

January 29, 2014

Ms. Su Ann Shupp  
Pennsylvania Department of Conservation and Natural Resources  
Heritage Trust Program  
Rachel Carson State Office Building  
P.O. Box 8767  
400 Market Street  
Harrisburg, PA 17105-8767

Dear Ms. Shupp:

**SUBJECT: PNDI REVIEW REQUEST FOR THE CONSUMPTIVE USE MITIGATION PLAN FOR THE BELL BEND NUCLEAR POWER PLANT COMBINED LICENSE APPLICATION**

**Background**

Pacific Northwest National Laboratory (PNNL) has been contracted by the U.S. Nuclear Regulatory Commission to assist in its review of an application submitted by PPL Bell Bend, LLC (PPL) for a combined license for the construction and operation of one new commercial nuclear power reactor at the Bell Bend Nuclear Power Plant (BBNPP) site, located west of the existing Susquehanna Steam Electric Station site in Luzerne County, Salem Township, Pennsylvania. The BBNPP site is situated near the west bank of the North Branch of the Susquehanna River, approximately 5 miles northeast of the town of Berwick, Pennsylvania (Figure 1).

The NRC's review extends to an examination of PPL's plan for mitigating the proposed plant's consumptive use of water from the North Branch of the Susquehanna River. PPL has proposed a primary and a secondary consumptive use mitigation option. An

overview of water bodies and water courses potentially affected by the primary and secondary options is provided in Figure 1.

The primary mitigation option includes releasing water from the existing Cowanesque Lake (Figure 2) during periods of low flow that may occur from May through October. Low flow would be determined at the U.S. Geological Survey Wilkes-Barre stream gage (located upstream of the proposed Bell Bend site on the North Branch Susquehanna River) using flows set by the Susquehanna River Basin Commission (SRBC). The Cowanesque Lake facilities may need to be modified to create additional storage (resulting in increased pool elevation and inundation of surrounding land) if existing storage were determined to be insufficient, which is not known at this time. The mitigation water would follow the Cowanesque River to its confluence with the Tioga River in New York just north of Lawrenceville, Pennsylvania (Figure 2). The primary option also includes expanding water treatment facilities at Rushton mine (located about one mile northeast of Osceola Mills, PA) to continuously discharge about 7-8 mgd (13-15 cfs) more treated water than presently released to Moshannon Creek (Figures 3 and 4). The primary option also includes raising the elevation of Aldred Lake (Figure 5). Aldred Lake facilities would not need to be modified, and the areal extent of inundation around the lake associated with raising the pool elevation is unknown. The water bodies and water courses, and Rushton Mine expansion area, that could be affected by these three activities associated with the primary consumptive use mitigation option are highlighted and labeled in Figures 1 through 5.

The secondary option consists solely of releasing water from the Tioga-Hammond Reservoir project located just to the south of Cowanesque Lake (Figure 2). The Tioga-Hammond Reservoir project consists of two separate dams, one on the Tioga River and one on Crooked Creek, which join about two miles below the project (Figure 2). The storage capacity (pool elevation) of the Tioga-Hammond Reservoir project would need to be increased via modifications to existing project facilities. The amount of increase in the pool elevation that would be required is currently unknown, as is the associated areal extent of inundation around the reservoirs. The areal extent of facility modification is also unknown. Mitigation water from the modified project would be released from Tioga Reservoir during periods of low flow that may occur from May through October. Low flow would be determined at the U.S. Geological Survey Wilkes-Barre stream gage using flows set by the SRBC. The mitigation water would follow the Tioga River to its confluence with the Cohocton River where the two form the Chemung River just west of Corning, New York (Figure 2).

The flow that would be released either from Cowanesque Lake or Tioga Reservoir for consumptive use mitigation for the proposed Bell Bend plant would be 43 cfs. The NRC is in the process of determining the likely timing, duration, and frequency of mitigation releases from Cowanesque Lake or the Tioga-Hammond Reservoir project. However, to aide in the requested PNDI review, the following hypothetical example of flow

duration is provided. Based on flows at the Wilkes Barre gage from 1981 through 2013, had the Bell Bend plant been operating under the proposed SRBC pass-by flow requirements for the plant, a release of 43 cfs would have occurred in 1991 and 1998 that would have lasted from late June through early August and from mid-July through early September, respectively. Flows during the summer of 1991 at the USGS gage on the Cowanesque River near Lawrenceville, PA were about 14-17 cfs. Thus, flows at this gage would have been increased by 3-4 times during the period when mitigation water would have been released. Note also that consumptive use mitigation for the adjacent, existing Susquehanna Steam Electric Station (SSES) amounts to 74 cfs, which is currently released from Cowanesque Lake at a lesser passby flow requirement at the Wilkes Barre gage than that proposed for Bell Bend. Thus, the 74 cfs for SSES is currently released less frequently than the 43 cfs would be for Bell Bend. However, when the passby flow requirements for both plants are exceeded simultaneously, up to around 117 cfs could be released.

**GIS Files**

Table 1 provides an explanation of the attached GIS shape files to aid in the PNDI review.

**Table 1.**

<b>GIS File Name</b>	<b>Explanation</b>
BBNPP_Centerpoint_utm.shp	Bell Bend site center point
CUMP_lakes.shp	Cowanesque Lake, Tioga & Hammond Reservoirs, Rushton Mine ponds
CUMP_mainSusqRiv2.shp	Polygon coverage of lower Susquehanna River (shows river width)
CUMP_rivers_interest.shp	Line coverage of all rivers/streams of interest
Rushton_Mine_Review_Area.shp	Digitized polygon showing area of interest at Rushton Mine
CUMP_TopoIndex_utm.shp	Shows location of Topo Quads covering all areas of interest (corresponds to the Excel and png files noted above in the "USGS 7.5 Minute Quads" section

The first 4 of these shape files form the bases for Figures 1-3 and 5 in this document, except for the underlying topographic component of these figures. The underlying topographic layer for Figures 1-3 and 5 may be obtained at the following website: <http://www.arcgis.com/home/item.html?id=30e5fe3149c34df1ba922e6f5bbf808f>. The attached GIS file noted in Table 1, Rushton\_Mine\_Review\_Area.shp, depicts the

estimated area of disturbance that could result from the facilities expansion at Rushton Mine. The area within the polygon is 40 acres.

### **USGS 7.5 Minute Quads**

A list of the names of quads that cover the Pennsylvania portion of the water bodies and water courses highlighted and labeled in Figures 1-5 is provided in the attached file "TopoQuad\_AreaOfInterest\_PA.xlsx." All these quads are depicted and labeled in the attached files "TopoQuadIndex\_North\_PA.png, TopoQuadIndex\_South\_PA.png, TopoQuadIndex\_West\_PA.png." The quads are available for free download from the following website:

[http://store.usgs.gov/b2c\\_usgs/usgs/maplocator/\(ctype=areaDetails&xcm=r3standardpitrex\\_prd&carearea=%24ROOT&layout=6\\_1\\_61\\_48&uiarea=2\)/.do](http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&carearea=%24ROOT&layout=6_1_61_48&uiarea=2)/.do)

Follow the subsequent points to download the quads:

- zoom in to Pennsylvania and the area of interest until the Topo Quad footprints appear
- choose Mark Points and click on Topo Quad of interest
- click on marker to bring up display of available maps
- using the "plus" icon, choose the Topo Quad (7.5x7.5 GRID) by name to add it to cart
- repeat for additional Topo Quads
- download cart

### **Project Reference Point**

Table 2 provides the geographic and projected coordinates for the center point of the site proposed for the Bell Bend Nuclear Power Plant, located about 5 miles northeast of the town of Berwick, Pennsylvania along the North Branch Susquehanna River (Figure 1). The shape file noted in Table 1, BBNPP\_Centerpoint\_utm.shp, is based on the projected center point coordinates. This project reference point is where the Bell Bend plant would be built and where water would be removed from the North Branch Susquehanna River.

**Table 2.**

<b>Geographic Coordinates</b>		<b>Projected Coordinates - US State Plane 1983 - PA North 3701</b>	
Longitude	Latitude	Easting	Northing
-76.165930	41.089227	733085.135	103670.703

## **Request**

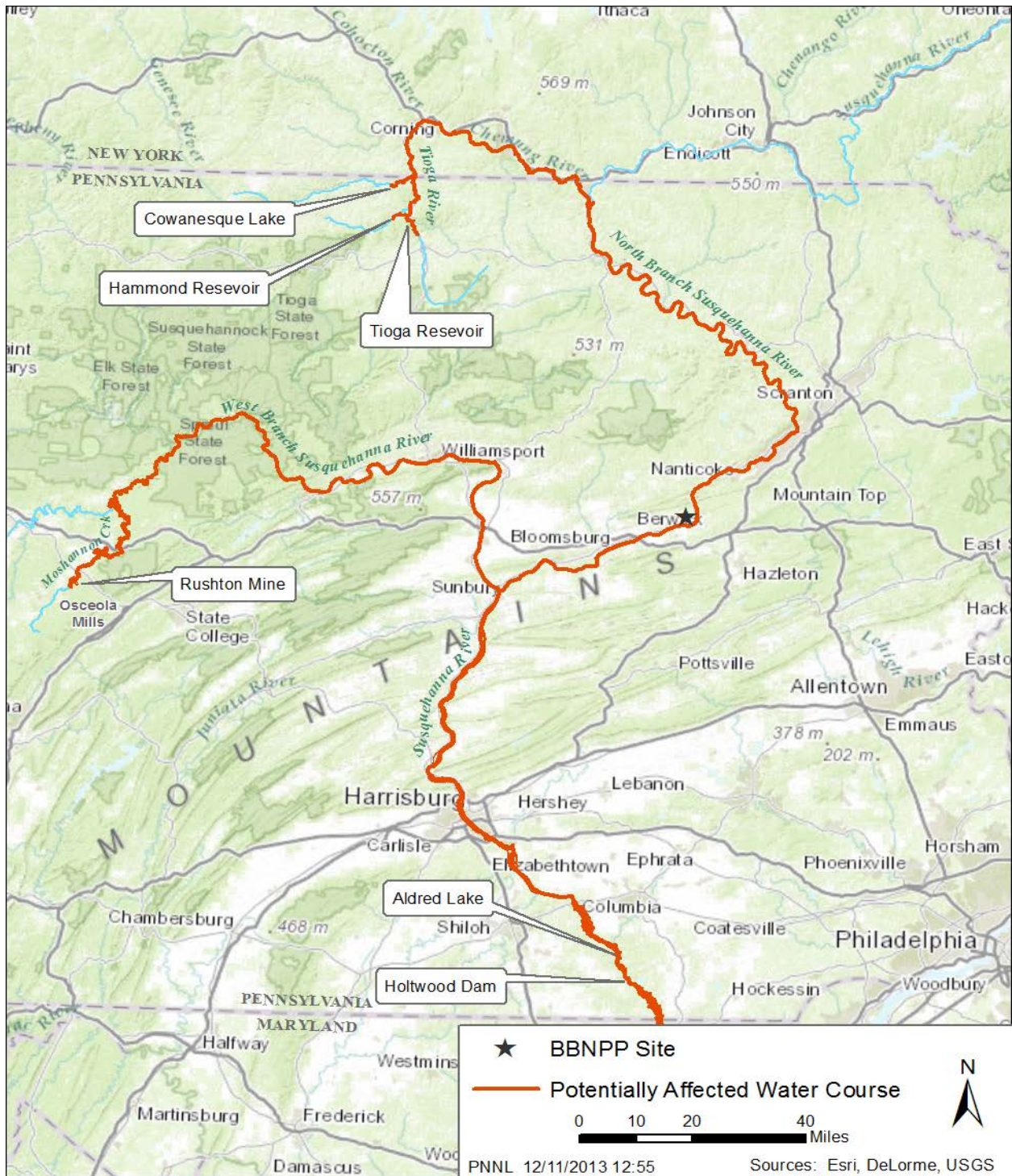
The NRC requests a listing of federally listed species and critical habitats; state-listed species; and state-ranked species and communities in and around the portions of the water bodies and water courses highlighted and labeled in Figure 1 (Figures 2, 3, and 5 are provided to show detail) that occur in Pennsylvania (GIS files and an index to the 7.5 minute quads that cover just the Pennsylvania portion are discussed above), and at the Rushton Mine expansion area (Figures 3 and 4). Please segregate the species and community occurrence information as follows:

- Cowanesque Lake and Cowanesque River (Figure 2)
- North Branch Susquehanna River from the New York State line to the proposed Bell Bend site (Figure 1)
- North Branch Susquehanna River from the proposed Bell Bend site downstream to its confluence with the West Branch of the Susquehanna River at Sunbury (Figure 1)
- mainstem Susquehanna River from Sunbury downstream to Harrisburg (Figure 1)
- mainstem Susquehanna River from Harrisburg downstream to Holtwood Dam (Figures 1 and 5)
- Rushton Mine expansion area (Figures 3 and 4)
- Moshannon Creek downstream from Rushton Mine to its confluence with the West Branch of the Susquehanna River (Figure 3)
- West Branch of the Susquehanna River from Moshannon Creek downstream to its confluence with the North Branch of the Susquehanna River at Sunbury (Figure 1)
- Tioga-Hammond Reservoir project and the Tioga River (Figure 2)

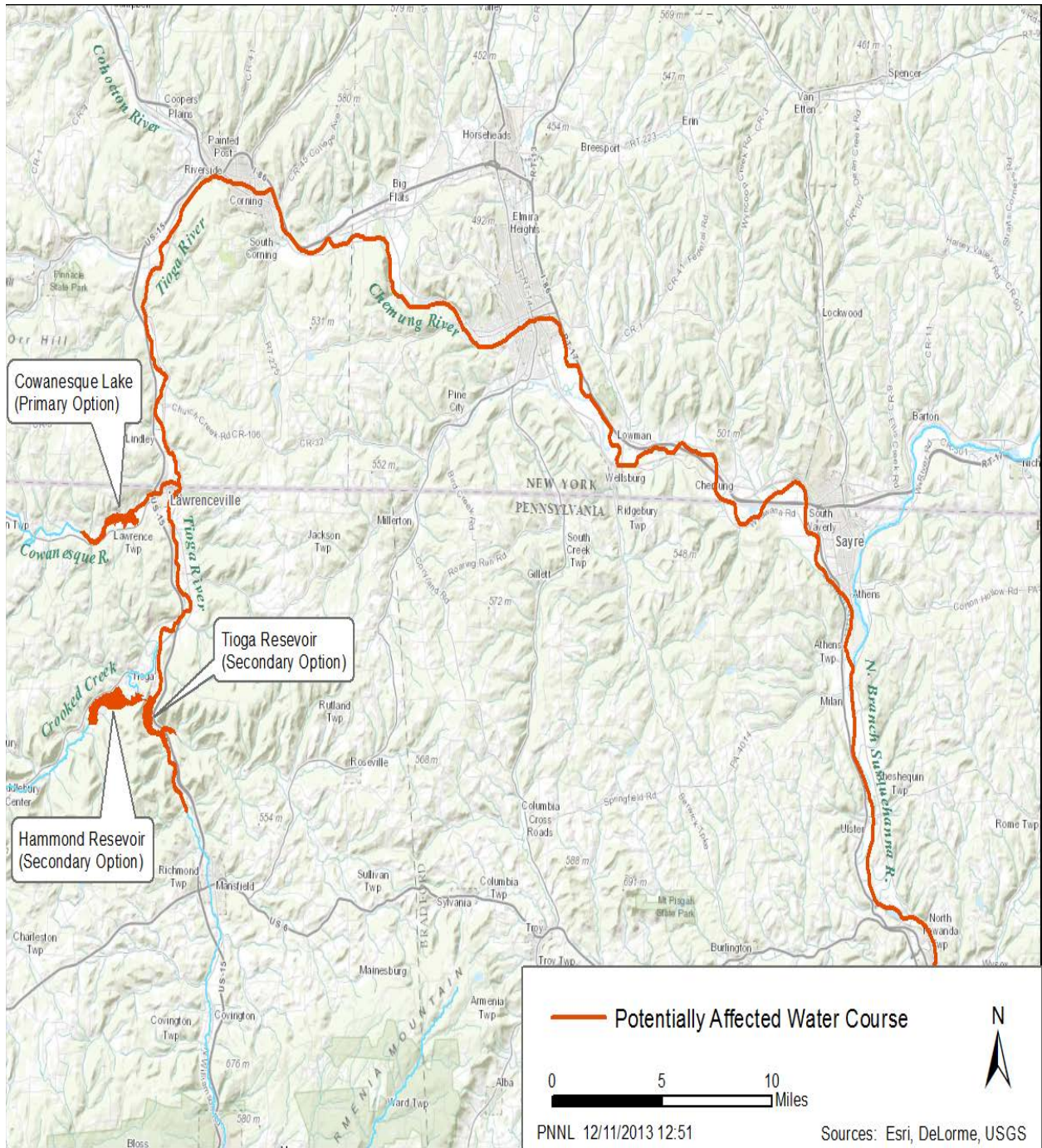
Please return correspondence to me preferably by e-mail, or alternatively at the address below, at your earliest convenience. If further clarifying information is needed, please contact me at 509-371-7186 or [james.becker@pnnl.gov](mailto:james.becker@pnnl.gov). Your assistance is greatly appreciated.

Sincerely,

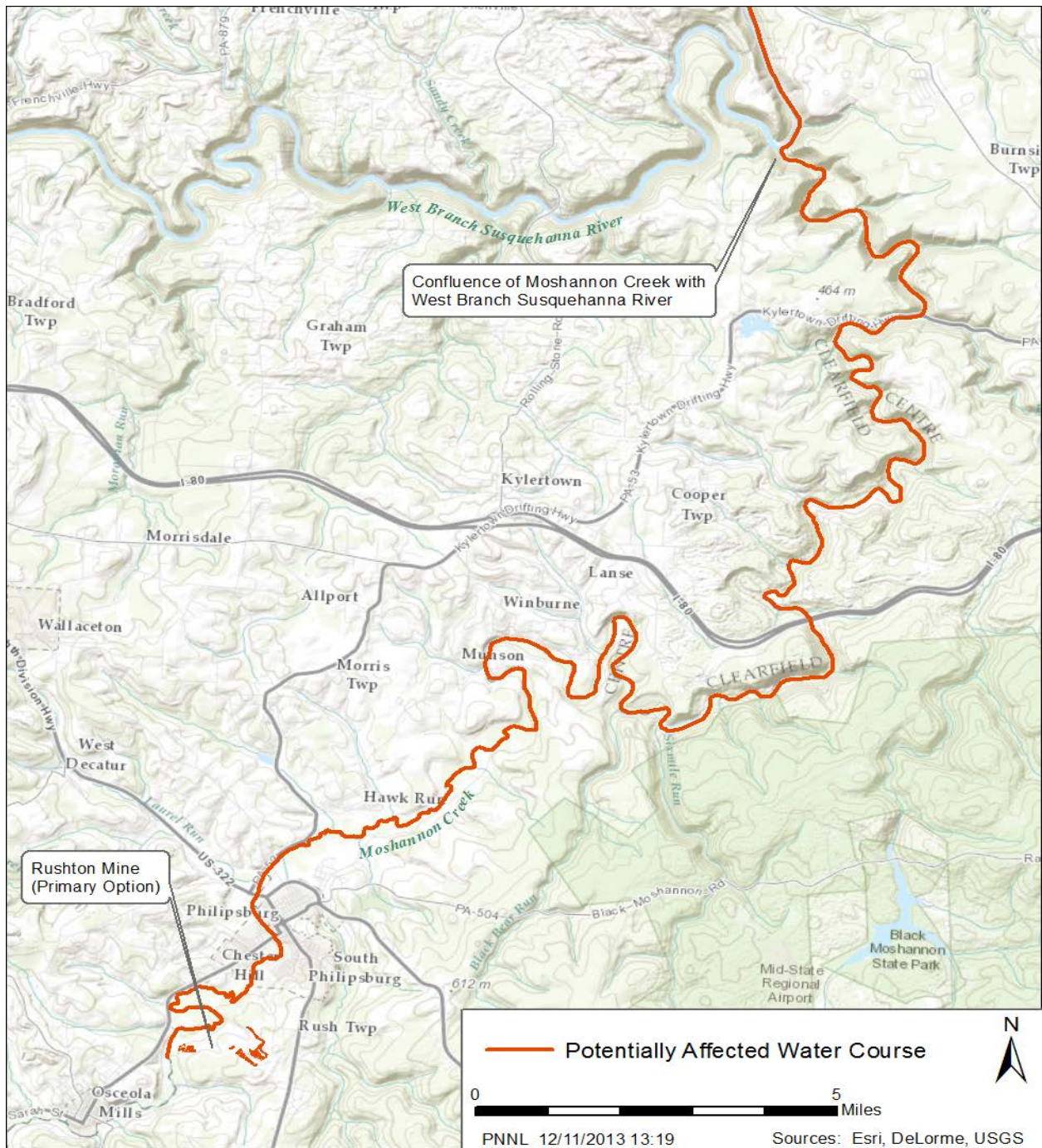
Jim Becker



**Figure 1.** Bell Bend Nuclear Station proposed site location and overview of the primary and secondary options of the consumptive use mitigation plan.

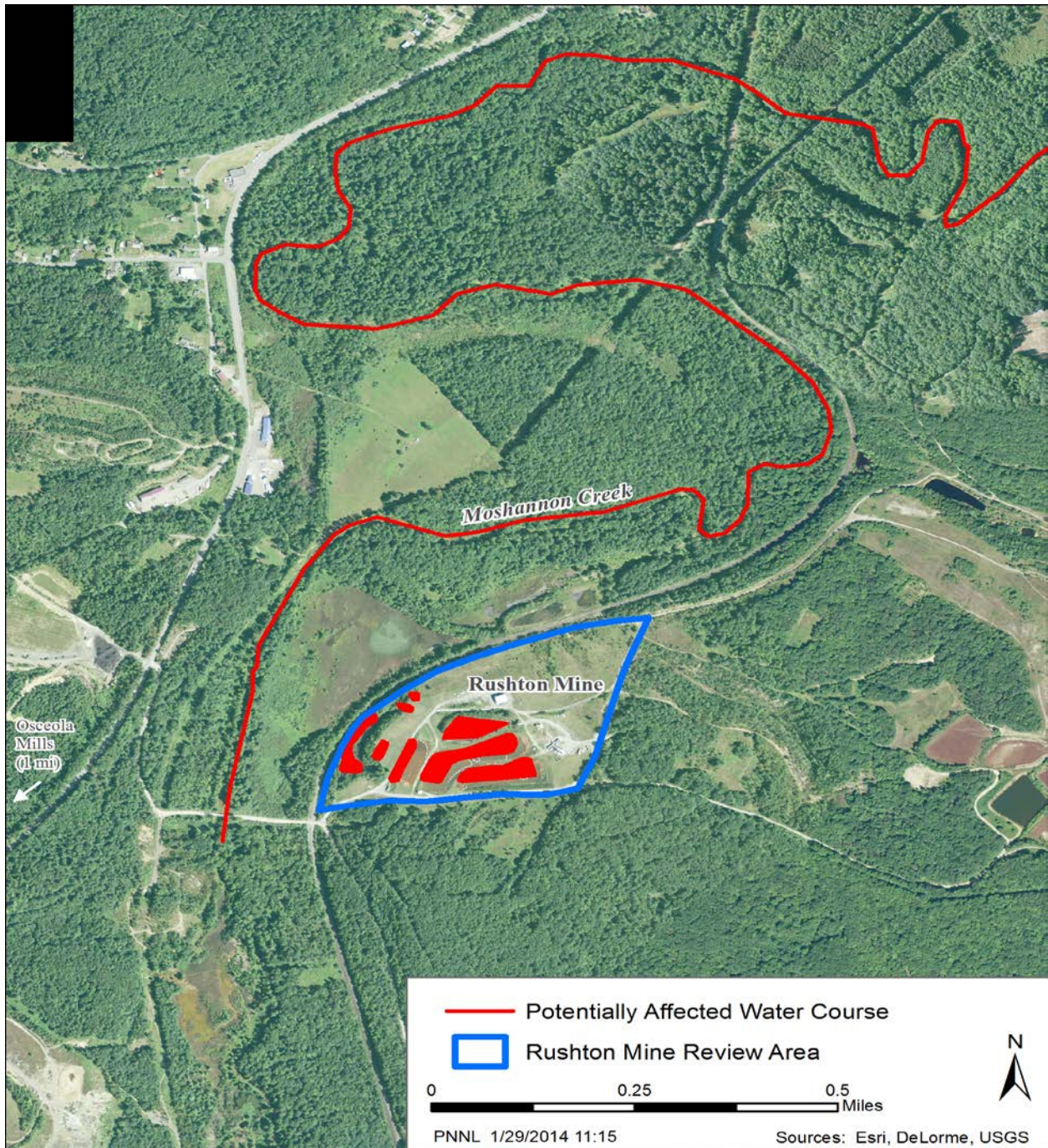


**Figure 2.** North portion of the primary and secondary mitigation options



**Figure 3.** West portion of the primary mitigation option.





**Figure 4.** Rushton Mine expansion area.

