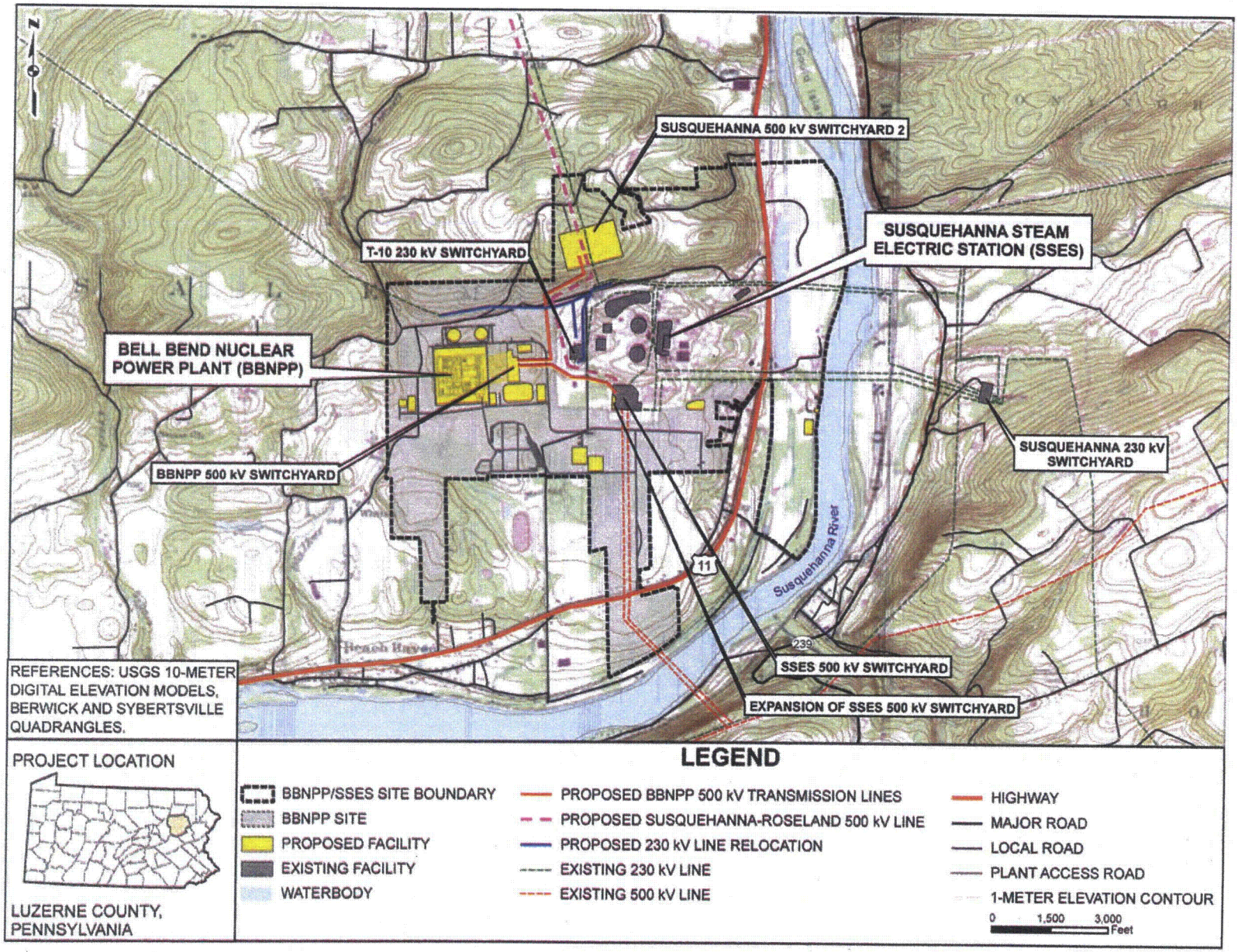
Figure 3.7-2— Site Topography and Generalized Transmission Line Corridor



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