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May 26, 2010

Mr. Jim Richenderfer
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Susquehanna River Basin Commission
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**BELL BEND NUCLEAR POWER PLANT**
**IFIM AND AQUATIC IMPACT STUDIES WORKPLAN UPDATE**
**BNP-2010-142 Docket No. 52-039**

References: 1) BNP-2010-103, "Study Plan to Assess the Potential Effects of the Bell Bend Project on Aquatic Resources and Downstream Users", dated April, 2010.

On April 29, 2010 PPL Bell Bend, LLC (PPL) submitted to the Susquehanna River Basin Commission (Commission) a study plan (Reference 1) that proposed certain studies to be performed during 2010 to evaluate the potential effects that BBNPP's operations might have on the aquatic biota and water quality in the river.

While the Commission and resource agencies have not yet completed their review of the submitted study plan, conditions in the river were such that PPL needed to start collecting river data and establishing transects at its high flow target in order to ensure that the data collection opportunity for 2010 would not be missed.

As a result of field work completed from May 5-7, 2010, Section 6.3 (pages 49 – 51 of the original study plan) has been rewritten (See Enclosure 1). This includes an updated narrative summarizing the Bell Bend Project PHABSIM Transect Selection that occurred and a revised Figure 6.4 showing approximate location of each transect. Average daily measured flows during this timeframe were close to the high flow target of 10,000 cfs. The preliminary average daily measured flows were 10,100 cfs, 9729 cfs, and 8994 cfs. The corresponding provisional daily mean flows at the USGS Wilkes-Barre gage were 9190 cfs, 8860 cfs, and 8330 cfs.

GIS native shape files will be sent to the Commission under a separate transmittal for confidential handling.

Should the Commission have any questions regarding the attached, please contact Bradley A. Wise, Environmental Permitting Supervisor, at 610-774-6508.

Respectfully,

George J. Kuczynski

GJK/dw

Enclosure 1) Revision of Section 6.3 of "Study Plan to Assess the Potential Effects of the Bell Bend Project on Aquatic Resources and Downstream Users"

cc

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Enclosure 1

Revised Section 6.3 of BNP-2010-103, "Study Plan to Assess the Potential Effects of the Bell Bend Project on Aquatic Resources and Downstream Users", dated April, 2010.

### *6.3. HABITAT REPRESENTATION AND TRANSECT SELECTION*

Development of a relationship between suitable aquatic habitat and river flow for selected species and life stages within the IFIM/PHABSIM framework depends on the measurement or estimation of physical habitat parameters (depth, velocity, substrate/cover) within the study reach. Generally, the lateral and longitudinal distribution of the values of these parameters at given river flows are determined at points along transect lines across the stream channel, positioned to account for spatial and flow-related variability. A variety of hydraulic modeling techniques can be used to estimate water depth and velocity as a function of river flow; substrate and cover values are generally fixed at a given point. With physical habitat thus characterized for a range of river flows, the suitability of the habitat (for a particular species and life stage) at each point is scaled from zero to one, usually by multiplying together the corresponding suitability values for depth, velocity, and substrate from the appropriate HSC curves. These point estimates of suitability are then used to weight the physical area of the study represented by each point, and the weighted areas are accumulated for the entire study reach to produce the index of useable habitat (WUA) as a function of river flow for each species and life stage.

This study will use the mesohabitat typing, or habitat mapping, approach originally described by Morhardt *et al.* (1983) and summarized by Bovee *et al.* (1998). In this design, mesohabitats (broadly defined habitat generalizations) are mapped over the entire study reach, such that each area of the waterway is characterized by a general habitat type, and the total length, or proportion, of the study reach assigned to each mesohabitat type is determined.

An initial boat-based site visit in early September 2009, when the prevailing river flow was approximately 3,400 cfs, provided information for the classification of the major mesohabitat types within the study area. Figure 6-4 shows the four major mesohabitat types found: pool, run/glide, riffle, and narrow channel. Preliminary transect locations were strategically selected to both represent the proportion of each habitat type in the study area, and to reflect the habitat variability within the habitat type (deep, shallow, split channel, etc.).

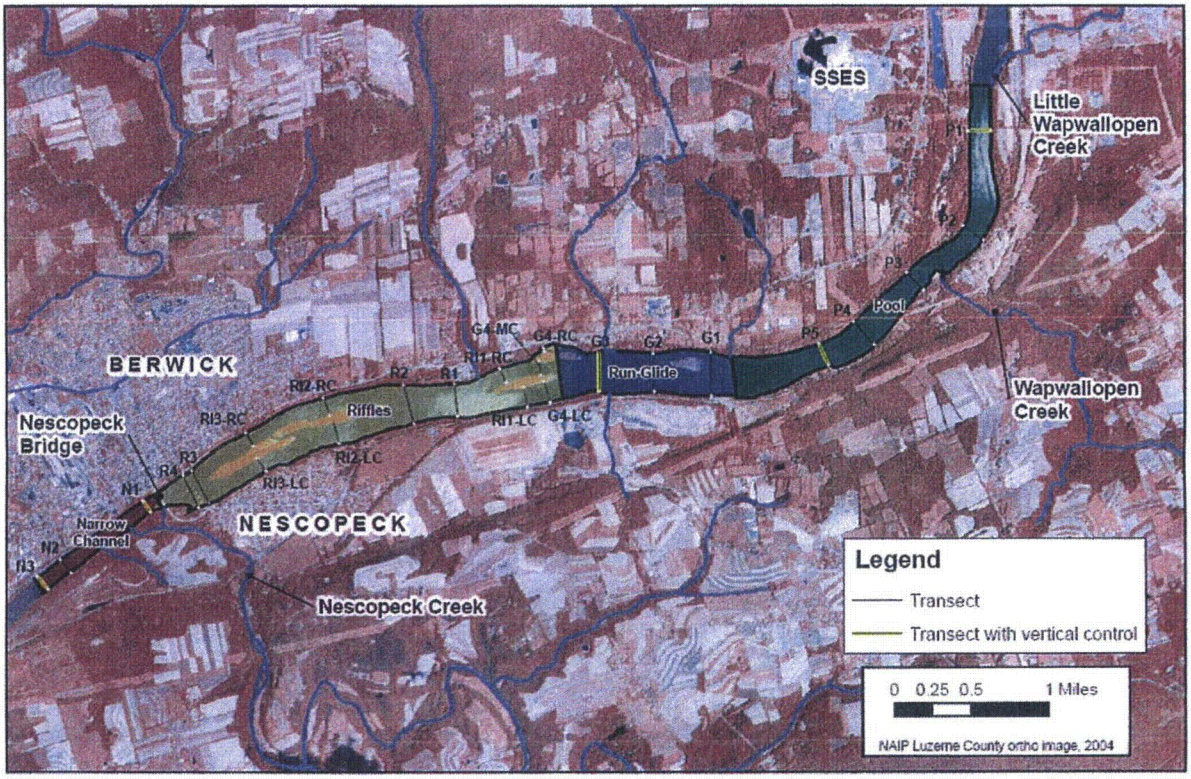


**Figure 6-4.**

The four major mesohabitat types in the aquatic habitat study reach with 19 selected transects.

**Table 6-4 Mesohabitat types for the Susquehanna River near the BBNPP**

| Mesohabitat Type | Description |
|---|---|
| Pool | Deep, slow water with turbulent flow (if present) only near the head. Retains standing water as discharge approaches zero. |
| Run/Glide | Shallow, fast water with smooth or laminar flow and little or no exposed substrates. Common in tailouts of deeper pools or interspersed with runs. Also referred to as flatwater or smooth run. |
| Riffle | Shallow with gravel, cobble, or boulder hydraulic control, fast water with turbulent flow. Possible exposed substrate, usually boulder. |
| Narrow Channel | Deep, fast water with turbulent flow and infrequent exposure of bedrock, boulders, or coarse substrate |

Actual transect placement took place between May 5 and 7, 2010 concurrent with high flow data collection. During transect placement the field crew first located the proposed transect endpoints using GPS. In most instances, transects were positioned as close as possible to the preliminarily selected locations. Five pool transects (P1 to P5) were selected to reflect variation in channel width and curvature. Four glide transects (G1 to G4) were placed within the "run/glide" habitat type, including one to represent the island and back channel at the lower end of that section. In Three riffle transects (R1 to R3) represent single-channel areas, again reflecting variation in stream width and depth, and another three (RI1 to RI3) were placed to represent the split-channel areas created by islands. A final three transects (N1 to N3) were selected to represent the "narrow channel" area downstream of Nescopeck Creek.

There were three exceptions during transect placement:

1) Pool P5 was moved upstream due to property and bank stabilization concerns along the left bank;
2) Glide G4 was intended to cross the tip of a mid-channel island and incorporate a small island near the right bank. Due to potential private property concerns the right channel portion of the transect was moved downstream. In addition, in order to maintain similar water surface elevations between channels, the remainder of the transect was also relocated, resulting in the inclusion of two islands and three channels. The final location of this transect is near the boundary of run/glide and riffle habitat, but based on observations at high flow the transect appears to incorporate both habitat types;
3) An additional riffle transect was added (R4) below a series of old bridge abutments to incorporate potential smallmouth bass spawning and rearing habitat.