Typically, non-reproductive females do not roost in colonies but may be present in the same trees as reproductive females.

Male Summer Roosts

Summer roosting habitat for male Indiana bats also is not well known. Males are most commonly found in the vicinity of their hibernaculum but may also disperse thought the summer range and roost individually or in small numbers.

Characteristics of Roost Trees

Indiana bats roost under the exfoliating bark of trees and occasionally in longitudinal crevices within trees; however, they rarely use cavities created by rot or woodpeckers. For maternity roosts (primary and alternate), females prefer dead or nearly dead trees, or dead parts of living trees such as dead trunks of trees with multiple trunks. They are occasionally found on living trees with lose peeling bark; however, these trees are thought to be used primarily as alternate maternity roosts during exceptionally warm or wet weather. A wide variety of tree species are used for maternity roosts and use is primarily related to local availability of trees with suitable structure rather than a preference for a particular species. In addition, regional differences in maternity roost tree characteristics may result from influencing factors such as weather and altitude.

Maternity roost trees are typically found in areas with high solar exposure such as openings within a forest, in a fence line, or along a wooded edge. Female Indiana bats may use structurally suitable trees in more interior sections of forest as maternity roosts during exceptionally warm or wet weather. Sizes of maternity roost trees vary, although larger diameter trees are preferred and may provide thermal advantages as well as more roosting spaces. The average range wide diameter of primary maternity roost trees is 18-inches. However, average diameters of primary and alternate maternity roost trees in several Midwestern states ranged from 16-inches to 24-inches, and an alternate maternity roost tree in Pennsylvania had a diameter of only 11-inches. The minimum height of maternity roost trees is typically greater than 10-feet, although the absolute height of maternity roost trees is thought to be less important than height and position relative to surrounding trees, which can affect the amount of solar exposure received by a tree.

Male Indiana bats are more flexible in their preferred summer roosting habitat. They roost in the same types of structurally suitable trees as females but not necessarily in areas with high solar exposure. In addition, male bats are more likely to roost in living trees and trees that are smaller since the average range wide diameter of male roost trees is 13-inches.

Based upon the research presented in USFWS 2007, female Indiana bat maternity roost trees (primary and alternate) are typically 11 inches in diameter at breast height (dbh) or greater, 10 feet in height or greater, dead with exfoliating, peeling or lose bark, and/or crevices. Primary roosts are situated in areas with high solar exposure and receive direct sunlight for more than half the day. Alternate roost trees may have a lower level of solar exposure. Trees with less than 10% live canopy will be considered dead to be consistent with USFWS "Forest Management Practices for Conserving Indiana Bats".

Male Indiana bat roost trees will encompass live and dead trees that have exfoliating, peeling or lose bark, and/or crevices with a 5 inch or greater dbh, regardless of their solar exposure. The 5-inch dbh criterion is used for consistency with USFWS guidance regarding tree cutting within the range of the Indiana bat during its summer roosting period, which is currently followed on adjacent SSES properties.

SURVEY METHODOLOGY

Proposed forest clearing on the BBNPP site may result in the loss of potential Indiana bat foraging and roosting habitat, as well as changes to the thermal regime of the remaining forest habitat. Normandeau proposes to conduct a survey of contiguous forest blocks proposed for clearing at the BBNPP site to determine the distribution, density and quality of Indiana bat roost trees (Figure 2). Our survey is intended to estimate the quality of roosting habitat in the forest proposed for clearing, and is not intended to inventory all potential roost trees present at the BBNPP site. Normandeau will survey both the edges and interiors of these forest habitats for the presence and quality of roost trees as defined above.

Mist-net surveys have not documented summer/maternity colony use of the site, although mist-netting effort was lower than recommended. Roosting and foraging by bats in the fall is the primary focus because three Indiana bat hibernacula occur near the BBNPP site In addition, summer roosting by male Indiana bats is likely. Therefore, the roost tree assessment will focus on roosting habitat for Indiana bats during their active season (spring, summer, and fall).

Forest Edges

Normandeau biologists will inspect the onsite edges of all forested areas proposed for clearing and evaluate all potential roost trees within a distance of 50-feet of the forest edge. The 50-foot margin has been used in published scientific studies and represents a conservative boundary for identifying potential roost trees along a forest edge that are likely to receive increased solar radiation relative to trees located in more interior sections of a forest. The positions of potential roost trees will be located using a Global Positioning System (GPS) with a sub-meter level of accuracy. A single GPS location will be taken at the center of clumps or otherwise closely associated groups of suitable roost trees. Field measurements of roost tree characteristics as described below will be recorded in digital or hardcopy format.

Forest Interiors

Normandeau will survey all contiguous forest blocks of approximately 2 acres or greater (18 total) proposed for clearing for the quality and density of Indiana bat roosting habitat. Forest blocks will be surveyed at the rate of one 100-ft radius sample plot per 5 acres or fraction thereof. There are 10 forest blocks between 2 acres and 10 acres in size and some 8 forest blocks greater than 10 acres in size. Additional plots will be located within forest blocks to insure that our sampling is representative of all forest habitats present, particularly forested wetlands. Each forest block and will be evaluated for potential roost trees. We will also characterize the overall vegetation community according to species composition, age, structure and other measures of habitat quality for Indiana bats as described under field measurements below. The center of each interior forest plot will be located with a sub-meter level GPS and data will be recorded in digital or hardcopy format.

Field Measurements

All trees in surveyed areas will be evaluated for suitability as roosts. The following information will be recorded for each potential roost tree: 1) species, 2) dbh, 3) roost tree condition (live, dead, or partially dead), 4) type of roost structure(s) (bark, crevice, and/or cavity), 5) date, 6) surveyor, and 7) sampling location (GPS coordinates). Field measurements are explained in more detail below. All measurements are for roost trees only, except in the forest interior plots where species identification and dbh will also be measured for the purpose of general categorization of the forest cover in each block.

1) <u>Species identification</u>: All trees will be identified to species. Dead trees and snags that are too far decayed for identification will be designated as unknown.

BBNPP Roost Tree Survey Study Plan

2) <u>Diameter at breast height (dbh)</u>: The dbh of each roost tree be measured to the nearest inch using a Biltmore stick, diameter tape or similar measuring device. For the purpose of categorizing the general forest cover, the minimum, maximum and average dbh will be measured in a similar manner from representative sub-samples of the trees in each of the forest interior plots.

3) <u>Roost Tree Condition: (Live, dead, or partially dead)</u>: Trees designated as live will be healthy in appearance and have more than 80% live canopy. Trees designated as dead will encompass snags and trees with less than 10% live canopy. Trees designated as partially dead will have 10-80% live canopy.

4) <u>Type of roost structure</u>: The type(s) of roost structure on the tree will be identified as bark (exfoliating or defoliating bark), crevice, or cavity.

5) Date: The date of the survey will be recorded as MMDDYYYY.

6) <u>Surveyor</u>: The name of the person who identified the tree to species, measured dbh and classified attributes 3-5 and 7 will be recorded. If more than one person contributes to the data, then a lead and assistants will be identified for each line of data.

7) <u>Sampling location (GPS coordinates</u>): The latitude and longitude of the base of each roost tree will be recorded using a sub-meter GPS. The datum and coordinate system will be chosen to coordinate with existing survey information for the BBNPP site.

Roost tree characterization

Trees will be categorized as having a "high", "moderate", or "low" potential for serving as a roost tree for Indiana bats.

<u>High</u> – Live, dead, and partially dead trees that are ≥ 16 " dbh and have roost structure. <u>Medium</u> – Live, dead, and partially dead trees that are 9 to 15" dbh and have roost structure. <u>Low</u> – Live, dead, and partially dead trees that are 5 to 8" dbh and have roost structure.

DATA ANALYSIS AND REPORT

Normandeau will prepare a report that summarizes the study findings. Roost tree identity, dbh, attribute data and rank as described above will be tabulated and presented by forest block. Our report will include a written discussion of the on-site forest characteristics as they pertain to the quality of the roosting habitat, as well as tabular summaries of data for forest edges and interior forest plots, maps showing the locations of vegetation plots and potential roosting habitat, and representative photographs of forest edges, interior forest sample plots and suitable roost trees.

REFERENCES

Menzel, M.A., J. Menzel, T. Carter, W. Ford, J. Edwards. 2001. Review of the Forest Habitat Relationships of the Indiana bat (*Myotis sodalis*). U.S. Department of Agriculture Forest Service Northeastern Research Station General Technical Report NE-284. 21 pp.

Rommé, R.C., K. Tyrell, and V. Brack, Jr. 1995. Literature summary and habitat suitability index model: components of summer habitat for the Indiana bat, Myotis sodalis. Report submitted to the Nongame Program, Indiana Department of Natural Resources, Bloomington, IN. 43 pp.

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USFWS, 2007. U.S. Fish and Wildlife Service. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. U.S. Fish and Wildlife Service, Fort Snelling, MN. 258 pp. USFWS, undated. Forest Management Practices for Conserving Indiana Bats. 2pp.



Indiana Bat Biological Evaluation and Management Plan





United States Department of the Interior

FISH AND WILDLIFE SERVICE Pennsylvania Field Office 315 South Allen Street, Suite 322 State College, Pennsylvania 16801-4850

May 7, 2012

RECEIVED MAY 2 1 2012

V.S. FISH & WILDLIFF

Laura Quinn-Willingham Environmental Project Branch 2 Division of New Reactor Licensing Office of New Reactors U.S. Nuclear Regulatory Commission Mail Stop: T-6 C32 Washington, DC 20555

RE: Bell Bend Nuclear Power Plant USFWS Project #2009-0501

Dear Ms. Quinn-Willingham:

This documents ongoing consultation between the Fish and Wildlife Service (Service), Nuclear Regulatory Commission, U.S. Army Corps of Engineers, and Pennsylvania Power and Light regarding PPL's proposed construction and operation of the Bell Bend Nuclear Power Plant (BBNPP) in Salem Township, Luzerne County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

This letter details our comments on the Indiana Bat Biological Evaluation and Management Plan for the Proposed Bell Bend Nuclear Power Plant Site, dated November 2011. This biological evaluation (BE) was prepared by Normandeau Associates, Inc. for the project applicant. We understand the Nuclear Regulatory Commission will be using the BE to develop a biological assessment for the purpose of initiating formal consultation with the Service due to the anticipated adverse effects of the project on the federally-listed, endangered Indiana bat (Myotis sodalis). These comments are provided to assist the Nuclear Regulatory Commission in working with the applicant to ensure the resulting biological assessment adequately addresses effects on the Indiana bat.

Project Description and Effects Analysis

The BE identifies the limit of disturbance associated with the BBNPP (Fig. 6), as well as the extent of existing forest cover and anticipated forest loss (Fig. 3). Based on Figure 6 in the BE, it appears that several forested areas will be isolated and potentially precluded from Indiana bat use by a combination of forest clearing and disturbance due to construction, operation and maintenance activities. However, the BE does not include a site plan depicting the location of various project features, including roads, transmission lines, buildings, parking lots, staging areas, *etc.* Nor does it indicate how long construction activities will occur within the limit of

disturbance. This makes it particularly difficult to determine the potential direct and indirect effects on Indiana bats that may be using forest habitat adjacent to the limit of disturbance. The biological assessment should include detailed site plans, as well as information on construction timing, sequencing and duration so project effects on the Indiana bat and its habitat can be evaluated.

Specifically, the BE indicates the BBNPP will result in 233.5 acres of forest loss, and 2.8 acres of forest loss due to isolation and fragmentation. However, the BE fails to consider that additional forest acreage may be temporarily or permanently lost as suitable foraging and roosting habitat for Indiana bats due to isolation and fragmentation. This would be expected to occur if the remaining forest is isolated from other forest by large, open areas (*e.g.*, parking lots, buildings, fields) or if construction and operation activities will disrupt bats trying to use these remaining forest fragments located in the midst of the BBNPP site.

Currently, there is a relatively large area of forest in the western half of the project area; this forest is contiguous with forests to the north and south of the project area. However, proposed forest clearing will fragment the on-site forest, leaving an assortment of small and large forest fragments that are surrounded by 300- to 1000-foot open areas during and after construction. Without knowing what will occur during and after construction in open spaces surrounding the fragmented forest blocks, it is difficult to evaluate the potential for short-term or long-term forest habitat degradation or loss due to nearby activities. The biological assessment should address this deficiency in consultation with the Service, and any additional impacts due to forest fragmentation and isolation should be offset through permanent forest conservation.

In addition, the BE fails to consider the effects of forest loss on a landscape scale. As the project is located within the swarming area of three Indiana bat hibernacula, development of the BBNPP would be expected to remove forest habitat for Indiana bats associated with those hibernacula. We recommend that the applicant assess recent aerial photographs to determine how much of the 10-mile radius depicted in Figure 5 is currently in hardwood and mixed-hardwood forest cover. This should be compared to forest impacts from the project, as a percentage of existing forest cover that would be lost due to development of the BBNPP.

Conservation Measures

The BE describes several conservation measures that will be implemented by the applicant to minimize and partially offset adverse effects on the Indiana bat. Trees will be cut from November 16 to March 31, when bats are expected to be hibernating. However, the BE indicates that this seasonal restriction may not be applied when "danger trees" greater than 5 inches d.b.h. must be cut. Prior to danger tree removal, the applicant proposes to have a qualified biologist evaluate the tree to determine whether or not Indiana bats will be harmed. As the BE does not specify how this evaluation would occur, we recommend that this conservation measure be modified as follows:

Danger Tree Removal – When it is determined that a "danger tree" of 5 inches d.b.h. or greater must be removed between April 1 and November 15, a qualified Indiana bat surveyor will observe the tree for bat emergence beginning at least 30 minutes before

sunset. If no bats are observed emerging from the tree and no bats are heard on the tree, the tree will be cut that evening, immediately following the emergence survey. While lighting may be necessary to safely fell the tree, no lighting will be used until after the emergence survey is completed. If any bats are observed, the USFWS will be consulted prior to the cutting of the tree.

The applicant proposes to partially offset the loss of forest habitat through a combination of forest preservation (386 acres), active reforestation (58 acres), and passive reforestation through natural succession (137 acres). All lands proposed for forest conservation are within 1500 feet of Walker Run and the North Branch of the Susquehanna River, and are either within the BBNPP project area or on adjacent, PPL-owned lands. The proposed preservation of existing forest is at a 1.6:1 compensation ratio, although this may approach a 1:1 compensation ratio after short- and long-term impacts on isolated forest blocks are further evaluated. While the BE indicates 386 acres of forest will be protected through a conservation easement, it is silent regarding the long-term fate of the reforested acreage and the acreage that will be allowed to revert to forest via natural succession. In the absence of any permanent protection of these lands, the applicant has not ensured that they will compensate for impacts to Indiana bat habitat.

To ensure adequate long-term protection and management of forest habitat for the Indiana bat, all of the conservation lands (*i.e.*, the entire 581 acres) should be subject to a permanent conservation easement. The conservation easement should be held by a conservation entity that is willing and able to hold and manage the conservation acreage in perpetuity for the benefit of the Indiana bat. The easement holder as well as the conservation easement is subject to Fish and Wildlife Service review and concurrence. A template conservation easement is enclosed. Alternatively, the applicant may want to consider transferring the conservation acreage directly (fee simple) to a conservation entity in consultation with the Service. The conservation easement and associated Resource Management Plan should be finalized prior to any Indiana bat habitat disturbance on the site of the BBNPP. The Resource Management Plan would replace the forest management guidelines on pages 30-31 of the BE, as some of those guidelines (*e.g.*, #6 and #8 on p. 31) would result in suitable but less than optimal roosting habitat for Indiana bats by reducing the number of large-diameter roost trees now and in the future.

In evaluating conservation lands for permanent forest habitat protection, it will be important for the applicant to assess, consider and disclose to the Service, Nuclear Regulatory Commission and prospective easement holder the degree to which those lands may be vulnerable to future habitat loss. These vulnerabilities may result from existing easements, liens, encumbrances or reserved rights related to the surface or subsurface of the property.

With regard to the lands that will be allowed to undergo natural succession to a state of forest cover, we recommend that the applicant implement measures to ensure the success of passive reforestation. This would include monitoring and management to control invasive plants that may interfere with the establishment of a diverse forest of native hardwood tree species. As the effects of forest loss in the BBNPP project area will be permanent, and as it will take decades for a new forest to mature, we recommend that efforts begin immediately to restore forests via reforestation and natural succession. Furthermore, if monitoring indicates a diverse hardwood

forest is not developing via natural succession, efforts should be implemented by the applicant or easement holder to ensure success.

Other Considerations

The project is known to occur within the swarming area associated with three Indiana bat hibernacula, but at this time, no Indiana bat maternity colony use is anticipated due to the negative mist-net survey results from the summer of 2008. As negative mist-net survey results are considered valid for five years, we recommend a re-survey of the BBNPP project area in 2013 in accordance with the most recent Fish and Wildlife Service survey protocols. If female or juvenile Indiana bats are found, further consultation would be warranted as the current BE (and the anticipated biological assessment) relate solely to the effects of the project on bats associated with the above-referenced hibernacula.

With the exception of the Indiana bat, no other federally-listed or proposed endangered or threatened species are known to occur in the project area. However, as the BE acknowledges, the northern long-eared bat (*Myotis septentrionalis*) and little brown bat (*Myotis lucifugus*) were captured during mist-netting in 2008, and both species are undergoing a status review to determine whether or not future listing under the Endangered Species Act may be warranted. If additional species are listed or proposed, or found to occur in the BBNPP project area, further consultation with the Service would be warranted.

This response relates only to endangered or threatened species under our jurisdiction. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

Please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

Please contact Carole Copeyon of my staff at 814-234-4090 if you have any questions or require further assistance.

Sincerely.

Clinton Riley Field Office Supervisor

Enclosure

cc: PGC – Librandi-Mumma COE – Amy Elliott PPL – Gary Petrewski Readers file ES file Response type: comments on BE ES:PAFO:ckc: 03/30/2012 Filename: P:\FROFFICE\Drafts\Drafts 2012\2009-0501_Bell Bend NPP_comments on BE.docx Indiana Bat Biological Evaluation and Management Plan for the Bell Bend Nuclear Power Plant Project, Rev. 0

Pennsylvania Game Commission Consultation

Indiana Bat Biological Evaluation and Management Plan for the Bell Bend Nuclear Power Plant Project, Rev. 0

List of Enclosed Correspondence

- 1. Letter from Rod Krich, UniStar Nuclear Energy LLC, to James R. Leigey, PGC, "Large Project Species of Special concern Screen, December 21, 2007.
- 2. Letter from James R. Leigey, PGC to Rod Krich, UniStar Nuclear Energy LLC "PNDI Search Database Search", April 10, 2008.
- 3. Letter from Terry L. Harpster, PPL Bell bend LLC, to Tracey Librandi Mumma, PGC, "Bell bend Nuclear Power Plant Large Project Species of Special concern Screen", September 20, 2010.
- 4. Letter from Olivia A. Braun, PGC, to Bradley A. Wise, PPL Bell Bend LLC, "Bell Bend Nuclear Power Plant Project Proposed Electrical Plant", December 28, 2010.



December 21, 2007

Mr. James R. Leigey Pennsylvania Game Commission Bureau of Land Management Division of Environmental Planning and Habitat Protection 2001 Elmerton Avenue Harrisburg, PA 17110-9797

SUBJECT: Large Project Species of Special Concern Screen UniStar Nuclear Energy, LLC, Berwick, PA NPP-1 Project Salem Township, Luzerne County, PA

Dear Mr. Leigey:

UniStar Nuclear Energy, LLC is conducting an environmental evaluation for an approximately 2.6 square mile (1,642 acres) project area on the Susquehanna Steam Electric Station (SSES) site and adjacent properties in Salem Township, Luzerne County, Pennsylvania (Figure 1). The project area boundaries encompass the entire footprint of possible disturbance for the construction and maintenance of additional electric generation facilities under consideration for the site.

UniStar Nuclear Energy, LLC wishes to screen the project area for species of special concern under jurisdiction of the Pennsylvania Game Commission. Please provide all current and historical information concerning the occurrence of rare, threatened and endangered species, as well as any other ecological resources of special concern within the project area. In addition, please provide this information for a 0.5-mile buffer surrounding the project area. This latter screen is requested for the purpose of evaluating environmental impacts and compliance with Pennsylvania Department of Environmental Protection regulations (e.g., 25 PA Code Chapter 105.17). A PNDI search form is attached for your use.

If you have any questions or need additional information please contact George Wrobel at (585) 771-3535.

Thank you for your assistance.

Sincerely,

Rod Krich Senior Vice President, Regulatory Affairs

Enclosures Site Location Map, Figure 1 PNDI Review Form





Indiana Bat Biological Evaluation and Management Plan



Pennsylvania Natural Diversity Inventory Project Planning & Environmental Review Form

This form provides site information necessary to perform an Environmental Review for special concern species and resources

listed under the Endangered Species Act of 1973, the Wild Resource Conservation Act, the Pennsylvania Fish and Boat code or

the Pennsylvania Game and Wildlife Code.

Applicant Information

Name ; UniStar Nuclear Energy, LLCAddress: 750 E. Pratt Street, 14th floor, Baltimore, MD 21202-3106Phone Number: 410-470-5518Fax Number: 585-771-3392

Contact Person Information - if different from applicant

Name: Mr. George Wrobel Address: same

Phone Number: 585-771-3535

Fax Number: 585-771-3392

Project Information

Project Name: Berwick, PA NPP-1

Project Locations: Lat N 41d 05m 11.54s Lon W 76d 09m 53.66s

Municipality: Salem Township County: Luzerne

X Attach a copy of a U.S.G.S 7 1/2 Minute Quadrangle Map with Project Boundaries clearly marked.

U.S.G.S. Quad Name: Berwick, PA and Sybertsville, PA

Project Description

Proposed Project Activity (including All earth disturbance areas and current conditions)

The Berwick, PA NPP-1 Project involves development of a combined license application (COLA) to the U.S. Nuclear Regulatory Commission (NRC) for potential construction and operation of a new nuclear powered steam electric plant in the vicinity of the Susquehanna Steam Electric Station. In the event a decision is made to develop the plant, associated activities would involve land clearing, grubbing, grading/excavation, and construction of plant and support facilities and structures; landscaping; and subsequent operation and maintenance of plant facilities and grounds. Land use of areas potentially disturbed consists predominantly of active/former farmland and forest and, to roadways, and natural vegetation (e.g., shrub-scrub).

Total Acres of Property: 1,642

Acreage to be Impacted: 780 (approximately)

- 1. Will the entire project occur in or on an existing building parking lot, driveway, road, maintained road shoulder, street, runway, paved area, railroad bed, or maintained lawn? Yes No X
- 2. Are there any waterways or waterbodies (intermittent or perennial rivers, streams, creeks, tributaries, lakes or ponds) in or near the project area, or on the land parcel? If so, how many feet away is the project? Yes X feet NO
- 3. Are wetlands located in or within 300 feet of the project area? Yes X No If No. is this the result of a wetland delineation?

If you have a "PNDI Project Environmental Review Receipt" with potential impacts, please send a receipt copy, this completed form, and a USGS Quad Map to the agency/agencies noted on the receipt. If you are unable to generate a PNDI Receipt because you do not have Internet access, complete this form, attach USGS Quad Map, and send them to your local DEP or County Conservation District. For review of a "Large Project," please send form and map to all the agencies listed below. See page 2 for more information.

Dept. of Conservation and Natural Resources Bureau of Forestry, Ecological Services Section 400 Market St., PO Box 8552 Harrisburg, PA 17105 fax: 717-771-0271 PA Game Commission Bureau of Land Management 2001 Elmerton Avenue Harrisburg, PA 17110-9797 fax: 717-787-6957 PA Fish and Boat Commission Natural Diversity Section 450 Robinson Lane Bellefonte, PA 10828 fax: 814-359-5175 US Fish and Wildlife Service Endangered Species Biologist 315 South Allen St., Suite 322 State College, PA 16801 no faxes please