BellBendCOLPEm Resource

From: Sgarro, Rocco R [rrsgarro@pplweb.com]
Sent: Wednesday, September 09, 2009 11:13 PM
To: Imboden, Stacey; 'Bruce.Mcdowell@pnl.gov'; Elliott, Amy H NAB02
Cc: 'Lutchenkov, Dimitri'; 'Beecher, Kimberly A'; 'Perdomo, Federico R'; Fields, Jerome S; Khanwalkar, Arundhati; Wise, Bradley A; Kelly, J Vincent; Harpster, Terry L; Kuczynski, George J; 'Mark Gutshall'; Canova, Michael
Subject: Bell Bend Alternative Sites Report
Attachments: BNP-2009-257 - Bell Bend Alternative Site Report.pdf

Stacey, Bruce, Amy:

Attached please find an advance copy of the Alternative Sites Report for Bell Bend. Please contact me if you have any questions.

Thanks!

Rocky

R. R. Sgarro
Manager - Nuclear Regulatory Affairs
PPL Bell Bend, LLC
W: 570.802.8102 (Bell Bend)
610.774.7552 (Allentown)
M: 610.657.4667
EM: rrsgarro@pplweb.com

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From: Sgarro, Rocco R

Created By: rrsgarro@pplweb.com

Recipients:
"'Lutchenkov, Dimitri'" <dimitri.lutchenkov@unistarnuclear.com>
Tracking Status: None
"'Beecher, Kimberly A'" <Kimberly.Beecher@unistarnuclear.com>
Tracking Status: None
"'Perdomo, Federico R'" <Federico.Perdomo@unistarnuclear.com>
Tracking Status: None
"Fields, Jerome S" <jsfields@pplweb.com>
Tracking Status: None
"Khanwalkar, Arundhati" <akhanwalkar@pplweb.com>
Tracking Status: None
"Wise, Bradley A" <bawise@pplweb.com>
Tracking Status: None
"Kelly, J Vincent" <jkelly@pplweb.com>
Tracking Status: None
"Harpster, Terry L" <tlharpster@pplweb.com>
Tracking Status: None
"Kuczynski, George J" <gjkuczynski@pplweb.com>
Tracking Status: None
"'Mark Gutshall'" <mark@landstudies.com>
Tracking Status: None
"Canova, Michael" <Michael.Canova@nrc.gov>
Tracking Status: None
"Imboden, Stacey" <Stacey.Imboden@nrc.gov>
Tracking Status: None
"'Bruce.Mcdowell@pnl.gov'" <Bruce.Mcdowell@pnl.gov>
Tracking Status: None
"Elliott, Amy H NAB02" <Amy.H.Elliott@usace.army.mil>
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R. R. Sgarro
Manager, Nuclear Regulatory Affairs

PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
Tel. 570.802.8102 FAX 570.802.8119
rrsgarro@pplweb.com

September 9, 2009

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

BELL BEND NUCLEAR POWER PLANT
ALTERNATIVE SITE EVALUATION
BNP-2009-257 Docket No. 52-039

The Bell Bend Nuclear Power Plant (BBNPP) alternative site analysis has recently been revised to incorporate lessons learned from the Calvert Cliffs Alternative Site revision process. The enclosure provides the BBNPP Alternative Site Evaluation, dated September 2009, which documents the site selection process utilized to confirm/validate the Bell Bend "Proposed Site."

The revised analyses affect the current text contained in the BBNPP Unit 3 Combined License Application (COLA) Revision 1. Section 9.3 of the BBNPP Revision 1 COLA will be revised to reflect the analyses documented in the enclosed report. The updated Section 9.3 will be submitted to the NRC upon completion and incorporated into a future revision of the BBNPP COLA.

There is one commitment in this letter: Revise ER Section 9.3 of the BBNPP COLA to reflect the changes to the alternative site analyses and submit to the NRC.

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 September 9, 2009

Respectfully,

Rocco R. Sgarro

RRS/kw

Enclosure: Bell Bend Nuclear Power Plant, Alternative Site Evaluation, Revision 0, September 2009, Luzerne County, Pennsylvania

cc: Mr. Joseph Colaccino
Branch Chief
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Mr. Samuel J. Collins
Regional Administrator
U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
King of Prussia, PA 19406-1415

Mr. Michael Canova
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Ms. Stacey Imboden
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852

Enclosure

Bell Bend Nuclear Power Plant
Alternative Site Evaluation, Revision 0
September 2009
Luzerne County, Pennsylvania

Bell Bend Nuclear Power Plant

Alternative Site Evaluation v.[0]

[●] September 2009

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Bell Bend Nuclear Power Plant

Alternative Site Evaluation, Revision 0

September 9, 2009

Preparer: _____ Date: 09/09/09

Reviewer: Federico Perdomo Date: 9/9/09

Approver: _____ Date: 09/09/09

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1. Introduction

PPL Bell Bend LLC has submitted a COLA for constructing and operating a U.S. Evolutionary Power Reactor (EPR) nuclear power station near the Susquehanna Steam Electric Station (SSES) in Luzerne County, Pennsylvania (*Proposed Site*). The deployment of a nuclear power facility is a major federal action which is subject to the National Environmental Policy Act (NEPA). In order to confirm the *Proposed Site* selected is the best location for the proposed nuclear power station, an alternatives analysis was conducted as required by the National Environmental Policy Act of 1969 (NEPA) and Code of Federal Regulations (CFR), Title 10, Part 51.45 (10 CFR 51.45).

Because of the large number and variety of criteria that were considered in the alternative site evaluation process, it was essential to develop and document the framework for conducting this process in an objective, consistent, and repeatable manner. In addition, it was important to develop an approach for determining weighing factors for each major criterion in order to assess sites based on the relative contribution of each criterion specific to the Region of Interest.

The following were used as general guidelines in developing and documenting the site selection process. Any deviations from the regulatory guidelines are noted in the text.

- NRC guidance: NUREG-1555, Environmental Standard Review Plan (ESRP), Section 9.3: Site Selection Process (NRC, 2007). This document formed the basis for the site selection process, as discussed later in this report.

- Regulatory Guide 4.2, Rev. 2, “Preparation of Environmental Reports for Nuclear Power Stations” (NRC, 1976). This guide was used in comparing the alternative sites to the proposed site. According to the guide, a cost-effectiveness analysis of realistic alternatives in terms of both economic and environmental costs can be conducted, if needed, to show why the proposed site is preferred over the alternative sites. In order to determine a suitable site, expected environmental impacts are appraised for each site. Quantifying impacts, while desirable, may not be possible for most factors because of a lack of adequate data. Under such circumstances, qualitative and general comparative statements supported by documentation may be used. The guide suggests various criteria that may be used for comparing the alternatives and the proposed nuclear power station, including the following:

  - Engineering and environmental factors: Meteorology; geology; seismology; hydrology; population density in site environments; access to road, rail, and water transportation; fuel supply and waste disposal routes; cooling water supply; water quality; sensitivity of aquatic and terrestrial habitats affected; commitment of resources; dedicated areas; projected recreational usage; and scenic values
  - Transmission hookup factors: Access to transmission system in place, problems of routing new transmission lines, problems of transmission reliability, and minimization of transmission losses
  - Construction factors: Access for equipment and materials, housing for construction workers
  - Land use factors: Land use types (including compatibility with zoning or use changes)
  - Cost factors: Construction costs, including transmission, fuel (annual), and operating and maintenance (annual) costs
  - Operating factors: Load-following capability
  - Alternative site cost factors: Land and water rights; base station facilities; main condenser cooling system; main condenser cooling intake structures and discharge system; transmission and substation facilities; access roads and railroads; and site preparation including technical investigations

- Regulatory Guide 4.7, Rev. 2, “General Site Suitability for Nuclear Power Stations” (NRC, 1998). This guide discusses the major site characteristics related to public health and

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safety and environmental issues that the NRC staff considers in determining the suitability of candidate sites for nuclear power stations. The safety issues that the NRC considers in its evaluation include geologic/seismic, hydrologic, and meteorological characteristics of proposed sites; exclusion areas and low population zones; population considerations as they relate to protecting the general public from the potential hazards of serious accidents; potential effects on a station from accidents associated with nearby industrial, transportation, and military facilities; emergency planning; and security plans. The environmental issues that the NRC considers in its evaluation include potential impacts on ecological systems, water use, land use, the atmosphere, aesthetics, and socioeconomics (social, cultural, and economic features [including environmental justice]).

- CFR, Title 10, Part 100, "Reactor Site Criteria," (NRC, 1996). This document requires that criteria, such as population density, use of site environments (including proximity to man-made hazards), and physical characteristics of the site be used as exclusionary criteria at a higher level to determine the acceptability of a site for a nuclear power reactor.

- Electric Power Research Institute (EPRI), Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application, Final Report (EPRI, 2002). The siting guide serves as a roadmap and tool and provides the methodology and framework for developing a detailed and specific process to meet the needs of early site permit (ESP) applicants for site selection. The siting guide is the industry standard for site selection and ESP preparation, and it is also appropriate to use with combined operating license applications. The siting guide describes a four-step site selection process involving sequential application of exclusionary, avoidance, and suitability criteria, as well as incorporation of preferences (or weighting factors) that are applied to the suitability criteria. Steps 1 and 2 of the siting process are areal in nature; screening of a relatively large region of interest (ROI) is performed to identify a number of discrete "site-sized" parcels for evaluation as a potential nuclear power station site. These steps are accomplished using mappable information. Steps 3 and 4 compare individual sites based on their relative suitability. This portion of the process begins with the use of mapped and other published information and concludes with detailed information collected through onsite investigations, as necessary. Step 4 culminates in selecting a proposed site.

Applicable State siting regulations as well as US Army Corps guidance were also reviewed to see if there were relevant criteria that needed to be incorporated into this site selection process.

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2. Alternative Site Evaluation Process

The Alternative Site Evaluation Process for Bell Bend was done consistent with the special case note in NUREG -1555 (1999), Section III (8) which states:

> *"Recognize that there will be special cases in which the proposed site was not selected on the basis of a systematic site-selection process. Examples include plants proposed to be constructed on the site of an existing nuclear power plant previously found acceptable on the basis of a NEPA review and/or demonstrated to be environmentally satisfactory on the basis of operating experience, and sites assigned or allocated to an applicant by a State government from a list of State-approved power-plant sites. For such cases, the reviewer should analyze the applicant's site-selection process only as it applies to candidate sites other than the proposed site, and the site-comparison process may be restricted to a site-by-site comparison of these candidates with the proposed site. As a corollary, all nuclear power plant sites within the identified region of interest having an operating nuclear power plant or a construction permit issued by the NRC should be compared with the applicant's proposed site."*

The alternative site evaluation process for Bell Bend implements the special case because the proposed plant would be located adjacent to an existing nuclear plant (the Susquehanna Steam Electric Station) previously found acceptable on the basis of a NEPA review. Under this process, we will implement a systematic site selection process search for alternatives to a *Proposed Site* submitted to the NRC as the proposed location for the nuclear plant, and then will compare the *Alternative Sites* to the *Proposed Site* in regard to environmental impacts to identify if environmental preference can be established for an alternative site. If environmental preference is established, then a second tier of evaluations is conducted based on other factors including commercial and financial criteria.

The process/procedure will follow NUREG-1555 utilizing elements of EPRI Guide and is depicted in Figures 2-1 and 2-2 and is delineated as follows:

- Establish the Region of Interest (ROI)
  - Establish the basis for the ROI and define the ROI
  - Develop the basis for establishing a pool of sites to evaluate
  - Establish an initial base pool of sites to evaluate
- Determine *Candidate Areas* within the ROI
  - Establish exclusionary criteria (e.g., population centers)
  - Apply the exclusionary criteria to the ROI
- Identify list of *Potential Sites*
  - Establish de-select criteria (e.g., < 420 ac (170 ha))
  - Apply de-select criteria to sites located within *Candidate Areas* to establish *Potential Sites*
- Identify list of *Candidate Sites*
  - Confirm *Potential Sites* are licensable and otherwise viable sites for constructing a new nuclear power station to establish *Candidate Sites*
- Identify list of *Alternative Sites*
  - Score *Candidate Sites* based on non-commercial weighted criteria (i.e., environmental basis)
    - Establish scoring criteria and basis
    - Establish weighting criteria and basis
    - Score *Candidate Sites*
  - Select the top 3 to 5 ranked *Candidate sites* as *Alternative Sites*
- Compare *Alternative Sites* to *Proposed Site*
  - Apply weighted scoring to *Proposed Site*
  - Evaluate if any *Alternative Sites* are "Environmentally Preferable" to the *Proposed Site*

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- If one or more of the *Alternative Sites* is significantly higher, then apply commercial scoring criteria to evaluate whether an *Alternative Site* is “Obviously Superior” to *Proposed Site*

The following subsections define and describe the detailed components of the alternative site evaluation-process for the subject new nuclear power plant.

Appendix F contains supporting environmental information that will be submitted to the Pennsylvania Department of Environmental Protection (PaDEP) and the U.S. Army Corps of Engineers (USACE) as part of the Joint Permit Application (JPA).

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Figure 2-1
Alternative Site Evaluation Process

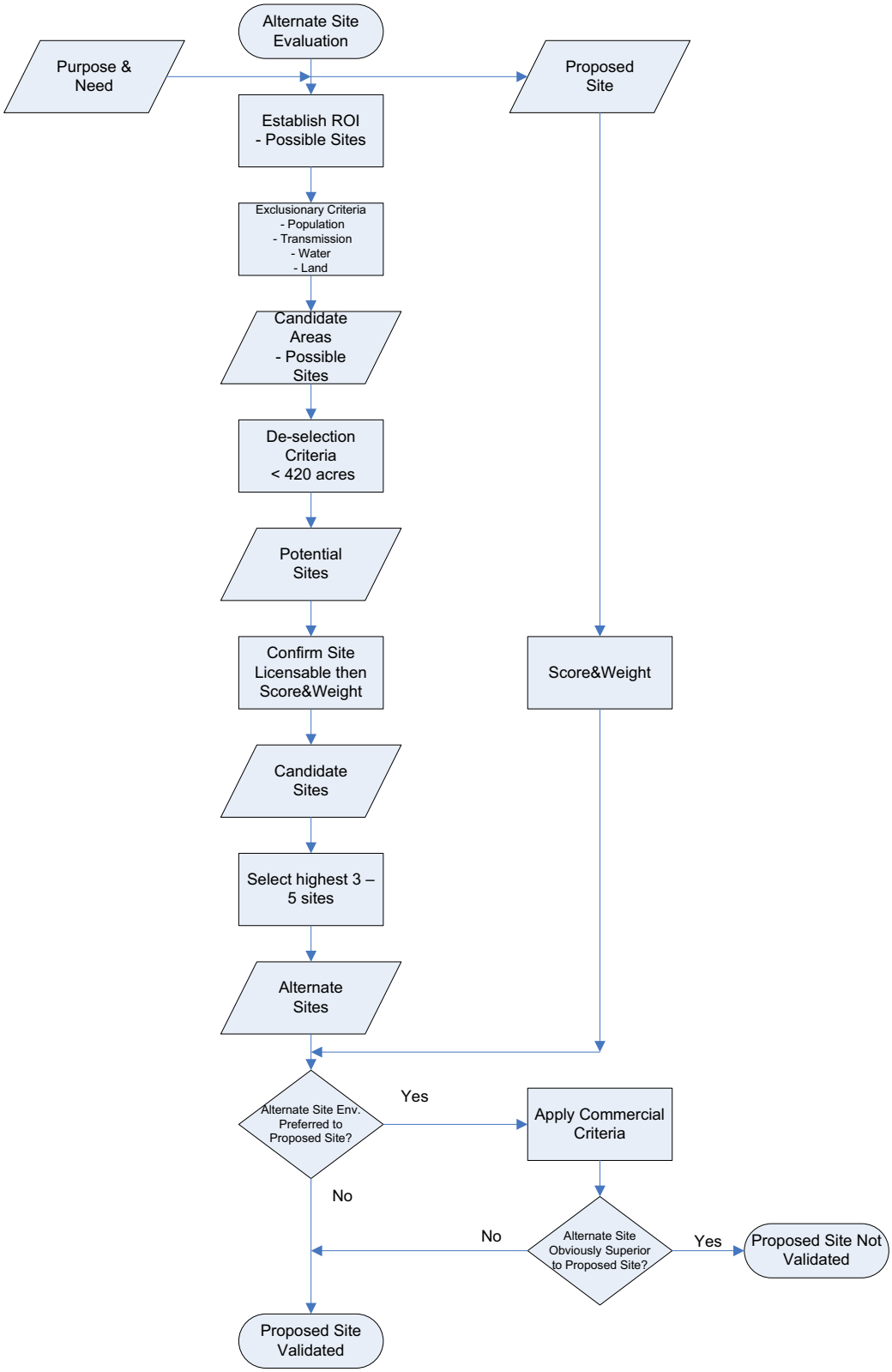

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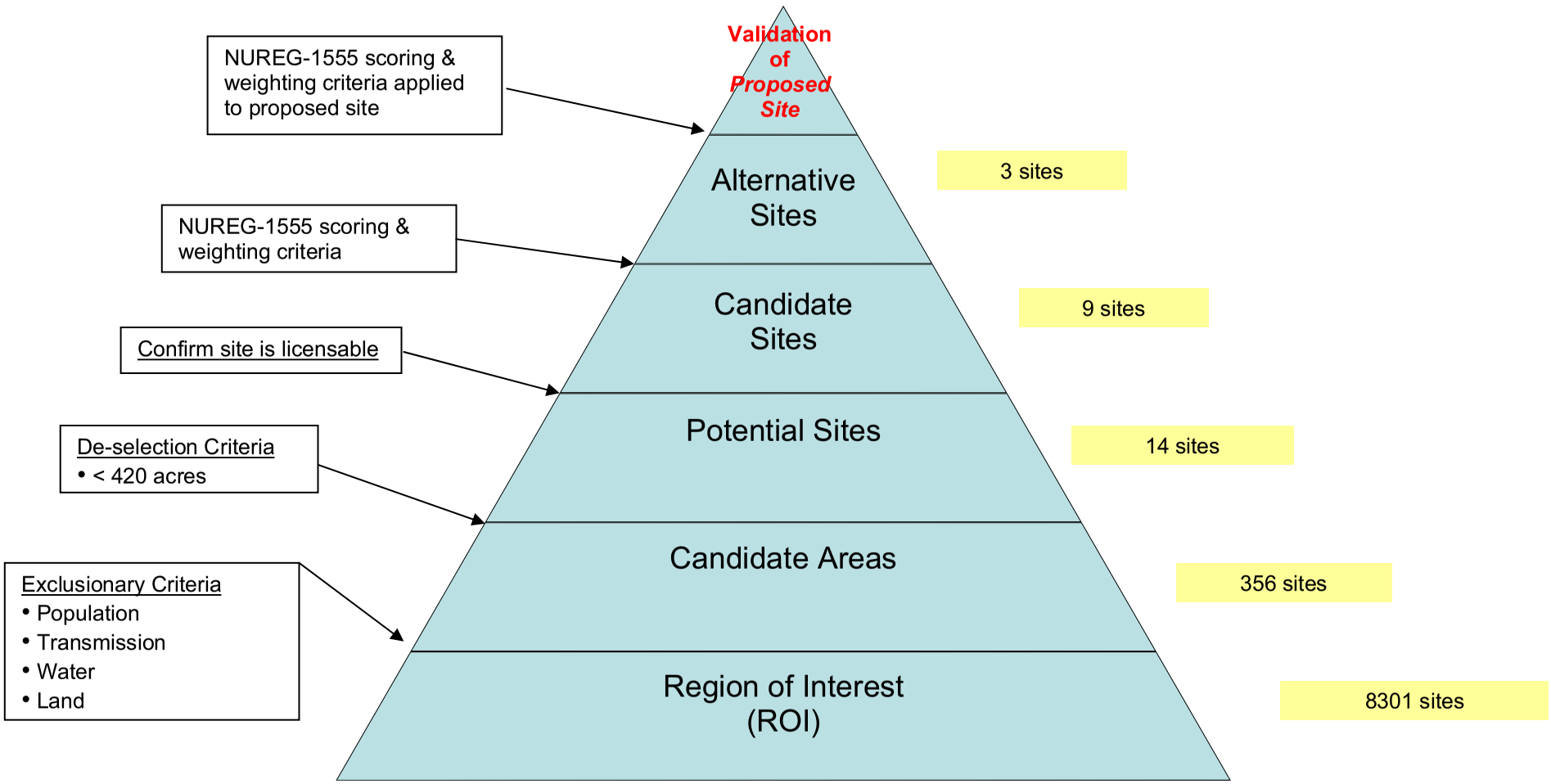
Figure 2-2
Alternative Site Evaluation Process Overview



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3. Region of Interest (ROI)

The first step in the site selection process was to define and identify the ROI. As defined in ESRP 9.3 (NRC, 2007), the ROI is the largest area considered and is the geographic area within which sites suitable for the size and type of nuclear power generating facility proposed by the applicant are evaluated. The basis for an ROI can be the state in which the proposed site is located or the relevant service area for the proposed facility. The geographic scope or primary market area for the proposed nuclear facility is generally defined as the eastern part of the Pennsylvania – New Jersey – Maryland Interconnection, LLC (PJM) classic market area, a sub-set of the entire PJM area, and is closely approximated by the service territories (i.e., areas) for the electric delivery companies identified and depicted on Figure 3-1. This primary market area and the ROI are one in the same. A detailed discussion of the need for power within this ROI is provided in Chapter 8 of the Environmental Report.

The initial pool of possible sites within the ROI was established from the following sources; (1) the U.S. Department of Energy, Energy Information Administration (EIA) State Energy Profiles for each of the four states in the ROI (References 12-15); (2) state brownfield site databases for the four states in the ROI (References 16-19) and (3) PPL-owned sites provided by PPL (e.g., Martins Creek (NJ) greenfield site). These sources included:

- Brownfield sites
- Remediation sites, including Voluntary Cleanup Program sites, National Priority List sites, and Federal Facilities undergoing remediation
- Power facilities
- Greenfield site

The sources identified above, in their entirety (i.e., without any additional filtering or screening) established the initial pool of 8301 possible sites which are subsequently used in the BBNPP alternative site selection process.

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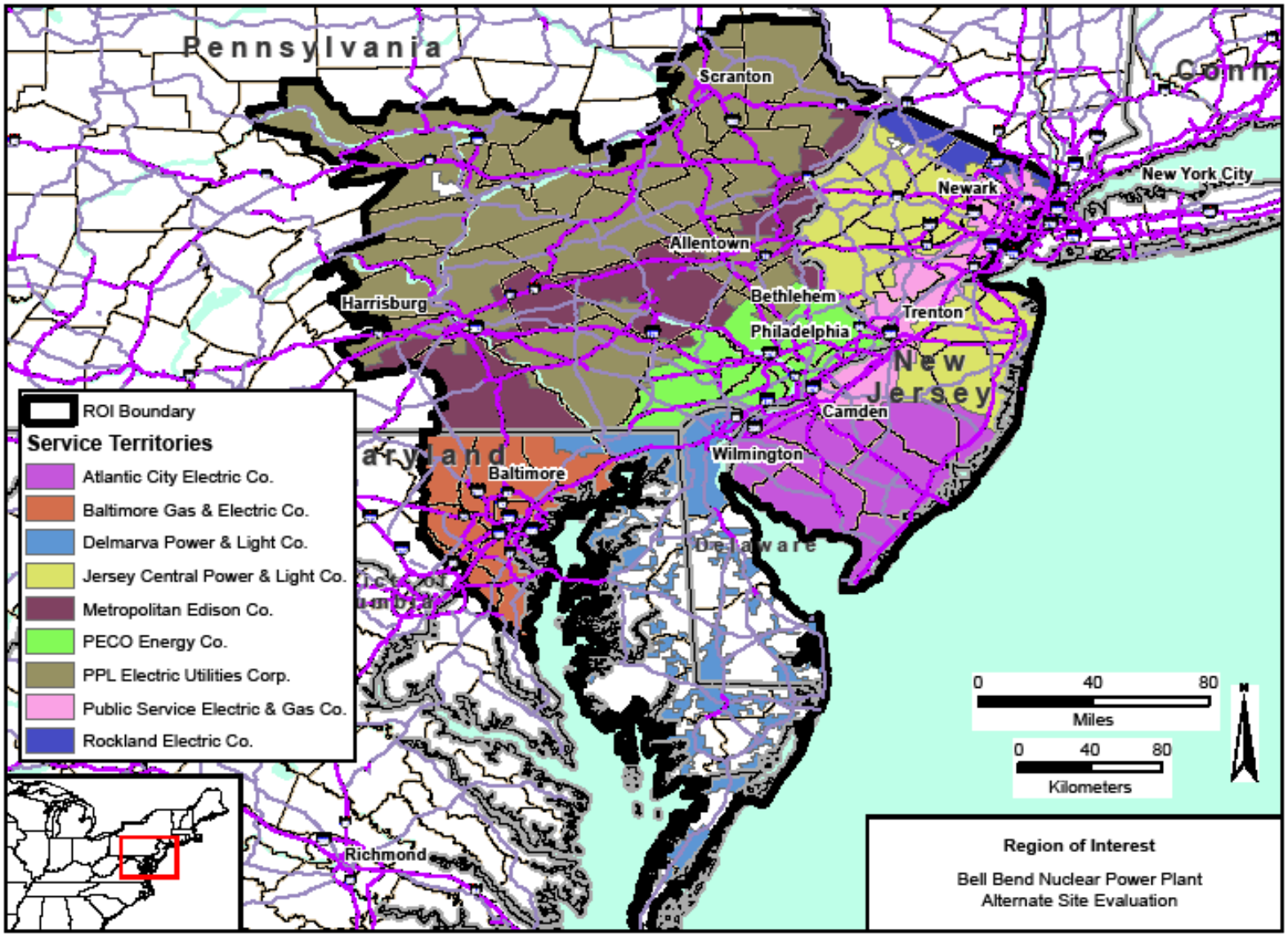
FIGURE 3-1
Region of Interest



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4. Candidate Areas

The next step in the site selection process was to identify suitable candidate areas by screening the ROI using exclusionary criteria. *Candidate Areas* refer to one or more areas within the ROI that remain after unsuitable areas have been removed. ROI screening was performed at a high level with the purpose of quickly identifying areas within the ROI that would not be suitable for the siting of a nuclear power station. The criteria used in the identification of the candidate areas are consistent with those identified in ESRP 9.3 (NRC, 2007) and the EPRI siting guide (EPRI, 2002) These exclusionary criteria are identified in Table 4-1 below. The exclusionary areas are shown individually graphically on Figures 4-1 through 4-4 and cumulatively in Figure 4-5. The *Candidate Areas* are those not within these exclusionary areas and are shown graphically in Figure 4-6 and 4-7. There are 356 possible sites within the *Candidate Areas*.

TABLE 4-1
Exclusionary ROI Screening Criteria to Establish Candidate Areas

Criteria	Detail
Population	Densely populated areas (that is, not located in an area with greater than or equal to 300 ppsm [or 300 persons per 2.6 km^2])
Transmission	Lack of 345 kV or higher transmission lines within 30 mi [48.3 km]). The 345 kV or higher transmission lines are needed for the EPR standard grid connection design.
Water	Lack of a cooling water source capable of supplying 50 MGD or more within 15 mi [24.1 kilometers].
Land	Dedicated land (that is, not located within national or state parks, or tribal lands)

The exclusionary criterion pertaining to population density used in this siting evaluation is more specific and more conservative than what is presented in 10 CFR 100. The information presented in 10 CFR 100 does not specify a permissible population density or total population within this zone because the situation may vary from case to case. NRC Regulatory Guide 4.7, Rev. 2 (NRC, 1998) contains the same information as presented in 10 CFR 100, but adds the following specific criteria:

> *Preferably a reactor would be located so that, at the time of initial site approval and within about 5 years thereafter, the population density, including weighted transient population, averaged over any radial distance out to 20 miles (cumulative population at a distance divided by the circular area at that distance), does not exceed 500 persons per square mile [ppsm]. A reactor should not be located at a site whose population density is well in excess of the above value.*

In addition, the EPRI siting guide contains the most conservative criterion with regard to population density and proximity to major population centers (that is, not located in an area with greater than or equal to 300 ppsm [or 300 persons per 2.6 km^2]) (EPRI, 2002). This siting evaluation used the conservative population criterion (300 ppsm) as an exclusionary criterion in the identification of candidate areas to be in alignment with current industry objectives.

Information gathered from the initial screening was used to identify areas not affected by the exclusionary screening criteria. The results of screening the ROI yielded those *Candidate Areas* identified in Figure 4-6 and 4-7.

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Figure 4-1
Exclusionary Criteria – Population Center

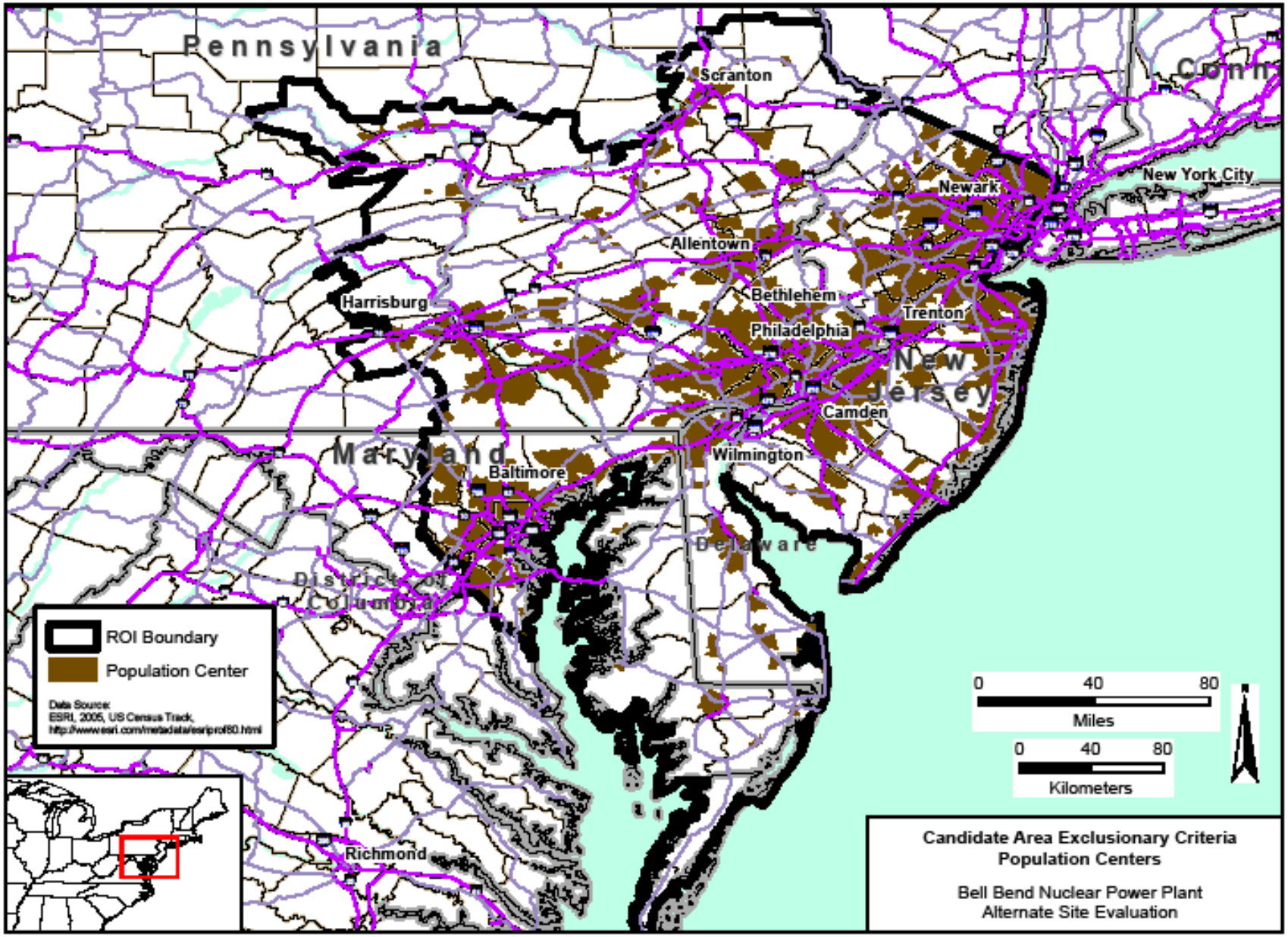

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Figure 4-2
Exclusionary Criteria – Transmission Line Exclusion Area

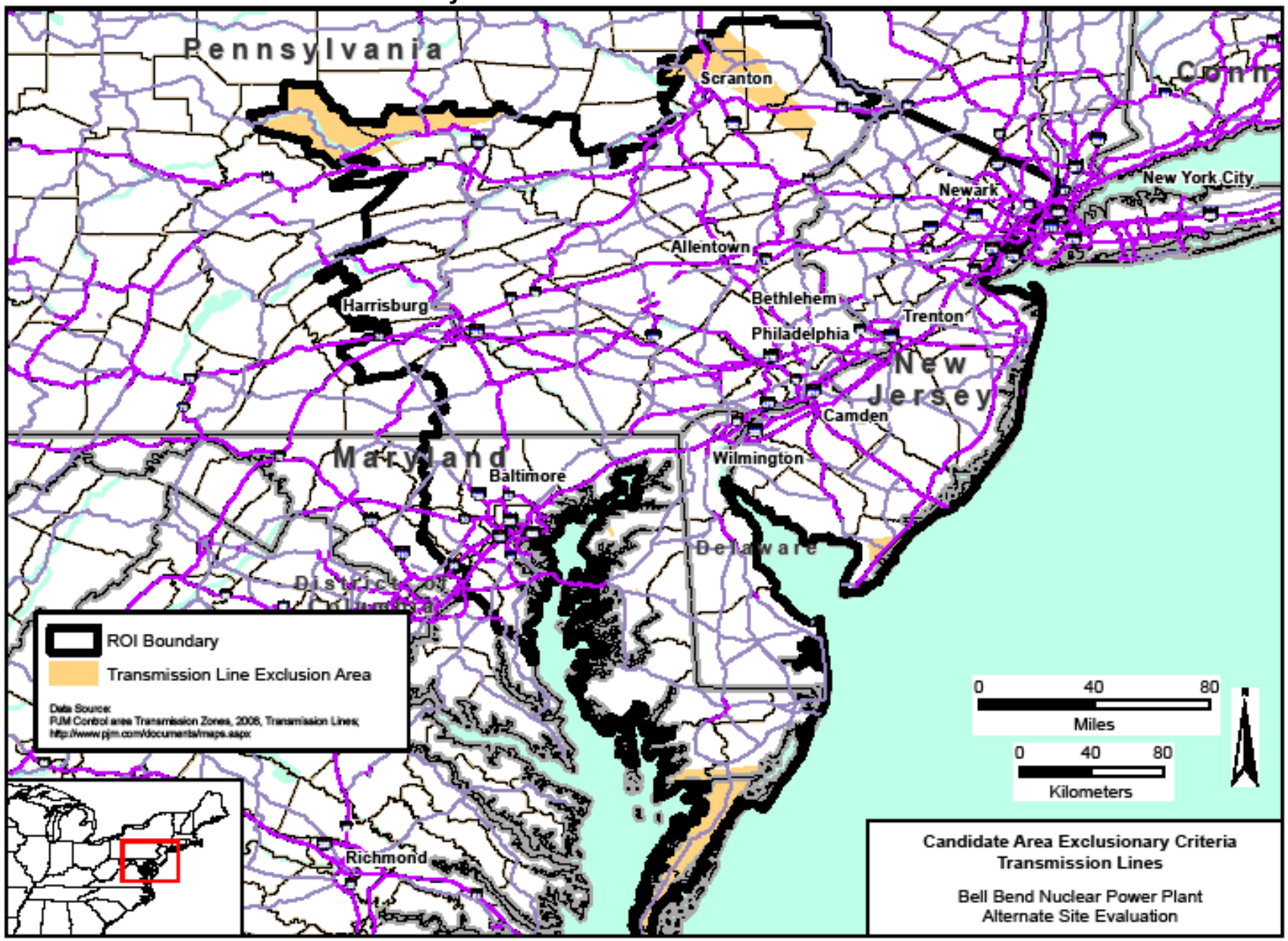

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Figure 4-3
Exclusionary Criteria – Waterway Exclusion Area

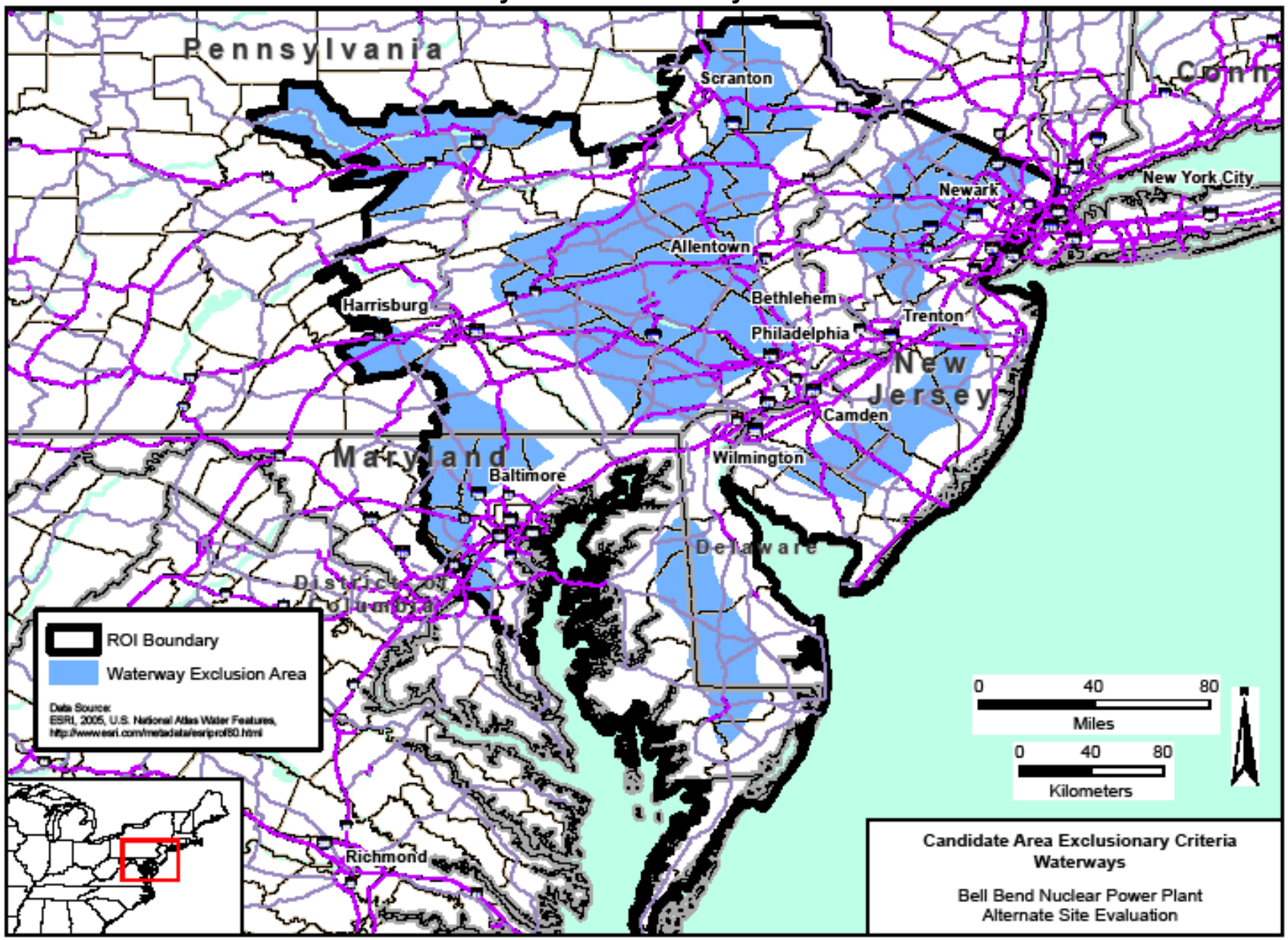

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Figure 4-4
Exclusionary Criteria – Dedicated Land

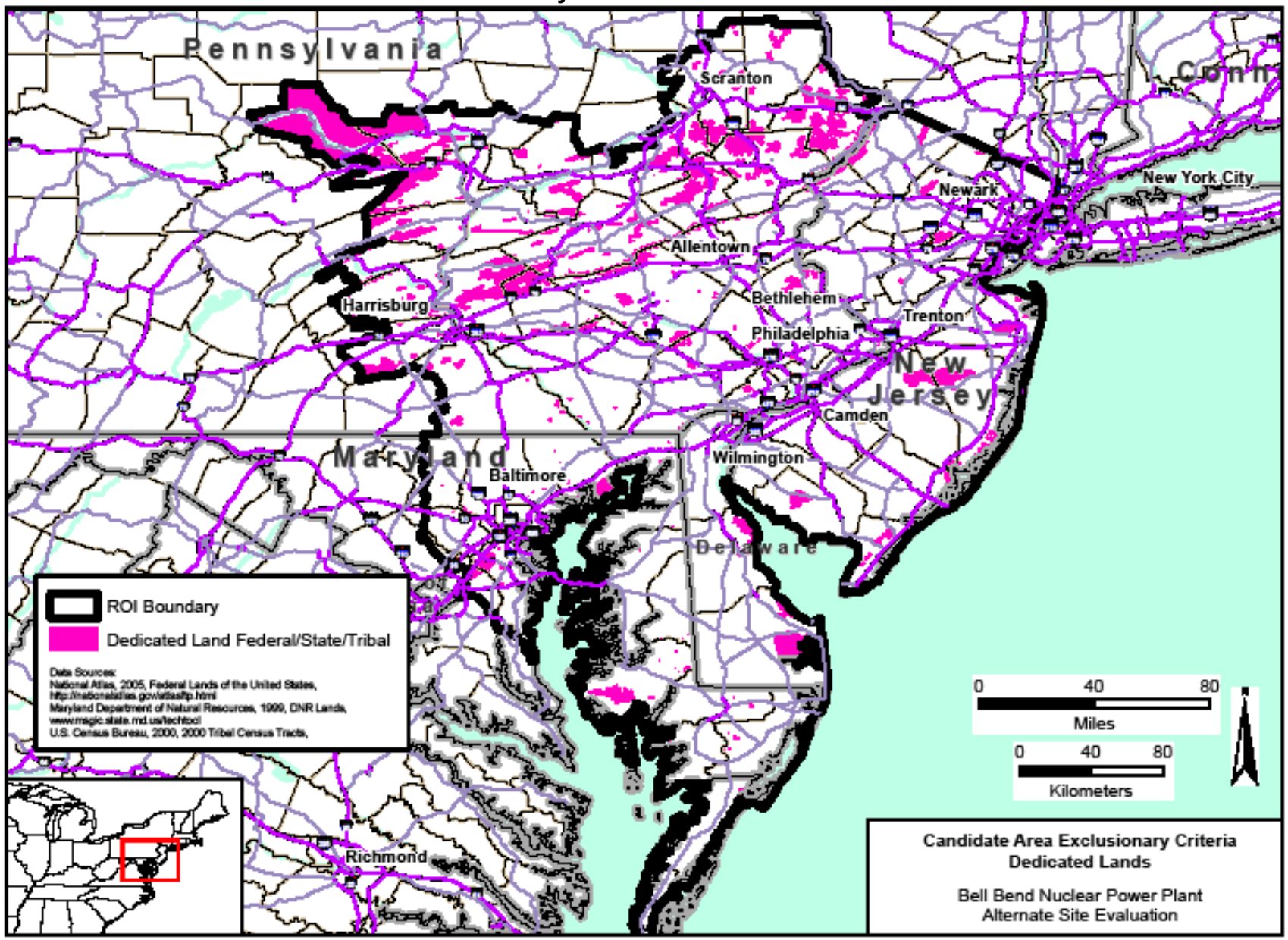

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Figure 4-5
Candidate Area Exclusionary Criteria - Composite

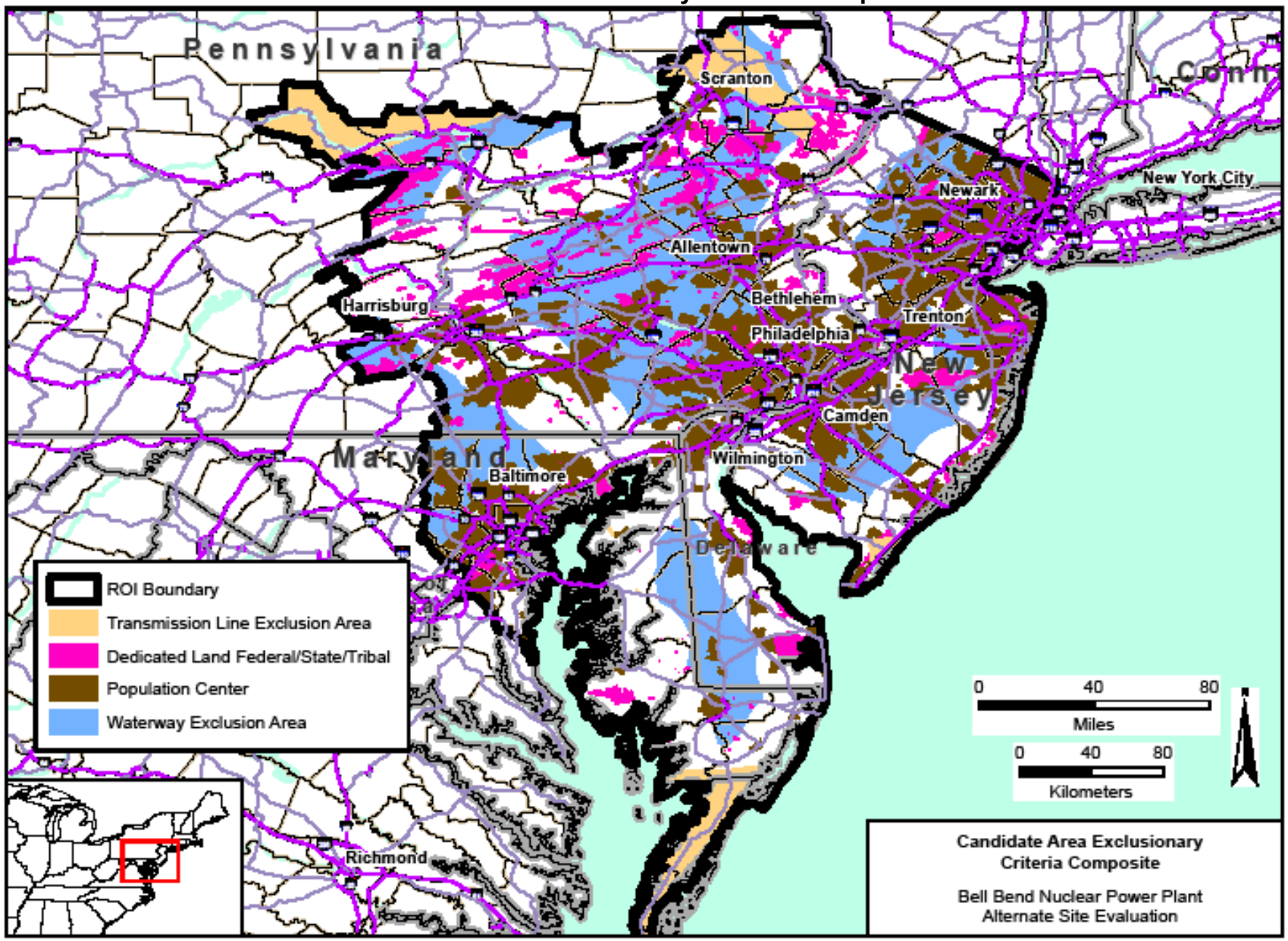

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Figure 4-6
Candidate Areas

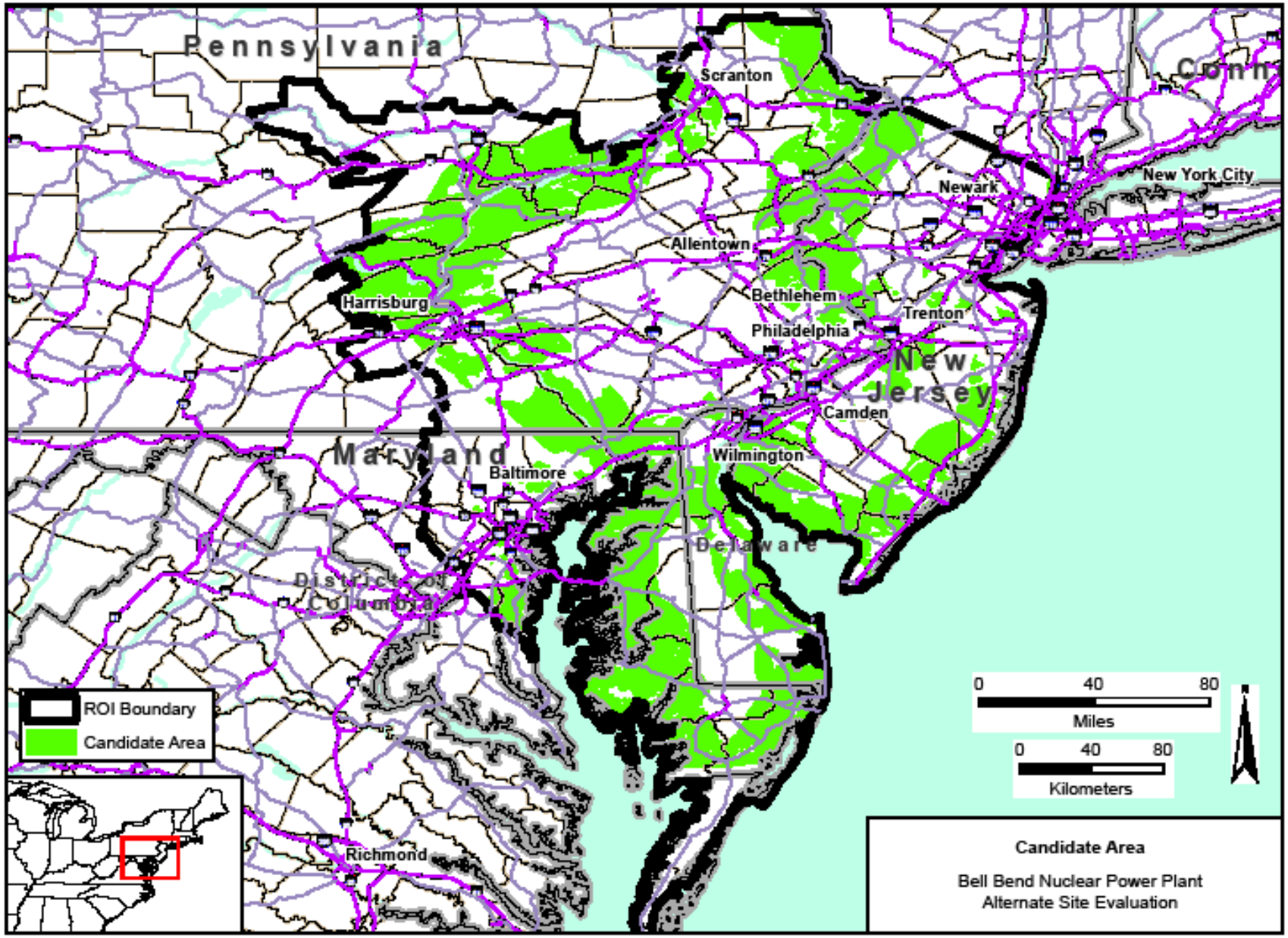

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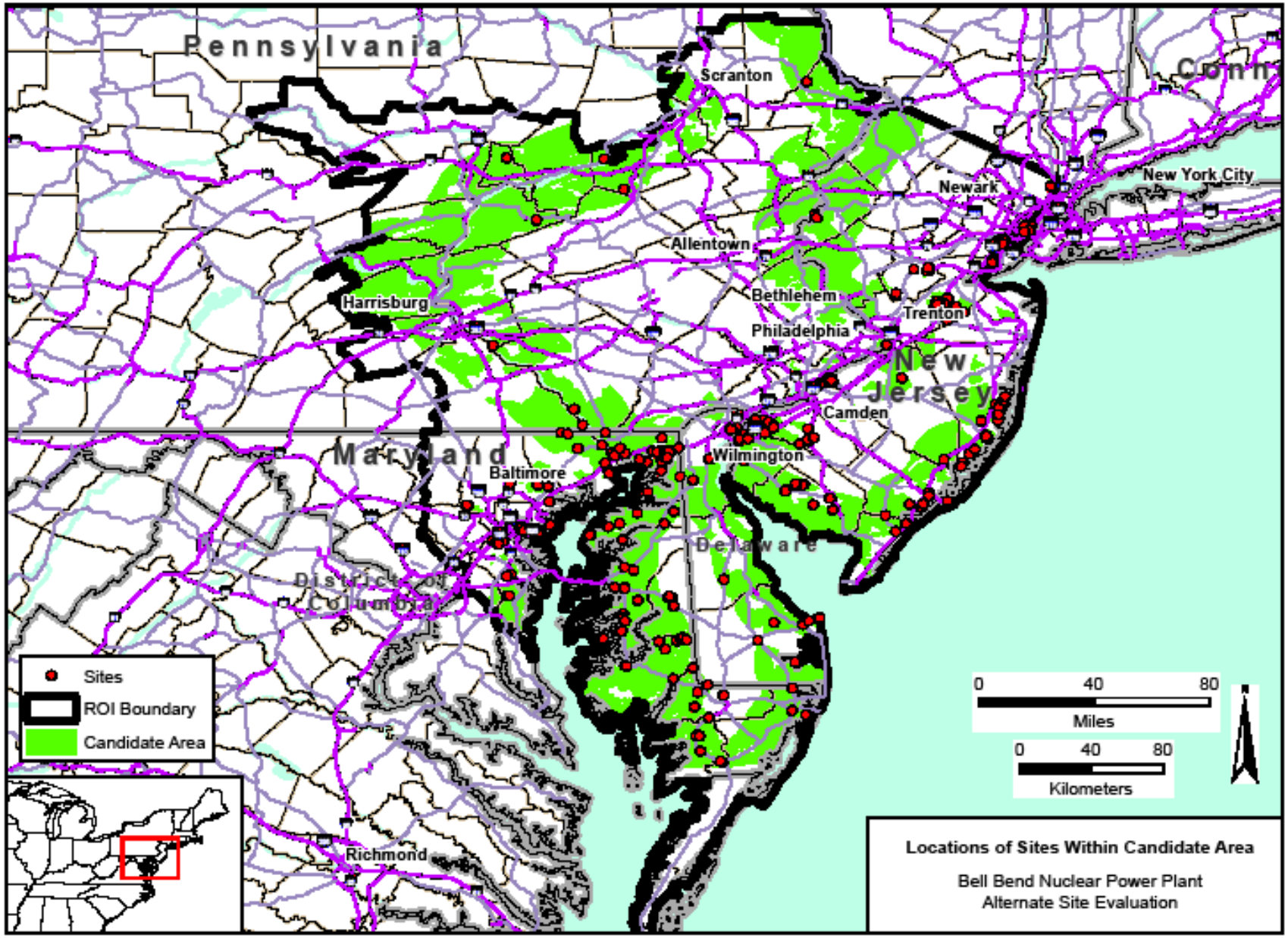
Figure 4-7
Sites in Candidate Areas



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5. Potential and Candidate Sites

The next step in the site selection process was to screen the candidate areas using refined discretionary criteria to identify potential geographic locations for the placement of the proposed nuclear power station. A de-select criteria, as allowed for in NUREG-1555 and EPRI Guide, was applied to the possible sites within the *Candidate Areas* to further screen down to *Potential Sites*. All sites less than 420 acres were screened out in this step. 420 acres has been identified as the minimum contiguous site size needed to construct the US EPR.

Fourteen (14) *Potential Sites* were identified after applying the de-select criteria of 420 acres. Of these, the BWI Airport site was determined not to be licensable due to its proximity to a commercial airport. Three sites (Sparrows Point, Keystone Industrial Port Complex, and Delaware City Plant) were determined not to be licensable due to being within a 20 mile proximity to a population center greater than 300 ppsm [or 300 persons per 2.6 km^2]). The Beiler site was determined not to be a viable option after obtaining reconnaissance level information (needed to support scoring) and cursory evaluation identified that; 1) the nearest water source, Sassafras Creek, does not meet 7Q10 volume requirements, and 2) the next nearest water source, the confluence of Sassafras and Chesapeake Bay, which is over 12 miles away at its nearest point is too shallow to support an inlet structure and would require significant dredging several more miles out which would be beyond the 15 mile exclusionary criterion. As a result, the following nine (9) sites were identified as licensable and viable for continuing as *Candidate Sites* (Figure 5-1) for the next step of the process.

<u>Candidate Sites</u>

- Bainbridge
- Conowingo
- Humboldt
- Martins Creek (NJ)
- Montour
- Peach Bottom
- Seedco
- Wallenpaupack
- Indian River

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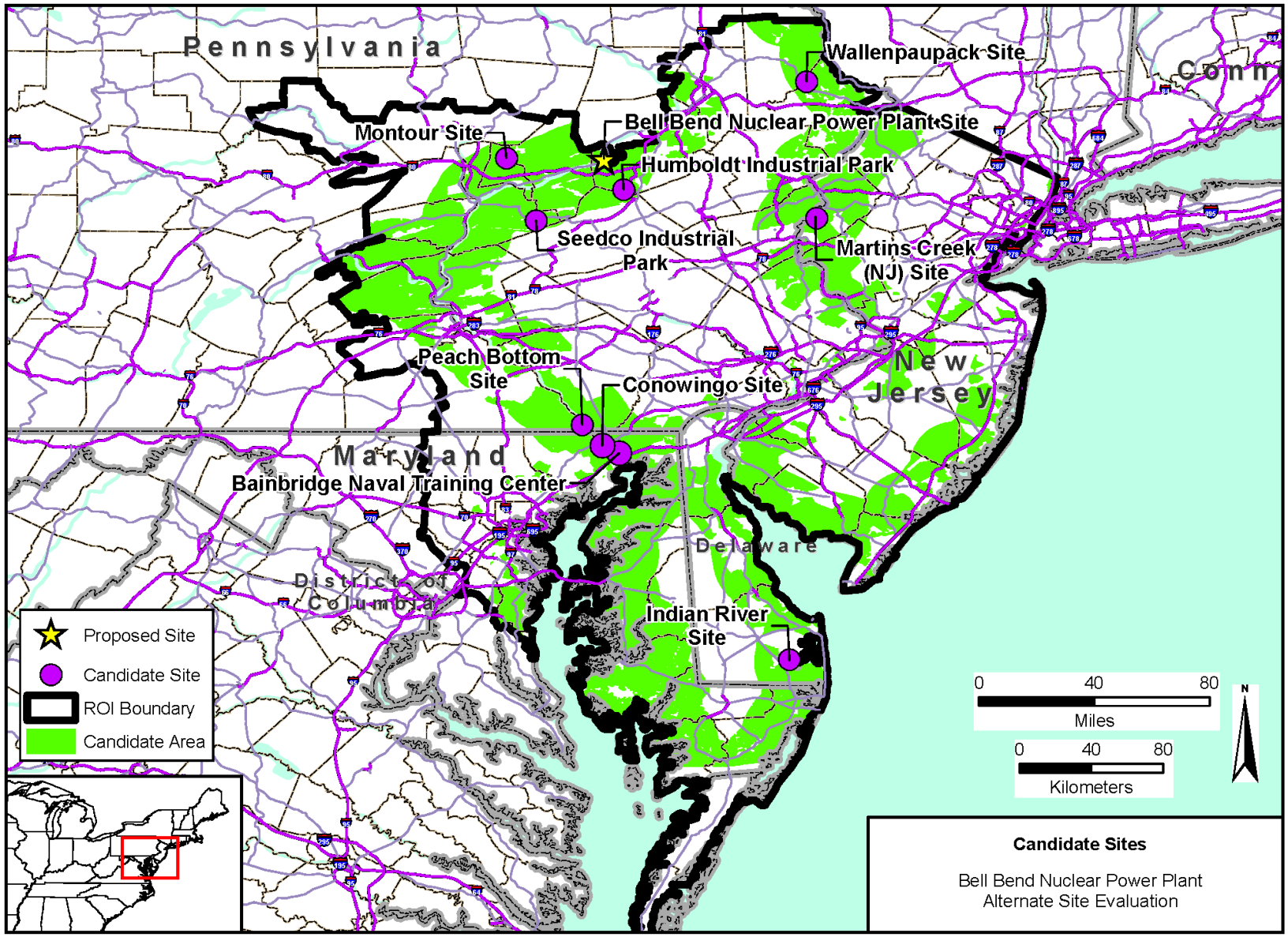
Figure 5-1
Candidate Sites



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6. Alternative Site Identification

The next step in the process was to identify *Alternative Sites* by scoring the Candidate *Sites* based on a set of non-commercial (i.e., environmental) criteria. The major criteria categories defined in NUREG -1555 were utilized for this purpose and were augmented with sub-criteria developed by a Delphi panel. A total of 16 major criteria comprised of 42 sub-criteria are utilized to score each *Candidate Site*. The environmental scoring criteria basis is described in Appendix A. Appendix B provides the rationale for inclusion of individual criteria in the site evaluation process based upon their relative importance to the site evaluation process. The scores applied to each sub-criteria are rolled up into an average for the major criteria and are then multiplied by a weighting factor established for each of the major criteria. The weighting values were established by a Delphi panel. The weighting factors as well as the composition of the Delphi panel are described in Appendix D.

According to Regulatory Guide 4.2, Rev. 2 (NRC, 1976):

> *The applicant is not expected to conduct detailed environmental studies at alternative sites; only preliminary reconnaissance-type investigations need be conducted.*

As such, the panel used readily available reconnaissance-level information sources which included publicly available data, information available from UniStar and BB/PPL files and personnel, and GoogleEarth™ images in order to evaluate, score, and rank the potential sites. Additional information and clarification of map and literature data were supplemented with site investigations as needed.

Following the weighting/scoring process a smaller pool of *Candidate Sites* was selected as *Alternative Sites* based upon the highest weighted scores. For this evaluation process it was determined to continue the evaluation with 3 *Alternative sites* (Figure 6-1) as listed below:

<u>*Alternative Sites*</u>

- Humboldt
- Montour
- Seedco

The results of the scoring process are shown in Table 6-1.

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Figure 6-1
Alternative Sites

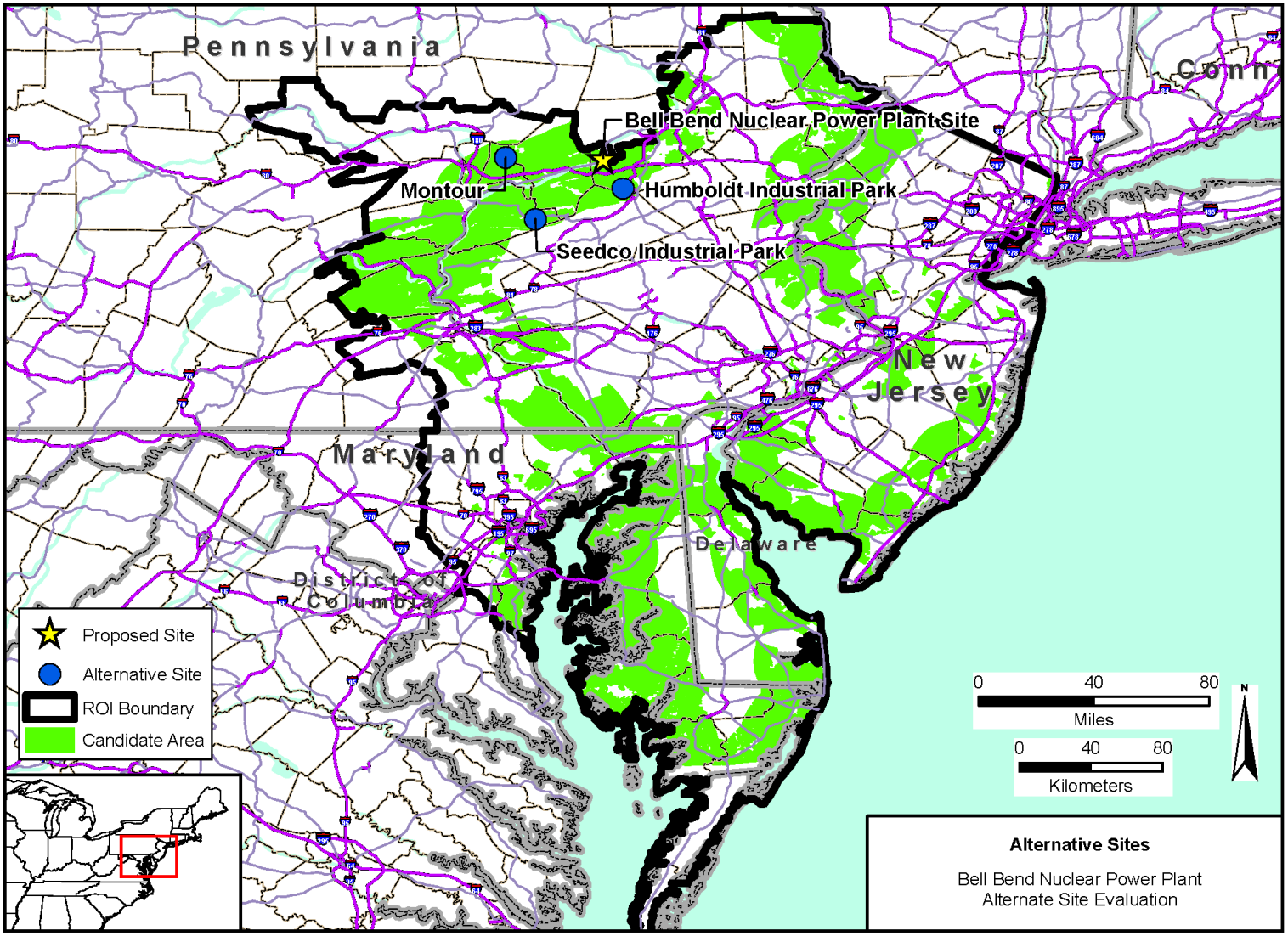

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Table 6-1
Weighted Scoring & Ranking to Determine Alternative Sites

Criteria[1]	Weight	Bainbridge		Conowingo		Humboldt		Martins Creek (NJ)		Montour	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
1. Land use, including availability, and areas requiring special consideration	**6.33**	**2.47**	**14.80**	**3.00**	**18.00**	**3.26**	**19.58**	**3.35**	**20.12**	**3.49**	**20.93**
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas		4.78		3.00		3.44		5.00		4.78	
1b. Special Areas: Hazardous waste or spoils areas		1.89		5.00		3.44		3.44		3.89	
1c. Zoning		1.22		5.00		5.00		5.00		1.44	
1d. Distance to dedicated land		3.00		1.00		3.00		1.00		5.00	
1e. Topography		1.44		1.00		1.44		2.33		2.33	
2. Hydrology, water quality, and water availability	**9.0**	**4.67**	**42.00**	**4.67**	**42.00**	**4.33**	**39.00**	**4.33**	**39.00**	**4.33**	**39.00**
2a. Water Quality (chemistry)		4.00		4.00		5.00		5.00		5.00	
2b. Receiving Body Water Quality		5.00		5.00		3.00		3.00		3.00	
2c. Volume		5.00		5.00		5.00		5.00		5.00	
3. Terrestrial resources (including endangered species)	**7.28**	**2.50**	**17.50**	**2.50**	**17.50**	**5.00**	**35.00**	**5.00**	**35.00**	**4.50**	**31.50**
3a. Endangered/threatened habitats		1.00		1.00		5.00		5.00		5.00	
3b. Floodplains		4.00		4.00		5.00		5.00		4.00	
4. Aquatic biological resources (including endangered species)	**7.28**	**1.00**	**7.00**	**1.00**	**7.00**	**4.00**	**28.00**	**2.00**	**14.00**	**4.00**	**28.00**
4a. Endangered/threatened habitats		1.00		1.00		5.00		1.00		5.00	
4b Thermal Discharge Sensitivity		1.00		1.00		3.00		3.00		3.00	
5. Socioeconomics (including aesthetics, demography, and infrastructure)	**5.50**	**4.00**	**22.00**	**4.00**	**22.00**	**4.00**	**22.00**	**4.20**	**23.10**	**2.40**	**13.20**
5a. Emergency services		5.00		5.00		5.00		5.00		3.00	
5b. Construction traffic		5.00		5.00		5.00		3.00		3.00	
5c. Construction workforce		5.00		5.00		5.00		5.00		3.00	
5d. Housing and necessities		1.00		1.00		1.00		3.00		1.00	
5e. Schools		4.00		4.00		4.00		5.00		2.00	
6. Environmental Justice	**4.72**	**3.50**	**17.50**	**4.00**	**20.00**	**4.50**	**22.50**	**4.50**	**22.50**	**4.50**	**22.50**
6a. Minority population		3.00		4.00		5.00		5.00		5.00	
6b. Low-income population		4.00		4.00		4.00		4.00		4.00	
7. Historic and Cultural Resources	**4.94**	**1.00**	**5.00**	**1.00**	**5.00**	**4.00**	**20.00**	**3.00**	**15.00**	**4.00**	**20.00**
7a. Historic properties		1.00		1.00		3.00		3.00		3.00	
7b. Historic districts		1.00		1.00		5.00		3.00		5.00	
8. Air Quality	**4.00**	**3.50**	**14.00**	**3.50**	**14.00**	**5.00**	**20.00**	**4.00**	**16.00**	**5.00**	**20.00**
8a. Climate and Meteorology: Weather risks/conditions		4.00		4.00		5.00		5.00		5.00	
8b. Class 1 Areas, Attainment / non-attainment Area		3.00		3.00		5.00		3.00		5.00	
9. Human Health	**6.06**	**1.33**	**8.00**	**2.67**	**16.00**	**2.67**	**16.00**	**1.00**	**6.00**	**3.00**	**18.00**
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone		1.00		3.00		1.00		1.00		3.00	

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UniStar NUCLEAR ENERGY

Table 6-1
Weighted Scoring & Ranking to Determine Alternative Sites

Criteria[1]	Weight	Bainbridge		Conowingo		Humboldt		Martins Creek (NJ)		Montour	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
9b. Radiological pathways – water		2.00		4.00		4.00		1.00		5.00	
9c. Radiological pathways - food		1.00		1.00		3.00		1.00		1.00	
10. Postulated Accidents(a)	**4.56**	**1.00**	**5.00**	**1.00**	**5.00**	**1.00**	**5.00**	**1.00**	**5.00**	**1.00**	**5.00**
10a. Distance to nearby potential hazards [per definition of Reg Guide 4.7]		1.00		1.00		1.00		1.00		1.00	
11. Transport of Radioactive Material (a)	**3.00**	**1.00**	**3.00**	**2.00**	**6.00**	**1.00**	**3.00**	**1.00**	**3.00**	**2.00**	**6.00**
11a. Operations/ Transportation: Support/challenges to transport of nuclear fuel and wastes		1.00		2.00		1.00		1.00		2.00	
12. Transmission corridors (land used, feasibility, and resources affected)	**7.72**	**4.00**	**32.00**	**4.00**	**32.00**	**3.00**	**24.00**	**3.00**	**24.00**	**2.00**	**16.00**
12a. Environmental impact of proposed transmission interconnection		4.00		4.00		3.00		3.00		2.00	
13. Population distribution and density	**8.67**	**3.00**	**27.00**	**3.50**	**31.50**	**4.00**	**36.00**	**2.00**	**18.00**	**4.00**	**36.00**
13a. Distance to population centers		4.00		4.00		5.00		2.00		4.00	
13b. Population density		2.00		3.00		3.00		2.00		4.00	
14. Facility costs	**5.50**	**4.95**	**27.20**	**1.50**	**8.25**	**3.00**	**16.50**	**2.50**	**13.75**	**1.56**	**8.55**
14a. Transportation: Barge access and capacity – distance, construction, or upgrade requirements		5.00		1.89		1.00		1.00		1.00	
14b. Transportation: Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements		4.89		1.11		5.00		4.00		2.11	
15. Geology/Seismology	**7.11**	**4.00**	**28.00**	**4.50**	**31.50**	**4.25**	**29.75**	**2.75**	**19.25**	**4.75**	**33.25**
15a. Geology/ Seismology: Vibratory ground motion – seismic peak ground acceleration		5.00		5.00		5.00		4.00		5.00	
15b. Geology/Seismology: Depth to bedrock, soil stability, and compaction		3.00		5.00		5.00		1.00		5.00	
15c. Geology/Seismology: Surface faulting and deformations		5.00		5.00		5.00		5.00		5.00	
15d. Geology/Seismology: Other geological hazards		3.00		3.00		2.00		1.00		4.00	
16. Wetlands	**8.33**	**5.00**	**40.00**	**4.33**	**34.67**	**4.33**	**34.67**	**5.00**	**40.00**	**5.00**	**40.00**
16a. Total wetlands		5.00		5.00		5.00		5.00		5.00	
16b. Wetlands Component of Site		5.00		3.00		3.00		5.00		5.00	
16c. High Quality Wetlands		5.00		5.00		5.00		5.00		5.00	
Total			310.0		310.4		**371.0**		313.7		**357.9**
Alternative Site? (Yes/No)[2]		**NO**		**NO**		**YES**		**NO**		**YES**	

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Table 6-1
Weighted Scoring & Ranking to Determine Alternative Sites

Criteria[1]	Weight	Peach Bottom Score	Peach Bottom Wt. Score	Seedco Score	Seedco Wt. Score	Wallenpaupack Score	Wallenpaupack Wt. Score	Indian River Score	Indian River Wt. Score
1. Land use, including availability, and areas requiring special consideration	**6.33**	**2.42**	**14.54**	**3.58**	**21.47**	**1.49**	**8.93**	**2.96**	**17.74**
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas		3.89		4.11		1.22		2.33	
1b. Special Areas: Hazardous waste or spoils areas		4.56		3.22		3.22		2.78	
1c. Zoning		1.67		5.00		1.00		5.00	
1d. Distance to dedicated land		1.00		4.56		1.00		1.00	
1e. Topography		1.00		1.00		1.00		3.67	
2. Hydrology, water quality, and water availability	**9.0**	**4.33**	**39.00**	**4.33**	**39.00**	**4.33**	**39.00**	**3.33**	**30.00**
2a. Water Quality (chemistry)		5.00		5.00		5.00		2.00	
2b. Receiving Body Water Quality		3.00		3.00		3.00		5.00	
2c. Volume		5.00		5.00		5.00		3.00	
3. Terrestrial resources (including endangered species)	**7.28**	**2.50**	**17.50**	**4.50**	**31.50**	**3.00**	**21.00**	**5.00**	**35.00**
3a. Endangered/threatened habitats		1.00		5.00		1.00		5.00	
3b. Floodplains		4.00		4.00		5.00		5.00	
4. Aquatic biological resources (including endangered species)	**7.28**	**2.00**	**14.00**	**4.00**	**28.00**	**4.00**	**28.00**	**3.00**	**21.00**
4a. Endangered/threatened habitats		1.00		5.00		5.00		5.00	
4b Thermal Discharge Sensitivity		3.00		3.00		3.00		1.00	
5. Socioeconomics (including aesthetics, demography, and infrastructure)	**5.50**	**3.80**	**20.90**	**4.00**	**22.00**	**2.80**	**15.40**	**2.80**	**15.40**
5a. Emergency services		5.00		5.00		1.00		5.00	
5b. Construction traffic		3.00		5.00		5.00		3.00	
5c. Construction workforce		5.00		5.00		5.00		3.00	
5d. Housing and necessities		1.00		1.00		1.00		1.00	
5e. Schools		5.00		4.00		2.00		2.00	
6. Environmental Justice	**4.72**	**4.00**	**20.00**	**1.00**	**5.00**	**3.50**	**17.50**	**2.50**	**12.50**
6a. Minority population		5.00		1.00		4.00		1.00	
6b. Low-income population		3.00		1.00		3.00		4.00	
7. Historic and Cultural Resources	**4.94**	**2.00**	**10.00**	**4.00**	**20.00**	**4.00**	**20.00**	**3.00**	**15.00**
7a. Historic properties		3.00		3.00		3.00		1.00	
7b. Historic districts		1.00		5.00		5.00		5.00	
8. Air Quality	**4.00**	**4.00**	**16.00**	**5.00**	**20.00**	**5.00**	**20.00**	**3.50**	**14.00**
8a. Climate and Meteorology: Weather risks/conditions		5.00		5.00		5.00		4.00	
8b. Class 1 Areas, Attainment / non-attainment Area		3.00		5.00		5.00		3.00	
9. Human Health	**6.06**	**2.33**	**14.00**	**2.33**	**14.00**	**2.33**	**14.00**	**3.00**	**18.00**
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone		1.00		1.00		1.00		3.00	

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Table 6-1
Weighted Scoring & Ranking to Determine Alternative Sites

Criteria[1]	Weight	Peach Bottom		Seedco		Wallenpaupack		Indian River	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
9b. Radiological pathways – water		5.00		3.00		5.00		5.00	
9c. Radiological pathways - food		1.00		3.00		1.00		1.00	
10. Postulated Accidents(a)	**4.56**	**1.00**	**5.00**	**1.00**	**5.00**	**1.00**	**5.00**	**1.00**	**5.00**
10a. Distance to nearby potential hazards [per definition of Reg Guide 4.7]		1.00		1.00		1.00		1.00	
11. Transport of Radioactive Material (a)	**3.00**	**2.00**	**6.00**	**1.00**	**3.00**	**2.00**	**6.00**	**2.00**	**6.00**
11a. Operations/ Transportation: Support/challenges to transport of nuclear fuel and wastes		2.00		1.00		2.00		2.00	
12. Transmission corridors (land used, feasibility, and resources affected)	**7.72**	**4.00**	**32.00**	**3.00**	**24.00**	**2.00**	**16.00**	**2.00**	**16.00**
12a. Environmental impact of proposed transmission interconnection		4.00		3.00		2.00		2.00	
13. Population distribution and density	**8.67**	**3.50**	**31.50**	**4.50**	**40.50**	**4.50**	**40.50**	**4.50**	**40.50**
13a. Distance to population centers		4.00		5.00		5.00		5.00	
13b. Population density		3.00		4.00		4.00		4.00	
14. Facility costs	**5.50**	**3.22**	**17.71**	**3.00**	**16.50**	**2.95**	**16.20**	**2.75**	**15.13**
14a. Transportation: Barge access and capacity – distance, construction, or upgrade requirements		5.00		1.00		1.00		1.00	
14b. Transportation: Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements		1.44		5.00		4.89		4.50	
15. Geology/Seismology	**7.11**	**4.75**	**33.25**	**3.75**	**26.25**	**4.00**	**28.00**	**4.00**	**28.00**
15a. Geology/ Seismology: Vibratory ground motion – seismic peak ground acceleration		5.00		5.00		5.00		5.00	
15b. Geology/Seismology: Depth to bedrock, soil stability, and compaction		5.00		3.00		3.00		1.00	
15c. Geology/Seismology: Surface faulting and deformations		5.00		5.00		5.00		5.00	
15d. Geology/Seismology: Other geological hazards		4.00		2.00		3.00		5.00	
16. Wetlands	**8.33**	**5.00**	**40.00**	**5.00**	**40.00**	**4.33**	**34.67**	**2.33**	**18.67**
16a. Total wetlands		5.00		5.00		5.00		5.00	
16b. Wetlands Component of Site		5.00		5.00		3.00		1.00	
16c. High Quality Wetlands		5.00		5.00		5.00		1.00	
Total			331.4		**356.2**		330.2		307.9
Alternative Site? (Yes/No)[2]		**NO**		**YES**		**NO**		**NO**	

[1] Yellow highlighted row is from Ref NUREG-1555 Subject Areas for Candidate Site Selection and Screening. No fill is Functional Evaluation Elements [Ref EPRI Siting Study]
[2] The three sites with the highest scores.

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7. Validation of Preferred Site

Following identification of the *Alternative Sites*, the next step in the site evaluation process is to screen and evaluate the *Alternative Sites* as compared to the *Proposed Site* to determine whether an *Alternative Site* is "Environmentally Preferable" to the *Proposed Site*. As noted in Section 2 of this report, this evaluation implements the special case note in NUREG-1555 (1999), Section III (8) in which the *Proposed Site* was not selected on the basis of a systematic site-selection process but is proposed to be constructed on or adjacent to the site of an existing nuclear power plant previously found acceptable on the basis of a NEPA review and/or demonstrated to be environmentally satisfactory on the basis of operating experience. As such, the *Proposed Site* is introduced in this step in the evaluation process, and is scored to the exact same 42 sub-criteria used in the previous section for *Potential Sites*. The *Proposed Site* score was then compared to the *Alternative Sites* scores. Table 7-1 presents the summary of this evaluation.

Evaluation of the *Alternative Sites* presented in Table 7-1 is based upon a maximum score of 500 points. The range of scores for the *Alternative Sites* is 356.2 (Seedco) to 371.0 (Humboldt). BBNPP, the *Proposed Site*, received a score of 370.1, slightly less than the 371.0 received by the highest scoring *Alternative Site*, Humboldt.

One standard deviation of the *Alternative Site* scores is 7.8 points. The difference between the Humboldt score and the score for BBNPP, the *Proposed Site*, is 0.9 points or less than 1 percent different from the BBNPP score. This level of difference between the scores was considered to be insignificant, and consequently, none of the *Alternative Sites* were found to be "Environmentally Preferable" to the *Proposed Site* following scoring and ranking with the selected environmental criteria. Consequently, commercial criteria were not used in the overall alternative site evaluation.

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Table 7-1
Evaluation for "Environmentally Preferable"

Criteria[1]	Weight	Bell Bend Score	Bell Bend Wt. Score	Humboldt Score	Humboldt Wt. Score	Montour Score	Montour Wt. Score	Seedco Score	Seedco Wt. Score
1. Land use, including availability, and areas requiring special consideration	**6.33**	**3.89**	**23.34**	**3.26**	**19.58**	**3.49**	**20.93**	**3.58**	**21.47**
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including protected area, cooling towers, ponds, switchyard, construction support areas		5.00							
1b. Special Areas: Hazardous waste or spoils areas		4.78							
1c. Zoning		3.67							
1d. Distance to dedicated land		3.00							
1e. Topography		3.00							
2. Hydrology, water quality, and water availability	**9.00**	**4.33**	**39.00**	**4.33**	**39.00**	**4.33**	**39.00**	**4.33**	**39.00**
2a. Water Quality (chemistry)		5.00							
2b. Receiving Body Water Quality		3.00							
2c. Volume		5.00							
3. Terrestrial resources (including endangered species)	**7.28**	**4.50**	**31.50**	**5.00**	**35.00**	**4.50**	**31.50**	**4.50**	**31.50**
3a. Endangered/threatened habitats		5.00							
3b. Floodplains		4.00							
4. Aquatic biological resources (including endangered species)	**7.28**	**4.00**	**28.00**	**4.00**	**28.00**	**4.00**	**28.00**	**4.00**	**28.00**
4a. Endangered/threatened habitats		5.00							
4b Thermal Discharge Sensitivity		3.00							
5. Socioeconomics (including aesthetics, demography, and infrastructure)	**5.50**	**3.00**	**16.50**	**4.00**	**22.00**	**2.40**	**13.20**	**4.00**	**22.00**
5a. Emergency services		5.00							
5b. Construction traffic		3.00							
5c. Construction workforce		3.00							
5d. Housing and necessities		1.00							
5e. Schools		3.00							
6. Environmental Justice	**4.72**	**4.50**	**22.50**	**4.50**	**22.50**	**4.50**	**22.50**	**1.00**	**5.00**
6a. Minority population		5.00							
6b. Low-income population		4.00							
7. Historic and Cultural Resources	**4.94**	**4.00**	**20.00**	**4.00**	**20.00**	**4.00**	**20.00**	**4.00**	**20.00**
7a. Historic properties		3.00							
7b. Historic districts		5.00							
8. Air Quality	**4.00**	**5.00**	**20.00**	**5.00**	**20.00**	**5.00**	**20.00**	**5.00**	**20.00**
8a. Climate and Meteorology: Weather risks/conditions		5.00							
8b. Class 1 Areas, Attainment / non-attainment Area		5.00							

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Table 7-1
Evaluation for "Environmentally Preferable"

Criteria[1]	Weight	Bell Bend Score	Bell Bend Wt. Score	Humboldt Score	Humboldt Wt. Score	Montour Score	Montour Wt. Score	Seedco Score	Seedco Wt. Score
9. Human Health	6.06	3.00	18.00	2.67	16.00	3.00	18.00	2.33	14.00
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone		3.00							
9b. Radiological pathways – water		5.00							
9c. Radiological pathways – food		1.00							
10. Postulated Accidents(a)	4.56	1.00	5.00	1.00	5.00	1.00	5.00	1.00	5.00
10a. Distance to nearby potential hazards [per definition of Reg Guide 4.7]		1.00							
11. Fuel Cycle Impacts(a)	3.00	1.00	3.00	1.00	3.00	2.00	6.00	1.00	3.00
11a. Operations/ Transportation: Support/challenges to transport of nuclear fuel and wa		1.00							
12. Transmission corridors (land used, feasibility, and resources affected)	7.72	4.78	38.24	3.00	24.00	2.00	16.00	3.00	24.00
12a. Environmental impact of proposed transmission interconnection		4.78							
13. Population distribution and density	8.67	3.50	31.50	4.00	36.00	4.00	36.00	4.50	40.50
13a. Distance to population centers		4.00							
13b. Population density		3.00							
14. Facility costs (environmental)	5.50	2.95	16.20	3.00	16.50	1.56	8.55	3.00	16.50
14a.Transportation: Barge access and capacity – distance, construction, or upgrade requirem		1.00							
14b.Transportation: Rail line access and capacity – distance, spur requirements, line capacity, upgrade requirements		4.89							
15. Geology/Seismology	7.11	4.00	28.00	4.25	29.75	4.75	33.25	3.75	26.25
15a. Geology/ Seismology: Vibratory ground motion – seismic peak ground acceleration		5.00							
15b. Geology/Seismology: Depth to bedrock, soil stability, and compaction		3.00							
15c. Geology/Seismology: Surface faulting and deformations		5.00							
15d. Geology/Seismology: Other geological hazards		3.00							
16. Wetlands	8.33	3.67	29.33	4.33	34.67	5.00	40.00	5.00	40.00
16a. Total wetlands		5.00							
16b. Wetlands Component of Plot		1.00							
16c. High Quality Wetlands		5.00							
Total			370.1		371.0		357.9		356.2
Is Alternative Site "Environmentally Preferable"? (Yes/No)				NO		NO		NO	

[1]Yellow highlighted row is from Ref NUREG-1555 Subject Areas for Candidate Site Selection and Screening. No fill is Functional Evaluation Elements [Ref EPRI Siting Study]

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8. Results of the Alternative Site Evaluation Process

The alternative site evaluation process discussed herein identified three alternatives to the *Proposed Site*. Following the special case process, those three *Alternative Sites* were compared to the *Proposed Site* with respect to 16 criteria comprised of 42 sub-criteria, and none of the *Alternative Sites* was found to be "Environmentally Preferable" to the proposed Bell Bend site. As such, no further evaluation is required.

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Appendix A—Environmental Scoring Criteria Basis

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
1. Land use, including availability, and areas requiring special consideration		
1a. Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas SCORED BY EXPERT PANEL[4]	Size and configuration of site	5 = No changes needed in layout and no restrictions for construction work area 3 = Limited changes needed in layout and/or some restrictions for construction work area 1 = Substantive changes needed in layout and/or substantive restrictions for construction work area
1b. Hazardous waste or spoils areas SCORED BY EXPERT PANEL[4]	Based on anticipated need for environmental remediation at the site or interconnects due to known current or previous uses (i.e. listed RCRA, CERCLIS, LUST or other designation)	5 = No/limited anticipated environmental remediation necessary 3 = Unknown if site needs environmental remediation 1 = Expected environmental remediation necessary
1c. Zoning SCORED BY EXPERT PANEL[4]	Compatibility with existing land use planning and proposed development	5 = Area zoned for industrial facilities/operations; no zoning restrictions; known ownership 3 = Area unzoned or unclear if zoning would be an issue; no known zoning restrictions for nuclear/industrial facilities; known ownership 1 = Area zoned for use other than industrial facilities/operations; likely zoning restrictions for nuclear/industrial facilities if zoning change is attempted; ownership unclear, or unknown
1d. Dedicated land SCORED BY EXPERT PANEL[4]	Distance to dedicated land (e.g., Federal, State, Tribal) from site	5 = No dedicated land within 10 miles of the site 3 = Dedicated land located greater than or equal to 5 but less than 10 miles of site 1 = Dedicated lands located within 5 miles of the site
1e. Topography SCORED BY EXPERT PANEL[4]	Site topography and resulting cut-and-fill requirements for construction	5 = Site topography is flat or has less than 50 feet of relief; no/limited cut-and-fill required. 3 = Site topography is hilly with greater than or equal to 50 feet but less than 100 feet of relief in the area to be developed; significant amounts of cut-and-fill required 1 = Site has steep topography with greater than 100 feet of relief in the area of the site to be developed
2. Hydrology, water quality, and water availability		
2a. Water Quality (chemistry) SCORED BY EXPERT PANEL[4]	Applicable State water quality standards (salt, brackish, fresh, polluted) as related to condenser CT cycles prior to blowdown	5 = Fresh water 4 = Fresh/Tidal water 3 = Oligohaline water 2 = Mesohaline water 1 = Salt or gray water

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
2b. Receiving Body Water Quality SCORED BY EXPERT PANEL[4]	Applicable State water quality classification Tier I, Tier II (as described and defined in COMAR 28.02.08.04-1) and Tier III (Outstanding National Resource Waters [ONRW] as described and defined in COMAR 28.02.08.04-2 for Maryland sites; State of Delaware Water Quality Standards as amended July 11, 2004 for Delaware sites; New Jersey Administrative Code 7:9B Surface Water Quality Standards for New Jersey sites; and Pennsylvania Code, Title 25, Chapter 93, Water Quality Standards for Pennsylvania sites)	Maryland sites: 5 = Tier 1 waters (i.e., no special state classification) 3 = Tier II waters (i.e., require antidegradation review of new or amended water/sewer plans and discharges) 1 = Tier III waters (i.e., ONRW) Delaware sites: 5 = Contact and recreation waters (primary and secondary) , fish, aquatic life & wildlife waters, industrial water supply 3 = Public water supply source, agricultural water supply, cold water fish (put and take), harvestable shellfish waters 1 = Waters of exceptional recreational or ecological significance (ERES) New Jersey sites: 5 = Saline waters (i.e., saline estuarine categories 1, 2, & 3, saline coastal) 3 = Freshwaters (i.e., Category 2 freshwaters: trout status, trout production, trout maintenance, non-trout) 1 = Outstanding National Resource Waters (i.e., Category 1 freshwater, Pinelands waters [fresh and saline]) Pennsylvania sites: 5 = Recreation and fish consumption (i.e., boating, fishing, water contact sports, esthetics), industrial water supply, wildlife water supply 3 = Aquatic life and/or water supply (i.e., cold water fishery, warm water fishery, migratory fishes, trout stocking; potable water supply, livestock water supply, irrigation) 1 = Special Protection (i.e., high quality waters, exceptional value waters)

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
2c. Water Availability SCORED BY EXPERT PANEL[4]	Metric based on lowest 7-day average flow in a ten year period (i.e., 7Q10) and need for 50 mgd water supply	5 = Source water body exceeds 7Q10 by 6-to 10% or equal to 10 times the needed volume for the annual requirement [182,500 MGD] 3 = Source water body exceeds 7Q10 by 2 to 5% or source water body is less than or equal to 5 times the needed volume for the annual requirement [91,250 MGD] 1 = Source water body 7Q10 does not meet 50 mgd or source water body is below needed volume for the annual requirement [18,250 MGD]
3. Terrestrial resources (including endangered species)		
3a. T&E habitats SCORED USING SCREENING DATA	Existence of mapped Federal and State T&E species habitat on or adjacent to site	5 = No T&E estimated habitat types onsite 3 = T&E estimated habitat types mapped within 1 mile of the site but not onsite 1 = T&E estimated habitat types onsite
3a. Floodplains SCORED USING SCREENING DATA	Existence of mapped Federal Emergency Management Area (FEMA) 100 or 500 year floodplain or State floodplain affecting site footprint	5 = No 100 or 500 year FEMA floodplain or State floodplain affecting approximate footprint of site 4 = 100 or 500 year FEMA floodplain or State floodplain affecting less than 10% of site footprint 3 = 100 or 500 year FEMA floodplain or State floodplain affecting 11% to 20% of site footprint 2 = 100 or 500 year FEMA floodplain or State floodplain affecting 21% to 30% of site footprint 1 = 100 or 500 year FEMA floodplain or State floodplain affecting greater than 30% of site footprint
4. Aquatic biological resources (including endangered species)		
4a. T&E habitats	Existence of mapped Federal and State T&E species habitat on or adjacent to site	5 = No T&E estimated habitat types onsite 3 = T&E estimated habitat types mapped within 1 mile of the site but not onsite 1 = T&E estimated habitat types onsite
4b. Thermal Discharge Sensitivity	Designated finfish/shellfish and/or other resource areas within intake or discharge waters	5 = No designated aquatic resources or habitats located within intake or discharge waters 3 = Designated warm water aquatic resources located within intake or discharge waters 1 = Designated cold water or marine aquatic resources located within intake or discharge waters

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services SCORED BY EXPERT PANEL[4]	Availability of existing emergency services infrastructure (police, fire, emergency medical service (EMS), and hospital services) to support increased construction and operation workforce	5 = At least two or more of each full time police, fire, EMS, and hospital services within the county of the proposed site 3 = At least one of each police, fire, EMS, and hospital services within the county of the proposed site 1 = At least one of any of the services part-time or volunteer police, fire, EMS, and hospital services within the county of the proposed site. Some services (e.g., hospital may require flights to other communities).
5b. Construction traffic SCORED BY EXPERT PANEL[4]	Ability of existing transportation infrastructure to support construction traffic	5 = State route or interstate highway within 1 mile 3 = State route or interstate highway greater than 1 but less than 5 miles 1 = State route or interstate highway greater than 5 miles
5c. Construction workforce SCORED BY EXPERT PANEL[4]	Availability of local construction workforce based on State, County, or local planning, zoning and industrial development commission databases. Availability of suitable population within commuting distance from which to draw the construction workforce.	5 = Workforce needed represents less than 5% of construction workforce within -50-mile region. 3 = Workforce needed represents 5 to 20% of construction workforce within 50-mile region. 1 = Workforce needed represents greater than 20% of construction workforce within 50-mile region.
5d. Housing and necessities SCORED BY EXPERT PANEL[4]	Availability of housing units, shopping and other services to support the peak construction workforce	5 = Number of vacant housing units is greater than 10 times the projected peak construction workforce within the counties in a 50 mile radius of the site and population centers of 25,000 or more are located within 5 miles of the site 3 = Number of vacant housing units is greater than 5 times but less than 10 times the projected peak construction workforce within the counties within a 50 mile radius of the site and population centers of 25,000 or more are located within 10 miles of the site. 1 = Number of vacant housing units is less than 5 times the projected peak construction workforce within the counties in a 50 mile radius of the site and population centers of 25,000 or more are located greater than 10 miles from site.

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
5e. Schools SCORED BY EXPERT PANEL[4]	Availability of existing schools to support increased construction and operation workforce	5 = Greater than 1,000 public and/or private high, middle, and elementary schools within a 50 mile radius of the site. 4 = 751 to 1,000 public and/or private high, middle, and elementary schools within a 50 mile radius of the site. 3 = 501 to 750 public and/or private high, middle, and elementary schools within a 50 mile radius of the site. 2 = 251 to 500 public and/or private high, middle, and elementary schools within a 50 mile radius of the site. 1 = Less than or equal to 250 public and/or private high, middle, and elementary schools) within a 50 mile radius of the site.

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
6. Environmental Justice (EJ)		
6a. Minority population SCORED USING SCREENING DATA	Presence of minority population within or abutting site	5 = Minority population in census block group (or adjacent census block group) less than 5 percent and minority population percentage in census block group less than 5 percentage points higher than county or state minority population percentage 4 = Minority population in census block group (or adjacent census block group) greater than 5 but less than 20 percent or minority population percentage in census block group greater than 5 but less than 10 percentage points higher than county or state minority population percentage 3 = Minority population in census block group (or adjacent census block group) greater than 20 but less than 35 percent or minority population percentage in census block group greater than 10 but less than 15 percentage points higher than county or state minority population percentage 2 = Minority population in census block group (or adjacent census block group) greater than 35 but less than 50 percent or minority population percentage in census block group greater than 15 but less than 20 percentage points higher than county or state minority population percentage 1 = Minority population in census block group (or adjacent census block group) greater than 50 percent or minority population percentage in census block group greater than 20 percentage points higher than county or state minority population percentage

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
6b. Low-income population SCORED USING SCREENING DATA	Presence of low-income population within or abutting site	5 – Low income population in census block group (or adjacent census block group) less than 5 percent and low income population percentage in census block group less than 5 percentage points higher than county or state low income population percentage 4 = Low income population in census block group (or adjacent census block group) greater than 5 but less than 20 percent or low income population percentage in census block group greater than 5 but less than 10 percentage points higher than county or state low income population percentage 3 = Low income population in census block group (or adjacent census block group) greater than 20 but less than 35 percent or low income population percentage in census block group greater than 10 but less than 15 percentage points higher than county or state low income population percentage 2 = Low income population in census block group (or adjacent census block group) greater than 35 but less than 50 percent or low income population percentage in census block group greater than 15 but less than 20 percentage points higher than county or state low income population percentage 1 = Low income population in census block group (or adjacent census block group) greater than 50 percent or low income population percentage in census block group greater than 20 percentage points higher than county or state low income population percentage
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites SCORED USING SCREENING DATA	Distance to site and number of National Register of Historic Places (NRHP) listed buildings, structures, objects and sites	5 = 0 NRHP buildings, structures, objects and sites within 1 mile or less from site 3 = Less than 5 NRHP buildings, structures, objects and sites within >1 to 5 miles from site 1 = 5 or more NRHP buildings, structures, objects and sites within >1 to 5 miles from site

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
7b. Historic districts SCORED USING SCREENING DATA	Distance to mapped NRHP listed historic districts from site	5 = 0 historic districts within 1 mile or less from site 3 = 1 historic district within >1 to 5 miles from site 1 = Greater than 1 historic district within >1 to 5 miles from site
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions SCORED USING SCREENING DATA	Estimation of potential severe weather impacts on operation of a new nuclear station	5 = Area exposed to a low frequency of occurrence or less severe tornadoes[3] and/or hurricanes 4 = Low frequency of occurrence of potentially damaging storms 3 = Moderate frequency of occurrence of area storms 2 = High frequency of occurrence of less severe area storms 1 = Area exposed to a high frequency or more severe tornadoes[3] and/or hurricanes
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area SCORED USING SCREENING DATA	In or out of an attainment / non-attainment area and Prevention of Significant Deterioration (PSD) Class I area	5 = In attainment area and outside PSD Class I area 3 = In non-attainment area and not in PSD Class I area 1 = In non-attainment area and/or within PSD Class I area
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone SCORED BY EXPERT PANEL[4]	Ability to evacuate area around site in event of an emergency	5 = 25 or less residences or businesses within 1 mile of site, and no schools or hospitals within 1 mile of site 3 = Greater than 25 and less than or equal to 75 residences or businesses within 1 mile of site, and no schools or hospitals within 1 mile of site 1 = Greater than 75 residences or businesses within 1 mile of site, or one or more schools or hospitals within 1 mile of site
9b. Radiological Pathways – Water SCORED USING SCREENING DATA	Based on distance to drinking water supply from site (ground and surface)	5 = Distance to any primary source aquifer or public water supply intake greater than 5 miles from the site 4= Distance to any primary source aquifer or public water supply intake greater than 3 miles but less than or equal to 5 miles from the site 3 = Distance to any primary source aquifer or public water supply intake greater than 2 miles but less than or equal to 3 miles from the site 2 = Distance to any primary source aquifer or public water supply intake greater than 1 mile but less than or equal to 2 miles from the site 1 = Distance to any primary source aquifer or public water supply intake less than 1 mile from the site

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
9c Radiological Pathways – Food SCORED USING SCREENING DATA	Distance to food pathways (e.g., shellfish beds, farms,)	5 = Agricultural land (based on land use/zoning map) or shellfish beds (measured by distance to bay) greater than 5 mile from site 4 = Agricultural land or shellfish beds greater than 3 mile and less than or equal to 5 mi from site 3 = Agricultural land or shellfish beds greater than 2 mile and less than or equal to 3 mi from site 2 = Agricultural land or shellfish beds greater than 1 mi and less than or equal to 2 mile from site 1 = Agricultural land or shellfish beds less than or equal to 1 mile from site
10. Postulated Accidents		
10a. Distance to nearby potentially hazardous facilities SCORED USING SCREENING DATA	Distance to hazardous facilities (e.g., military facilities, such as munitions storage or ordnance test ranges; chemical plants; refineries; mining and quarrying operations; oil and gas wells; gas and petroleum product installations; or air, waterway, pipeline or rail transport facilities for hazardous materials) and major airports	5 = No potentially hazardous facilities within 5 miles from site or no major airports within 10 miles from site 3 = Potentially hazardous facilities greater than 2 miles but less than 5 miles from site or major airports 5 miles to less than 10 miles from site 1 = Potentially hazardous facilities less than or equal to 2 miles from site or major airports within 5 miles from site
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Transport of nuclear fuel and wastes SCORED USING SCREENING DATA	Distance and route to low level disposal site(s) and spent fuel repository (i.e., Yucca Mountain) from site	5 = Site is adjacent to disposal sites. 4 = Distance to Yucca Mountain is less than 1000 mi, and distance to low-level waste disposal site(s) is less than 500 mi. 3 = Distance to Yucca Mountain is less than 2000 mi, and distance to low-level waste disposal site(s) is less than 1000 mi. 2 = Distance to Yucca Mountain is greater than 2000 mi, and distance to low-level waste disposal site(s) is greater than 1000 mi. 1 = Distance to Yucca Mountain is greater than 2000 mi, and distance to low-level waste disposal site(s) is greater than 1000 mi, AND population densities within first 10 mi of route(s) are greater than 2601 person/mi^2.

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Environmental impact of proposed transmission interconnection SCORED BY EXPERT PANEL[4]	Length of proposed right-of-way (ROW) from site to point of transmission interconnection, including assessment of environmental impact (i.e., existing ROW vs. greenfield)	5 = 345 kV or greater transmission on site. 4= Point of interconnection (POI) less than or equal to 5 miles with no existing ROW or less than or equal to 10 miles with existing ROW requiring expansion 3 = POI greater than 5 miles but less than or equal to 10 miles with no existing ROW or greater than 10 miles but less than or equal to 30 miles with existing ROW requiring expansion 2 = POI greater than 10 miles but less than or equal to 20 miles with no existing ROW or greater than or equal to 30 miles with existing ROW requiring expansion 1 = POI less than 30 miles with no existing ROW
13. Population distribution and density		
13a. Distance to population centers SCORED USING SCREENING DATA	Distance to population centers (i.e., US Census consolidated cities and incorporated places) of 25,000 or more persons from site	5 = No population centers within 20 miles 4 = One or more population centers greater than 15 miles but less than or equal to 20 miles 3 = One or more population centers greater than 10 miles but less than or equal to 15 miles 2 = One or more population centers greater than 5 miles but less than or equal to 10 miles 1= One or more population centers within 5 miles
13b. Population density SCORED USING SCREENING DATA	Existing population density within 20 mi radius of site	5 = Population density within 20 mi radius less than or equal to 50 persons per square mile (ppsm) 4 = Population density within 20 mi radius greater than 50 ppsm but less than or equal to 200 ppsm 3 = Population density within 20 mi radius greater than 200 ppsm but less than or equal to 350 ppsm 2 = Population density within 20 mi radius greater than 350 ppsm but less than or equal to 500 ppsm 1= Population density within 20 mi radius greater than 500 ppsm

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements SCORED BY EXPERT PANEL[4]	Availability of nearest barge access or ability to construct new barge landing	5 = Viable barge access existing at site 3 = No existing barge access at site, but existing barge access within 5 mi or landing may be built at site 2 = No existing barge access at site but construction of a landing may be possible within 5 mi of site 1 = No barge access possible at or within 5 mi of site
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements SCORED BY EXPERT PANEL[4]	Estimated distance and condition of nearest accessible active rail line	5 = Active rail line less than 1 mile from site 4 = Rail line less than 1 mile from site but inactive or needing refurbishment 3 = Active rail line 1 mile to less than 5 mile from site 2 = Rail line 1 mile to less than 5 mile from site but inactive or needing refurbishment and needing refurbishment 1 = Rail line greater than or equal to 5 mile from site
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration SCORED USING SCREENING DATA	Peak ground acceleration (PGA)	5 = PGA is < 0.10g with a 2% probability of exceedance in 50 years ($4x\ 10^{-4}$) 4 = PGA is 0.10 to 0.15g with a 2% probability of exceedance in 50 years ($4x\ 10^{-4}$) 3 = PGA is 0.15 to 0.25g with a 2% probability of exceedance in 50 years ($4x\ 10^{-4}$) 2 = PGA is 0.25 to 0.30g with a 2% probability of exceedance in 50 years ($4x\ 10^{-4}$) 1 = PGA is > 0.30g with a 2% probability of exceedance in 50 years ($4x\ 10^{-4}$)
15b. Depth to bedrock soil stability SCORED USING SCREENING DATA	Depth to bedrock; soil stability including liquefaction potential, bearing strength and general foundation conditions	5 = Bedrock or recognized highly competent soil at or within 20 feet of the ground surface 3 = Tertiary-aged or older soil, or Quaternary-aged glacial till soil, at or within 20 feet of the ground surface 1 = Quaternary-aged soil (other than glacial till) extends greater than 20 feet below the ground surface
15c. Surface faulting and deformations SCORED USING SCREENING DATA	Presence of surface faulting based on USGS Quaternary fault database	5 = Site greater than 100 mi from any capable fault 4 = Site 100 to 50 mi from any capable fault 3 = Site 50 to 25 mi from any capable fault 2 = Site 25 to 5 mi from any capable fault 1 = Site with capable or questionable aged fault(s) within 5 mi

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Appendix A—Environmental Scoring Criteria Basis (continued)

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
15d. Other geological hazards SCORED USING SCREENING DATA	Presence of other geologic hazards, such as karst features, subsurface mines, and volcanoes	5 = Hazards present or likely within 50 miles of the site 4 = Hazards present or likely within 20 miles of the site 3 = Hazards present or likely within 10 miles of the site 2 = Hazards present or likely within 3 miles of the site or a moderate risk 1 = Hazards present or likely at or within 0.5 miles of the site or a serious risk
16. Wetlands		
16a. Total Wetlands Within Property Boundary SCORED USING SCREENING DATA	Percent of wetlands within property boundary	5 = Less than 10% of site classified as wetlands based on National Wetland Inventory (NWI) or state-mapped wetlands 4 = Greater than or equal to 10% and less than 20% of site classified as wetlands based on NWI or state-mapped wetlands 3 = Greater than or equal to 20% and less than 30% of site classified as wetlands based on NWI or state-mapped wetlands 2 = Greater than or equal to 30% and less than 40% of site classified as wetlands based on NWI or state-mapped wetlands 1 = Greater than or equal to 40% of site classified as wetlands based on NWI or state-mapped wetlands
16b. Total Acres of Wetlands Within Site SCORED USING SCREENING DATA	Acres of wetlands onsite	5 = Less than 1 acre of site classified as wetlands based on NWI or state-mapped wetlands 3 = Greater than 1 acre and less than 5 acres of site classified as wetlands based on NWI or state-mapped wetlands 1 = Greater than 5 acres of site classified as wetlands based on NWI or state-mapped wetlands
16c. High Quality Wetlands Within Site SCORED USING SCREENING DATA	Presence of state-designated high quality wetlands onsite	5 = No high quality wetlands onsite 1 = High quality wetlands onsite

1 Yellow highlighted row is from Ref NUREG-1555 Subject Areas for Candidate Site Selection and Screening. No fill is Functional Evaluation Elements [Ref EPRI Siting Study].

2 Unless otherwise indicated, distances are calculated from the center point of a parcel or "site" of approximately 420 acres within the property boundary.

3 Based on NRC Regulatory Guide 1.76, Table 1 classifications by geography.

4 Delphi process used to develop score. It should be noted that in some cases the panel could not come to convergence on unanimous score. In these instances the panel chose to use the median value which resulted in fractional values (i.e., not whole numbers) for some scores.

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Appendix B—Scoring Criteria Rationale

Ranking Criteria[1]	Metric	Rationale
1. Land use, including availability, and areas requiring special consideration		
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas	Size and configuration of plot	Adequate land area within a single location to accommodate EPR development is critical to avoiding impacts to greenfield sites, fragmentation of natural habitat, safety during facility construction and operation, and for optimization of plant operations, including appropriately designed features to protect the environment such as stormwater management systems, wastewater treatment facilities, waste storage areas, and emissions control systems.
1b. Hazardous waste or spoils areas	Based on the site's anticipated need for environmental remediation due to known current or previous uses.	Avoidance of unremediated hazardous waste facilities prevents inadvertent release of toxic materials to the environment and disruptions to the site development process resulting from discovery of unanticipated waste sources.
1c. Zoning	Current Zoning and Ownership based on the site's existing zoning classification(s) by area community (ies)	Individual communities implement zoning ordinances to protect the integrity and character of a town, including environmental resources. Conformance with zoning preserves lands with documented values to a community and socioeconomic benefits associated with designated land uses.
1d. Distance to dedicated land	Proximity to federal, state, county and local parks, forests, preserves, historic sites, Native American Reservations, National Parks, Monuments, Forests, wildlife refuges, scenic river parkways, recreation areas and other significant sites based on the linear distance from the site boundary.	In accordance with regulatory standards, the siting of industrial facilities such as a nuclear power station is preferred at locations not encroaching upon dedicated lands whose aesthetics, recreational opportunities, access, or integrity may be diminished in perception or in fact by nearby development.
1e. Topography	Site topography and resulting cut-and fill requirements for amount of site preparation required for proposed facility construction	Flat to moderate relief is critical to avoidance of large scale land disturbance (cut and fill) actions requiring excessive blasting, earth management including off site materials disposal, and potential secondary impacts such as erosion and sedimentation.
2. Hydrology, water quality, and water availability		
2a. Water Quality	Ground and surface water intake water quality (salt, brackish, fresh, polluted) based on US EPA or State classifications Candidate site must have access to 50 MGD or more makeup	Increased water source purity lends to reduced particulate emissions, and avoids the need to pre-treat the cooling water source via desalinization or other energy-requiring filtration operations.
2b. Receiving Body Water Quality	Applicable State water quality classification Tier I, Tier II (as described and defined in COMAR 28.02.08.04-1) and Tier III (Outstanding National Resource Waters [ONRW] as described and defined in COMAR 28.02.08.04-2)	Consideration of cooling water source quality is made to discourage impacts to protected or high quality water bodies, as well as those waters already impaired by other uses or contaminant sources.

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Appendix B—Scoring Criteria Rationale (continued)

Ranking Criteria[1]	Metric	Rationale
2c. Water availability	"Metric based on lowest 7-day average flow with a ten year return frequency (i.e., 7Q10) and need for 50 mgd water supply	Adequate water volume is necessary to accommodate the consumptive use proposed and to avoid potential impacts to aquatic biota, wetlands, water quality, and other downstream uses when a water source is drawn beyond its safe yield.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	Existence of mapped T&E species habitat on or adjacent to site	Documented T&E species and their habitats must be avoided in accordance with state and federal law and to respect their intrinsic value.
3b. Floodplains	Existence of mapped FEMA 100 or 500 year floodplain affecting site footprint	Federally mapped floodplains serve to accommodate floodwaters and protect downstream property, and represent a potential safety risk.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	Existence of mapped T&E species habitat in makeup/ cooling water supply, or on or adjacent to site	Documented T&E species and their habitats must be avoided in accordance with state and federal law and to respect their intrinsic value.
4b. Thermal Discharge Sensitivity	Designated finfish/shellfish and/or other resource areas within intake or discharge waters	Considers potential impacts to sensitive aquatic biota that may be impacted by a high temperature discharge to a cooling water a source.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	Availability of existing emergency services (police, fire, EMS, hospital services) based on full-time, part-time or volunteer local or county police, fire and emergency response services	Emphasizes project siting in communities with increasingly comprehensive emergency services.
5b. Construction traffic	Ability of existing transportation infrastructure to support construction traffic	Evaluates the infrastructure and efficacy of existing roadways and traffic to prioritize siting within areas where construction traffic will not exacerbate poor transportation infrastructure conditions.
5c. Construction workforce	Availability of local construction workforce based on State, County, or local planning, zoning and industrial development commission databases Availability of suitable population within commuting distance from which to draw the construction workforce	Evaluates construction workforce available and ranks sites based on worker availability, emphasizing use of local labor forces.
5d. Housing and necessities	Availability of housing units, shopping and other services to support the peak construction workforce	Considers existing available housing, prioritizing sites with increasing nearby housing facilities (based on vacancy) and supporting infrastructure availability.

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Appendix B—Scoring Criteria Rationale (continued)

Ranking Criteria[1]	Metric	Rationale
5e. Schools	Availability of existing schools to support increased construction and operation workforce	Prioritizes sites with comprehensive or high ranking educational facilities to accommodate needs of construction workforce.
6. Environmental Justice (EJ)		
6a. Minority population	Presence of minority population within or abutting site	Seeks to avoid unnecessary impacts to minority populations by prioritizing development outside of areas with predominant minority residents based on census block group data.
6b. Low-income population	Presence of low-income population within or abutting site	Seeks to avoid unnecessary impacts to low-income populations by prioritizing development outside of areas with predominant low-income residents based on census block group data.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	Distance to site and number of National Register of Historic Places (NRHP) listed buildings, structures, objects and sites	Considers potential aesthetic and other associated impacts to historic sites based upon nearby facility siting, and prioritizes site selection in areas lacking in documented NHRP listed buildings, structures, objects and sites.
7b. Historic districts	Distance to mapped NRHP listed historic districts from site	Considers potential aesthetic and other associated impacts to a historic district based upon nearby facility siting, and prioritizes site selection in areas lacking in/further from listed historic districts.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	Estimation of potential severe weather impacts on operation of a new nuclear station	Prioritizes plant siting in locations with reduced frequency of weather conditions potentially hazardous to nuclear plant operation.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	In or out of an attainment / non-attainment area and Prevention of Significant Deterioration (PSD) Class I area	Seeks to preserve air quality by discouraging plant siting within a non-attainment area for one or more pollutants or within a Class I PSD mapped location.
9. Human Health		
9a. Emergency preparedness program–proximity of residences/businesses for exclusion zone	Ability to evacuate area around site in event of an emergency	Prioritizes plant siting in areas where a full exclusion zone may be established without inclusion of nearby residences or businesses.
9b. Radiological pathways - water	Distance to drinking water supply from site (ground and surface)	Promotes avoidance of potential human ingestion of contaminated water in the case of an accident.

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Appendix B—Scoring Criteria Rationale (continued)

Ranking Criteria[1]	Metric	Rationale
9c. Radiological pathways - food	Distance to food pathways from site (e.g., shellfish beds, farms)	Promotes avoidance of potential human ingestion of contaminated food sources in the case of an accident.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	Distance to hazardous facilities (e.g., military facilities, such as munitions storage or ordnance test ranges; chemical plants; refineries; mining and quarrying operations; oil and gas wells; gas and petroleum product installations; or air, waterway, pipeline or rail transport facilities for hazardous materials) and major airports	Prioritizes plant siting in locations where risk of exacerbating an accident starting at the generation facility from a missile impact or inadvertent release of hazardous materials may affect nearby hazardous facilities.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	Distance and route to low level disposal site(s) and spent fuel repository (i.e., Yucca Mountain) from site	Ease of transport based on road conditions and distance to disposal locations is evaluated with the assumption that shorter routes on major arteries have less potential hazard to human health and the environment.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	Based upon proximity of adequate (345/500 kV) transmission.	Considers the likely potential for expanded land clearing and impact to undeveloped lands and biota resulting from construction of new or significantly widened transmission corridor.
13. Population distribution and density		
13a. Distance to population centers	Distance to US Census Populated Places population centers of 25,000 or more persons from site	In accordance with regulatory standards, the siting of a nuclear power station is discouraged nearby centers of high population.
13b. Population density	Existing population density within 20 mi radius of site	In accordance with regulatory standards, the siting of a nuclear power station is discouraged nearby regions with high population density.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	Based upon availability of nearest barge access or ability to construct new landing.	Use of existing barge slips reduces environmental impact associated with the need for slip construction of alternate means of site access. Criteria promotes sites with existing barge access.

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Appendix B—Scoring Criteria Rationale (continued)

Ranking Criteria[1]	Metric	Rationale
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	Based upon estimated distance and condition of nearest active rail line.	Use of existing rail lines reduces environmental impact associated with the need for line construction of alternate means of site access. Criteria promotes sites with existing active rail access.
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration	Peak ground acceleration (PGA)	Criteria promotes siting in locations where PGA does not represent a significant potential hazard to reactor stability.
15b. Depth to bedrock, soil stability, and compaction	Depth to bedrock; soil stability including liquefaction potential, bearing strength and general foundation conditions	Criteria promotes siting in locations where bedrock and soil conditions are optimal for reactor construction and safety.
15c. Surface faulting and deformations	Presence of surface faulting based on USGS Quaternary fault database	Criteria promotes siting in locations where surface faults and fault activity do not represent a significant potential hazard to reactor stability.
15d. Other geological hazards	Presence of other geologic hazards, such as karst features, subsurface mines, and volcanoes	Criteria promotes avoidance of locations considered intrinsically hazardous based upon subsurface conditions.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	Percent of wetlands within property boundary	Considers net total acreage of wetlands for comparison among sites and prioritization of sites without regulatory wetlands and waterways.
16b. Total Acres of Wetlands Within Site	Acres of wetlands onsite	In order to avoid sites comprised predominantly of wetlands, percent wetlands is considered to allow promotion of locations with reduced wetland acreage in comparison to the entire property.
16c. High Quality Wetlands Within Site	Presence of state-designated high quality wetlands onsite	Considers wetlands of exceptional value and promotes impact avoidance in site selection.

[1] Yellow highlighted row is from Ref NUREG-1555 Subject Areas for Candidate Site Selection and Screening. No fill is Functional Evaluation Elements [Ref EPRI Siting Study]

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Appendix C—Environmental Scoring Justification

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
1. Land use, including availability, and areas requiring special consideration		
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas	3.44	According to the Delphi Panel, the facility could be accommodated on an approximate 420 acre site within the existing property with some changes needed to the layout and some restrictions for construction work areas.
1b. Hazardous waste or spoils areas	3.44	The Pennsylvania Department of Environmental Protection (PDEP) eMapPA Internet Mapping System database, indicated that the site contains abandoned mine land along its southern boundary with State Route 924. It is unknown if the site needs environmental remediation.
1c. Zoning	5.00	According to the Hazel Township Zoning Map, the Humboldt Industrial Park is zoned as I-2 (Industrial).
1d. Distance to dedicated land	3.00	The nearest Dedicated Land, Tuscarora State Park, is located approximately 9.3 mi from the Humboldt Industrial Park.
1e. Topography	1.44	There is approximately 230 ft of relief across the site. It has steep topography with greater than 100 ft of relief in the area of the site to be developed.
2. Hydrology, water quality, and water availability		
2a. Water Quality	5	The segment of the Susquehanna River proposed to be the source of cooling water for the Humboldt Industrial Park is considered freshwater surface water. This portion of the Susquehanna River is located approximately 10 mi from the Humboldt Industrial Park. This segment of the river is identified as part of Drainage List K (§ 93.9k – Main Stem, Lackawanna River to West Branch Susquehanna River) of the Susquehanna River Basin.
2b. Receiving Body Water Quality	3	This segment of the Susquehanna River Basin is part of the main stem of the Susquehanna River between the Lackawanna River and the West Branch Susquehanna River. The Water Use Protected designation for this segment of the river is warm water fishery.
2c. Water availability	5	The main source of water for the Humboldt Industrial Park would be the Susquehanna River. The lowest 7-day average flow with a ten year return frequency (7Q10) for the period of record (July 1999 – July 2009) for the river at the nearest USGS gage (01536500) is approximately 505 mgd. The total water usage at the site is estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	5	No identified federally or state-listed threatened and endangered (T&E) terrestrial species or their habitats have been identified on or adjacent to the site.
3b. Floodplains	5	The site footprint is not affected by a 100- or 500-year Federal Emergency Management (FEMA) floodplain or state floodplain zone.

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Appendix C—Environmental Scoring Justification (continued)

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	5	No federally or state-listed T&E aquatic species were identified as occurring onsite at the Humboldt Industrial Park.
4b. Thermal Discharge Sensitivity	3	The Humboldt Industrial Park would use the Susquehanna River as the source of cooling water. The main stem of the Susquehanna River in this area is classified as a warm-water fishery.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Approximately 11 hospitals, 31 police stations or sheriff departments, and 39 fire stations or departments (including volunteer stations) are located within Luzerne County. Luzerne County has an Emergency Management Agency that helps prepare for, manage and recover from any type of natural disaster and emergency or threat to security that may occur in Luzerne County. Pennsylvania also has an emergency management agency with jurisdiction over Luzerne County.
5b. Construction traffic	5	State Highway 924 is located within 1 mile of the site to the southeast.
5c. Construction workforce	5	According to the Department of Labor (DOL), Bureau of Labor Statistics (BLS) May 2008 metropolitan and non-metropolitan area data estimates within 50-miles of the site, the construction workforce required for the project, assumed to be similar to the estimated maximum construction workforce for the Bell Bend Nuclear Power Plant (BBNPP), would represent less than 2 percent of the total construction workforce in the area.
5d. Housing and necessities	1	According to the census tract data, a total of 156,777 housing units are vacant or not occupied, which represents approximately 40 times the projected construction workforce, assumed to be similar to the estimated maximum construction workforce for the BBNPP. The nearest population center of 25,000 or more is Wilkes-Barre, Pennsylvania, which is approximately 23 mi away.
5e. Schools	4	There are approximately 869 public and private elementary, middle, and high schools located within a 50-mile radius of the site.

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Appendix C—Environmental Scoring Justification (continued)

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
6. Environmental Justice (EJ)		
6a. Minority population	5	The Humboldt Industrial Park is located in Census Tract (CT) 217001 Block Group (BG) 2. The site's CT/BG (CT 217001 BG 2) has a slightly higher percentage of minority residents compared to five of the seven adjacent CT/BGs, but a lower percentage of minority residents compared to Luzerne County and the State of Pennsylvania. Two adjacent CT/BGs (CT 216502 BG 2 and CT 217001 BG 1) have the highest minority population percentage (1.9 percent) of the CT/BGs at or adjacent to the site. These CT/BGs' (CT 216502 BG 2 and CT 217001 BG 1) minority population percentages are below Luzerne County and the State of Pennsylvania.
6b. Low-income population	4	The percent of poverty for CT 217001 BG 2 is lower than six of the seven adjacent CT/BGs, Luzerne County, and the State of Pennsylvania. An adjacent CT/BG (CT 217001 BG 1) has the highest low-income population percentage (16.6 percent) of the CT/BGs at or adjacent to the site. This CT/BG's (CT 217001 BG 1) low-income population is 5.5 percent higher than the State of Pennsylvania.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	3	Based on available information from the National Register of Historic Places (NRHP) and Pennsylvania State Historic Preservation Office (SHPO), there are two NRHP-listed properties within 5 mi of the Humboldt Industrial Park, none of which are less than 1 mi from the site.
7b. Historic districts	5	Based on available information from the NRHP and Pennsylvania SHPO, there are no NRHP-listed historic districts within 5 mi of the Humboldt Industrial Park.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	5	The historical frequency of occurrence of tornadoes in Pennsylvania is low, with only 2 reported occurrences of F4 (Fujita Scale) tornadoes (207–260 mph), and less than 20 reported occurrences of an F3 tornado (158-206 mph) since 1950. Given the large size of the state, this equates to a very low expected frequency of occurrence of a tornado at any given location. The observed frequency of occurrence of hurricanes passing through Pennsylvania is very low. There have been no reported occurrences of Category 3 hurricanes (110-130 mph) passing within 100 miles of the state, and only three Category 2 hurricanes (96-110 mph) have passed within 100 miles of the state (only one made landfall) during the period of record (approximately 100 years). The site is located more than 100 miles from the coast.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	5	The Humboldt Industrial Park is in Luzerne County, which is currently designated to be in maintenance status. There are no PSD Class I areas in Pennsylvania, and there are no Class I areas within 100 mi of the site.

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Appendix C—Environmental Scoring Justification (continued)

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
9. Human Health		
9a. Emergency preparedness program – proximity of residences/businesses for exclusion zone	1	There are greater than 75 residences or businesses within 1 mi of the site. No schools or hospitals are located within 1 mi of the Site.
9b. Radiological pathways - water	4	The distance from the site to the nearest public water supply intake is greater than 3 mi, but less than 5 mi. The exact distances to public water supply intakes greater than 5 mi could not be ascertained from the best available data sources at the time of this analysis. The distance to the sole source aquifer (New Jersey Coastal Plain Aquifer System) is greater than 5 miles (43.41 miles).
9c. Radiological pathways - food	3	There is agricultural land located approximately 2.3 mi from the site. The nearest shellfish beds are located greater than 50 mi from the site.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	1	A Norfolk Southern rail line is located 0.5 mile from the center of the Humboldt site. Interstate 81 is 2.2 mi from the site. The Hazelton Generation Facility, a natural gas-fired electrical plant, is located 1.3 mi from the site. There is also a propane facility near the site located just east on route 924. There is a shale mine, Bonner Shale Quarry, located within 1.8 mi of the site. There are six anthracite mining operations within 5 mi of the site: Beaver Brook Coal Beaver Brook Mine (2.8 mi), AC Fuels Audenried Mine (3.2 mi), Beltrami Enterprises (3.6 mi), Northeastern Power-Honeybrook Mine (3.8 mi), South Tamaqua Coal Pockets-Yorktown Bank (4 mi), and Pagnotti Enterprises-Spring Mountain Colliery (4.6 mi). There are no major airports or military air bases or stations within 10 mi of the site.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	1	The distance from the Humboldt Industrial Park to the National Repository at Yucca Mountain is greater than 2,000 mi, and the distance to Waste Control Specialists in Andrews, Texas, the closest low-level waste site, is greater than 1,000 mi, whether by rail or road. There is one location where the population density along the rail route within the first 10 miles of the Humboldt Industrial Park is greater than 2,601 persons per square mile (ppsm). There are no census tracts along the road route with a greater than 2,601 ppsm population density.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	3.00	There are two existing 500 kV transmission lines within the 30-mi radius of the site: one line is approximately 10.2 mi away from the Humboldt Industrial Park and the other 500 kV transmission line is approximately 11.6 mi away from the site. Therefore, the nearest viable transmission line to consider for a potential point of intersection (POI) is 500 kV transmission line approximately 10.2 mi from the site.

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Appendix C—Environmental Scoring Justification (continued)

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
13. Population distribution and density		
13a. Distance to population centers	5	Based on the U.S. Census consolidated cities and incorporated places, the nearest population center of 25,000 or more, Wilkes-Barre, Pennsylvania, is located 22.8 miles from the Humboldt Industrial Park.
13b. Population density	3	Based on 2007 U.S. Census Bureau data, the population density within a 20-mile radius of the Humboldt site is 222 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1	The nearest barge access to the Humboldt Industrial Park is located more than 50 miles away from the site on the Susquehanna River.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	5.00	There is an existing Norfolk Southern Railway Class I rail line at the Humboldt Industrial Park. The rail line runs along the eastern edge of the site.
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration	5	Based on the U.S. Geological Survey's (USGS) 2008 National Seismic Hazard Map, the Peak Ground Acceleration (PGA) with 2 percent probability of exceedance in 50 years at this site is 0.078g.
15b. Depth to bedrock, soil stability, and compaction	5	Based on available information from the Pennsylvania Natural Resources Conservation Service (NRCS), the Pocono series soils are very deep, well drained soil formed in residuum or glacial till from acid sandstone and conglomerate. Depth to bedrock is greater than 60 inches. A search of the Pennsylvania Groundwater Information System (PaGWIS) for groundwater wells within a one-mile radius of the site identified six wells; however, no depth to bedrock was reported at this site. The soils are derived from Quaternary-aged glacial till or residuum developed from older sedimentary rocks.
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between the site and the closest fault area (the Central Virginia Seismic Zone) is greater than 100 mi.
15d. Other geological hazards	2	Based on queries of the Bureau of Topographic and Geologic Survey (BTGS), PDCNR, and the National Mine Map Repository (NMMR), there is not significant karst development within 20 mi of the site, susceptibility of landslides are categorized as relatively low, and numerous listings of both underground (U), surface (S), and combined (C) mine types were identified in Luzerne County. No readily available maps showing underground mine locations in relation to the site were found; however, based on the general distribution maps of anthracite coal in Luzerne County, it is likely that underground mines occur within 3 miles of the site.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the National Wetlands Inventory (NWI) database, approximately 3.1 percent, or 116 acres of the 3,796-acre property, is wetlands.

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Appendix C—Environmental Scoring Justification (continued)

Humboldt Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
16b. Total Acres of Wetlands Within Site	3	According to the NWI database, the ~420-acre site contains approximately 4 acres of wetlands.
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands

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Appendix C—Environmental Scoring Justification (continued)

Montour Site		
Ranking Criteria[1]	**Score**	**Justification**
1. Land use, including availability, and areas requiring special consideration		
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas	4.78	The facility could be accommodated on an approximately 420 acre site within the existing property with no changes needed to the layout and no restrictions for construction work areas.
1b. Hazardous waste or spoils areas	3.89	The PDEP eMapPA Internet Mapping System database did not identify any hazardous waste areas on the site or in the vicinity and no environmental remediation is anticipated. However, the Delphi Panel noted that the site is immediately adjacent to an active coal power plant with sludge ponds bordering the site.
1c. Zoning	1.44	According to the Montour County Zoning Map, the Montour site is located in the Residential – Agricultural zoning district.
1d. Distance to dedicated land	5.00	The nearest Dedicated Land, Milton State Park, is located approximately 11.4 mi from the Montour site. It should be noted that the PPL-owned Montour Preserve (a recreational lake with boating and fishing, picnic areas, wildlife refuge, educational areas, hiking, hunting, etc.) is located less than 1.5 mi north of the site. This site is not included in the database of Dedicated Lands because it is privately owned.
1e. Topography	2.33	This site has steep topography with approximately 132 ft of relief across the site, although the steeper relief is concentrated on the southernmost and northernmost portions of the site.
2. Hydrology, water quality, and water availability		
2a. Water Quality	5	The segment of the West Branch Susquehanna River proposed to be the source of cooling water for the Montour site is considered freshwater surface water. This portion of the West Branch Susquehanna River is located approximately 10 mi from the Montour site. This segment of the river is identified as part of Drainage List L (§ 93.9l – Main Stem) of the Susquehanna River Basin.
2b. Receiving Body Water Quality	3	This segment of the Susquehanna River Basin is part of the main stem of the West Branch Susquehanna River. The Water Use Protected designation for this main stem of the West Branch Susquehanna River is warm water fishery.
2c. Water availability	5	The main source of water for the Montour site would be the West Branch Susquehanna River. The 7Q10 for the period of record (July 1999 – July 2009) for the river at the nearest USGS gage (01553500) is approximately 489 mgd. The total water usage at the Montour site estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	5	No identified federally or state-listed T&E terrestrial species or their habitats have been identified on or adjacent to the site.

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Appendix C—Environmental Scoring Justification (continued)

Montour Site		
Ranking Criteria[1]	**Score**	**Justification**
3b. Floodplains	4	Approximately 10 percent of the site footprint is affected by a 100- or 500-year FEMA floodplain or state floodplain zone.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	5	No federally or state-listed T&E aquatic species were identified as occurring onsite at the Montour site.
4b. Thermal Discharge Sensitivity	3	The Montour site would use the West Branch of the Susquehanna River as the source of cooling water. The main stem of the West Branch of the Susquehanna River in this area is classified as a warm-water fishery.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	3	One hospital and three police stations or sheriff departments are located within Montour County. The Montour County, Pennsylvania, Fire Services consists of six fire departments, one of which is a volunteer fire department. Montour County has an emergency management agency that coordinates and executes the emergency operations and hazard mitigation plans. Pennsylvania also has an emergency management agency with jurisdiction over Montour County.
5b. Construction traffic	3	There are no interstates, U.S. highways, or state highways within 1 mi of the site. State Highway 44 is located within 5 mi of the site to the north and east. Other state highways within 5 mi of the site include State Highway 54 to the west, State Highway 254 to the southeast, and State Highway 642 to the southeast.
5c. Construction workforce	3	According to May 2008 DOL BLS metropolitan and non-metropolitan data estimates, the construction workforce required for the project, assumed to be similar to the estimated maximum construction workforce for the BBNPP, would represent less than 2 percent of the total construction workforce in the area.
5d. Housing and necessities	1	According to the census tract data, a total of 130,160 housing units are vacant or not occupied, which represents approximately 33 times the projected construction workforce, assumed to be similar to the estimated maximum construction workforce for the BBNPP. The number of vacant housing units is greater than 10 times the projected peak construction workforce. The nearest population center of 25,000 or more is Williamsport, Pennsylvania, which is approximately 20 mi away.
5e. Schools	2	There are approximately 427 public and private elementary, middle, and high schools within a 50-mile radius of the site.

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Appendix C—Environmental Scoring Justification (continued)

Montour Site		
Ranking Criteria[1]	**Score**	**Justification**
6. Environmental Justice (EJ)		
6a. Minority population	5	The Montour site is located in CT 9501 BG 3. The site's CT/BG (CT 9501 BG 3) has a slightly higher percentage of minority residents compared to all of the adjacent CT/BGs, but a lower percentage of minority residents compared to Montour County and the State of Pennsylvania. The site's CT/BG has the highest minority population percentage (2.6 percent) of the CT/BGs at or adjacent to the site. The site's CT/BG (CT 9501 BG 3) minority population percentage is below Montour County and the State of Pennsylvania.
6b. Low-income population	4	The percent of poverty for CT 9501 BG 3 is higher than all adjacent CT/BGs, Montour County, and the State of Pennsylvania. The site's CT/BG has the highest low-income population percentage (14.8 percent) of the CT/BGs at or adjacent to the site. The site's CT/BG (CT 9501 BG 3) low-income population is 6.1 percent higher than Montour County.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	3	Based on available information from the NRHP and Pennsylvania SHPO, there is one NRHP-listed property within 5 miles of the Montour site, but it is not located within 1 mi of the site.
7b. Historic districts	5	Based on available information from the NRHP and Pennsylvania SHPO, there are no NRHP-listed historic districts within 5 mi of the Montour site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	5	The historical frequency of occurrence of tornadoes in Pennsylvania is low, with only 2 reported occurrences of F4 (Fujita Scale) tornadoes (207-260 mph), and less than 20 reported occurrences of an F3 tornado (158-206 mph) since 1950. Given the large size of the state, this equates to a very low expected frequency of occurrence of a tornado at any given location. The observed frequency of occurrence of hurricanes passing through Pennsylvania is very low as the site located more than 100 mi from the coast. There have been no reported occurrences of Category 3 hurricanes (110-130 mph) passing within 100 miles of the state, and only three Category 2 hurricanes (96-110 mph) have passed within 100 miles of the state (only one made landfall) during the period of record (approximately 100 years).
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	5	The Montour site is in Montour County, which is currently designated as in attainment for all pollutants. There are no PSD Class I areas in Pennsylvania, and there are no Class I areas within 100 miles of the site.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	3	There are greater than 25, but less than 75 residences or businesses located within 1 mi of the Site. No schools or hospitals located within 1 mi of the Site.

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Appendix C—Environmental Scoring Justification (continued)

Montour Site		
Ranking Criteria[1]	**Score**	**Justification**
9b. Radiological pathways - water	5	The distance from the Site to the nearest sole source aquifer (SSA; the Clinton Street Ballpark SSA) is greater than 5 mi (66.78 miles). A public water supply intake does not exist within 5 miles of the Site.
9c. Radiological pathways - food	1	The site contains agricultural land. The closest shellfish beds are located greater than 50 mi from the site.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	1	A Norfolk Southern rail line is located 1.4 mi from the approximately center of the Montour site. Crop Production, a chemical and pesticides manufacturer and fertilizer mixing facility, is located 1.7 miles from the site. Montour Steam Electric Station, a coal-fired electric plant is 2 mi from the site. There are no major airports or military air bases or stations within 10 miles of the site.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	2	The distance from the Montour site to the National Repository at Yucca Mountain is greater than 2,000 mi, and the distance to Waste Control Specialists in Andrews, Texas, the closest low-level waste site, is greater than 1,000 mi, whether by rail or road. The population densities along the transportation routes within the first 10 mi of the Montour site are less than 2,601 ppsm.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	2.00	There are two existing 500 kV transmission lines within the 30-mi radius from the Montour site for possible interconnection. One 500 kV transmission line is approximately 14.3 mi away and the second is approximately 20.5 mi away. Therefore, the nearest viable transmission line to consider for a potential POI is the 500 kV transmission line approximately 14.3 mi away. To accommodate this new POI option, there is the possibility of creating a new 1.4 mi right-of-way (ROW) to an existing 230 kV ROW and expanding that ROW to allow for a new transmission line for a new POI with the nearest 500 kV transmission line.
13. Population distribution and density		
13a. Distance to population centers	4	Based on the U.S. Census consolidated cities and incorporated places, the nearest population center of 25,000 or more, Williamsport, Pennsylvania, is located 19.6 mi from the Montour site.
13b. Population density	4	Based on 2007 U.S. Census Bureau data, the population density within a 20-mi radius of the Montour site is 160 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1	The nearest existing barge access to the Montour site is located more than 50 miles away from the site on the Susquehanna River.

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Appendix C—Environmental Scoring Justification (continued)

Montour Site		
Ranking Criteria[1]	**Score**	**Justification**
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	2.11	There is a Norfolk Southern Railway freight rail line about 1.4 miles southwest of the site.
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration	5	Based on the USGS' 2008 National Seismic Hazard Map, the PGA with 2 percent probability of exceedance in 50 years at this site is 0.061g.
15b. Depth to bedrock, soil stability, and compaction	5	According to Pennsylvania DCNR, NRCS, and the USGS, depth to bedrock is likely within 20 ft below ground surface (bgs). The uppermost-soils are formed from Quaternary-derived glacial till, which are generally recognized as competent.
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between the site and the closest fault area (the Central Virginia Seismic Zone) is greater than 100 miles.
15d. Other geological hazards	4	According to the Pennsylvania DCNR and the BTGS, no sinkholes occur in the counties surrounding the Montour Site. The DCNR indicated that the susceptibility to landslides has been categorized as generally low, but includes local areas of high to moderate susceptibility. A search of the NMMR for mines in Montour County did not produce any results; however, searches for mines in Columbia, Northumberland, and Lycoming counties resulted in multiple mine listings for underground, surface, and combined-type mines for coal and non-coal commodities. No readily available maps showing underground mine locations in relation to the site were found. A map showing the locations of non-coal mines in Montour County identified multiple locations but does not distinguish between mine types (underground vs. surface vs. combined). These non-coal mine locations are within a 20 mi radius based on visual inspection of non-coal mine distribution in Montour County. Anthracite mines are common in Northumberland and Columbia counties to the south of the site estimated at distances greater than 20 mi but less than 50 mi.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 4 percent, or 138 acres of the 3,538-acre property, is wetlands.
16b. Total Acres of Wetlands Within Site	5	According to the NWI database, the 420-acre site does not contain any wetlands.
16c. High Quality Wetlands Within Site	5	According to the NWI maps, there are no wetlands within the Montour site; therefore, this site does not contain any state-designated high-quality wetlands.

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Appendix C—Environmental Scoring Justification (continued)

Seedco Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
1. Land use, including availability, and areas requiring special consideration		
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas	4.11	The facility could be accommodated on an approximate 420 acre site within the existing property with little or no changes needed to the layout and little or no restrictions for construction work areas.
1b. Hazardous waste or spoils areas	3.22	The Seedco Industrial Park was reviewed using the PDEP eMapPA Internet Mapping System database. The database indicated that the site contains abandoned mine land throughout the site. It is unknown if the site requires environmental remediation.
1c. Zoning	5.00	According to Coal Township, the Seedco Industrial Park is zoned as M-1 (manufacturing). The site has no known zoning restrictions.
1d. Distance to dedicated land	4.56	The nearest Dedicated Land, the State Game Lands, is located approximately 15 mi from the Seedco Industrial Park.
1e. Topography	1.00	The site has steep topography with approximately 300 feet of relief across the site.
2. Hydrology, water quality, and water availability		
2a. Water Quality	5	The segment of the Susquehanna River proposed to be the source of cooling water for the Seedco Industrial Park is considered freshwater surface water. This portion of the Susquehanna River is located approximately 15 mi from the Seedco Industrial Park. This segment of the river is identified as part of Drainage List M (§ 93.9m – Main Stem, West Branch to Juniata River) of the Susquehanna River Basin.
2b. Receiving Body Water Quality	3	This segment of the Susquehanna River Basin is part of the main stem of the Susquehanna River between the West Branch Susquehanna River and the Juniata River. The Water Use Protected designation for this segment of the river is warm water fishery.
2c. Water availability	5	The main source of water for the Seedco Industrial Park would be the Susquehanna River. The lowest 7Q10 for the period of record (July 1999 – July 2009) for the river at the nearest USGS gage (01554000) is approximately 9,720 mgd. The total water usage at the Seedco Industrial Park is estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	5	No identified federally or state-listed T&E terrestrial species or their habitats have been identified on or adjacent to the site.
3b. Floodplains	4	Approximately 3 percent of the site footprint is affected by a 100- or 500-year FEMA floodplain or state floodplain zone.

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Appendix C—Environmental Scoring Justification (continued)

Seedco Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	5	No federally or state-listed T&E aquatic species were identified as occurring onsite at the Seedco Industrial Park.
4b. Thermal Discharge Sensitivity	3	The Seedco Industrial Park would use the Susquehanna River as the source of cooling water. The main stem of the Susquehanna River in this area is classified as a warm-water fishery.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Two hospitals, 15 police stations or sheriff departments, and 24 fire stations or departments (including volunteer stations) are located within Northumberland County. Northumberland County has a department of public safety that maintains programs and procedures that protect lives and property within the county from the effects of natural or man-made disasters. Pennsylvania also has an emergency management agency with jurisdiction over Northumberland County.
5b. Construction traffic	5	State Highway 61 is located within 1 mi of the site to the north.
5c. Construction workforce	5	According to May 2008 DOL BLS metropolitan and non-metropolitan area data estimates, the construction workforce required for the project, assumed to be similar to the estimated maximum construction workforce for the BBNPP, would represent less than 2 percent of the total construction workforce in the area.
5d. Housing and necessities	1	According to the census tract data, a total of 125,072 housing units are vacant or not occupied, which represents approximately 32 times the projected construction workforce. The number of vacant housing units is greater than 10 times the projected peak construction workforce, assumed to be similar to the estimated maximum construction workforce for the BBNPP. The nearest population center of 25,000 or more is Harrisburg, Pennsylvania, which is approximately 38 mi away.
5e. Schools	4	There are approximately 869 public and private elementary, middle, and high schools located within a 50-mi radius of the site.
6. Environmental Justice (EJ)		
6a. Minority population	1	The Seedco Industrial Park is located in CT 9612 BG 2. The site's CT/BG (CT 9612 BG 2) has a higher percentage of minority residents compared to 10 of the 11 adjacent CT/BGs and Northumberland County, but a lower percentage of minority residents compared to the State of Pennsylvania. An adjacent CT/BG (CT 9612 BG 1) has the highest minority population percentage (36.0 percent) of the CT/BGs at or adjacent to the site. This CT/BG's (CT 9612 BG 1) minority population is 33.1 percent higher than Northumberland County. In addition, there is detention facility nearby called Northwestern Academy.

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Appendix C—Environmental Scoring Justification (continued)

Seedco Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
6b. Low-income population	1	The percent of poverty for CT 9612 BG 2 is lower than 7 of the 11 adjacent CT/BGs, Northumberland County, and the State of Pennsylvania. An adjacent CT/BG (CT 9616 BG 1) has the highest low-income population percentage (37.1 percent) of the CT/BGs at or adjacent to the site. This CT/BG's (CT 9616 BG 1) low-income population is 26.1 percent higher than the State of Pennsylvania.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	3	Based on available information from the NRHP and Pennsylvania SHPO, there are two NRHP-listed properties within 5 mi of the site; however, neither are within 1 mi of the site.
7b. Historic districts	5	Based on available information from the NRHP and Pennsylvania SHPO, there are no NRHP-listed historic districts within 5 mi of the site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	5	The historical frequency of occurrence of tornadoes in Pennsylvania is low, with only 2 reported occurrences of F4 (Fujita Scale) tornadoes (207-260 mph), and less than 20 reported occurrences of an F3 tornado (158-206 mph) since 1950. Given the large size of the state, this equates to a very low expected frequency of occurrence of a tornado at any given location. The observed frequency of occurrence of hurricanes passing through Pennsylvania is very low. There have been no reported occurrences of Category 3 hurricanes (110-130 mph) passing within 100 mi of the state, and only three Category 2 hurricanes (96-110 mph) have passed within 100 mi of the state (only one made landfall) during the period of record (approximately 100 years).
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	5	The Seedco Industrial Park is in Northumberland County, which is currently designated as in attainment for all pollutants. There are no PSD Class I areas in Pennsylvania, and there are no Class I areas within 100 miles of the site.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	1	There are greater than 75 residences or businesses located within 1 mi of the Site. No schools or hospitals are located within 1 mi of the Site.
9b. Radiological pathways – water	3	The distance from the site to the nearest public water supply intake is greater than 2 miles, but less than 3 mi. The exact distances to public water supply intakes could not be ascertained from the best available data sources at the time of this analysis. The distance to the sole source aquifer (New Jersey Coastal Plain Aquifer System) is greater than 5 mi (63.17 miles).
9c. Radiological pathways – food	3	There is agricultural land (2.2 mi) greater than 2 mi, but less than or equal to 3 mi from the site. The nearest shellfish beds are located greater than 50 mi from the site.

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Appendix C—Environmental Scoring Justification (continued)

Seedco Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	1	A Conrail rail line is located 0.3 mi from the approximate center of the Seedco Industrial Park. There are two manufacturers within 5 mi of the site: Montour Oil Shamokin Terminal, a bulk petroleum terminal (2.9 mi); and Explo Tech, an explosives manufacturer (3.5 mi). There are no major airports or military air bases or stations within 10 mi of the site.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	1	The distance from Seedco Industrial Park to the National Repository at Yucca Mountain is greater than 2,000 mi, and the distance to Waste Control Specialists in Andrews, Texas, the closest low-level waste site, is greater than 1,000 mi, whether by rail or road. There is one census tract along the truck and rail routes with a population density greater than 2,601 ppsm. This census tract is located within the first 10 mi from the site.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	3.00	There are four existing 500 kV transmission lines within the 30-mi radius of the site: one line is approximately 9.2 mi away from the Seedco Industrial Park, another line is approximately 16.3 mi from the site, and the other two 500 kV transmission lines are approximately 25.8 mi away from the site. Therefore, the nearest viable transmission line to consider for a potential POI is the 500 kV transmission line is approximately 9.2 mi away. To accommodate this new POI option, there is the possibility of creating a new 9.2 mi ROW north-northwestward to the nearest existing 500 kV transmission line.
13. Population distribution and density		
13a. Distance to population centers	5	Based on the U.S. Census consolidated cities and incorporated places, the nearest population center of 25,000 or more, Harrisburg, Pennsylvania, is located 38.3 mi from the Seedco Industrial Park.
13b. Population density	4	Based on 2007 U.S. Census Bureau data, the population density within a 20-mi radius of the Seedco Industrial Park is 195 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1	The nearest existing barge access to the Seedco Industrial Park is located more than 50 mi away from the site on the Susquehanna River.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	5.00	There is an existing Conrail freight rail line at the Seedco Industrial Park. The rail line runs along the western edge of the property.

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Appendix C—Environmental Scoring Justification (continued)

Seedco Industrial Park		
Ranking Criteria[1]	**Score**	**Justification**
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration	5	Based on the USGS' 2008 National Seismic Hazard Map, the Peak PGA with 2 percent probability of exceedance in 50 years at this site is 0.071g.
15b. Depth to bedrock, soil stability, and compaction	3	According to Pennsylvania DCNR, NRCS, and the USGS, the bedrock at this site may be within 20 feet of the existing ground surface or residual soils developed from Paleozoic bedrock could extend greater than 20 ft bgs.
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between the site and the closest fault area (the Central Virginia Seismic Zone) is greater than 100 mi.
15d. Other geological hazards	2	According to the BTGS and Pennsylvania DCNR, there are sinkholes within 20 miles of the site and the susceptibility to landslides has been categorized as generally low, but includes local areas of high to moderate susceptibility. A search of NMMR for mines in Northumberland County resulted in multiple listings for underground, surface, and combined-type mines for coal and non-coal commodities. No readily available maps showing underground mine locations in relation to the site were found; however, the site is located within the southern anthracite field and underground mines within 3 mi are a possibility. A map showing the locations of non-coal mines in Northumberland County identified multiple locations but does not distinguish between mine types (underground vs. surface vs. combined) (DCNR, 2009b). These non-coal mine locations are within a 10-mi radius based on visual inspection of non-coal mine distribution in Northumberland County.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 0.2 percent, or 2 acres of the 1,061-acre property, is wetlands.
16b. Total Acres of Wetlands Within Site	5	According to the NWI database, the 424-acre site contains approximately 0.8 acre of wetlands.
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands.

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Appendix C—Environmental Scoring Justification (continued)

BBNPP Site		
Ranking Criteria[1]	**Score**	**Justification**
1. Land use, including availability, and areas requiring special consideration		
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas	5.00	The proposed plant layout plan can be accommodated on the site as shown in the BBNPP Environmental Report (ER) (UniStar Nuclear Services, LLC [UniStar Nuclear], 2009a) with no changes needed in the layout and no restrictions for construction work areas.
1b. Hazardous waste or spoils areas	4.78	According to the PDEP eMapPA, the site contains or is located adjacent to the PP&L Class I Demo Site #3, a Residual Waste Operation Landfill. The PDEP database indicated that the landfill is inactive and in compliance.
1c. Zoning	3.67	According to the BBNPP ER, most of the BBNPP site is zoned as Agricultural District, with a much smaller portion zoned as Conservation District. Areas to the north and east containing the existing nuclear power plant are zoned heavy industrial. According to Delphi Panel members from PPL, rezoning of the BBNPP site is expected to be complete by November 2009.
1d. Distance to dedicated land	3.00	The nearest Dedicated Land, Ber Vaughn Park, is located approximately 5.8 mi from the BBNPP site.
1e. Topography	3.00	There is approximately 130 ft of relief across the site. However, the plot plan can be accommodated with limited cut and fill activities.
2. Hydrology, water quality, and water availability		
2a. Water Quality	5	The segment of the North Branch of the Susquehanna River that would be the source of cooling water for the BBNPP is considered freshwater surface water. This portion of the North Branch of the Susquehanna River is located approximately 2 mi from the BBNPP site. This segment of the river is identified as part of Drainage List K (§ 93.9k - Lackawanna River to West Branch) of the Susquehanna River Basin.
2b. Receiving Body Water Quality	3	The segment of the North Branch of the Susquehanna River Basin is part of the main stem of the Susquehanna River between the Lackawanna River and the West Branch Susquehanna River. The Water Use Protected designation for this segment of the river is warm-water fishery.
2c. Water availability	5	The main source of water for the BBNPP site would be the North Branch of the Susquehanna River. The lowest 7-day average flow in a 10-year period (7Q10) for the period of record (July 1999 – July 2009) for the river at the nearest USGS gage (01536500) is approximately 505 million gallons per day (mgd). The total water usage at the BBNPP site is estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	5	No identified federally or state-listed T&E terrestrial species or their habitats have been identified on or adjacent to the site.

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Appendix C—Environmental Scoring Justification (continued)

BBNPP Site		
Ranking Criteria[1]	**Score**	**Justification**
3b. Floodplains	4	Approximately 8 percent of the site footprint is affected by a 100- or 500-year FEMA floodplain or state floodplain zone.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	5	While a variety of federally and state-listed T&E aquatic species have been identified as occurring within and near the BBNPP site, to date, surveys have not identified any aquatic T&E species.
4b. Thermal Discharge Sensitivity	3	The BBNPP site would use the North Branch of the Susquehanna River as the source of cooling water. The main stem of the North Branch of the Susquehanna River in this area is classified as a warm-water fishery.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Eleven hospitals, 31 police stations or sheriff departments, and 39 fire stations or departments (including volunteer stations) are located within Luzerne County. Luzerne County has an emergency management agency that helps prepare for, manage, and recover from any type of natural disaster and emergency or threat to security that may occur within the county. Pennsylvania also has an emergency management agency with jurisdiction over Luzerne County.
5b. Construction traffic	3	No interstates, U.S. highways, or state highways are located within 1 mi of the site. U.S. Highway 11 is located within 5 mi of the site to south and east. Other state highways within 5 mi of the site include State Highway 239 to the east, and State Highway 93 and State Highway 339 to the south.
5c. Construction workforce	3	According to Chapter 4 of the BBNPP ER (UniStar Nuclear, 2009a), an estimated maximum workforce of 3,950 employees would be needed during construction of the facility. According to May 2008 DOL BLS metropolitan and non-metropolitan area data estimates, the construction workforce required for the project would represent approximately 6 percent of the total construction workforce in the area.
5d. Housing and necessities	1	According to the census tract data, a total of 130,348 housing units are vacant or not occupied, which represents approximately 33 times the projected construction workforce. The nearest population center of 25,000 or more is Wilkes-Barre, Pennsylvania, which is approximately 16 mi away.
5e. Schools	3	There are approximately 636 public and private elementary, middle, and high schools within a 50-mi radius of the site.

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Appendix C—Environmental Scoring Justification (continued)

BBNPP Site		
Ranking Criteria[1]	**Score**	**Justification**
6. Environmental Justice (EJ)		
6a. Minority population	5	The BBNPP site is located in Census Tract (CT) 2161 Block Group (BG 2). The site's CT/BG (CT 2161 BG 5) has a lower percentage of minority residents compared to eight of the ten adjacent CT/BGs, Luzerne County and the State of Pennsylvania. An adjacent CT/BG (CT 2162 BG 5) has the highest minority population percentage (2.2 percent) of the CT/BGs at or adjacent to the site. This CT/BG's (CT 2162 BG 5) minority population percentage is below Luzerne County and the State of Pennsylvania.
6b. Low-income population	4	The percent of poverty for CT 2161 BG 2 is higher than nine of the ten adjacent CT/BGs, but less than Luzerne County and the State of Pennsylvania. An adjacent CT/BG (CT 2161 BG 2) has the highest low-income population percentage (10.2 percent) of the CT/BGs at or adjacent to the site. This CT/BG's (CT 2161 BG 2) low-income population percentage is below Luzerne County and the State of Pennsylvania.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	3	Based on available information from the NRHP and the Pennsylvania SHPO, there are three NRHP-listed properties within 5 miles of the site; however, none are within 1 mi of the site.
7b. Historic districts	5	Based on available information from the NRHP and Pennsylvania SHPO, there are no NRHP-listed historic districts within 5 mi of the site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	5	The historical frequency of occurrence of tornadoes in Pennsylvania is low, as it is located more than 100 mi from the coast, with only 2 reported occurrences of F4 (Fujita Scale) tornadoes (207-260 miles per hour [mph]), and less than 20 reported occurrences of an F3 tornado (158-206 mph) since 1950. Given the large size of the state, this equates to a very low expected frequency of occurrence of a tornado at any given location. The observed frequency of occurrence of hurricanes passing through Pennsylvania is very low. There have been no reported occurrences of Category 3 hurricanes (110-130 mph) passing within 100 mi of the state, and only three Category 2 hurricanes (96-110 mph) have passed within 100 mi of the state (only one made landfall) during the period of record (approximately 100 years).
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	5	The BBNPP site is in Luzerne County, which is currently designated as in attainment for all pollutants. There are no PSD Class I areas in Pennsylvania, and there are no Class I areas within 100 mi of the site.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	3	There are greater than 25, but less than 75 residences or businesses within 1 mi of the Site. No schools or hospitals located within 1 mi of the Site.
9b. Radiological pathways - water	5	The distance from the Site to the nearest sole source aquifer (New Jersey Coastal Plain Aquifer System) is greater than 5 mi (49.64 mi). A public water supply intake does not exist within 5 mi of the Site.

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Appendix C—Environmental Scoring Justification (continued)

BBNPP Site		
Ranking Criteria[1]	**Score**	**Justification**
9c. Radiological pathways - food	1	The site is located on agricultural land. Shellfish beds are located more than 50 mi from the site.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	1	A Canadian Pacific rail line is located across the Susquehanna River 2.0 mi from the BBNPP site. There is a PPL-owned rail line approximately 0.7 mi from the site reactor building location on the west side of the Susquehanna River, however, hazardous materials are not transported via this line. A natural gas pipeline operated by Williams Gas is located 1.9 mi from the site. There are two industrial sites within 5 mi of the site: Sun Pipeline at Hess Mountain (3.8 mi) and Berwick Armory (4 mi). There are four quarries located within 5 mi of the site: Rinehimer Quarry (clay and shale) (1.3 mi), Bower Salem Quarry (clay) (1.4 miles), Riverview Block Quarry (shale) (1.8 mi), and Bower Cedar Rock Quarry (shale) (2.8 mi). There are no major airports or military air bases or stations within 10 mi of the site.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	1	The distance from the BBNPP site to the National Repository at Yucca Mountain is greater than 2,000 mi, and the distance to Waste Control Specialists in Andrews, Texas, the closest low-level waste site, is greater than 1,000 mi, whether by rail or road. There is one census tract along the truck and rail routes with a population density greater than 2,601 ppsm. This census tract is located within the first 10 mi from the site.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	4.78	There are two existing 500 kV transmission lines, the Susquehanna 500 kV lines for possible interconnection to the east of the BNNPP site. Therefore, the nearest viable transmission lines to consider for a potential POI are 500 kV transmission lines located approximately 0.8 mi away from the site.. To accommodate this new POI option, there is the possibility of creating a new 0.8 mi ROW to allow for a new transmission corridor for a new POI with the Susquehanna 500kV lines. In addition, new transmission system upgrades, including the Susquehanna-Roseland line, are being pursued by the Pennsylvania-New Jersey-Maryland Interconnection, LLC (PJM) and PPL Electric Utilities independent of the Bell Bend project. This new line is targeted for completion by 2012, thereby, enabling the new units to also directly connect to the new Susquehanna-Roseland line.
13. Population distribution and density		
13a. Distance to population centers	4	Based on the U.S. Census consolidated cities and incorporated places, the nearest population center of 25,000 or more, Wilkes-Barre, Pennsylvania, is located 16.2 mi from the BBNPP site.
13b. Population density	3	Based on 2007 U.S. Census Bureau data, the population density within a 20-mi radius of the BBNPP site is 243 ppsm.

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Appendix C—Environmental Scoring Justification (continued)

BBNPP Site		
Ranking Criteria[1]	**Score**	**Justification**
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1	The nearest existing barge access to the BBNPP site is located more than 50 mi away from the site on the Susquehanna River.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	4.89	A rail spur owned by PPL runs up to the eastern border of the site.
15. Geology/Seismology		
15a. Vibratory ground motion – seismic peak ground acceleration	5	Based on the USGS's 2008 National Seismic Hazard Map, the PGA with 2 percent probability of exceedance in 50 years at this site is 0.071g.
15b. Depth to bedrock, soil stability, and compaction	3	According to the Pennsylvania DCNR, NRCS, and the BBNPP Final Safety Analysis Report (UniStar Nuclear, 2009b), the depth to bedrock may be greater than 20 feet, with Quaternary-age soils overlying the site. However, the existing structures at the adjacent BBNPP units facility are founded on sound rock, and; therefore, depth of rock at the site may be practical for foundations .
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between the site and the closest fault area (the Central Virginia Seismic Zone) is greater than 100 mi.
15d. Other geological hazards	3	According to the BTGS, karst features are greater than 20 mi from the site. According to the Pennsylvania DCNR, the susceptibility of the area to landslides has been categorized as generally low, but includes local areas of high to moderate susceptibility. The NMMR states that there are numerous listings of underground (U), surface (S), and combined (C) mine types in Luzerne County. Luzerne County contains the North Anthracite Field and the Eastern Middle Anthracite Field. No readily available maps showing underground mine locations in relation to the site were found; however, based on the general distribution maps of anthracite coal in Luzerne County, it is likely that underground mines occur within 10 mi of the site.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 4.7 percent, or 41 acres of the 882-acre property, is wetlands.
16b. Total Acres of Wetlands Within Site	1	According to the NWI database, the 424-acre site contains approximately 29 acres of wetlands.
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands

[1] Yellow highlighted row is from Ref NUREG-1555 Subject Areas for Candidate Site Selection and Screening. No fill is Functional Evaluation Elements [EPRI Siting Study]

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Appendix D—Weighting Criteria

In evaluating the inevitable trade-offs between suitability criteria, it is necessary to assign a relative importance (i.e., weight) to each criterion in selecting a power plant site. As such, weighting factors were assigned to each of the 16 major criteria topics using the Delphi process with a nine member panel. This panel was developed, based on their knowledge, skills, and specific areas of expertise, to conduct the evaluation of the *Potential Sites*. This panel established the weighting factors and evaluated specific criteria that were defined to be subjective in nature.

The Delphi Panel responsible for development of the Bell Bend Nuclear Power Plant siting evaluation included two members from CH2MHILL, two members from AREVA, and five members from PPL/Bell Bend (comprised of three senior environmental professionals, a regulatory manager, and an engineering manager). In addition, subject matter experts (SME), from CH2MHILL and AREVA, were available to discuss and provide input as requested by panel members for further clarification during the session.

Panel members rated the importance of each criterion and assigned weights relative to the other criteria, which are presented in the table below.

Criteria Topic	Weight
1. Land use, including availability, and areas requiring special consideration	6.0
2. Hydrology, water quality, and water availability	9.0
3. Terrestrial resources (including endangered species)	7.0
4. Aquatic biological resources (including endangered species)	7.0
5. Socioeconomics (including aesthetics, demography, and infrastructure)	5.5
6. Environmental Justice	5.0
7. Historic and Cultural Resources	5.0
8. Air Quality	4.0
9. Human Health	6.0
10. Postulated Accidents(a)	6.0
11. Fuel Cycle Impacts(a)	3.0
12. Transmission corridors (land used, feasibility, and resources affected)	8.0
13. Population distribution and density	9.0
14. Transportation Access	5.5
15. Geology/Seismology	7.0
16. Wetlands	8.0

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Appendix E—Acronyms and Abbreviations

ac	acre
ASCE	American Society of Civil Engineers
CEG	Constellation Energy Group, Incorporated
CFR	Code of Federal Regulations
COMAR	Code of Maryland Regulations
CPCN	Certificate of Public Convenience and Necessity
DOE	U.S. Department of Energy
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
EPR	Evolutionary Power Reactor
EPRI	Electric Power Research Institute
ESP	early site permit
ESRP	Environmental Standard Review Plan
FDR	Franklin D. Roosevelt
FEMA	Federal Emergency Management Agency
GIS	geographic information system
ha	hectare
km	kilometer
km^2	square kilometer
kV	kilovolt
MDNR	Maryland Department of Natural Resources
MDE	Maryland Department of the Environment
MDPSC	Maryland Public Services Commission
mi	mile
mi^2	square mile
NEPA	National Environmental Policy Act of 1969
NRC	U.S. Nuclear Regulatory Commission
NUREG	U.S. Nuclear Regulatory Commission: Reports or brochures on regulatory decisions, results of research, results of incident investigations, and other technical and administrative information.
ppsm	persons per square mile
PPRP	Power Plant Research Program
PSC	Public Services Commission
PSL	Public Service Law
RCRA	Resource Conservation and Recovery Act
rem	roentgen equivalent man
ROI	region of interest
SEQRA	State Environmental Quality Review Act
TEDE	total effective equivalent dose
UniStar	UniStar Nuclear Operating Services

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Appendix F—US Army Corps of Engineers (USACE) Information

This appendix contains information submitted to the Pennsylvania Department of Environment Protection (PaDEP) and USACE as part of the Joint Permit Application (JPA) and is comprised of three sections: 1) Project Purpose, 2) the JPA package, and 3) Supplemental Environmental Resource Report siting sections.

Section F1 - Purpose

The basic project purpose for the project is to generate electricity for additional baseload capacity.

The overall purpose of the project is to construct a nuclear power plant facility to provide for additional baseload electrical generating capacity to meet the growing demand in the Region of Interest (ROI) which is defined as the Eastern Classic PJM.

Section F2 – Documentation

The following table list the items submitted in the JPA and identifies those documents included herein.

Document	Content	
Joint Federal/State Application, Dated September 2010*	Cover Letter	Copy in App F*
	Detailed Work Descriptions for Impacts to Tidal and Non-Tidal Wetlands	Copy in App F*
	Tidal and Non-Tidal Figures	Copy in App F *
	Supplemental Environmental Resource Report w/Appendices A, B, and C.	Copy in App F*
	Three Volumes of Environmental Reports Including - Final Flora Survey Report, Final Rare Plant Survey, Final Faunal Survey & related correspondence between UniStar and U.S. Fish and Wildlife Service, National Marine Fisheries Service, and Maryland DNR, Aquatic Field Studies, Submerged Aquatic Vegetation Surveys, Final Wetland Delineation Report	Copy in App F*
	Stormwater Management Plan and associated documents	Copy in App F*
	Concept Site Plan	Copy in App F*
	11" X 17" Color Site Plan	Copy in App F*

Section F3 - Supplemental Environmental Resource Report*

* The current schedule for submitting the JPA is September 2010. The applicant is also responding to USACE RAIs that will comprise a substantial part of the exhibits to the JPA application. This information including the USACE-specific Supplemental Environmental Resource Report is scheduled to be completed Q4 2009 and will be incorporated as applicable into this report.

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