Enclosure 1

PPL Response to SRBC Letter Dated January 19, 2011

Comment 1

The first page of Enclosure 1 referenced a meeting in July 2009, stating that the Commission required an IFIM study because of additional consumptive use of water by the Bell Bend Nuclear Power Plant (BBNPP) project. To reiterate our position outlined in our July 26, 2010 letter, PPL has several options to comply with Commission policies and regulations that do not require performance of an IFIM study. These options include: (1) accept an approval condition requiring a passby flow of 20 percent of the average daily flow (ADF) during operations; (2) provide releases from upstream storage water to fully mitigate the withdrawal and consumptive use at flows less than 20 percent ADF; and (3) otherwise alter plant operations to accommodate low river flows (less than 20 percent ADF). The IFIM study is only required if PPL wishes to attempt to demonstrate that the aquatic life in the river would not be degraded due to water withdrawals for BBNPP if none of the three options above are fully implemented, or are implemented at a different low flow threshold, such as Q7-10. In short, Commission staff has allowed an IFIM study to be considered by PPL to provide information to support as a fourth option, but the choice of this option is at the discretion of PPL. This comment also applies to a similar statement on page 7 and page 11.

Response

We concur that implementation of IFIM studies to further evaluate the need for a passby flow was at PPL's discretion. We will correct this language in the record version of the final study plan.

Comment 2

In Section 1, pages 9 and 10, the discussion of Commission Policy No. 2003-01 indicates a misunderstanding of that policy. Section III, paragraph B, of that policy clearly provides wide latitude for the Commission to set passby flow requirements to assure water quality is not compromised by water withdrawals. As additional studies, such as Commission Publication No. 253 (Consumptive Use Mitigation Plan, issued in March 2008), become available, the Commission will give due consideration to any study in determining water quality impacts.

Response

PPL has previously made the SRBC aware of our concerns regarding the Commission's passby flow policy. We believe that the language in this section of the workplan fairly summarizes the text of the passby flow policy. The policy explicitly states the following: "If the surface-water withdrawal or ground-water withdrawal impact is minimal in comparison to the natural or continuously augmented flows of a stream or river, no passby flow will be required. Minimal is defined as 10 percent or less of the natural or continuously augmented 7-day, 10-year low flow (Q7-10) of the stream or river.....". As staff is aware, the Bell Bend water withdrawal is approximately five percent of 7Q10 flow. While PPL respectfully recognizes Commission discretion, a plain reading of the text of the policy suggests a clear intention by the Commission not to impose a passby flow when flow impacts are minimal as defined in the policy.

Comment 3

Section 3.1.1 states that, "Flow in the river between Nescopeck Creek and Fishing Creek will be assumed to be the sum of the Wilkes-Barre flow and the Nescopeck flow." The method to simulate flow needs to be further clarified. The stated method does not take into consideration: (1) the drainage in between the Wilkes-Barre gage and the Nescopeck Creek confluence with the Susquehanna River, which includes numerous tributaries to the Susquehanna River (including the U.S. Geological Survey [USGS]-gaged Wapwallopen Creek); (2) how flow will be simulated from a non-realtime Nescopeck Creek USGS gage; and (3) what flow will be simulated from the Nescopeck Creek USGS gage.

Response

We will modify the Study Plan so that Section 3.1.1 presents only background hydrologic data and Sections 6, 7, and 10 present methods for estimating flow for each study component. Sections 6, 7 and 10 address aquatic habitat, water quality, and downstream user impacts of the proposed withdrawal, respectively.

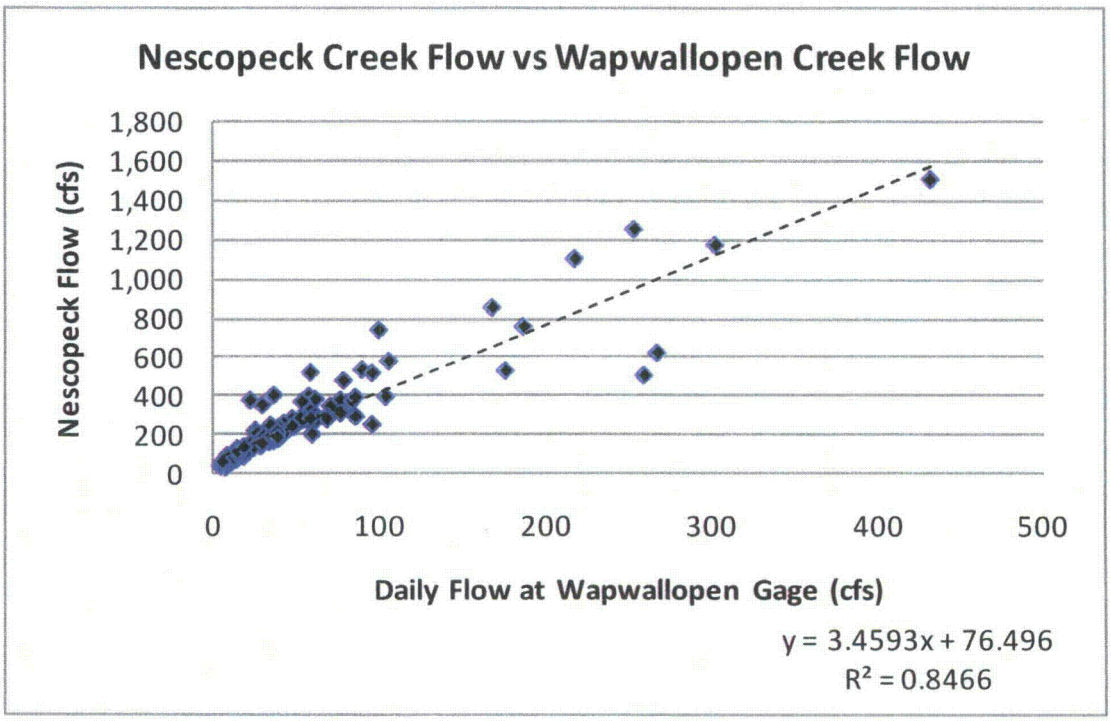
We will remove most of the referenced discussion from 3.1.1 and place it in the respective aquatic habitat, water quality, and downstream user sections (Sections 6, 7, and 10).

In Section 6 ("Aquatic Habitat Modeling Using IFIM"), we will note that the Nescopeck Creek flow is not required for the IFIM study because the IFIM study reach ends just a short distance downstream of the Nescopeck Creek entry point.

In Section 7 ("Water Quality Assessment of Nescopeck AMD Discharges"), we will document derivation of the proposed method for estimating the Nescopeck Creek flow for the days or time periods for which an estimated Nescopeck flow is necessary. This documentation will be presented in a separate subsection entitled "Estimating Nescopeck Creek Flows." The proposed method will be to correlate Nescopeck daily flow to daily flow gaged by USGS in the Wapwallopen Creek at Wapwallopen as follows:

$$\text{Nescopeck flow (cfs)} = [\ 3.46 * \text{Wapwallopen flow (cfs)}\ ] + 76.5 \text{ cfs}$$

Determination of the proposed correlation makes use of the approximately 140 Nescopeck Creek flows observed since 1949, as shown in the figure, below.



In Section 10 ("Assessment of Potential Impacts on Downstream Users"), we will note that flows in the Susquehanna River from the BBNPP site to the Nescopeck Creek will be taken as Wilkes-Barre flows (Q_{WB}) plus 2.8%; from the Nescopeck Creek to Fishing Creek as $1.028*Q_{WB} + Q_{NC}$, where Q_{NC} is the estimated daily flow in Nescopeck Creek derived from the gaged daily flow in Wapwallopen Creek as indicated above; and further downstream if needed as $1.028*Q_{WB}+Q_{NC}+Q_{FC}$, where Q_{FC} is the flow in Fishing Creek. Fishing Creek flow is gaged near Bloomsburg. If Q_{FC} is needed, we will indicate how the gaged Fishing Creek flow will be modified to represent the total inflow of Fishing Creek to the Susquehanna River.

Comment 4

In Table 3-4, the 20 percent ADF values are incorrect. The 20 percent ADF for Wilkes-Barre should be 2,740 cubic feet per second (cfs) (13,700 average flow from Table 3-3 times 0.2).

Response

The 20% ADF value of 2,690 cfs in the table for Wilkes-Barre was taken from the SRBC's Consumptive Use Mitigation Plan (2008), as noted in a footnote. Table 3-4 has been modified to show the 2,740 cfs value based on a more current record, as requested by the Commission.

Table 3-4 Reduction in river stage for hypothetical consumptive use of 28 mgd

	Wilkes-Barre		Danville	
Ambient flow	Flow (cfs)	Stage reduction (ft)	Flow (cfs)	Stage reduction (ft)
7Q10	820	0.043	931	0.018
10% ADF	1,370	0.036	1,555	0.015
15% ADF	2,055	0.026	2,333	0.015
20% ADF	2,740	0.027	3,110	0.013

Comment 5

In Section 3.2.1, page 18, the dissolved oxygen (DO) values that were measured are in an acceptable range; however, DO values can vary significantly based on the time of day and water temperature. Commission staff requires this information to determine the significance of the DO values. Also, the samples were not collected in the study area and, therefore, are not relevant.

Response

The dissolved oxygen values presented in Section 3.2.1 were provided as background information. The Hunlock Creek and Danville stations were selected because they were the closest, readily available USGS stations at which DO was measured. We agree the values are not directly applicable to the Study Reach. These values will not be used in the study, however, as requested we are providing time of day and water temperatures for the referenced DO data on the attached CD ("WQ Data.xls").

Comment 6

Section 3.2.1 states that, "Pennsylvania provides the following criteria for temperature (Pa. Code, Chapter 93. Water Quality Standards, § 93.7. Specific water quality criteria): Maximum temperatures in the receiving water body resulting from heated waste sources are regulated under Chapters 92, 96 and other sources where temperature limits are necessary to protect designated and existing uses. Additionally, these wastes may not result in a change by more than 2°F during a 1-hour period." Section 3.2.3, SSES and BBNPP Thermal Discharges, illustrates models of thermal plumes (Table 3-8) with temperature rises that far exceed the Chapters 92 and 96 limits on temperature change in receiving waters. Table 3-9 similar illustrates both lower and upper temperature rises that exceed the Chapters 92 and 96 limits on temperature change in receiving waters. PPL must demonstrate that the proposed thermal plume will not violate the water quality criteria standards or, alternatively, provide rationale for not meeting the standards.

Response

The diagrams and table do not show temperature changes over a one-hour period, instead they show temperature rises over background. Because SSES operates at a steady rate and BBNPP is expected to operate similarly, temperature hourly changes are expected to be small. Furthermore, the Bell Bend project will be subject to NPDES permitting by the PA Department of Environmental Protection which will ensure project compliance with appropriate water quality criteria.

Comment 7

In Section 3.2.2, page 19, pH values can vary significantly based on the time of day. Commission staff requires the time of day that the samples were taken to determine the significance of the pH values.

Response

The pH values presented in Section 3.2.2 were provided to characterize water quality in the Nescopeck Creek as background information for the Study Plan. In Section 7 we proposed a sampling plan and analysis to address the consumption-related aspect of the inflows from the AMD-impacted Nescopeck Creek. However, as requested, we are providing the time of day for the samples collected at the referenced USGS station on the attached CD ("WQ Data.xls").

Comment 8

Section 3.2.5 indicates the use of time-of-travel dye dispersion studies for the present study to calibrate the alternate hydraulic model. Because these studies are going to be used to calibrate the hydraulic model, these studies should be provided to the Commission for review.

Response

The intent of Section 3.2.5 (and all of Section 3) is to provide the SRBC with historical data and previous studies as background to the present study. The referenced dye study was performed by Sutron Corporation in 1984 at Susquehanna River flows of 1,950, 15,400, and 46,550 cfs. The objective of this study was to characterize time-of-travel below SSES under different flow regimes. Data from this study would have been used if the proposed Alternate Hydraulic Model were implemented. However, hydraulic data in the Study Reach were obtained at the desired range of Susquehanna River flows in 2010 and the PHABSIM model has been validated with this velocity and depth data. Consequently the dye study data were not used to calibrate the hydraulic model. For informational purposes, we have provided a copy of the Sutron study on the attached CD ("Sutron Report 1985.pdf" and "Sutron Report Appendices 1985.pdf"). PPL will remove the last sentence of this section in the study plan ("For the present study, these data will be used to calibrate the alternate hydraulic model (Section 6.5)."

Comment 9

In Table 3-8, the intake and discharge rates for BBNPP are significantly different than the rates in the surface water and consumptive use applications. Also, the projected temperature rise for the Susquehanna Steam Electric Station (SSES) is significantly greater than BBNPP (12.5°F vs. 3.5°F). The Ecology III Thermal Plume Studies, submitted in Appendix A, should be used as a reference point to calibrate the thermal model used for this study. For example, the summer scenario in this study uses an 11,200 gallons per minute (gpm) discharge rate for SSES, which is inconsistent with the measured SSES discharge rate of 12,000 gpm published in the Ecology III summer study. These discrepancies need justification in order for the proposed scenarios to be acceptable. Additionally, Commission staff requires validation of the thermal model including related peer-reviewed literature. This comment also applies to Table 3-9 and Figures 3-2

through 3-5. Finally, to provide a comprehensive thermal discharge study, the model should be used to analyze a river flow rate of 820 cfs, which is the Q7-10 flow rate.

Response

Our response is provided in several parts below.

1). In Table 3-8, the intake and discharge rates for BBNPP are significantly different than the rates in the surface water and consumptive use applications.

Table 3-8 summarizes the Susquehanna River, BBNPP, and SSES flows and temperatures used for the thermal plume modeling performed for the BBNPP Environmental Report (ER). These flows and temperatures were developed from information that was available in early 2008. For the modeling to be performed under this Study Plan, we will use data consistent with the surface water and consumptive use applications.

Based on discussions with Commission staff PPL will modify the study plan to evaluate the proposed scenarios shown in Table 1. We propose to examine the two periods when relatively larger thermal plumes may be present: (1) the winter period when temperatures in the Susquehanna River are lowest, and maximum differences between the BBNPP blowdown and river temperatures occur; and (2) the late summer period when river flows are lowest, and dispersion and dilution of the plume may be limited by low flows.

Specifically, the proposed scenarios were derived from daily calculations for the three-year period August 2004-July 2007 that made use of available observations, including monitoring of flow and usage at SSES. These scenarios were selected to represent, for both winter and summer, (a) low flows with maximum BBNPP ΔTs and (b) mean flows with mean BBNPP ΔTs. The month of December was selected for the "winter" period because the greatest simulated BBNPP ΔT occurred in December. The month of September was selected for the "summer" period because the lowest river flows tend to occur in September.

Table 1 Proposed scenarios and parameters

	Scenario			
	Winter low flow and maximum BBNPP ΔT	Winter average	Summer low flow and maximum BBNPP ΔT	Summer average
Susquehanna River Parameters				
Flow, cfs [1]	December 7Q10	December mean	Annual 7Q10	September mean
	2,220 [2]	14,906	843 [3]	4,729
Water surface elevation, ft [4]	486.5	490.4	485.7	487.6
Water temperature, °F [5]	12/23/2004	December mean	9/23/2004	September mean
	33.2	37.8	62.3	69.1
BBNPP Parameters				
Blowdown flow rate, gpm [6]	12/23/2004	December mean	9/23/2004	September mean
	6,867	5,967	7,664	7,620
Blowdown temperature, °F [6]	12/23/2004	December mean	9/23/2004	September mean
	68.4	58.2	79.2	77.6
ΔT, F degrees [7]	35.2	20.4	16.9	8.4
SSES Parameters				
Blowdown flow rate, gpm [8]	December mean		September mean	
	8,119	8,119	10,689	10,689
Blowdown temperature, °F [8]	December mean		September mean	
	62.4	62.4	79.5	79.5
ΔT, F degrees [7]	29.2	24.6	17.2	10.4

[1] Source: daily flow record, USGS Susquehanna River gage at Wilkes-Barre, values adjusted (i.e., increased) by 2.8% to reflect the additional drainage area between the gage and BBNPP; also see Study Plan, Table 3-3
[2] Source: DFLOW analysis of December daily Wilkes-Barre flow record, adjusted by 2.8%.
[3] Source: SRBC "Consumptive Use Mitigation Plan."
[4] Source: Depth-Level-Flow Relationship of the Susquehanna River at Susquehanna SES Environmental Laboratory, Ecology III, 1991 – see attached CD ("Depth-Level-Flow Relationship Ecology III, Inc. 1991.pdf").
[5] Source: Daily mean temperature data for the period August 2004 to July 2007, Ecology III, 2008 – see attached CD ("Daily mean temperature data Ecology III, Inc. 2008.pdf").
[6] Source: simulation of daily BBNPP operation, August 2004-December 2007; assumes full power, minimum cycles of concentration, and no cooling of blowdown between plant and River – see attached CD ("Monitored and calculated blowdown temperatures.xlsx").
[7] Difference between blowdown temperature and River water temperature.
[8] Source: monitored SSES plant data, August 2004-December 2007 – see attached CD ("Monitored and calculated blowdown temperatures.xlsx").

2). Also, the projected temperature rise for the Susquehanna Steam Electric Station (SSES) is significantly greater than BBNPP (12.5°F vs. 3.5°F).

The simulations for the ER were designed to project the size and configuration of the thermal plume for the period when the highest and lowest Susquehanna River temperatures occur (i.e., summer and winter) combined with mean and low flow conditions. These combinations were shown in Table 3-8 as Scenarios 1 through 4. Scenario 5 was added after completion of Scenarios 1 through 4 although it is nearly identical to Scenario 3.

Because the BBNPP cooling towers are designed to limit discharge blowdown temperatures to 90 F, the difference between the maximum blowdown discharge temperature (90 F) and the maximum observed Susquehanna River temperature (86.5 F) was calculated to be 3.5°F (the "ΔT"). The SSES cooling towers are not limited to a blowdown discharge temperature of 90 F and consequently the ΔT value for SSES used in the ER summer simulations was higher.

3). The Ecology III Thermal Plume Studies, submitted in Appendix A, should be used as a reference point to calibrate the thermal model used for this study. For example, the summer scenario in this study uses an 11,200 gallons per minute (gpm) discharge rate for SSES, which is inconsistent with the measured SSES discharge rate of 12,000 gpm published in the Ecology III summer study. These discrepancies need justification in order for the proposed scenarios to be acceptable.

We have used the most recently available data in developing the blowdown rates shown in Table 1.

4). Additionally, Commission staff requires validation of the thermal model including related peer-reviewed literature. This comment also applies to Table 3-9 and Figures 3-2 through 3-5.

The thermal plume surveys were made available after the ER was written. An examination of the survey results showed that the thermal plume was limited in extent and that a near-field model would better represent the dimensions and configuration of the plume.

We have simulated the results of the Ecology III thermal plume surveys with EPA's model for estimating sizes and configurations of wastewater plumes, CORMIX, at the indicated flows and compared modeled and observed temperatures. The comparisons are shown in Table 2. The survey reports are included on the attached CD ("Thermal Plume Studies 1986-1987 Ecology III.pdf" and "Thermal Plume Surveys Summer 2008 Ecology III.pdf").

Relevant CORMIX references and peer-reviewed applications of the model can be found at http://www.cormix.info/references.php.

Table 2 Comparison of Ecology III observed thermal plume dimensions and dimensions computed using EPA's CORMIX model

	Scenario				
	Autumn	Winter	Spring	Summer 1	Summer 2
	11/5/1986	1/9/1987	5/14/1987	8/21/2008	9/3/2008
Susquehanna River Parameters					
Flow, cfs	4,840	9,250	5,120	3,230	2,140
Water surface elevation, ft	487.8	489.0	487.9	487.0	486.5
Water temperature, °F [1]	47.0	33.5	65.5	74.5	74.3
SSES Parameters					
Blowdown flow rate, gpm	8,000	8,000	8,000	12,000	12,000
Blowdown temperature, °F	62.0	61.0	75.0	81.1	84.3
ΔT, F degrees	15.0	27.5	9.5	6.6	10.0
Distance to the 0.5°F isotherm, ft					
Observed [2]	125	25	80	120	300
Computed	27	26	9	21	498
Distance to the 1.0°F isotherm, ft					
Observed [2]	0	0	0	0	16
Computed	6	6	2	4	21

[1] When reported by Ecology III as variable, the lowest value was used; this choice exaggerates the temperature rise.
[2] As reported in Ecology III, this is the projection of the plume onto a horizontal plane.

5). Finally, to provide a comprehensive thermal discharge study, the model should be used to analyze a river flow rate of 820 cfs, which is the Q7-10 flow rate.

This scenario has been included as the summer low flow; see Table 1 for parameters. Also, the December Q7-10 rate has been included as the winter low flow condition. All flow rates have been adjusted to the BBNPP site in proportion to the ratio (1.028) of the estimated drainage area of the river at BBNPP to the drainage area at the Wilkes-Barre gaging station.

Comment 10

In Section 3.3.1, fish community refers to an Appendix B in an Ecology III report that presents a species list of fisheries identified through multi-year sampling at SSES. Please include Appendix B from the Ecology III report in this submittal.

Response

The reference in Section 3.3.1 – Fish Community, incorrectly infers that species composition based on seine and electrofishing collections is an appendix to an Ecology III report. The information is actually compiled from the on-going Ecology III sampling and is contained within Appendix B of the Study Plan.

The wording in the revised Study Plan will be corrected to reflect that this information is provided in Appendix B of the Study Plan. The information is contained in tables entitled, "Number and percent composition of fish collected by seining relative to SSES and Bell Bend Projects on the Susquehanna River, 2004-2007. Reproduced from Ecology III (2004-2008)," and, "Susquehanna Steam Electric Station Environmental Studies," which were revised and provided to the SRBC in PPL's response letter dated November 30, 2010, in response to a comment by the SRBC to a similar reference in Section 6.2.1 of the Study Plan.

Comment 11

In Section 3.3.2, Commission staff recommends PPL develop, with assistance from the U.S. Fish and Wildlife Service (USFWS) and/or the Pennsylvania Fish and Boat Commission (PFBC), a supplemental program for protection of migrating American shad should their restoration program identify migrating shad in the vicinity of BBNPP.

Response

This comment is not relevant to the study plan. PPL has historically cooperated with the resource agencies with respect to American shad restoration, and would expect to continue to do so. A formal program, if desired, can be considered as part of the Commission's regulatory action.

Comment 12

In Section 3.4, there is a reference to an Appendix B in an Ecology III report that presents a species list of benthic organisms identified via 2007-2008 sampling at SSES. Please include the referenced appendix in this submittal.

Response

The reference in Section 3.4 – Macroinvertebrates and Mussel Species incorrectly infers that species composition of benthic organisms collected from 2007-2008 are included in an Ecology III report. The information is actually compiled from Ecology III sampling and included in Appendix B of the Study Plan. The wording in the revised Study Plan will be corrected to reflect that this information is provided in Appendix B of the Study Plan.

Comment 13

Section 7 states that, "The initial extent of the study reach for this assessment is from the Nescopeck Creek 13 miles downstream to the Fishing Creek in Bloomsburg (Figure 4-1). The expectation is that complete mixing of the Nescopeck Creek and Susquehanna River will occur within this reach for all combinations of Nescopeck Creek and Susquehanna River flow rates." There should be data or supporting evidence for this statement, given broad assumptions about flow mixing and potential impacts from consumptive use of the river flows and contribution of abandoned mine drainage (AMD) waters from Nescopeck Creek. Additionally, the proposed protocol for pH sampling appears inadequate to accurately define the boundaries of the AMD plume. The AMD plume would be more accurately defined by sampling once in the middle and then sampling at regular intervals from the east bank until the pH values are similar to the reading from the middle reading. Also, because of the variability of pH readings during a 24-

hour period due to biological changes and the dilution due to flow variability, constant pH monitoring is required to determine compliance with Chapter 93 water quality standards for pH.

Response

The SRBC has commented on three elements of the proposed Nescopeck Creek water quality assessment. These are (1) a request for evidence that the recognizable AMD plume extends no farther than Fishing Creek; (2) a suggestion that the lateral/transverse extent of the AMD plume be determined using a different protocol; and, (3) a requirement to conduct continuous pH measurements to determine diurnal variations.

- The 2010 pH field studies

Subsequent to the submission of the Study Plan, Ecology III performed ten AMD plume surveys in 2010 at a variety of Susquehanna River flow rates using the protocol described in the Study Plan. Dates of the surveys and corresponding flows of the Susquehanna River at Wilkes-Barre are shown below. On the attached CD ("Water quality survey plots.ppt") are diagrams showing plotted pH values for each survey. The surveys were generally conducted over a 2-hour period at mid-day.

Table 3 Nescopeck Creek-Susquehanna River pH survey dates and flows

Survey date	Susquehanna River flow at Wilkes-Barre, cfs	Number of data points
5/21/2010	10700	28
6/25/2010	3910	15
8/6/2010	1810	36
8/13/2010	2180	42
9/21/2010	1650	32
9/24/2010	1580	27
9/29/2010	1460	31
10/6/2010	30600	37
10/20/2010	14200	37
10/29/2010	22400	32

The diagrams show that the AMD plume initially attaches to the left (east) bank for all observed flows and mixes within 2.5 miles of the point where Nescopeck Creek enters, either at its upstream or, more commonly, its downstream outlet. The plume remains attached to the left bank for a greater distance when Susquehanna River flows are high.

- The Nescopeck Creek AMD study reach

In response to Element 1 of Comment 13, the longitudinal extent of the plume was determined over the range of flows during the above-referenced surveys by comparing collected pH data to ascertain where readings taken transversely were clearly not showing differentiation and thus defining the longitudinal extent of AMD runoff effects.

As evidenced by the data collected in the 2010 surveys the point of complete mixing of the plume is well within the extent of the AMD study reach assumed in the Study Plan,

which is bounded by Fishing Creek in Bloomsburg approximately 14 mi downstream from the mouth of the Nescopeck Creek.

- Defining the width of the AMD plume

  In response to Element 2, the SRBC has suggested that the protocol for evaluating the transverse extent of the AMD plume commence with an initial reading taken in the center of the river and then extending outward to the east bank. As noted, the pH plume that was observed during the 2010 survey appeared to be immediately adjacent to the left (east) bank and never extended beyond two hundred feet (approximately) toward the center of the river. At no time did the plume reach the center of the river where it could obstruct fish migration. In fact, fish were often observed in the plume beginning 1/3 miles downriver from the mouth of Nescopeck Creek. By utilizing the protocol in the Study Plan which is to commence readings from the east bank of the river and then extending the transect into the river towards the middle and beyond, the total lateral extent of the plume was clearly identified in the field.

  Because of these factors, we believe that the proposed pH sampling protocol in the Study Plan has resulted in an accurate definition of the boundaries of the plume.

- Need for diurnal measurements

  In response to Element 3 of the SRBC Comment 13, there may be minor diurnal changes in the pH of the Nescopeck Creek and in the Susquehanna River. To provide the SRBC with relevant data we are proposing to conduct a one day sampling event, measuring pH in the Nescopeck Creek, in the Susquehanna immediately upstream of the Nescopeck Creek, and at two locations downstream of the Nescopeck Creek, one location within the plume and one beyond the fully-mixed point to quantitatively assess diurnal pH variations. The record study plan will be modified accordingly. We will indicate that, based on field surveys, the AMD study reach extends from the entrance of the Nescopeck Creek to a point 2.5 miles downstream.

Comment 14

In Section 8, a comprehensive analysis of the impacts of the cooling tower blowdown should include impacts of the chemical additives to the blowdown. The analysis should include the impacts of biocides, antifreeze chemicals, and other additives.

Response

As noted above in response to Comment 6, the Bell Bend project will be subject to NPDES permitting by the PA Department of Environmental Protection which will ensure project compliance with appropriate water quality criteria. Chemical additives will also be subject to the approval of the PA Fish & Boat Commission. Due to this separate regulation there is no basis for Commission staff to assume any impact to the receiving stream. Studies are therefore not warranted.

Comment 15

In Section 11, the schedule for some of the monitoring and analytical activities will need to be revised to reflect incorporation of the above comments.

Response

PPL intends to document all 2010 data collection and analysis in a study report to be provided to Commission staff by April 2011. Any additional planned data collection or analysis as may be desired by Commission staff will be documented in a supplemental report(s).