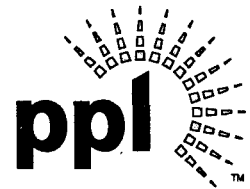


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April 19, 2011

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**BELL BEND NUCLEAR POWER PLANT  
BBNPP PLOT PLAN CHANGE COLA  
SUPPLEMENT, PART 3 (ER); SECTION 6.5  
BNP-2011-074                      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-2010-231, R. R. Sgarro (PPL Bell Bend, LLC) to U.S. NRC, "Clarification of Schedule for COLA Part 11 Reports," dated September 10, 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, 2, and 3, 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.

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 6.5, Revision 2g. The revised BBNPP COLA section supersedes previously submitted information in its entirety.

No open RAIs are associated with the enclosed COLA section. No previously submitted responses to RAIs are affected by the changes shown in the enclosed COLA section. No departures and/or exemptions from the U.S. EPR FSAR for this BBNPP COLA section have

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been created or revised as a result of the PPC. No new or revised RAI responses are included in this transmittal.


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

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 April 19, 2011

Respectfully,



Rocco R. Sgarro

RRS/kw

Enclosure: Revised BBNPP COLA Part 3 (ER); Section 6.5, Revision 2g

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Enclosure

Revised BBNPP COLA Part 3 (ER), Section 6.5, Revision 2g

## 6.5 ECOLOGICAL MONITORING

The following sections present information regarding ecological monitoring for terrestrial ecology, land use, and aquatic ecology of the Bell Bend Nuclear Power Plant (BBNPP) site areas likely to be affected by site preparation, construction, and operation and maintenance of BBNPP. The monitoring programs are designed based on anticipated environmental impacts through the various stages of BBNPP project implementation. This section complies with NRC Regulatory Guide Sections 4.7 and 4.11 regarding general site suitability studies and terrestrial environmental studies to allow reasonably certain predictions that there are no significant impacts to the terrestrial ecology associated with the construction or operation of BBNPP.

Monitoring programs to detect changes in the ecology begin before application submittal and continue during site preparation and construction and throughout station operation and maintenance. The monitoring programs cover elements of the ecosystem where a causal relationship between station construction and operation and adverse changes are established or strongly suspected. An evaluation of the standardization, adequacy and accuracy of data collection and analytical methods used in the monitoring programs is included.

### 6.5.1 Terrestrial Ecology and Land Use

The following sections present information on monitoring programs for terrestrial ecology and land use likely to be affected by site preparation, construction, or operation and maintenance of the facility. The monitoring programs are designed based on anticipated environmental impacts through the various stages of project implementation.

#### 6.5.1.1 Preapplication Monitoring

Section 2.2.1 describes the site features and land use including a map showing these features. Section 2.2.2 describes the existing and proposed transmission line corridors and Section 2.4.1 describes the field studies performed to determine the major plant communities and important species and habitats. Note that the details of the type, frequency and duration of observations or samples taken at each location are contained in the individual reports for the field studies discussed in Section 2.4.1. The field studies and Section 2.4.1 discuss the distribution and abundance of important species and habitats. Critical life history information including parameters such as feeding areas, wintering areas and migration routes are also discussed in Section 2.4.1. Descriptions of modifications that may affect existing patterns of plant and animal communities including the development of cooling ponds and reservoirs, cooling towers, transmission line corridors and access routes is discussed in Section 4.3.1.

Mitigation requirements for unavoidable impacts to wetlands will be guided by conditions established in permits issued by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Federal Water Pollution Control Act (EPA, 1977) and by the Pennsylvania Department of Environmental Protection (PADEP) under its Chapter 105 Dam Safety and Waterway Management Regulations (PA, 1991). Section 1.3 contains a list of the permits required for this project as well as the applicable Federal and State regulations. Monitoring of mitigation success will be defined and executed with reference to these regulations. Additional guidance will be provided by "Design Criteria for Wetland Replacement" (PADEP, 1997), and "Mitigation and Monitoring Guidelines" (USACE, 2004).

As part of the mitigation design process, all wetlands likely to be affected by BBNPP site preparation and construction will be evaluated to determine their functions and values by a methodology accepted by USACE and PADEP. Functions identified will be used as the basis of mitigating loss of wetlands during site development.

As an essential record of overall project area baseline conditions, field surveys and aerial photography of the proposed site and transmission line system were obtained prior to construction. The resulting map of vegetation types by structure (e.g., herbaceous, shrub-scrub, sapling/small trees) and moisture regime (e.g., emergent wetland, droughty outcrops) serve as a guide to identify suitable habitats of Federal and State-listed species of plants and animals. Following the results of a listed-species field survey, access roads and staging areas within the proposed site were located so as to avoid such habitats to the extent possible. Management plans will be prepared that aim to enhance or at least perpetuate the habitat for target species. Repeated aerial photography every five years including some field observations to verify the information gathered from photo interpretation will serve as a record of forest regrowth in restored areas after completion of construction as proposed in Section 4.3.1.4. It would also provide evidence of any erosion around construction and other work areas, and indicate changes in vegetation that may call for corrective action (e.g., wind throws) or aid in the scheduling of routine transmission corridor right-of-way management.

Wildlife surveys of mammals, birds, reptiles, amphibians, and terrestrial invertebrates were conducted at the BBNPP site during 2007 and 2008. Additional terrestrial surveys were completed during May and June 2010. In addition, plant species were inventoried as part of the wetlands delineation and plant community mapping field studies conducted during ~~the same time period, 2007 and 2008 and in Spring 2010.~~ Table 2.4-1 identifies the important ~~terrestrial special~~ species at the BBNPP ~~OCA Site.~~ The Northern myotis, peregrine falcon, long dash butterfly, and black dash butterfly have been observed on the site. In addition, recreationally important fauna (white-tailed deer, black bear, wild turkey) and ecologically important fauna (meadow vole, deer mouse, white-footed mouse, scarlet tanager) were observed but are also known to commonly occur in surrounding areas. Plants that are commercially important (black cherry) and ecologically important (red maple, river birch, spicebush, skunk cabbage, Canada goldenrod) were also observed onsite. Similarly, these plant species are very common both locally and regionally.

There are no continuous monitoring programs required for terrestrial ecology and land use in this phase of the project.

#### **6.5.1.2 Site Preparation, Construction and Pre-Operational Monitoring**

A description of site preparation and construction impacts on terrestrial resources, including wetlands, is discussed in Section 4.1.

Mitigating wetlands lost to BBNPP site development will commence according to mitigation plans developed for USACE and PADEP approval. Any monitoring required during site preparation, construction and pre-operation will follow guidelines developed by the USACE and the Commonwealth of Pennsylvania in accordance with conditions specified in required permits listed in Table 1.3-1. Additional monitoring including program elements, actions and reporting levels will be specified as required by the PA Department of Environmental Protection; Pennsylvania Stormwater Best Management Practices Manual (PADEP, 2008); Best Management Practices (BMPs) for erosion and sediment control as provided in Title 25 PA Code, Chapter 102 (PA, 2000); the NPDES permit; and other applicable permits obtained for construction. This plan and program will be implemented during this phase in order to minimize impacts to wetlands, groundwater and aquatic ecology.

In accordance with the baseline studies performed during the preapplication timeframe and existing plant experience at the nearby SSES site, no additional monitoring programs are proposed for:

- ◆ Bird collisions with plant structures, transmission lines and towers, and cooling towers; and
- ◆ Impacts to important species and habitats.

These parameters have all been determined to have a small impact on terrestrial ecology as discussed in Section 4.3.1, and Section 4.3.2. In addition, there is a commitment to place flashing lights or reduce lighting on the large cooling towers to minimize bird collisions once these structures are built.

There are no continuous monitoring programs required for terrestrial ecology and land use in this phase of the project.

### 6.5.1.3 Operational Monitoring

Operation and maintenance impacts of the proposed transmission system are addressed in Section 5.6.1. There are no continuous monitoring programs required for terrestrial ecology and land use in this phase of the project

## 6.5.2 Aquatic Ecology

The following sections present information regarding ecological monitoring for aquatic ecosystems likely to be affected by site preparation, construction, or operation and maintenance of the facility. The monitoring programs are designed based on anticipated environmental impacts through the various stages of project implementation.

Section 2.3.3 documents the pre-existing water quality characteristics of the freshwater bodies in the vicinity of the plant and the Susquehanna River. The principal aquatic ecological features of the BBNPP site and vicinity are described in Section 2.4.2, including freshwater systems on the BBNPP site and the intake and discharge areas of the Susquehanna River. Impacts to aquatic systems from construction of the facilities are described in Section 4.3.2. Impacts to aquatic systems from operation of the cooling system are described in Section 5.3.1.2. Impacts from waste discharges are described in Section 5.5.

### 6.5.2.1 Preapplication Monitoring

Long-term monitoring of the Susquehanna River has occurred in relation to operation of SSES. This long-term monitoring program included water quality, algae, periphyton, benthic macroinvertebrates, and fish. Currently, the program samples river water quality on a quarterly basis, and the fish assemblage is sampled from spring to fall. In addition to the ongoing water quality and fish data collections, benthic macroinvertebrates were collected in the summer of 2007 and 2008. A mussel survey was completed during October 2007 in the vicinity of the proposed BBNPP intake/discharge structures. Other preapplication monitoring has been conducted on the BBNPP site, including sampling for fish in the ~~ponds~~ ponds, the Canal and adjacent waters, Walker Run, and Unnamed Tributary 1 and benthic macroinvertebrate collections in Walker Run and Unnamed Tributary ~~2.5~~. This recent data collection effort is reported in Section 2.4.2. An impingement and entrainment study was ~~initiated in~~ performed from April 2008 through March 2009 at the SSES intake structure to provide data on potential impingement and entrainment at the proposed BBNPP ~~water intake structure.~~ Intake Structure. Some historical impingement data have also been collected but is limited to the fall outmigration period in years where American shad were stocked up-river from SSES. A macroinvertebrate collection was completed during the summer of 2008-2008, and fish sampling was conducted in the North Branch Canal, Canal Outlet, and a Marshland adjacent to the Canal in the spring of 2010. The aforementioned data collection efforts provide a sufficient

basis for describing the ecological resources existing on and in the vicinity of the BBNPP site. Sampling locations, sampling methods and quality control are discussed in Section 2.4.2.

No rare or unique aquatic species were identified in the on-site ponds or Walker Run. The aquatic species that occur on site are ubiquitous, common, and easily located in nearby waters. Typical fish species found in the ponds included bluegill, largemouth bass, and brown bullhead. The Walker Run fish community was predominantly comprised of creek chub, white sucker, and blacknose dace. The composition of the fish assemblage ~~is assumed in the Canal and adjacent waters was found~~ to be similar to the fish assemblage in Lake ~~Took-A-While, Took-a-while, a Lakelake~~ that is hydrologically connected to the ~~North Branch Canal~~. The fish assemblage in the ~~lake~~ Canal and adjacent waters is dominated by bluegill, ~~other common~~ green sunfish, and golden shiner. However, as discussed in detail in Section 2.4.2, a single specimen of brook stickleback, a candidate species ~~include carp and largemouth bass~~ of concern in Pennsylvania, was collected in the Canal Outlet. The most important aquatic ~~macroinvertebrate~~ macroinvertebrate species in the on-site water bodies are the juvenile stages of aquatic insects. No mussels were observed in the ponds, Canal ~~or and adjacent waters of~~ Walker Run. Figure 2.4-3 through Figure 2.4-6 show the collection locations in the ~~river~~ River and on site in the ponds, Walker Run, and the Canal.

No rare fish species were collected in the Susquehanna River. All of the collected species are common inhabitants of large rivers in Pennsylvania and include several game fishes including smallmouth bass, walleye, and muskellunge.

Two important species of mussels, green floater and yellow lampmussel, were collected from the river. The yellow lampmussel was collected during the mussel survey completed in October 2007. This survey was performed both upstream and downstream of the proposed BBNPP intake/discharge structures. The green floater was collected in the benthic macroinvertebrate samples taken during August 2007. Both species are listed as species of special concern by the Pennsylvania Fish and Boat Commission (PFBC). Construction activities will likely have minimal impact to mussels in the Susquehanna River. However, surveys may be required prior to intake/discharge structure construction to determine if mussels are present in the vicinity of these areas and, if so, these mussels may need to be relocated. This determination is coordinated with the ~~Pennsylvania~~ Pennsylvania Fish and Boat Commission as construction plans for BBNPP become more definite. A description of both species is included in Section 2.4.2.

Descriptions of modifications that may affect existing patterns of plant and animal communities such as dams, impoundments, dredging, filling of wetlands, and clearing of stream banks are discussed in Section 4.3.2.

There are no continuous monitoring programs required for aquatic ecology in this phase of the project. The surveys performed to establish baseline conditions were sufficient to document the composition and abundance of aquatic organisms on site and in the river.

#### **6.5.2.2 Construction and Pre-Operational Monitoring**

Construction and preoperational monitoring programs are proposed for resources that may affect aquatic ecology, including thermal monitoring (as discussed in Section 6.1), hydrological monitoring (as discussed in Section 6.3) and chemical monitoring (as discussed in Section 6.6). ~~Aquatic ecology monitoring is proposed during BBNPP site preparation and plant construction for Walker Run.~~



Walker Run will be monitored after re-construction of two sections of the stream on the BBNPP site. Monitoring will be undertaken for fish and benthic macroinvertebrates once new channel construction is completed. Monitoring will start a minimum of 30 days after watering the new channel. This will allow for sufficient time for colonization by fish and benthic macroinvertebrates. Sampling should be completed upstream of the new channel, within the new channel, and downstream of the new channel. Monitoring stations will be similar to those during pre-application monitoring (Figure 2.4-1). Fish and benthic macroinvertebrate sampling will be completed at each location. Both fish and benthic macroinvertebrate collections should be completed during the spring and fall. Additionally, habitat assessments of the constructed channel should also be completed at the time the biological samples are collected.

Construction monitoring mainly consists of drainage from excavations which are pumped to a storm water discharge point. Approval of storm water management and erosion/sediment control plans will be obtained in accordance with the National Pollution Discharge Elimination System (NPDES) permit (PA, 2000). The Pennsylvania Department of Environmental Protection will issue a permit to include pollutants typically found at a construction site such as sediments and petroleum hydrocarbons.

Storm water discharges from impervious surfaces at the new facility will be controlled and minimized by following guidelines established in Pennsylvania's Stormwater Best Management Practices Manual. This plan calls for periodic monitoring and record keeping of the engineered controls to ensure they are effective in minimizing silt runoff and evaluating the need to repair or replace the installed controls such as silt fences, hay bales, berms and settling ponds (PADEP, ~~2008~~ 2006). The U.S. Army Corps of Engineers 404 Permit may contain requirements for aquatic monitoring as it relates to chemical spills or control of silt discharging into water bodies. Implementation of the Preparedness, Prevention, and Contingency Plan requires periodic monitoring and record keeping ensuring to ensure spill controls are established and maintained to minimize impacts to the aquatic environment.

Details as to monitoring program elements, sampling procedures and equipment, data analysis, quality control and reporting will be contained in the various permits and approvals required for construction.

BBNPP will be designed to meet the Phase I, New Facility requirements published at 40 CFR 125.80 to 89, under Track I (CFR, 2008). The cited EPA requirements meet the Clean Water Act 316(b) rules to verify there will be minimal adverse environmental impact to fish and other aquatic organisms due to impingement and entrainment for the new intake structure.

### 6.5.2.3 Operational Monitoring

Operational aquatic ecology monitoring may be required as a condition of a new NPDES permit and for compliance with the Clean Water Act 316(b) Rule (CFR 2008). The permit will require flow and water quality monitoring, such as monitoring of certain chemical constituents in the discharge and temperature.

Aquatic biological monitoring may be required in the river, Walker Run, and in several unnamed tributaries after completion of construction and after initiation of plant operation. This monitoring would most likely entail additional aquatic collections at the same locations as the preapplication monitoring.

The River biota monitoring program should consist of summer benthic macroinvertebrate collections, monthly fish collections from spring through fall, and quarterly water quality monitoring. The sample locations would be upstream and downstream of the BBNPP diffuser bar, similar to the monitoring program currently in place for SSES. Data has been collected in the Susquehanna River for over 24 years in support of SSES operations. The monitoring originally included sampling of macroinvertebrates, fish, algae, periphyton, and water quality in the river. The current program samples water quality on a quarterly basis and fish on a monthly basis from spring through fall. ~~Some historical impingement data has also been collected but is limited to the fall outmigration period in years when American shad were stocked up river from SSES. Currently a year-long Impingement Mortality and Entrainment study is being completed at the existing SSES intake structure. The study includes weekly 24-hour duration year-round impingement sampling and entrainment sampling, that is focused around the primary fish spawning period, approximately April-August.~~

Monitoring within Walker Run and unnamed tributaries to Walker Run may also be necessary. This monitoring should include both benthic macroinvertebrate and fish surveys at the same locations as those completed in the pre-application monitoring (Figure 2.4-1, 2.4-3). Spring and fall collections for both groups should be sufficient to document changes in the community associated with operation of BBNPP. Additionally, water quality and habitat monitoring may also be necessary.

Several unnamed tributaries (Unnamed Tributaries ~~1, 2, 3, 4, and 5~~) may be impacted by construction and operation of BBNPP (Figure 2.4-1, 2.4-3). Monitoring of these tributaries may include benthic macroinvertebrate collections during the spring and fall. Benthic macroinvertebrate surveys were completed in Unnamed Tributaries ~~23 and 35~~ during pre-application monitoring. Unnamed Tributary 3 was dry during the sampling effort. In all three streams operational monitoring should include benthic macroinvertebrate collections at the same locations as pre-application monitoring and possibly habitat assessments to document changes in the stream channel associated with runoff from the BBNPP site.

The Clean Water Act Section 316(b) (CFR 2008) requires that the location, design, construction and capacity of a cooling water intake structure reflect the best technology available (BTA) for minimizing adverse environmental impacts. The Phase I Rule, 40 CFR 125 (CFR 2008), addresses new sources of cooling water intake at steam electric plants. The BBNPP cooling water intake structure is designed to meet the Clean Water Act Section 316(b) (CFR 2008) Phase I requirements for new facilities under Track 1 (closed cycle cooling and intake screen velocity less than or equal to 0.5 fps (0.15 mps)).

As noted in Section 5.5.1.1, the discharges to surface waters from plant operations will include cooling water blowdown and storm water runoff. Concentrations of chemicals in the cooling water discharge will be controlled by the NPDES permit. Sanitary wastewater lines will be tied into a publicly owned treatment works operated by the Berwick Area Joint Sewer Authority.

Storm water discharges from impervious surfaces at the BBNPP will be controlled and minimized by provisions of Pennsylvania's Stormwater Best Management Practices Manual. An Erosion and Sediment Control Plan is required to be implemented at a construction site in which best management practices are utilized to control erosion and sediment. The plan provides detailed descriptions of various best management practices that can be implemented on site to reduce stream channel erosion, pollution, siltation and sedimentation and local flooding. A Preparedness, Prevention, and Contingency Plan is required by Pennsylvania (Pa Code Section 91.33 and 91.34). The plan shall identify areas in which toxic or

hazardous substances are stored or handled that may have the potential to cause non-compliance. BMP's shall be developed for each identified area. A Post-Construction Stormwater Management Plan must be prepared and implemented to identify the BMP's to be installed to manage and treat the stormwater discharge so that water quality is protected after construction activities are terminated.

In addition, water withdrawn from the Susquehanna River is regulated as part of the Susquehanna River Basin Commission (SRBC, 2008). The Susquehanna River Basin Commission oversees the consumptive use permitting process under Article 3, Section 3.10.2(ii) of the Commission. The withdrawn water will be used for makeup water in the plant cooling system.

Operation of the BBNPP will not require use of groundwater.

A recent nuclear industry initiative by the Nuclear Energy Institute and NRC assessment (NRC, 2006) of existing nuclear reactors indicates that requirements related to groundwater monitoring during plant operation may change for present and future nuclear reactors. Therefore, this developing issue will continued to be followed and future requirements will be addressed, as applicable.

### 6.5.3 References

**CFR, 2008.** Title 40, Code of Federal Regulations, Sections 125.80-89, Track 1, Requirements Applicable to Cooling Water Intake Structures for New Facilities Under Section 316(b) of the Act, 2008.

**EPA, 1977.** Environmental Protection Agency, Section 404 of the Federal Water Pollution Control Act, Clean Water Act, Amended 1977, Website: <http://www.epa.gov/npdes/pubs/cwatxt.txt>, Date accessed: June 4, 2008.

**NRC, 1999.** Standard Review Plans for Environmental Reviews for Nuclear Power Plants, NUREG-1555, Nuclear Regulatory Commission, October 1999.

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**PA, 2000.** Title 25 PA Code, Chapter 102, Erosion and Sediment Control, January 2000, Website: <http://www.pacode.com/secure/data/025/chapter102/chap102toc.html>, Date accessed: June 3, 2008. 2000.

**PADEP, 1997.** Design Criteria – Wetlands Replacement/Monitoring. Pennsylvania Department of Environmental Protection, February 1997.

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**SRBC, 2008.** Susquehanna River Basin Commission, Policies, Guidances, and Regulations, Website: <http://www.srbc.net/policies/policies.htm#Policies>, Date accessed: May 28, 2008.

**USACE, 2004.** Mitigation and Monitoring Guidelines, Baltimore District Regulatory Program, U. S. Army Corps of Engineers, November 2004.