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NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

October 15, 2009

UN#09-422

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

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Calvert Cliffs Nuclear Power Plant, Unit 3
Supplemental Response to Environmental Report
RAI No. 1019, U.S. Army Corps of Engineers (USACE)
Question No. 1 and No. 5

References:
1) Laura Quinn (NRC) to Greg Gibson (UniStar Nuclear Energy), "Request for Additional Information Related to the Environmental Review for the Calvert Cliffs Combined License Application – Revised Alternative Sites," dated September 18, 2009.
2) Greg Gibson (UniStar Nuclear Energy) to NRC Document Control Desk letter UN#09-404, "Response to Environmental Report RAI No. 1019, U.S. Army Corps of Engineers (USACE)," dated September 25, 2009.

The purpose of this letter is to provide a supplemental response to Questions No. 1 and No. 5 of the U.S. Army Corps of Engineers (USACE) request for additional information (RAI) No. 1019. RAI No. 1019 consisted of five questions from the USACE for Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 as provided in NRC letter to UniStar Nuclear Energy, dated September 18, 2009 (Reference 1). The initial response to RAI 1019 (Questions 1 through 5) was provided in Reference 2.

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Enclosure 1 provides the supplemental response to Question No. 1 and No. 5 of RAI No. 1019. Enclosure 2 provides the revised CCNPP Unit 3 Alternate Site Evaluation, dated October 2009, with a revised Appendix F in response to RAI 1019 Question 1. A Licensing Basis Document Change Request has been initiated to incorporate the COLA changes into a future revision of the CCNPP Unit 3 Combined License Application. This response does not include any new regulatory commitments.

Additionally, this response contains no proprietary or security sensitive information.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Dimitri Lutchenkov at (410) 470-5524.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on October 15, 2009

Greg Gibson

Enclosures:

1) Response to NRC Request for Additional Information, RAI No. 1019, U.S. Army Corps of Engineers (USACE), Question No. 1 and No. 5, Calvert Cliffs Nuclear Power Plant Unit 3

2) Calvert Cliffs Nuclear Power Plant Unit 3, Alternate Site Evaluation, Revision 2, October 15, 2009

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office
Kathy Anderson, US Army Corps of Engineers (w/enclosure)

GTG/FRP/mdf

Enclosure 1

Response to NRC Request for Additional Information
RAI No. 1019, US Army Corps of Engineers (USACE)
Question No. 1 and No. 5,
Calvert Cliffs Nuclear Power Plant Unit 3

RAI No. 1019

US Army Corps of Engineers (Corps) RAIs

Question 1

Delete the permit application, cultural resources report and mitigation plan from the Alternatives Evaluation Report Appendix F.

Response

The permit application, cultural resources report and mitigation plan have been removed from the Alternative Site Evaluation Report (ASER) Appendix F as requested, and the ASER is reissued as Revision 2 (see Enclosure 2).

COLA Impact

CCNPP COLA ER Sections 9.3.3 and 9.3.4 will be revised as follows in a future revision of the COLA:

9.3.3 SUMMARY AND CONCLUSIONS

The detailed site evaluations are contained in the Calvert Cliffs Alternate Site Evaluation, October ~~August~~ 2009 (UniStar, 2009). Table 9.3-4, Weighted Scoring of Candidate Sites, compares the weighted numerical scores of the Selected and Candidate sites derived from the above referenced Alternate Site Evaluation. Table 9.3-8 is a Comparison of Proposed and Alternate Sites using the NRC Three-level Standard of significance. The Summary and Conclusions based upon the foregoing are discussed below.

9.3.4 REFERENCES

UniStar, 2009. Calvert Cliffs Nuclear Power Plant Unit 3 Alternate Site Evaluation, UniStar Nuclear Energy. October ~~August~~ 2009.

Question 5:

Provide a Corps-focused alternative site analysis which must include a text description of the wetland and stream impact analysis outcome for the offsite and onsite alternatives. Based on potential/proposed wetland and stream impact information, provide a statement indicating which site location would be the Least Environmentally Damaging Practicable Alternative (LEDPA). If not the selected project, explain the reasons the LEDPA site was not selected.

Response

Table 9.3-12 of ER Chapter 9 of the Calvert Cliffs Unit 3 COLA presents the impacts of the EPR project at four sites; the proposed site and three alternative sites. The relevant information from the subject table needed for a 404(b)1 analysis and subsequent LEDPA determination by the USACE has been provided in Appendix F of the Alternative Site Evaluation Report (see Enclosure 2).

Review of ER Tables 9.3-12, 9.3-13, and 9.3-14 identifies that relative to impacts to Waters of the U.S. *on the site itself,* EASTALCO would be the LEDPA site. However, further evaluation of associated off-site impacts required for water line and transmission line right-of-way (ROW) construction associated with the Alternative Sites, supports Calvert Cliffs Unit 3 as the LEDPA site.

A LEDPA analysis, by regulation, should help identify a site with the least impact to Waters of the U.S. *and with no significant adverse impacts to other environmental resources* as the Least Environmentally Damaging Practicable Alternative Accordingly, based upon a comprehensive evaluation, including 41 other environmental impact criteria used to evaluate the four sites, Calvert Cliffs Unit 3 Alternative Site Evaluation Report (ASER) and supporting materials clearly demonstrate that the Calvert Cliffs Unit 3 site has the smallest overall impact to environmental resources and therefore is the environmentally preferred location for construction of the EPR within the defined Region of Interest, Maryland.

The dredging for barge access is unique to Calvert Cliffs due to its location and existing nuclear facilities. The proposed tidal wetland impact is approximately 5.7 acres (4.5 acres due to the barge slip restoration and the balance of 1.2 acres is associated with the intake structure, discharge pipe, and fish return). The barge facility restoration work to access the pier and improve navigation would have eventually been necessary to service the existing facilities at Units 1 and 2. The tidal work does not impact the overall LEDPA conclusion, as Calvert Cliffs was selected based on a comprehensive evaluation as described below.

The Alternative Sites Bainbridge and EASTALCO share a similar navigable riverine environment where in-water Cooling Water Intake Structure (CWIS) components are proposed. Similar methods of in-water work and identical impacts below Ordinary High Water (OHW) or Mean High Water shoreline (MHW) were assumed. Certain assumptions were used in the calculations of impacts associated with in-water work, estimated at 0.23 acre (100'x100'). These assumptions are based on understanding of the physical environment, based on screening level data and experience of the UniStar Nuclear Energy team with similar projects. Primary factors included the following: an assumption that 0.23 acre would accommodate the cooling water intake system components and any necessary turbidity curtain array or coffer dam; work within the 0.23 acre disturbance footprint could accommodate dredging, blasting, drilling, or any other typical construction methods; the use of horizontal directional drilling (HDD) could be employed

to avoid open cut or surface lay pipeline impacts; the pump house and support structures can be sited outside of any regulatory resource area.

The Thiokol Alternative Site is located along the Patuxent River. Because of the soft muddy substrate documented to be in the river at the location of the cooling water intake and discharge locations and a shallow shelf along the southern shoreline that must be spanned to reach suitable water depths, the following assumptions were included in the calculation of impacts presented here: 1) HDD will not be an effective technology, 2) dredging must be employed for the pipe trench and CWIS component locations, 3) the CWIS would need to be located 1000' or greater offshore. Under this scenario, work would be proposed to impact approximately 2.25 acres of waters below MHW, and require approximately 8,000 cubic yards of (in-place) sediment.

COLA Impact

UniStar letter UN#09-403, dated September 25, 2009, provided changes to COLA ER Tables 9.3-12, 9.3-13, and 9.3-14. This transmittal (UN#09-422) provides supplemental revision to ER Table 9.3-12. The CCNPP COLA ER Table 9.3-12 will be updated as follows in a future COLA revision:

Table 9.3-12 Comparison of Wetland and Waterway Impacts: CC3 vs. Alternate Sites

	Calvert Cliffs [16 ~~13~~]		Bainbridge		EASTALCO		Thiokol [17 ~~14~~]	
Property Acreage	2057.2		1068.6		1742.1		620.0	
Wetlands – Total Property[1] (ac)	173.2		4.6		21.0		49.8	
Wetlands – Site[2] (ac)	6.6		0.0		0.0		34.5	
Streams – Total Property[3] (LF)	21805		8654		32944		7055	
Streams – Site[4] (LF)	3604		1557		1311		3435	
Wetlands Affected – Site[5] (ac)	6.6		0.0		0.0		34.5	
Streams Affected – Site[6] (LF)	3604		1557		1311		3435	
Section 10 Waters: Tidal (ac)	5.7[7]		NA		NA		2.25[8]	
Navigable Riverine (ac)	N/A		0.23[9]		0.23[9]		NA	
Off-Site Wetlands/Waterways Affected –ROWs and Interconnects (ac/LF)[10 ~~7~~]	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams
CWIS (in-water components)(ac)[11 ~~8~~]	0.23	0	0.23	0	0.23	0	0.23	0
CW Pump House (ac.)[12 ~~9~~]	NA	NA	0	0	0	0	0	0
Water Line ROW (ac)[13 ~~10~~]	NA	NA	1.3	0	3.2	865	0.4	0
Transmission Line ROW (ac)[14 ~~11~~]	0	0	3.0	4926	0.2	1820	26.6	4051
RR Spur/Improvements (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Access Roadways (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Other Off-Site Uses (ac)[15 ~~12~~]								

[1] "*Total Property*" includes the entirety of the alternate site facility contiguous land holdings (black outline).

[2] "*Site*" includes the 420 parcel on the Total Property selected for EPR development (red outline).

[3] Describes the total length of all streams on the Total Property in linear feet. Includes both mapped perennial and intermittent waterways and obvious drainage ways observed during site inspections or interpreted from desktop mapping.

[4] Describes streams within the 420 EPR Site, calculated in the same manner as streams for "Total Property".

[5] An assumption has been made that any wetlands within the 420 acre Site would be affected.

[6] An assumption has been made that any streams within the 420 acre Site would be affected by construction.

[7] The actual, not estimated, proposed impacts to Sec. 10 regulated tidal waterways below ordinary high water (OHW) or mean high water shoreline (MHW) is approximately 5.7 acres.

[8] The Thiokol site cooling water intake and discharge structures are located within the Patuxent River. Directional drilling would not be possible based on soft mud substrate, and suitable water depths are located 1000' feet into the river channel seaward of OHW or MHW. Accordingly, dredging of a 1000' x 45' pipe trench (4' deep) in addition to 0.5 acres for aquatic structures is proposed, totaling approximately 2.25 acres. Dredging volume (in place) is estimated to be approximately 8,000 cubic yards.

[9] For both the Bainbridge and EASTALCO Alternative Sites, 0.23 acre (100'x100') of wetland disturbance below OHW is assumed. This estimation of impact is based upon prior experience in similar environments, and assumes use of directional drilling to approach intake sites, and the ability to contain the intake and discharge structures within a coffer dam or turbidity curtain array with area 0.23 acres.

[10 ~~7~~] An assumption has been made that any wetlands or streams within the ROWs or interconnects would be affected by construction. Impacts associated with ROW construction and some in-water construction

activities are temporary in nature.

[11-8]An assumption has been made to allow a 100'x100' area of impact for in-water cooling water intake system (CWIS) components. No alternate sites are proposed to use shoreline intake structures; all intake/discharge structures are proposed to be sited at a depth of -20' MLW or greater. Horizontal directional drilling (HDD) is proposed to access off shore locations.

[12-9]A cooling water pump house would be located alongshore to the selected cooling water source, and would occupy 0.5 acre total area.

[13-10]For the purposes of this evaluation, it has been assumed that any water line ROW would require a 120' width for construction to allow installation of 2-60" pipes.

[14-11]For new transmission line construction or reconductoring of existing circuits to accommodate the EPR, a 300' wide cleared ROW is assumed to be required. The Transmission Corridor for the Thiokol site is different from the one in the March 2009 Requests for Additional Information Responses (UN#09-140)

[15-12]Other off-site uses include any required parking, laydown, staging requiring land alteration.

[16-13]ER Section 4.1.1.1 (Rev. 5) states the CCNPP3 and supporting facilities will be located on 2,070 acres; ER Section 4.3.1.3 (Rev. 5) states the construction of CCNPP3 will permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas. This table provides data primarily for the approximate 420-acre EPR Site (see Footnote 2) for consistent comparison with the alternative sites and, therefore, some data in this table will be different from quantities of affected acreage stated in the ER Rev. 5.

[17-14] ER Section 9.3.2.4.5 (UN#09-319) states that the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream within the 619 ac Thiokol site. This table provides data primarily for an approximate 420-acre EPR site within the overall property boundary. Therefore the data on affected wetlands and streams in this table will differ from the data presented in ER Section 9.3.2.4.5 (UN#09-319). ~~[13]ER Section 4.1.1.1 claimed the CCNPP3 and supporting facilities would be located on 2,070 acres; ER Section 4.3.1.3 stated the construction of CCNPP3 would permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas~~

~~[14] RAI Section 9.3.2.4 states the former Thiokol site is a 620 ac property; RAI Section 9.3.2.4.5 states the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream (Source: National Wetlands Inventory, Branch of Resource and Mapping Support, Geospatial Data – The Wetlands Geo Web; U.S. Fish and Wildlife Service, Website: http://www.fws.gov/wetlands/. Accessed July 2008.)~~

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.

MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Enclosure 2

Calvert Cliffs Nuclear Power Plant Unit 3
Alternate Site Evaluation, Revision 2
October 15, 2009

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Calvert Cliffs Nuclear Power Plant Unit 3

Alternate Site Evaluation v.[2]

[•] October 2009

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Calvert Cliffs Nuclear Power Plant Unit 3

Alternate Site Evaluation, Revision 2

October 15, 2009

Preparer: _____ Date: 10/15/09

Reviewer: _____ Date: 10/15/09

Approver: _____ Date: 10/15/09

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1. Introduction

UniStar Nuclear Energy has submitted a COLA for constructing and operating a U.S. Evolutionary Power Reactor (EPR) nuclear power station on the Calvert Cliffs Campus (*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 factors that were considered in the site selection process, it was essential to develop and document the framework for conducting this process. In addition, it was important to develop an approach for weighing factors and assessing sites based on the relative contribution of each factor to the applicant's overall objectives.

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 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 were reviewed to see if there were relevant criteria that needed to be incorporated into this site selection process and they are summarized as follows:

- State of Maryland – The Power Plant Research Program (PPRP) of the Maryland Department of Natural Resources (MDNR) was established under the Power Plant Siting and Research Act of 1971 (PPRP, 2006). The PPRP coordinates and receives recommendations from various federal, state, and local agencies regarding the Certificate of Public Convenience and Necessity (CPCN) application with ultimate disposition of these recommendations and the application itself by the Maryland Public Services Commission (PSC) (COMAR, 2007). Among other functions, the PPRP evaluates potential impacts of the proposed facility on environmental resources, including air, surface water and groundwater, terrestrial resources, cultural and historic resources, and socioeconomics, while assessing overall site suitability. This evaluation is for all proposed power facilities, including new plants, expansions of existing plants, and transmission lines (PPRP, 2006). These environmental considerations are consistent with the criteria included in this site selection process

2. Alternative Site Evaluation Process

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."*

This alternative site evaluation process for Calvert Cliffs Unit 3 implements the special case and will proceed with 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 alternate 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 *Alternate Sites*
  - Score *Potential 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 *Alternate Sites*
- Compared *Alternate Sites* to *Proposed Site*
  - Apply weighted scoring to *Proposed Site*
  - Evaluate if any *Alternate Sites* are "Environmentally Preferred" to the *Proposed Site*
  - If one or more of the *Alternate Sites* is significantly higher, then apply commercial scoring criteria to evaluate whether an *Alternate 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 U.S. Army Corps of Engineers (USACE) information including project purpose and the Least Environmentally Damaging Practicable Alternative (LEDPA) Analysis.

Figure 2-1
Alternative Site Evaluation Process

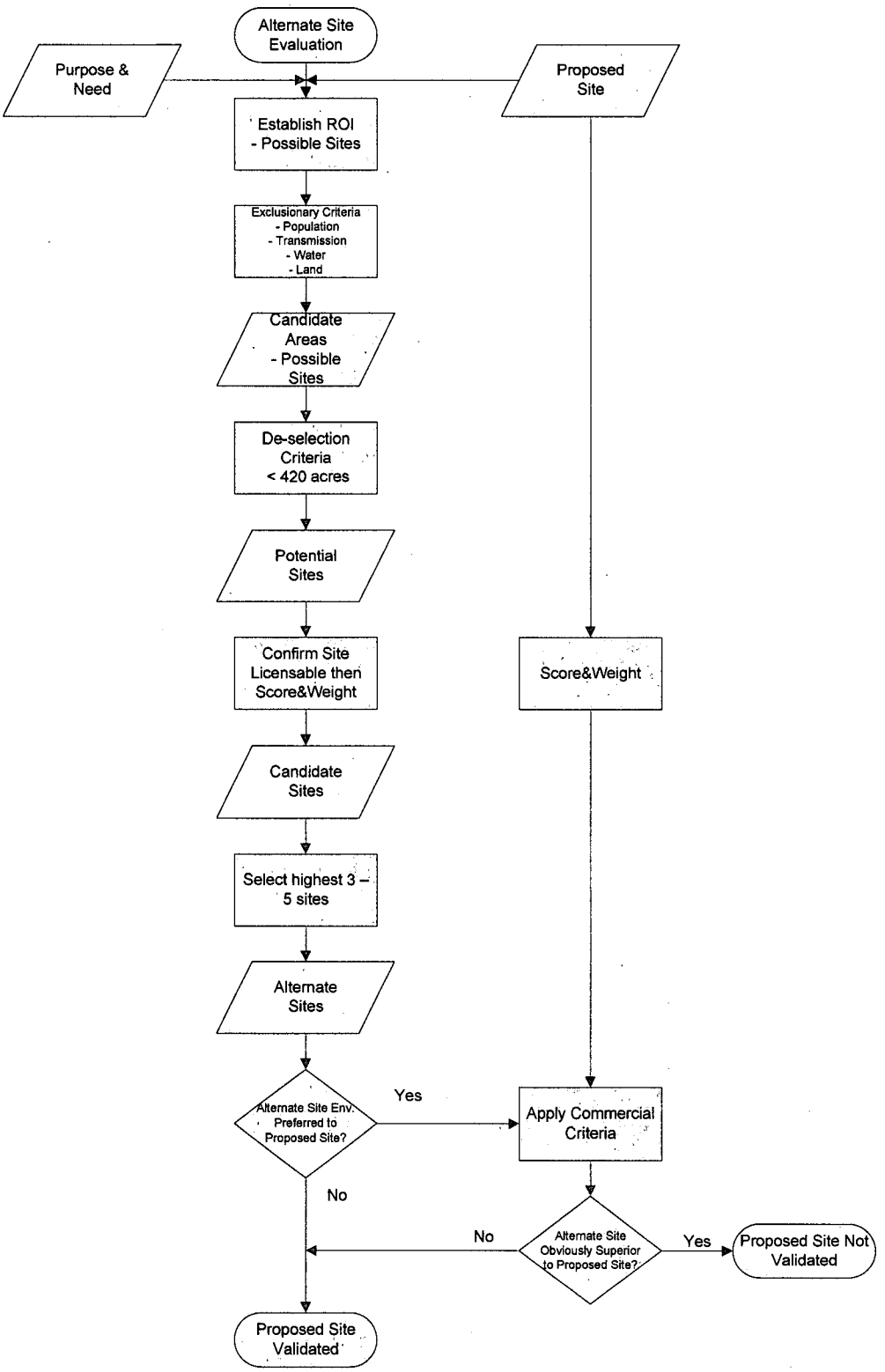
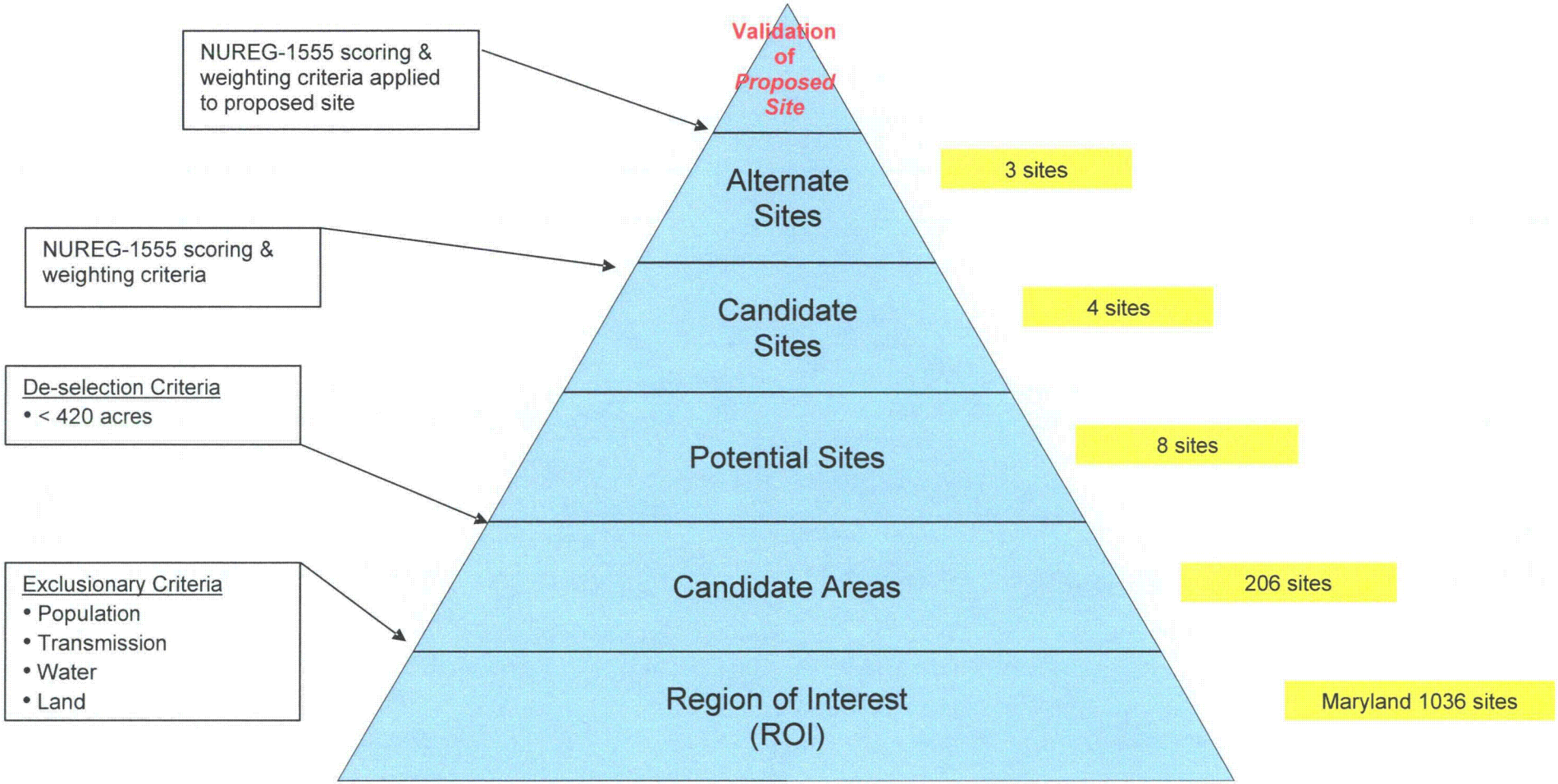


Figure 2-2
Alternative Site Evaluation Process Overview



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. Furthermore, ESRP 9.3 states that the ROI can be a state. The "Purpose and Need" stated in Part 3 of the Calvert Cliffs Nuclear Power Plant Unit 3 (CCNPP3) COLA is:

> *"The purpose is to build and operate a large baseload merchant power plant that will generate needed power for Maryland."*

Furthermore, the Maryland Public Service Commission (PSC) (Ref.17 and 18) has identified that "Maryland suffers from a State-wide shortfall in net generating capacity", that nuclear provides the highest cumulative economic value added ("EVA") compared to the costs of all other energy scenarios, and an expectation that the needed electric power, to meet in-state demand, should not be imported into the state (i.e., generation from within the state boundary of MD) to ensure reliable and cost-effective power to the Maryland consumer. In addition, the PSCs Final Order in Case No. 9127 granting a Certificate of Public Convenience and Necessity (CPCN), References 19 and 20, for construction of Calvert Cliffs Unit 3 states that:

> *"The plant will constitute a new large source of power that would be of benefit to the citizens and State of Maryland, with record showing that such plant location at the site of an existing nuclear plant campus will reduce impacts, and with conditions accepted herein will meet all applicable environmental standards and requirements."*

Based on the aforementioned, the ROI is defined as the state of Maryland (Figure 3-1) and is consistent with the requirements of ESRP 9.3.

The initial pool of possible sites within the ROI was established from two sources, the Maryland Department of the Environment's *Brownfields, Voluntary Cleanup Programs and State Remediation Site* database, as well as the U.S. Energy Information Administration *State Energy Profile* database. These sources included:

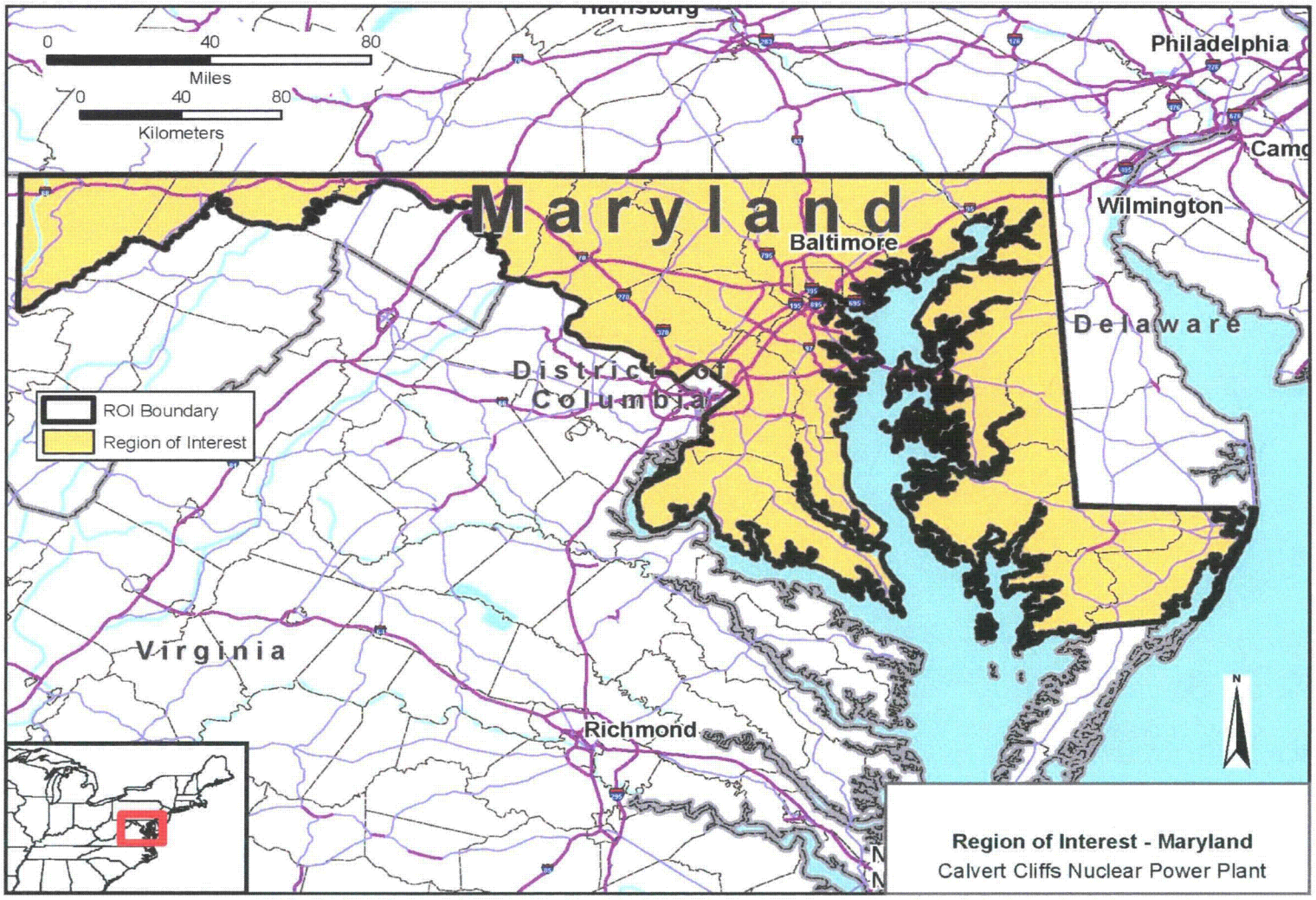
- Brownfield sites
- Remediation sites, including Voluntary Cleanup Program sites, National Priority List sites, and Federal Facilities undergoing remediation
- Power facilities

These two databases in their entirety (i.e., without any additional filtering or screening) established the initial pool of 1036 possible sites which are subsequently used in the CCNPP3 alternate site selection process.

Greenfield sites were not included in either database and hence this pool of sites does not include any such sites. Greenfield sites are being addressed on a generic basis in the Environmental Report.

A detailed discussion of the need for power in Maryland is provided in Chapter 8 of the Environmental Report.

FIGURE 3-1
Region of Interest



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 206 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.

Figure 4-1
Exclusionary Criteria – Population Center

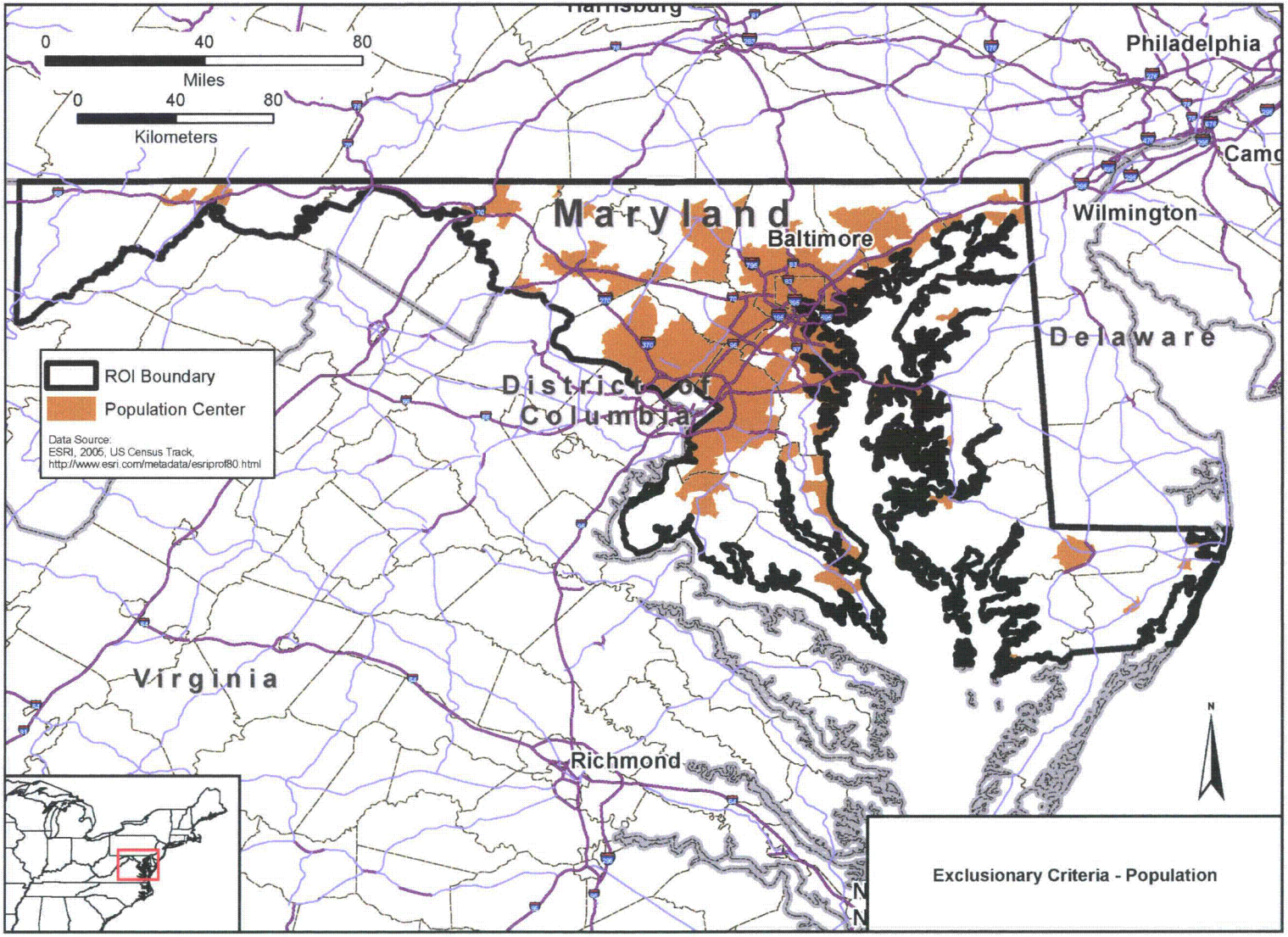


Figure 4-2
Exclusionary Criteria – Transmission Line Exclusion Area

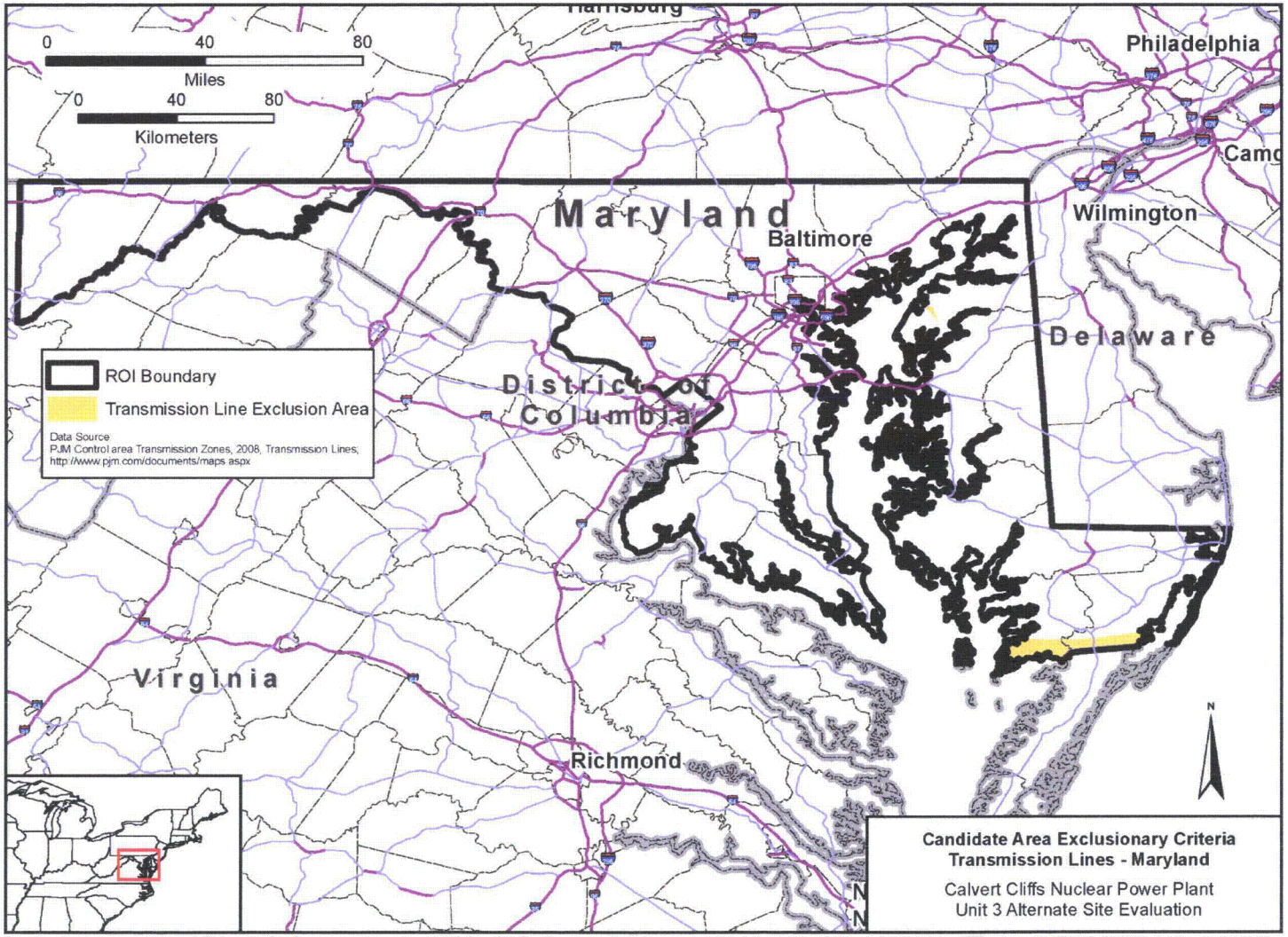


Figure 4-3
Exclusionary Criteria – Waterway Exclusion Area

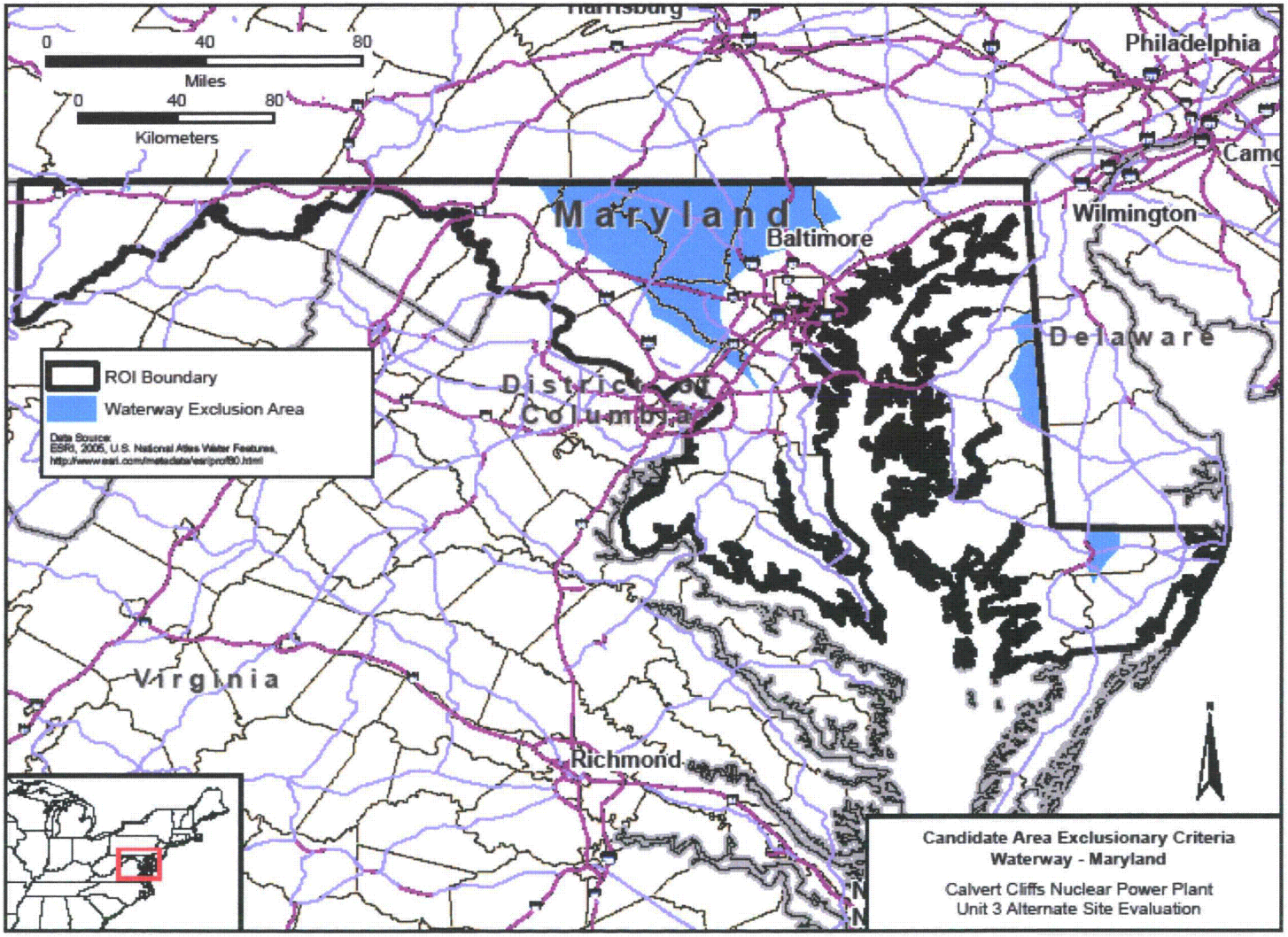


Figure 4-4
Exclusionary Criteria – Dedicated Land

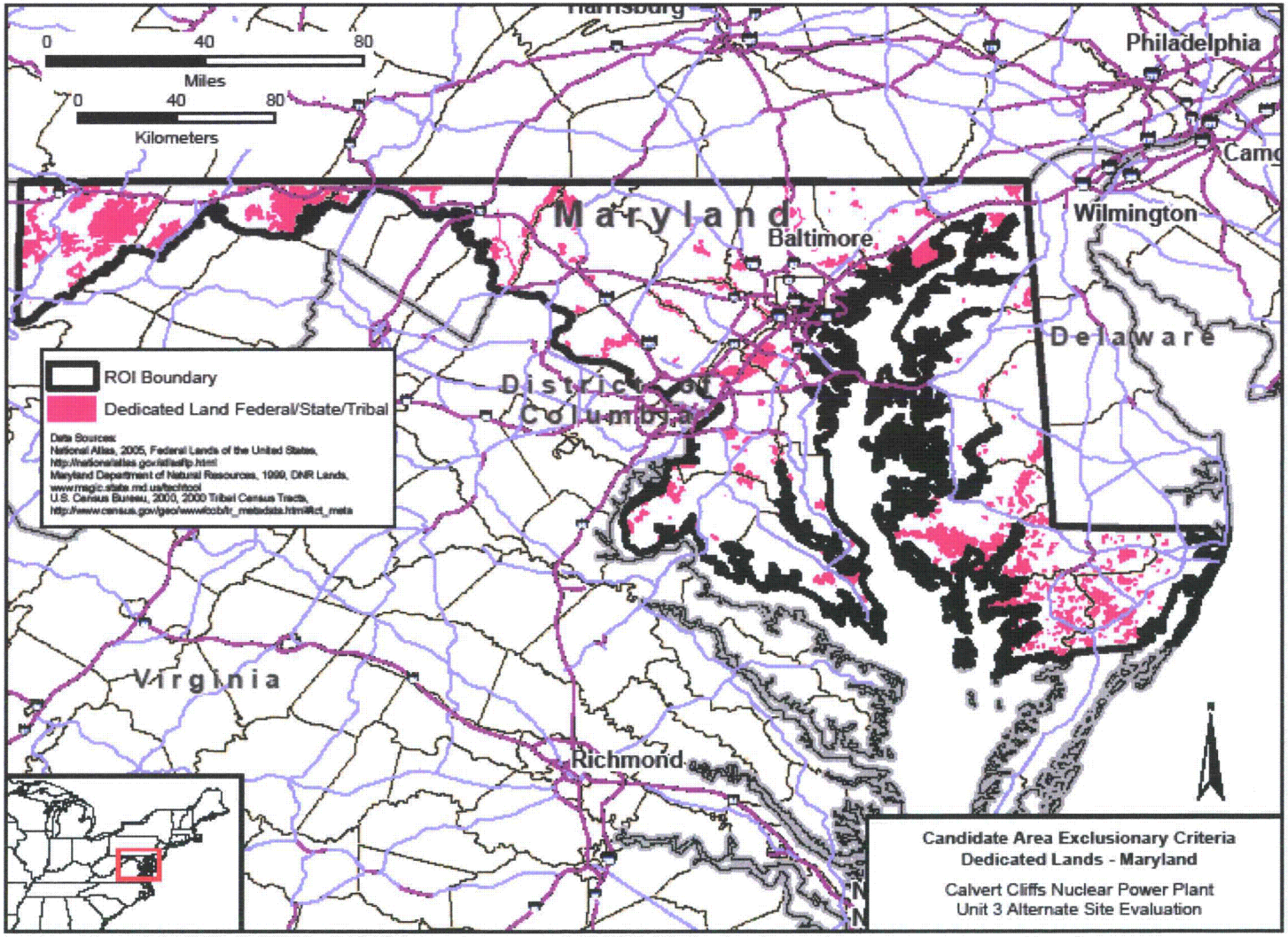


Figure 4-5
Candidate Area Exclusionary Criteria - Composite

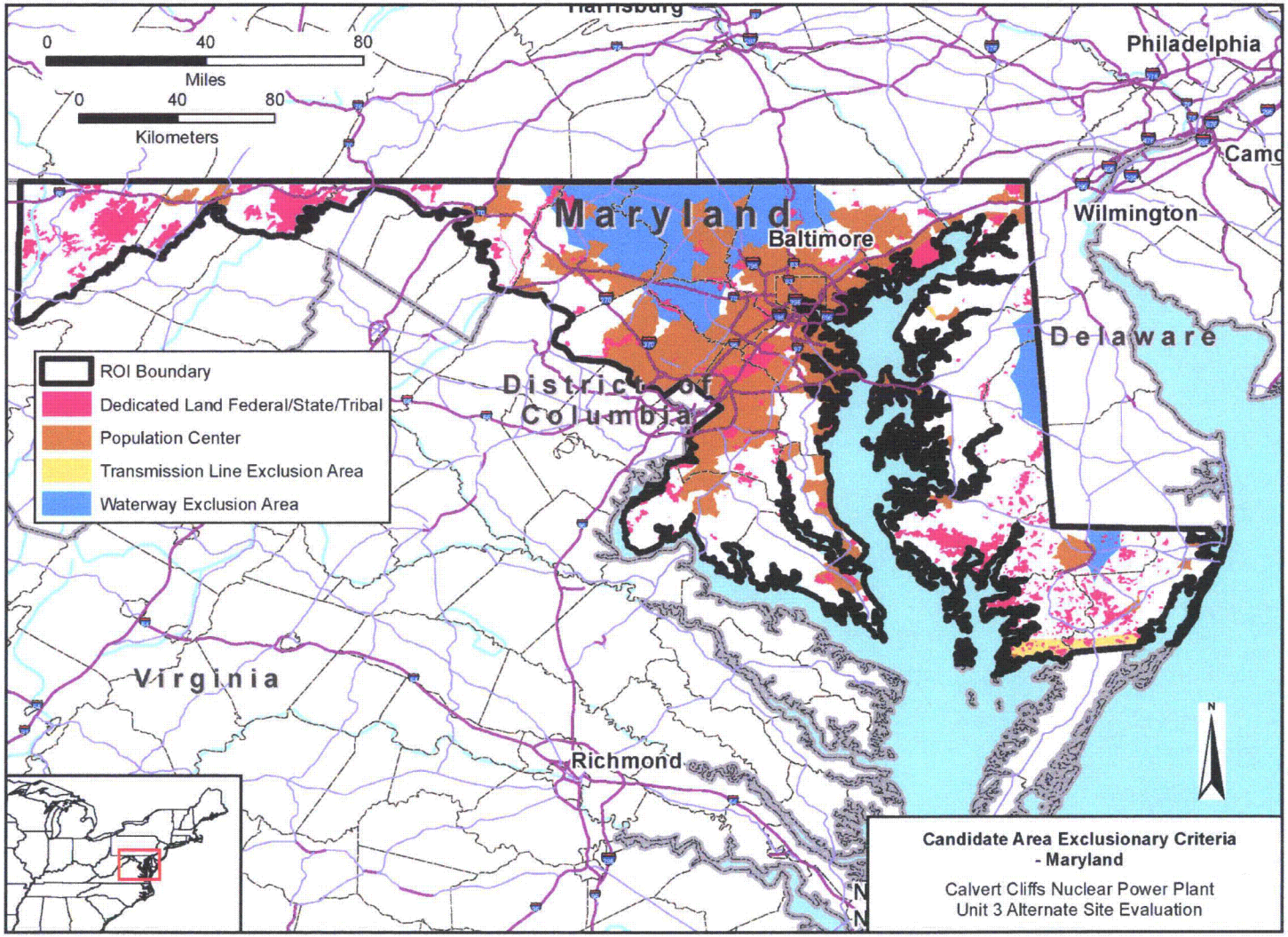


Figure 4-6
Candidate Areas

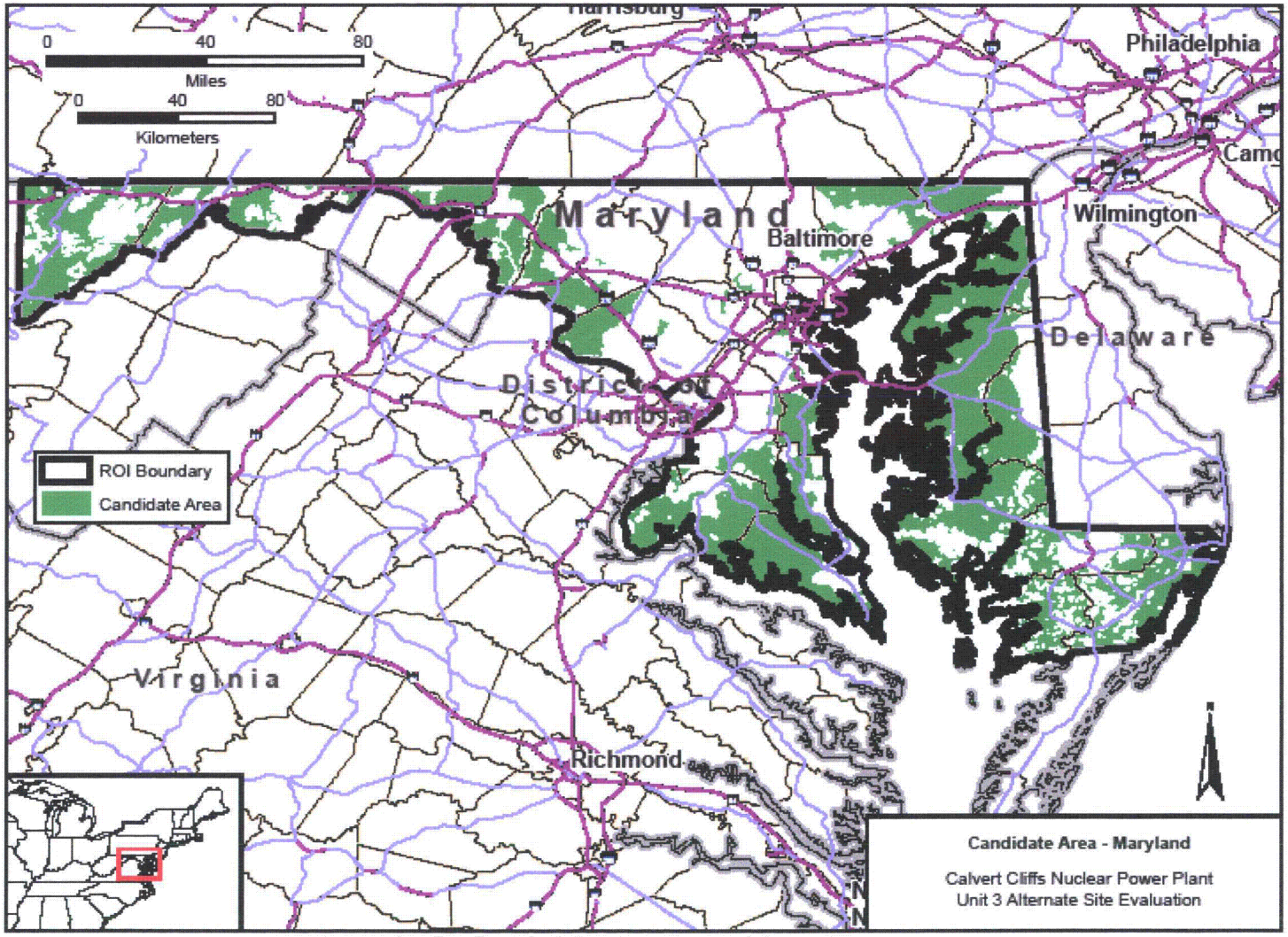
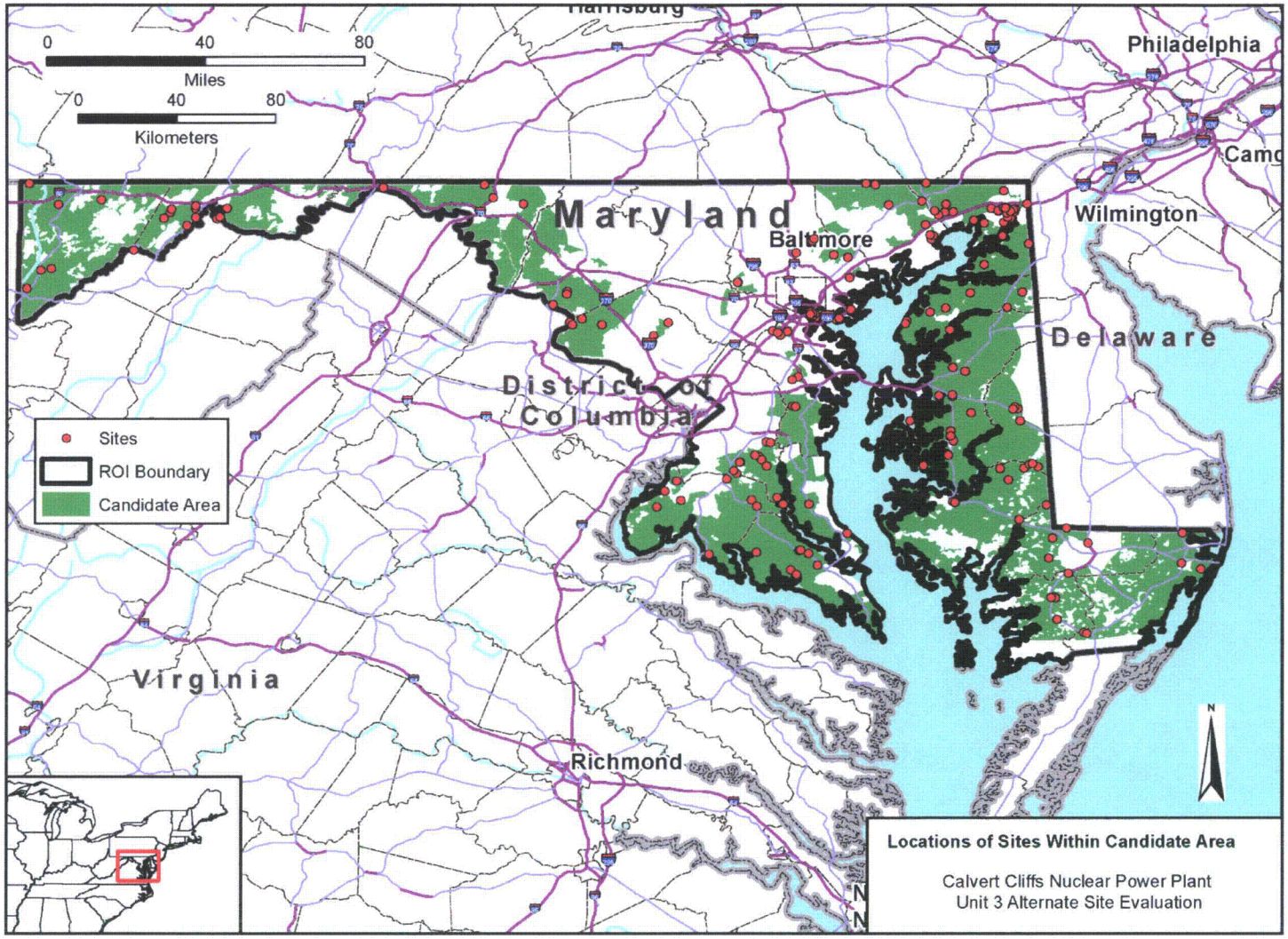


Figure 4-7
Sites in Candidate Areas



5. Potential and Candidate Sites

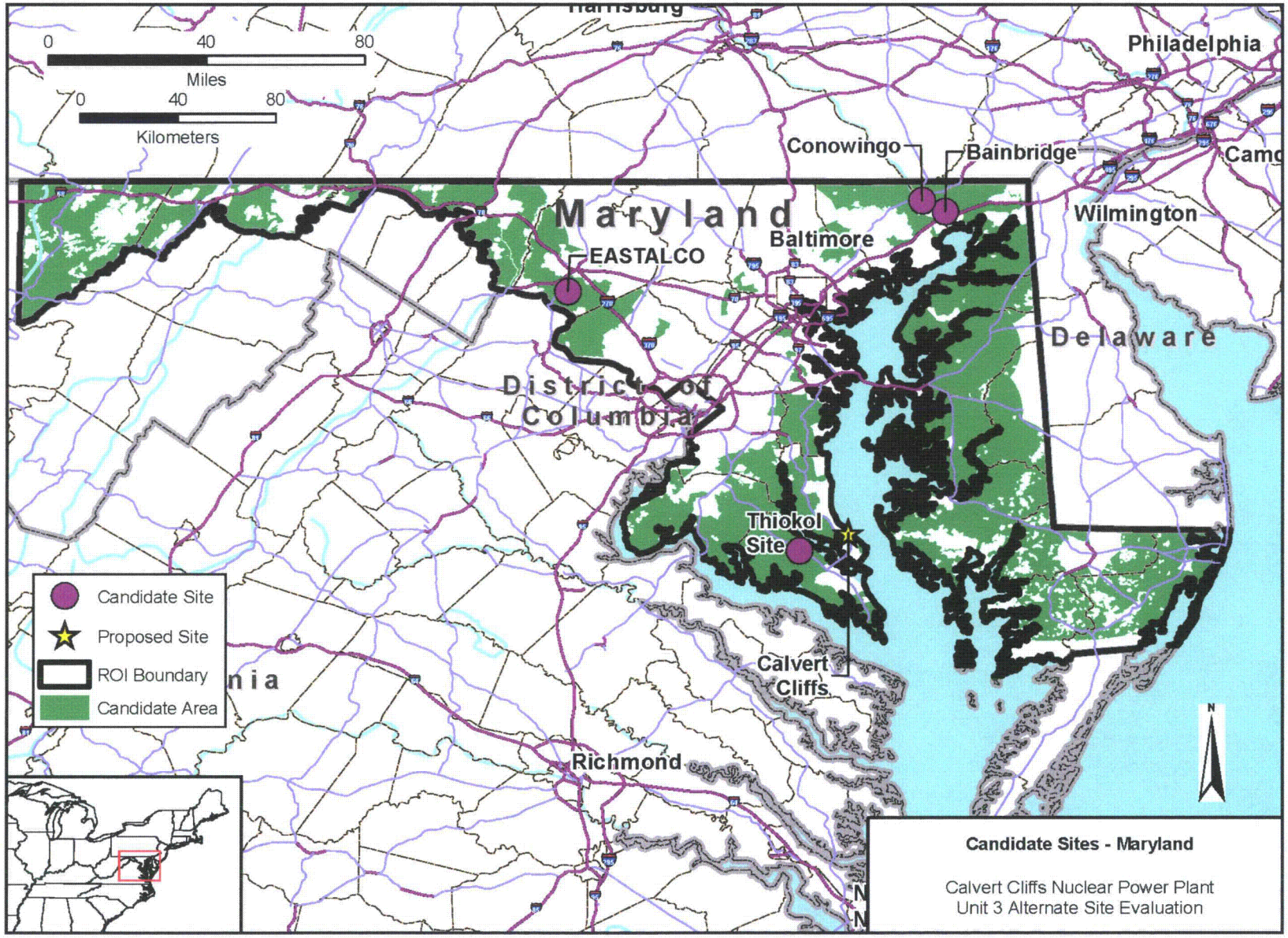
The next step in the site selection process was to screen the candidate areas using refined discretionary criteria to identify potential geographic locations for the placement of the proposed nuclear power station. A de-select criteria, as allowed for in NUREG-1555 and EPRI Guide, was applied to the 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.

Eight (8) *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. The Sparrows Point site was 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 Morgantown site was determined not to be a viable option based on the fact that utilizing Morgantown as the site does not meet the "need for power". That is, removing an existing/operating 1486MW facility such as Morgantown to replace it with 1600MW for a net addition of 114MW does not increase electric supply significantly and, as such, does not meet the need for power. 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 four (4) sites were identified as licensable and viable for continuing as *Candidate Sites* (Figure 5-1) for the next step of the process.

Candidate Sites

- Bainbridge
- Conowingo
- EASTALCO
- Thiokol Site

Figure 5-1
Candidate Sites



6. Alternate 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 CEG 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 *Alternate 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:

Alternate Sites

- Bainbridge
- EASTALCO
- Thiokol Site

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

Figure 6-1
Alternative Sites

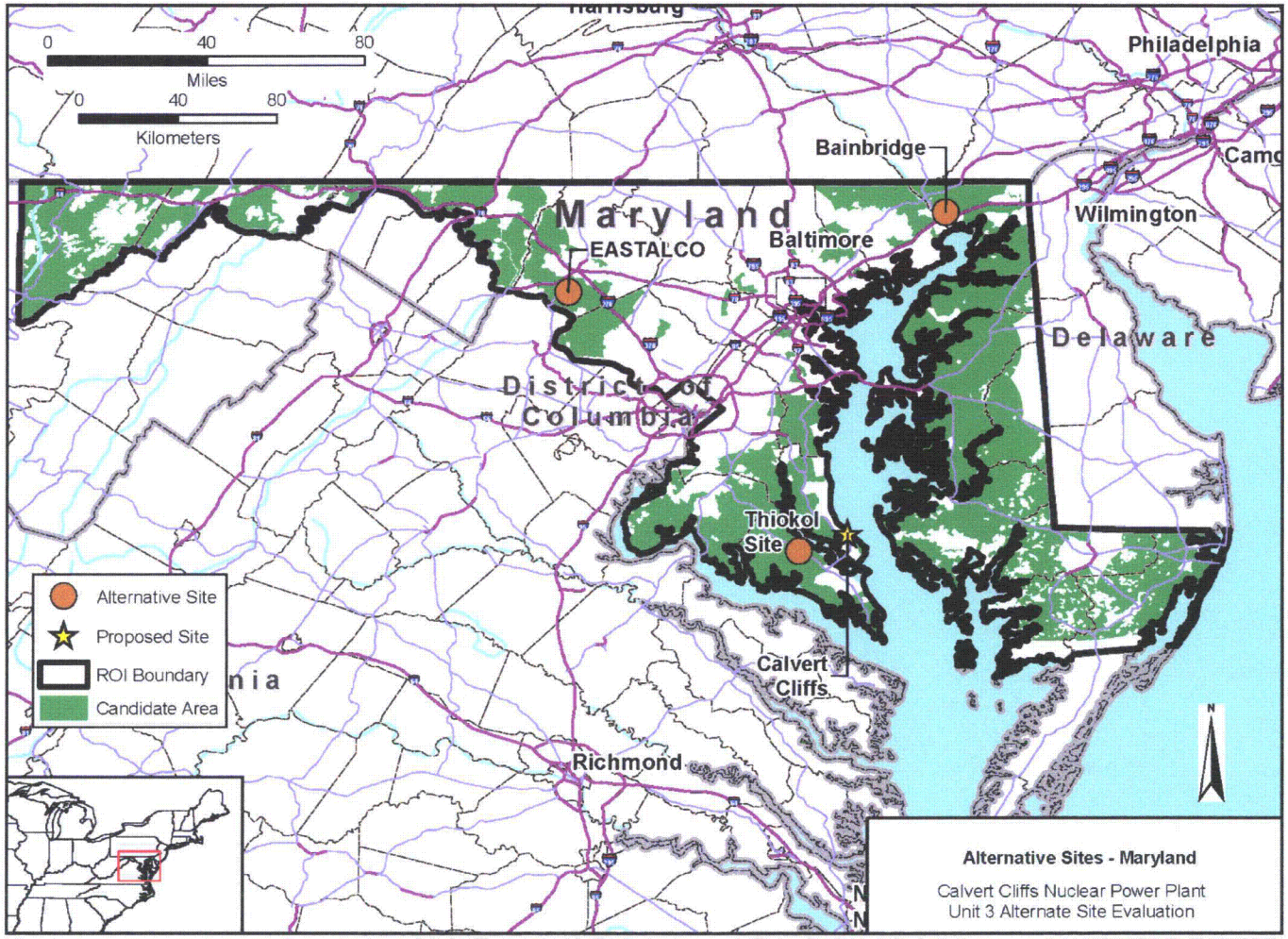


Table 6-1
Weighted Scoring & Ranking to Determine Alternative Sites

Criteria[1]	Weight	Bainbridge		Conowingo		EASTALCO		Thiokol	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
1. Land use, including availability, and areas requiring special consideration	6.33	3.1	19.9	3.6	22.9	3.7	23.7	3.1	19.4
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including the protected area, cooling towers, ponds, switchyard, construction support areas		5.0		5.0		5.0		5.0	
1b. Special Areas: Hazardous waste or spoils areas		2.3		5.0		2.7		2.8	
1c. Zoning		2.0		4.8		5.0		2.1	
1d. Distance to dedicated land		2.8		1.0		1.0		1.0	
1e. Topography		3.6		2.3		5.0		4.4	
2. Hydrology, water quality, and water availability	9.0	4.7	42.0	4.7	42.0	5.0	45.0	4.0	36.0
2a. Water Quality (chemistry)		4.0		4.0		5.0		2.0	
2b. Receiving Body Water Quality		5.0		5.0		5.0		5.0	
2c. Volume		5.0		5.0		5.0		5.0	
3. Terrestrial resources (including endangered species)	7.28	2.5	18.2	2.5	18.2	4.0	29.1	2.5	18.2
3a. Endangered/threatened habitats		1.0		1.0		3.0		1.0	
3b. Floodplains		4.0		4.0		5.0		4.0	
4. Aquatic biological resources (including endangered species)	7.28	1.0	7.3	1.0	7.28	3.0	21.8	1.0	7.28
4a. Endangered/threatened habitats		1.0		1.0		3.0		1.0	
4b Thermal Discharge Sensitivity		1.0		1.0		3.0		1.0	
5. Socioeconomics (including aesthetics, demography, and infrastructure)	5.50	4.0	22.0	4.4	24.2	5.0	27.5	3.6	19.8
5a. Emergency services		5.0		5.0		5.0		5.0	
5b. Construction traffic		5.0		5.0		5.0		5.0	
5c. Construction workforce		5.0		5.0		5.0		5.0	
5d. Housing and necessities		1.0		3.0		5.0		1.0	
5e. Schools		4.0		4.0		5.0		2.0	
6. Environmental Justice	4.72	4.0	18.9	4.0	18.9	2.5	11.8	2.0	9.44
6a. Minority population		4.0		4.0		1.0		2.0	
6b. Low-income population		4.0		4.0		4.0		3.0	
7. Historic and Cultural Resources	4.94	1.0	4.94	1.0	4.94	2.0	9.88	4.0	19.76
7a. Historic properties		1.0		1.0		1.0		3.0	
7b. Historic districts		1.0		1.0		3.0		5.0	
8. Air Quality	4.00	3.5	14.0	3.5	14.0	4.0	16.0	4.5	18.0
8a. Climate and Meteorology: Weather risks/conditions		4.0		4.0		5		4.0	
8b. Class 1 Areas, Attainment / non-attainment Area		3.0		3.0		3		5.0	
9. Human Health	6.06	1.0	6.1	2.0	12.0	2.7	16.2	3.3	20.0
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone		1.0		4.0		2.0		4.0	

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

Criteria[1]	Weight	Bainbridge		Conowingo		EASTALCO		Thiokol	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
9b. Radiological pathways – water		1.0		1.0		5.0		5.0	
9c. Radiological pathways - food		1.0		1.0		1.0		1.0	
10. Postulated Accidents(a)	4.56	1.0	4.6	1.0	4.6	1.0	4.6	3.0	13.7
10a. Distance to nearby potential hazards [per definition of Reg Guide 4.7]		1.0		1.0		1.0		3.0	
11. Transport of Radioactive Material (a)	3.00	2.0	6.0	2.0	6.0	1.0	3.0	2.0	6.0
11a. Operations/ Transportation: Support/challenges to transport of nuclear fuel and wastes		2.0		2.0		1.0		2	
12. Transmission corridors (land used, feasibility, and resources affected)	7.72	4.0	30.9	3.5	27.0	4.0	30.9	3.0	23.2
12a. Environmental impact of proposed transmission interconnection		4.0		3.5		4.0		3.0	
13. Population distribution and density	8.67	2.5	21.7	2.5	21.7	1.5	13.0	4.5	39.0
13a. Distance to population centers		3.0		2.0		1.0		5.0	
13b. Population density		2.0		3.0		2.0		4.0	
14. Facility costs	5.50	4.7	25.6	2.2	11.8	3.2	17.6	1.6	8.5
14a. Transportation: Barge access and capacity – distance, construction, or upgrade requirements		4.7		1.9		1.4		1.7	
14b. Transportation: Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements		4.6		2.4		5.0		1.4	
15. Geology/Seismology	7.11	4.0	28.4	4.5	32.0	3.8	26.7	3.8	26.7
15a. Geology/ Seismology: Vibratory ground motion – seismic peak ground acceleration		5.0		5.0		5.0		5.0	
15b. Geology/Seismology: Depth to bedrock, soil stability, and compaction		3.0		5.0		4.0		2.0	
15c. Geology/Seismology: Surface faulting and deformations		5.0		5.0		5.0		5.0	
15d. Geology/Seismology: Other geological hazards		3.0		3.0		1.0		3.0	
16. Wetlands	8.33	5.0	41.7	4.3	36.0	5.0	41.7	3.7	30.5
16a. Total wetlands		5.0		5.0		5.0		5.0	
16b. Wetlands Component of Site		5.0		3.0		5.0		1.0	
16c. High Quality Wetlands		5.0		5.0		5.0		5.0	
Total			312.0		298.2		338.3		318.0
Alternative Site? (Yes/No)[2]		YES		NO		YES		YES	

[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 score.

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 *Alternate 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 312.0 (Bainbridge) to 338.3 (EASTALCO). CCNPP3, the *Proposed Site*, received a score of 333.2, slightly less than the 338.3 received by the highest scoring *Alternative Site*, EASTALCO.

One standard deviation of the *Alternative Site* scores is 16.2 points. The difference between the EASTALCO score and the score for CCNPP Unit 3, the *Proposed Site*, is 5.1 points or less than 2 percent different from the CCNPP3 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 alternate site evaluation.

Table 7-1
Evaluation for "Environmentally Preferred"

Criteria[1]	Weight	Calvert Cliffs		Bainbridge		EASTALCO		Thiokol	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
1. Land use, including availability, and areas requiring special consideration	6.33	4.1	26.1	3.7	23.7	3.6	22.9	3.1	19.4
1a. Land Area and Existing Facilities: Ability to support the combined EPR footprint including protected area, cooling towers, ponds, switchyard, construction support areas		5.0							
1b. Special Areas: Hazardous waste or spoils areas		4.8							
1c. Zoning		5.0							
1d. Distance to dedicated land		1.4							
1e. Topography		4.4							
2. Hydrology, water quality, and water availability	9.00	4.0	36.0	4.7	42.0	5.0	45.0	4.0	36.0
2a. Water Quality (chemistry)		2.0							
2b. Receiving Body Water Quality		5.0							
2c. Volume		5.0							
3. Terrestrial resources (including endangered species)	7.28	3.0	21.8	2.5	18.2	4.0	29.1	2.5	18.2
3a. Endangered/threatened habitats		1.0							
3b. Floodplains		5.0							
4. Aquatic biological resources (including endangered species)	7.28	1.0	7.3	1.0	7.3	3.0	21.8	1.0	7.3
4a. Endangered/threatened habitats		1.0							
4b Thermal Discharge Sensitivity		1.0							
5. Socioeconomics (including aesthetics, demography, and infrastructure)	5.50	3.4	18.7	4.0	22.0	5.0	27.5	3.6	19.8
5a. Emergency services		3.0							
5b. Construction traffic		5.0							
5c. Construction workforce		5.0							
5d. Housing and necessities		1.0							
5e. Schools		3.0							
6. Environmental Justice	4.72	3.5	16.52	4.0	18.9	3.0	14.2	2.0	9.4
6a. Minority population		3.0							
6b. Low-income population		4.0							
7. Historic and Cultural Resources	4.94	3.0	14.8	1.0	4.9	2.0	9.9	4.0	19.8
7a. Historic properties		1.0							
7b. Historic districts		5.0							
8. Air Quality	4.00	3.5	14.0	3.5	14.0	4.0	16.0	4.5	18.0
8a. Climate and Meteorology: Weather risks/conditions		4.0							
8b. Class 1 Areas, Attainment / non-attainment Area		3.0							

Table 7-1
Evaluation for "Environmentally Preferred"

Criteria[1]	Weight	Calvert Cliffs		Bainbridge		EASTALCO		Thiokol	
		Score	Wt. Score	Score	Wt. Score	Score	Wt. Score	Score	Wt. Score
9. Human Health	6.06	3.0	18.2	1.0	6.1	2.7	16.2	3.3	20.2
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone		3.0							
9b. Radiological pathways – water		5.0							
9c. Radiological pathways – food		1.0							
10. Postulated Accidents(a)	4.56	1.0	4.6	1.0	4.6	1.0	4.6	3.0	13.7
10a. Distance to nearby potential hazards [per definition of Reg Guide 4.7]		1.0							
11. Fuel Cycle Impacts(a)	3.00	2.0	6.0	2.0	6.0	1.0	3.0	2.0	6.0
11a. Operations/ Transportation: Support/challenges to transport of nuclear fuel and wa		2.0							
12. Transmission corridors (land used, feasibility, and resources affected)	7.72	4.5	34.7	4.0	30.9	4.0	30.9	3.0	23.2
12a. Environmental impact of proposed transmission interconnection		4.5							
13. Population distribution and density	8.67	4.5	39.0	2.5	21.7	1.5	13.0	4.5	39.0
13a. Distance to population centers		5.0							
13b. Population density		4.0							
14. Facility costs (environmental)	5.50	3.0	16.5	4.7	25.6	3.2	17.6	1.6	8.5
14a. Transportation: Barge access and capacity – distance, construction, or upgrade requirem		5.0							
14b. Transportation: Rail line access and capacity – distance, spur requirements, line capacity, upgrade requirements		1.0							
15. Geology/Seismology	7.11	4.0	28.4	4.0	28.4	3.8	26.7	3.8	26.7
15a. Geology/ Seismology: Vibratory ground motion – seismic peak ground acceleration		5.0							
15b. Geology/Seismology: Depth to bedrock, soil stability, and compaction		3.0							
15c. Geology/Seismology: Surface faulting and deformations		5.0							
15d. Geology/Seismology: Other geological hazards		3.0							
16. Wetlands	8.33	3.7	30.5	5.0	41.7	5.0	41.7	3.7	30.5
16a. Total wetlands		5.0							
16b. Wetlands Component of Plot		1.0							
16c. High Quality Wetlands		5.0							
Total			333.2		312.0		338.3		318.0
Is Alternate Site "Environmentally Preferred"? (Yes/No)				NO		NO		NO	

1

8. Results of the Alternative Site Evaluation Process

The alternate site evaluation process discussed above was implemented in order to validate the selected *Proposed Site* for the location of UniStar's proposed nuclear power station within the identified ROI. The results of the alternate site evaluation process validated the Calvert Cliffs Nuclear Power Plant Unit 3 site as the *Proposed Site*.

The evaluation and comparison of the *Alternative Sites* to the *Proposed Site* verified that none of the *Alternative Sites* are "Environmentally Preferable" to the *Proposed Site* and, thus, no further evaluation is required.

9. References

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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
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

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)	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)
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 zones affecting site footprint	5 = No 100 or 500 year FEMA floodplain or State floodplain zones affecting approximate footprint of site 4 = 100 or 500 year FEMA floodplain or State floodplain zones affecting less than 10% of site footprint 3 = 100 or 500 year FEMA floodplain or State floodplain zones affecting 11% to 20% of site footprint 2 = 100 or 500 year FEMA floodplain or State floodplain zones affecting 21% to 30% of site footprint 1 = 100 or 500 year FEMA floodplain or State floodplain zones affecting greater than 30% of site footprint
4. Aquatic biological resources (including endangered species)		
4a. 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

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
4b. Thermal Discharge Sensitivity SCORED USING SCREENING DATA	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
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.

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
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.
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.

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

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
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

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
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
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

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 2,601 person/mi^2.

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 US Census Populated Places population centers 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
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 1 = No barge access possible at or within 5 mi of site

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
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 at or within 20 feet of the ground surface 1 = Quaternary-aged soil 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
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

Ranking Criteria[1]	Metric[2]	Scoring Basis[2]
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.

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.

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.

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.

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.

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]

Appendix C—Environmental Scoring Justification

Bainbridge		
Ranking Criteria[1]	Score	Justification
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	5	Facility could be accommodated on an approximate 420-acre site within the property with limited changes needed to the layout and/or some restrictions for construction work area.
1b. Hazardous waste or spoils areas	2.3	The site contains two areas where previous contamination has not been completely removed. The selected remedies for these locations are institutional controls (deed restrictions on the landfill cap and ground water use).
1c. Zoning	2	Site is zoned as BSU – Bainbridge Special Use and is located within the State of Maryland's Cecil County Enterprise Zone.
1d. Distance to dedicated land	2.8	The nearest dedicated land, Deer Creek Park, is located approximately 6.9 miles from the site.
1e. Topography	3.6	While there is a significant degree of topographic relief at the site (262 feet total), the great majority of this grade change occurs near or along the bluff adjacent to the Susquehanna River (the bluff itself is approximately 142 feet high). This would not significantly affect development of the 420 EPR site, which is relatively flat across approximately 70 percent of the site. The score of 3.6 (rather than 1) reflects the expert panel's consideration of the limited cut and fill operations to build a power plant on the 420 acre site considering the limited area within the site that is impacted by steeper relief.
2. Hydrology, water quality, and water availability		
2a. Water Quality	4	The segment of the Susquehanna River that would be the source of cooling water is designated as tidal fresh water estuary. This portion of the Northern Chesapeake Bay (CB1TF2) surface water segment is part of the Lower Susquehanna River Area Sub-Basin [COMAR 26.08.02.08(B)(2)(a)].
2b. Receiving Body Water Quality	5	The segment of the Lower Susquehanna River Sub-Basin considered as a potential cooling water source does not have a special water quality classification and is considered a Tier I water. The Surface Water Use Designation for the Northern Chesapeake Bay (CB1TF2) segment is Use II-P: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting and Public Water Supplies [COMAR 26.08.02.03-3(C-1)].
2c. Water availability	5	The main source of water for the site would be the Susquehanna River. The lowest 7-day average flow with a ten year return frequency (7Q10) for the period of record (42 years) for the river at the nearest United States Geological Survey (USGS) gage (01578310) is approximately 2452 million gallons per day (mgd). The total water usage at the site is estimated to be 50 mgd.

Bainbridge		
Ranking Criteria[1]	Score	Justification
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	1	One known location of federally-listed species and one location of state-listed species were identified onsite; all locations consisted of some terrestrial habitat. (Species identification is not available at this reconnaissance level.)
3b. Floodplains	4	The 100 or 500 year FEMA floodplain or state floodplain zones affect approximately 1 percent of the site.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	1	One known location of federally-listed species was identified onsite and encompasses some mapped wetlands. (Species identification is not available at this reconnaissance level.)
4b. Thermal Discharge Sensitivity	1	This site would use the freshwater portion of the Susquehanna River for cooling water and this segment of the river is designated as tidal fresh water estuary. This portion of the Northern Chesapeake Bay (CB1TF2) surface water segment is part of the Lower Susquehanna River Area Sub-Basin (COMAR 26.08.02.08(B)(2)(a)). The Surface Water Use Designation for the Northern Chesapeake Bay (CB1TF2) segment is Use II-P: *Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting and Public Water Supplies* (COMAR 26.08.02.03-3(C-1)). Maryland's antidegradation policy classifies this portion of the Susquehanna River as Tier 1.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Approximately three hospitals, eight police stations, and 18 fire stations or departments (including volunteer stations) are located within Cecil County. Cecil County has an office of emergency services that coordinates disaster, mitigation, preparedness response, and recovery.
5b. Construction traffic	5	State Highway 276 is adjacent to the north of the site and U.S. Highway 222 is adjacent to the south of the site. Other roads within one mile of the site include State Highway 275, State Highway 269. Interstate 95 is also located within five miles southeast of the site.
5c. Construction workforce	5	According to occupational projections for 2004 through 2014, there appears to be a general upward trend for construction and extraction employment within the Susquehanna Workforce Investment Area (WIA), which includes Cecil and Harford counties. An increase in employment indicates additional competition in acquiring workforce for the construction of the project. In addition, according to 2014 projections, the construction workforce required for the project, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3, would represent approximately 34 percent of the total construction workforce within the WIA. According to May 2008 U.S. Department of Labor (DOL), Bureau of Labor Statistics (BLS) metropolitan and non-metropolitan area data within 50 miles of the site, the construction workforce required for the project would represent less than 2 percent of the total construction workforce.

Bainbridge		
Ranking Criteria[1]	**Score**	**Justification**
5d. Housing and necessities	1	According to the census tract data, a total of 243,587 housing units are vacant or not occupied, which represents more than 61 times the projected construction workforce, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3. The nearest population center greater than 25,000 is Bel Air South, which is just over 10 miles away.
5e. Schools	4	Approximately 812 public and private elementary, middle, and high schools are located within a 50 mile radius of the site.
6. Environmental Justice (EJ)		
6a. Minority population	4	The site is located in CT 31201 BG 3. CT 31201 BG 3 has a lower percentage of minority residents (8.6 percent) compared to one of the two adjacent CTs, and the State of Maryland (36.0 percent) and a slightly higher percentage of minority residents compared to the other adjacent CT and Cecil County (6.4 percent). CT 31201 BG 2, an adjacent CT/BG to the project site, has the highest minority population (17.4 percent) of the CT/BGs at or adjacent to the site.
6b. Low-income population	4	The percent of poverty for CT 31201 BG 3 is slightly higher (9.5 percent) but comparable to the Cecil County (7.2 percent) and the State of Maryland (8.5 percent) and lower than the two adjacent CTs. CT 31201 BG 2, an adjacent CT/BG to the project site, has the highest low-income population (11.6 percent) of the CT/BGs at or adjacent to the site.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	1	Based on data available from the Maryland Historical Trust (MHT) and the National Register of Historic Places (NRHP), there are a total of 12 NRHP listed properties within 5 miles of the site; 2 properties are within one mile of the site. The 2 properties located within a mile of the site are: the Paw Paw Building, and the Edward W. Haviland House. Due to the site's location, both Cecil and Harford County were considered when reviewing the MHT's database.
7b. Historic districts	1	Based on data available through the NRHP and MHT, there are 4 NRHP listed historic districts within 5 miles of the site, 2 of which are less than 1 mile from the site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	4	Based on NRC Regulatory Guide 1.76, Figure 1, the site has a low expected occurrence of tornadoes that are only expected to be moderate in intensity (<200 mph). Based on hurricane strike data reported by the National Hurricane Center, the site is in an area that has experienced approximately 2 to 6 hurricanes since 1900, a very low frequency of occurrence.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	3	The site is located Cecil County, which is identified by U.S. EPA as a non-attainment area for 8-hr ozone. The site is not located in a PSD Class I Area.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	1	There are approximately 263 total residences and businesses within 1 mile of the site based on a review of aerial maps. In addition, there are 3 schools within 1 mile of the site. There are no hospitals within 1 mile of the site.

Bainbridge		
Ranking Criteria[1]	**Score**	**Justification**
9b. Radiological pathways - water	1	The nearest surface water (Susquehanna River) is less than 1 mile from the site (0.91 miles), is freshwater, and is designated as a public water supply. This portion of the Northern Chesapeake Bay (CB1TF2) surface water segment is part of the Lower Susquehanna River Area Sub-Basin [COMAR 26.08.02.08(B)(2)(a)]. The Surface Water Use Designation for the Northern Chesapeake Bay (CB1TF2) segment is Use II-P: *Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting and Public Water Supplies* [COMAR 26.08.02.03-3(C-1)]. The nearest sole source aquifer is greater than 5 miles from the site (24 miles).
9c. Radiological pathways - food	1	Agricultural land is located approximately 0.24 miles from the site. Shellfish beds are approximately 5.1 miles from the site.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	1	A Consolidated Rail Corporation (Conrail) rail line (0.9 miles from the center of the site) and the Susquehanna River (1.3 miles from the center of the site) border the western edge of the site. Interstate-95 is 2.2 miles from this site. Hooker Chemical and Plastics Corporation, manufacturer of plastics materials, synthetic resins, and non-vulcanized elastomers, is 3.2 miles from the site. There are no major airports or naval air stations within 10 miles.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	2	The distance from the site to the National Repository at Yucca Mountain is greater than 2000 miles and the distance to the nearest low-level waste disposal site, Waste Control Specialists in Andrews, Texas, is greater than 1000 miles, whether by rail or road. There are two census tracts, one each along the rail and the truck routes, with population densities greater than 2601 people per square mile (ppsm). These census tracts are located greater than the first 10 miles but less than the first 20 miles from the site.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	4	There are four existing 500 kV transmission lines available for possible interconnection: two are about 5 mi north of the site, two lines are about 13 mi from the site, and the other 500 kV line is about 23 mi away from the site. Therefore, the nearest viable transmission line to be considered for a potential point of intersection (POI) is a 500 kV transmission line located about 4.9 mi away from the site.
13. Population distribution and density		
13a. Distance to population centers	3	Based on the U.S. Census Populated Place Areas, the nearest population center of 25,000 or more, Bel Air South, is located 10.2 miles from the site.
13b. Population density	2	The population density within a 20-mile radius of the site, based on 2007 U.S. Census Bureau data, is 395 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	4.7	There is existing barge access at the site on the Susquehanna River.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	4.6	There is an existing Conrail rail line along the western border of the site.

Bainbridge		
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 Ground Acceleration (PGA) with 2 percent probability of exceedance in 50 years at this site is 0.089g. The center of Aberdeen Proving Grounds is located approximately 11 miles from the center of the site. Ordinance testing is performed at Aberdeen, but data is not currently available to evaluate the magnitudes and locations of detonations associated with this testing. However, it is not anticipated that this testing would cause unacceptable ground motions at the site, and it has therefore not been incorporated in the rating for this subcriteria.
15b. Depth to bedrock, soil stability	3	Based on the available information from the Maryland Geologic Survey (MGS), the United States Department of Agriculture (USDA), and the Maryland Department of the Environment (MDE), the bedrock at this site may be within 20 feet of the existing ground surface, or quaternary soils could extend greater than 20 feet below ground surface (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 miles.
15d. Other geological hazards	3	Queries of the United States Department of the Interior (USDI) "National Mine Map Repository" database identified one underground mine within Cecil county, in which the site resides, and numerous underground mines in adjacent counties to the north and west. Based on this information, underground mines may be present within 10 miles of the site. The site is located approximately 20 miles from the closest identified potential karst susceptible area, the Long Green Valley. Potentially karstic Coastal Plain Unconsolidated (CPU) sediments are not indicated within 20 miles of the site.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the National Wetlands Inventory (NWI) database, approximately 0.4 percent, or 4.6 acres of the 1,069 acre property are wetlands.
16b. Total Acres of Wetlands Within Site	5	According to the NWI database, the 423-acre site does not contain any wetlands.
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands.

EASTALCO		
Ranking Criteria[1]	**Score**	**Justification**
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	5	The facility could be accommodated on an approximate 420-acre site within the property with limited changes needed to the layout and/or some restrictions for construction work area.
1b. Hazardous waste or spoils areas	2.7	This property is listed on the state's State-Master List of sites of the MDE, Land Restoration Program, Internet Mapping System database and it is unknown if the site needs environmental remediation.
1c. Zoning	5	This site is zoned GI – General Industry and A-Agricultural.
1d. Distance to dedicated land	1	The nearest dedicated land, Monocacy Natural Resources Management Area, is located approximately 3.5 miles from the site.
1e. Topography	5	There is approximately 33 feet of relief across the site. The topography is generally flat and has less than 50 feet of relief, with limited cut-and-fill requirements.
2. Hydrology, water quality, and water availability		
2a. Water Quality	5	The portion of the Potomac River that would be the source of cooling water is considered to be fresh water. This segment of the Potomac River is designated as part of the Middle Potomac River Area Sub-Basin surface water segment [COMAR 26.08.02.08(P)(1)].
2b. Receiving Body Water Quality	5	The area of the Middle Potomac River considered as a potential cooling water source does have a drinking water supply special water quality use classification and is considered a Tier I water. The Surface Water Use Designation for the Middle Potomac River Area Sub-Basin segment is Use I-P: Water Contact Recreation, Protection of Nontidal Warmwater Aquatic Life and Public Water Supply [COMAR 26.08.02.03-3(B)].
2c. Water availability	5	The main source of water for the proposed site will be the northerly portion of the main stem of the Potomac River. The 7Q10 for the period of record (114 years) for the river at the nearest USGS gage (01638500) is approximately 3715 mgd. The total water usage at the site is estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	3	One known location of state-listed species was identified about 1 mile south of the site boundary. This location encompasses terrestrial habitats. (Species identification is not available at this reconnaissance level.)
3b. Floodplains	5	No 100 or 500 year FEMA floodplain or state floodplain zones affect the site footprint.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	3	One known location of state-listed species was identified about 1 mile south of the site boundary. This location encompasses mapped aquatic habitats consisting of streams. (Species identification is not available at this reconnaissance level.)

EASTALCO		
Ranking Criteria[1]	**Score**	**Justification**
4b. Thermal Discharge Sensitivity	3	This site would use the Potomac River for cooling water and this portion of the river is considered to be fresh waters. This segment of the Potomac River is designated as part of the Middle Potomac River Area Sub-Basin surface water segment (COMAR 26.08.02.08(P)(1)). The Surface Water Use Designation for the Middle Potomac River Area Sub-Basin segment is Use I-P: *Water Contact Recreation, Protection of Nontidal Warmwater Aquatic Life and Public Water Supply* (COMAR 26.08.02.03-3(B)). Maryland's antidegradation policy classifies this portion of the Potomac River as Tier 1.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Approximately five hospitals, five police stations, and 22 stations or departments (including volunteer stations) are located within Frederick County. Frederick County has a division of emergency management that coordinates disaster mitigation, preparedness, and recovery.
5b. Construction traffic	5	State Highway 351 is located just off of the site to the west. Interstate 70 (to the north), Interstate 270 (to the east) and U.S. Highway 15 (to the west) are also located within five miles of the site.
5c. Construction workforce	5	According to occupational projections for 2004 through 2014, there appears to be a general upward trend for construction and extraction employment within the Frederick County WIA. An increase in employment indicates additional competition in acquiring workforce for the construction of the project. In addition, according to 2014 projections, the construction workforce required for the project, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3, would represent approximately 33 percent of the total construction workforce within the WIA. According to May 2008 BLS metropolitan and non-metropolitan area data within 50 miles of the site, the construction workforce required for the project would represent less than 2 percent of the total construction workforce.
5d. Housing and necessities	5	According to the census tract data, a total of 189,404 housing units are vacant or not occupied, which represents approximately 48 times the projected construction workforce, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3. The nearest population center greater than 25,000 is Frederick, which is approximately 4 miles away.
5e. Schools	5	Approximately 1113 public and private elementary, middle, and high schools are located within a 50 mile radius of the site.
6. Environmental Justice (EJ)		
6a. Minority population	1	The site is located in CT 7523 BG 2. CT 7523 BG 2 has a lower percentage (11.5 percent) of minority residents compared to two of the five adjacent CTs and the State of Maryland (36.0 percent) and a higher percentage compared to Frederick County (10.7 percent). CT 7510 BG 4, an adjacent CT/BG to the project site, has the highest minority population (40.4 percent) of the CT/BGs at or adjacent to the site and had a percent minority population over 30 percent greater than Frederick County, MD.

EASTALCO		
Ranking Criteria[1]	**Score**	**Justification**
6b. Low-income population	4	The percent of poverty for CT 7523 BG 2 is slightly higher (5.9 percent) when compared to two of the five adjacent CTs and Frederick County (4.5 percent). CT 7523 BG 2 is lower than three of the five adjacent CTs and the State of Maryland (8.5 percent). CT 7523 BG 4, an adjacent CT/BG to the project site, has the highest low-income population (7.7 percent) of the CT/BGs at or adjacent to the site.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	1	According to data available through the MHT and the NRHP, there are 17 NRHP list properties within 5 miles of the site; 1 property is less than 1 mile from the site (Carrollton Manor).
7b. Historic districts	3	According to data available through the MHT and the NRHP, there is 1 historic district within 5 miles of the site, the Buckeystown Historic District. It is more than 1 mile from the site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	5	Based on NRC Regulatory Guide 1.76, Figure 1, the site has a low expected occurrence of tornadoes that are only expected to be moderate in intensity (<200 mph). The site is located approximately 80 miles inland and not in a coastal area subject to hurricane strikes.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	3	The site is located Frederick County, which is identified by U.S. EPA as a non-attainment area for 8-hr ozone and PM2.5. The site is not located in a PSD Class I Area.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	2	There are approximately 33 total residences and businesses within 1 mile of the site based on a review of aerial maps. In addition, there are no schools or hospitals within 1 mile of the site.
9b. Radiological pathways - water	5	The nearest sole source aquifer is greater than 5 miles from the site (5.9 miles). The nearest surface water is the Potomac River and portions are freshwater. The segment of the Potomac River closest to the site is designated as part of the Middle Potomac River Area Sub-Basin surface water segment [COMAR 26.08.02.08(P)(1)]. This area of the Middle Potomac River does have a drinking water supply special water quality use classification. The Surface Water Use Designation for the Middle Potomac River Area Sub-Basin segment is Use I-P: *Water Contact Recreation, Protection of Nontidal Warmwater Aquatic Life and Public Water Supply* [COMAR 26.08.02.03-3(B)]. However, the distance to the Potomac River is greater than 5 miles from the site (5.5 miles).
9c. Radiological pathways - food	1	Agricultural land is located approximately 0.08 miles from the site. Shellfish beds are approximately 43.5 miles from the site.
10. Postulated Accidents(a)		
10a.Distance to nearby potentially hazardous facilities	1	A Baltimore and Ohio (B&O) rail line and spur are 0.7 and 0.5 miles from the site, respectively. McCormick Paint Works, a paint, resin, enamel, and lacquer manufacturer, and Trans-Tech, Inc., a manufacturer of ceramics and advanced electronic materials, are located 1.9 and 2.0 miles, respectively, from the site. Capricorn Pharmaceuticals, a pharmaceutical preparations corporation, is 2.4 miles away. Interstate-70 and I-270 are 4.6 and 4.8 miles, respectively, from the site. There are no major airports or naval air stations within 10 miles of this site.

EASTALCO		
Ranking Criteria[1]	**Score**	**Justification**
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	1	The distance from site to the National Repository at Yucca Mountain is greater than 2000 miles and the distance to the nearest low-level waste disposal site, Waste Control Specialists in Andrews, Texas, is greater than 1000 miles, whether by rail or road. There is one census tract along the truck route with a population density greater than 2601 ppsm. This census tract is located within the first 10 miles from the site.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	4	There are seven existing 500 kV transmission lines near the site, all within 5 mi of the site. The nearest viable transmission line to be considered for a potential POI is a 500 kV transmission line, located about 3.5 mi away from the site.
13. Population distribution and density		
13a. Distance to population centers	1	Based on the U.S. Census Populated Place Areas, the nearest population center of 25,000 or more, Frederick, is located 4.3 mi from the site.
13b. Population density	2	The population density within a 20-mile radius of the site, based on 2007 U.S. Census Bureau data, is 474 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1.4	The nearest barge access to the site is located 45.8 miles from the site.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	5	A B&O Railroad line is located 0.7 miles from the site with a spur of the railroad located 0.5 miles from 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 0.058g.
15b. Depth to bedrock, soil stability	4	Based on available information from MGS, NRCS, and MDE, the bedrock at this site may be within 20 feet of the existing ground surface in some areas, though bedrock surface undulations may be expected in a karst environment.
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between site and the closest fault area (the Central Virginia Seismic Zone) is greater than 50 miles.
15d. Other geological hazards	1	Queries of the USDI "National Mine Map Repository" database identified one mine of undefined type within Frederick county, in which the site resides, and a few underground mines in adjacent counties to the east, north, and west. Based in this information, underground mines may be present within 10 miles of the site. There is a potential for karst features within 0.5 miles of the site.
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 2 percent, or 21 acres of the 1,742 acre property are wetlands.
16b. Total Acres of Wetlands Within Site	5	According to the NWI database, the identified 425-acre site does not contain any wetlands.

EASTALCO		
Ranking Criteria[1]	**Score**	**Justification**
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands.

Thiokol		
Ranking Criteria[1]	**Score**	**Justification**
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	5	This site could be accommodated on an approximate 420-acre site within the property with limited changes needed to the layout and/or some restrictions for construction work area.
1b. Hazardous waste or spoils areas	2.8	This site was formerly a munitions manufacturing facility and is listed on MDE's Voluntary Cleanup Program and the state's Non-Master List of sites. Remediation activities were conducted at the site in the 1990s to locate and subsequently remove unexploded ordnance (UXO). As a precautionary measure, the property contains covenants that restrict residential development in two areas that total approximately 67 acre in size and encompass potential burial sites of UXO. In December 1999, MDE confirmed that no significant chemical contamination exists above acceptable risk levels.
1c. Zoning	2.1	This site is zoned as Rural Preservation District.
1d. Distance to dedicated land	1	The nearest dedicated land, Greenwell State Park, is located approximately 4.3 miles from the site.
1e. Topography	4.4	The site has approximately 33 feet of relief across the site. The topography is generally flat and has less than 50 feet of relief, with limited cut-and-fill requirements.
2. Hydrology, water quality, and water availability		
2a. Water Quality	2	The segment of the Patuxent River that would be the source of cooling water for the site is designated as mesohaline waters. This portion of the Lower Patuxent River Mesohaline 1 (PAXMH1) surface water segment is part of the Patuxent River Area Sub-Basin [COMAR 26.08.02.08(M)(2)(d)].
2b. Receiving Body Water Quality	5	The Lower Patuxent River Mesohaline 1 (PAXMH1) segment of the Patuxent River Area Sub-Basin that is the area proposed for the source of cooling water for the site does not have special water quality classifications and is considered a Tier I water. The Surface Water Use Designation for the Lower Patuxent River Mesohaline 1 (PAXMH1) is Use II: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting [COMAR) 26.08.02.03-3(C)].
2c. Water availability	5	The main source of water for the proposed site will be the Lower Patuxent River Mesohaline 1 segment. The 7Q10 for the period of record (32 years) for the river at the nearest USGS gage [01594440] is approximately 181 mgd. The total water usage at the site is estimated to be 50 mgd.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	1	This entire site falls within a known location of a federally-listed species. The site contains terrestrial habitat. (Species identification is not available at this reconnaissance level.)
3b. Floodplains	4	The 100 or 500 year FEMA floodplain or state floodplain zones affects approximately 6 percent of the site footprint.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	1	This entire site falls within a known location of a federally-listed species. The site contains aquatic habitat including mapped streams and wetlands. (Species identification is not available at this reconnaissance level.)

Thiokol		
Ranking Criteria[1]	**Score**	**Justification**
4b. Thermal Discharge Sensitivity	1	This site would use the tidally influenced portion of the Patuxent River as its main cooling water source and this portion of the river is designated as mesohaline waters. This portion of the Lower Patuxent River Mesohaline 1 (PAXMH1) surface water segment is part of the Patuxent River Area Sub-Basin (COMAR 26.08.02.08(M)(2)(d)). The Surface Water Use Designation for the Lower Patuxent River Mesohaline 1 (PAXMH1) is Use II: SUPPORT OF ESTUARINE AND MARINE AQUATIC LIFE AND SHELLFISH HARVESTING (COMAR 26.08.02.03-3C). Maryland's antidegradation policy classifies this portion of the Patuxent River as Tier 1.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	5	Approximately two hospitals, one police station, and nine fire stations or departments (including volunteer stations) are located within St. Mary's County. St. Mary's County has an emergency communication division that coordinates disaster preparedness response.
5b. Construction traffic	5	State Highway 235 is adjacent to the north of the site. State Highway 472 is also located just outside of one mile north of the site.
5c. Construction workforce	5	According to occupational projections for 2004 through 2014, there appears to be a general upward trend for construction and extraction employment within the Southern Maryland WIA which includes Calvert, Charles and St. Mary's counties. An increase in employment indicates additional competition in acquiring workforce for the construction of the project. In addition, according to 2014 projections, the construction workforce required for the project, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3, would represent approximately 38 percent of the total construction workforce within the WIA. According to May 2008 BLS metropolitan and non-metropolitan area data within 50 miles of the site, the construction workforce required for the project would represent less than 2 percent of the total construction workforce.
5d. Housing and necessities	1	According to the census tract data, a total of 145,957 housing units are vacant or not occupied, which represents approximately 37 times the projected construction workforce, assumed to be similar to the estimated maximum workforce for the Calvert Cliffs Unit 3. The nearest population center of greater than 25,000 is St. Charles, which is approximately 20 miles away.
5e. Schools	2	Approximately 499 public and private elementary, middle, and high schools are located within a 50 mile radius of the site.
6. Environmental Justice (EJ)		
6a. Minority population	2	The site is located in CT 9956 BG 3. CT 9956 BG 3 has a lower percentage (6.3 percent) of minority residents compared to four out of the five adjacent CTs, St. Mary's County (18.4 percent) and the State of Maryland (36.0 percent). CT 9956 BG 4, an adjacent CT/BG to the project site, has the highest minority population (36.4 percent) of the CT/BGs at or adjacent to the site.

Thiokol		
Ranking Criteria[1]	**Score**	**Justification**
6b. Low-income population	3	CT 9956 BG 3 has a higher percent poverty level (21.7 percent) than all adjacent CTs, St Mary's County (7.2 percent) and the State of Maryland (8.5 percent). CT 9956 BG (project site), has the highest low-income population (21.7 percent) of the CT/BGs at or adjacent to the site.
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	3	There are 3 NRHP listed properties less than 5 miles but more than 1 mile from the site. Although the site is located in St. Mary's County, both the MHT and the NRHP databases were utilized to determine if any historic properties in Calvert County, MD were within 5 miles of the site.
7b. Historic districts	5	There are no NRHP listed historic districts within 1 mile of the site, nor are there any NRHP listed historic districts less than 5 miles from the site. Although the site is located in St. Mary's County, both the MHT and the NRHP databases were also checked to determine if any historic districts in Calvert County, MD were within 5 miles of the site. There were no additional historic districts in Calvert County within 5 miles of the site.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	4	Based on NRC Regulatory Guide 1.76, Figure 1, the site has a low expected occurrence of tornadoes that are only expected to be moderate in intensity (<200 mph). Based on hurricane strike data reported by the National Hurricane Center, the site is in an area that has experienced approximately 2 to 6 hurricanes since 1900, a very low frequency of occurrence.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	5	The site is located St. Mary's County, which is identified by U.S. EPA as in attainment for all pollutants. The site is not located in a PSD Class I Area.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	4	There are approximately 116 total residences and businesses within 1 mile of the site based on a review of aerial maps. In addition, there are no schools or hospitals within 1 mile of the site.
9b. Radiological pathways - water	5	The nearest sole source aquifer is greater than 5 miles from the site (57 miles). Although the nearest surface water (Patuxent River) is approximately 2.7 miles from the site, only portions of the Patuxent River are freshwater and it is not designated as a public water supply. The segment of the Patuxent River closest to the site is the Lower Patuxent River Mesohaline 1 (PAXMH1) surface water segment which is part of the Patuxent River Area Sub-Basin [COMAR 26.08.02.08(M)(2)(d)]. The Surface Water Use Designation for the Lower Patuxent River Mesohaline 1 (PAXMH1) is Use II: *Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting* [COMAR) 26.08.02.03-3(C)].
9c. Radiological pathways - food	1	Agricultural land is located approximately 0.23 miles from the site and shellfish beds are located approximately 2.7 miles from the site.
10. Postulated Accidents(a)		
10a. Distance to nearby potentially hazardous facilities	3	Leonardtown Armory is located 4.9 miles from the site. The site is located 2.7 miles from the Patuxent River. There are no rail lines within 5 miles and no airports or naval air stations within 10 miles.

Thiokol		
Ranking Criteria[1]	**Score**	**Justification**
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a. Support/challenges to transport of nuclear fuel and wastes	2	The distance from the site to the National Repository at Yucca Mountain is greater than 2000 miles and the distance to the nearest low-level waste disposal site, Waste Control Specialists in Andrews, Texas, is greater than 1000 miles, whether by rail or road. The population densities along the transportation routes within the first 10 miles of the site are less than 2601 ppsm.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	3	There are five existing 500 kV transmission lines: three are within 10 mi and are located at the existing Calvert Cliffs Nuclear Power Plant in Calvert County, one line is about 14 mi away, and the other 500 kV transmission line is about 25 mi to the north-northwest of the site. The most viable transmission line to be considered for a potential POI is a 500 kV transmission line located about 13.92 mi away from the site.
13. Population distribution and density		
13a. Distance to population centers	5	Based on the U.S. Census Populated Place Areas, the nearest population center of 25,000 or more, St. Charles, is located 20.3 miles from the site.
13b. Population density	4	The population density within a 20-mile radius of the site, based on 2007 U.S. Census Bureau data, is 150 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	1.7	The nearest barge access is 17.9 miles from the site, on the Potomac River.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	1.4	The nearest rail line is 16.3 miles from 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 0.052g.
15b. Depth to bedrock, soil stability	2	Based on available information from the MGS, NRCS, and MDE, the bedrock at this site is likely too deep for founding the proposed plant structures on rock. The soils above rock may be either quaternary or tertiary in age.
15c. Surface faulting and deformations	5	Based on the USGS Earthquake Hazards Program/Quaternary Fault and Fold Database, the distance between site and the closest fault area (the Central Virginia Seismic Zone) is greater than 50 miles.
15d. Other geological hazards	3	Queries of the USDI "National Mine Map Repository" database did not identify any reported underground mines in St. Mary's county, in which the site resides, or in any of the adjacent counties. Based on this information, the potential for underground mines is not identified within 20 miles of the site. The potential for significant bedrock karst features is not identified within 50 miles of the site. However, potentially karstic CPU sediments may be present within 10 miles of the site. The potential for significant karst complications associated with CPU sediments may not be as great as for bedrock karst, but sufficient information is not readily available to evaluate the potential risk.

Thiokol		
Ranking Criteria[1]	**Score**	**Justification**
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 8 percent, or 50 acres of the 620 acre property are wetlands.
16b. Total Acres of Wetlands Within Site	1	According to NWI database, the 421-acre site contains approximately 34 acres of wetlands.
16c. High Quality Wetlands Within Site	5	This site does not contain any state-designated high-quality wetlands.

Calvert Cliffs 3		
Ranking Criteria[1]	**Score**	**Justification**
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	5	Proposed layout plan can be accommodated on the site as shown in the Environmental Report with little changes needed in the layout and no restrictions for construction work areas.
1b. Hazardous waste or spoils areas	4.8	MDE Land Restoration Program Internet Mapping System database did not identify any hazardous waste areas on the site or in the vicinity and no environmental remediation is anticipated.
1c. Zoning	5	Site is zoned for a combination of light industrial and farm and forest district uses. No zoning restrictions were identified based on Section 1-2 of the Calvert County Zoning Ordinance exempting qualified commercial power generating facilities from the requirements of the zoning ordinances as they are regulated by the State and Federal Government. A qualified commercial power generating facility is a facility that has been issued a Certificate of Public Convenience and Necessity by the Maryland Public Service Commission.
1d. Distance to dedicated land	1.4	The Calvert Cliffs State Park is the nearest dedicated land and is located approximately 0.7 miles from the site.
1e. Topography	4.4	There are approximately 98 feet of relief across the site. The topography is hilly with less than 100 feet of relief, with significant amounts of cut-and-fill required.
2. Hydrology, water quality, and water availability		
2a. Water Quality	2	The Middle Central Chesapeake Bay segment of the Chesapeake Bay would be the source of cooling water and this segment is designated as mesohaline waters.
2b. Receiving Body Water Quality	5	The segment of the Chesapeake Bay being considered as the source of cooling water does not have a special water quality classification and is considered a Tier I water. The Surface Water Use Designation for the Middle Central Chesapeake Bay (CB4MH) segment is Use II: Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting [COMAR 26.08.02.03-3(C)].
2c. Water availability	5	According to USGS data, the estimated mean monthly flow to the Chesapeake Bay was 1617 mgd. Additionally, the Chesapeake Bay holds more than 15 trillion gallons of water.
3. Terrestrial resources (including endangered species)		
3a. Endangered/threatened habitats	1	Multiple locations of known federally-listed T&E species were identified onsite; all of these locations include terrestrial habitats. Additionally, a Maryland Natural Heritage Area was identified onsite.
3b. Floodplains	5	No 100 or 500 year FEMA floodplain or state floodplain zones affect the site footprint.
4. Aquatic biological resources (including endangered species)		
4a. Endangered/threatened habitats	1	Multiple locations of known federally-listed species were identified onsite; all of these locations encompassed mapped aquatic habitats including streams and wetlands. Additionally a Maryland Natural Heritage Area was identified onsite, which does encompass mapped aquatic habitats.

Calvert Cliffs 3		
Ranking Criteria[1]	**Score**	**Justification**
4b. Thermal Discharge Sensitivity	1	This site would use the Middle Central Chesapeake Bay (CB4MH) segment of the Chesapeake Bay proposed for the source of cooling water. This water body is designated as mesohaline waters. The Surface Water Use Designation for the Middle Central Chesapeake Bay (CB4MH) segment is Use II: *Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting* (COMAR 26.08.02.03-3(C)). Maryland's antidegradation policy classifies this portion of the Chesapeake Bay as Tier 1.
5. Socioeconomics (including aesthetics, demography, and infrastructure)		
5a. Emergency services	3	Approximately one hospital, two police stations, and seven fire stations or departments (including volunteer stations) are located within Calvert County. Calvert County has an emergency management and safety division that coordinates disaster preparedness planning.
5b. Construction traffic	5	Existing roads are present adjacent the west side of the site, including State Highway 4 and State Highway 2. One other major road, State Highway 765, is located within one mile of the site.
5c. Construction workforce	5	According to occupational projections for 2004 through 2014, there appears to be a general upward trend for construction and extraction employment within the Southern Maryland WIA, which includes Calvert, Charles and St. Mary's Counties. An increase in employment indicates additional competition in acquiring workforce for the construction of the project. In addition, according to 2014 projections, the construction workforce required for the project, an estimated maximum construction workforce of 3,950 employees, would represent approximately 38 percent of the total construction workforce within the WIA. According to May 2008 BLS metropolitan and non-metropolitan area data within 50 miles of the site, the construction workforce required for the project would represent less than 2 percent of the total construction workforce.
5d. Housing and necessities	1	According to the census tract data, a total of 172,269 housing units are vacant or not occupied within the counties in a 50-mile radius of the site, which represents more than 43 times the projected construction workforce, an estimated maximum of 3,950 employees. The nearest population center greater than 25,000 is St. Charles, which is approximately 25 miles away.
5e. Schools	3	Approximately 538 public and private elementary, middle, and high schools are located within a 50 mile radius of the site.
6. Environmental Justice (EJ)		
6a. Minority population	3	The site is located in CT 861001 BG 1. CT 861001 BG 1 has a lower percentage of minority residents (9.5 percent) compared to all adjacent CTs, Calvert County (16.1 percent) and the State of Maryland (36.0 percent). CT 8609 BG 1, an adjacent CT/BG to the project site, has the highest minority population (28.8 percent) of the CT/BGs at or adjacent to the site.
6b. Low-income population	4	CT 861001 BG 1 has 0 percent of its population below the poverty level, which is lower than all adjacent CTs, Calvert County (4.4 percent) and the State of Maryland (8.5 percent). CT 8609 BG 1, an adjacent CT/BG to the project site, has the highest low-income population (7.1 percent) of the CT/BGs at or adjacent to the site.

Calvert Cliffs 3		
Ranking Criteria[1]	**Score**	**Justification**
7. Historic and Cultural Resources		
7a. Historic buildings, structures, objects and sites	1	Based on the information available from both the MHT and the NRHP, there are no NRHP listed properties within 1 mile of the site. There are 5 NRHP listed properties within 5 miles of the site.
7b. Historic districts	5	No NRHP-listed historic districts are located within 5 miles of the site and there are no NRHP listed historic districts within a mile of the site, according to the MHT and the NRHP.
8. Air Quality (Climate & Meteorology)		
8a. Weather risks/conditions	4	Based on NRC Regulatory Guide 1.76, Figure 1, the site has a low expected occurrence of tornadoes that are only expected to be moderate in intensity (<200 mph). Based on hurricane strike data reported by the National Hurricane Center, the site is in an area that has experienced approximately 2 to 6 hurricanes since 1900, a very low frequency of occurrence.
8b. Prevention of Significant Deterioration (PSD) Class I Area, Attainment / Non-attainment Area	3	The site is located Calvert County, which is identified by U.S. EPA as a non-attainment area for 8-hr ozone. The site is not located in a PSD Class I Area.
9. Human Health		
9a. Emergency preparedness program– proximity of residences/businesses for exclusion zone	3	There are approximately 26 total residences and businesses within 1 mile of the site based on a review of aerial maps. There are no schools or hospitals within 1 mile of the site.
9b. Radiological pathways - water	5	The nearest sole source aquifer is greater than 5 miles from the site (52 miles). The nearest surface water (Chesapeake Bay) is approximately 0.64 miles from the site. However, the water is brackish and is not designated as a public water supply. The segment of the Chesapeake Bay adjacent to the site (CB4MH) has a Surface Water Use Designation of Use II: *Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting* [COMAR 26.08.02.03-3(C)].
9c. Radiological pathways - food	1	Agricultural land is approximately 0.5 miles from the site and potential shellfish beds are located approximately 0.64 miles from the site.
10. Postulated Accidents(a)		
10a.Distance to nearby potentially hazardous facilities	1	Calvert Cliffs Nuclear Power Plant Units 1 and 2 are located 0.6 miles from the site. Cove Point Liquid Natural Gas plant is located 3.2 miles away. The Chesapeake Bay is 0.8 miles from the site. There are no major airports or naval air stations within 10 miles.
11. Fuel Cycle Impacts (Transport of Radioactive Material)		
11a.Support/challenges to transport of nuclear fuel and wastes	2	The distance from the site to the National Repository at Yucca Mountain is greater than 2000 miles and the distance to the nearest low-level waste disposal site, Waste Control Specialists in Andrews, Texas, is greater than 1000 miles, whether by rail or road. The population densities along the transportation routes within the first 10 miles of the site are less than 2601 ppsm.
12. Transmission corridors (land used, feasibility, and resources affected)		
12a. Proximity/availability of power corridors	4.5	There are three existing 500 kV transmission lines within 0.5 mi of the site and one 500 kV line about 15.8 mi of the site. The nearest viable transmission line to be considered for a potential POI is a transmission line located about 0.47 mi away from the site.

Calvert Cliffs 3		
Ranking Criteria[1]	**Score**	**Justification**
13. Population distribution and density		
13a. Distance to population centers	5	Based on the U.S. Census Populated Place Areas, the nearest population center of 25,000 or more, St. Charles, is located 25.3 miles from the site.
13b. Population density	4	The population density within a 20 mile radius of the site, based on 2007 U.S. Census Bureau data, is 135 ppsm.
14. Facility costs [Transportation Access]		
14a. Barge access and capacity – distance, construction, or upgrade requirements	5	There is an existing barge unloading facility at the site.
14b. Rail line access and capacity – distance, spur requirements, line capacity, or upgrade requirements	1	The nearest rail line is located 27.5 miles from 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 0.050g.
15b. Depth to bedrock, soil stability	3	Based on available information from the MGS, USDA, and NRCS, the bedrock at this site is likely too deep for founding the proposed plant structures on rock. The soils above rock are tertiary in age.
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 50 miles.
15d. Other geological hazards	3	Within the Coastal Plain Physiographic Province on which this site sits, bedrock is buried by thick deposits of unconsolidated sediments. Calcareous sediment deposits are present within the Coastal Plain in southern and central Maryland, and are indicated as potentially karstic CPU calcareous sediments on a recent draft karst map. Potential CPU sediments are indicated near the site. Queries of the USDI "National Mine Map Repository" database did not identify any reported underground mines in Calvert or adjacent counties. Based on this information, the potential for significant bedrock karst features or underground mines is not identified within 20 miles of the site. However CPU sediments may be present within 10 miles of the site. The potential for significant karst complications associated with CPU sediments may not be as great as for bedrock karst, but sufficient information is not readily available to evaluate the potential risk. Due to the extent of previous subsurface investigations at the site, the potential for CPU karst complications is relatively more defined than at other sites in the Coastal Plain.

Calvert Cliffs 3		
Ranking Criteria[1]	**Score**	**Justification**
16. Wetlands		
16a. Total Wetlands Within Property Boundary	5	According to the NWI database, approximately 8 percent, or 173 acres of the 2,057 acre property are wetlands.
16b. Total Acres of Wetlands Within Site	1	According to the NWI database, the approximately 421-acre site contains approximately 7 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 [Ref EPRI Siting Study].

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 Calvert Cliffs Nuclear Power Plant Unit 3 siting evaluation included two members from CH2MHILL, two members from AREVA, and five members from UniStar (comprised of an attorney, finance lead, developer, commercial lead, and project management). 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	6.33
2. Hydrology, water quality, and water availability	9.00
3. Terrestrial resources (including endangered species)	7.28
4. Aquatic biological resources (including endangered species)	7.28
5. Socioeconomics (including aesthetics, demography, and infrastructure)	5.50
6. Environmental Justice	4.72
7. Historic and Cultural Resources	4.94
8. Air Quality	4.00
9. Human Health	6.06
10. Postulated Accidents(a)	4.56
11. Fuel Cycle Impacts(a)	3.00
12. Transmission corridors (land used, feasibility, and resources affected)	7.72
13. Population distribution and density	8.67
14. Transportation Access	5.50
15. Geology/Seismology	7.11
16. Wetlands	8.33

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
CWIS	Cooling Water Intake Structure
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
HDD	horizontal directional drilling
km	kilometer
km^2	square kilometer
kV	kilovolt
LEDPA	Least Environmentally Damaging Practicable Alternative
MDNR	Maryland Department of Natural Resources
MDE	Maryland Department of the Environment
MDPSC	Maryland Public Services Commission
MHW	Mean High Water shoreline
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.
OHW	ordinary high water
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
USACE	U.S. Army Corps of Engineers

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

This appendix contains: 1) Project Purpose, 2) the Least Environmentally Damaging Practicable Alternative (LEDPA) Analysis.

Section F1 - Purpose

The basic 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 State of Maryland.

Section F2 – LEDPA Analysis

Table 9.3-12 of ER Chapter 9 of the Calvert Cliffs Unit 3 COLA presents the impacts of the EPR project at four sites; the proposed site and three alternative sites. The relevant information from the subject table needed for a 404(b)1 analysis and subsequent LEDPA determination by the USACE has been provided in the COLA ER Tables 9.3-12, 9.3-13, and 9.3-14 below.

Review of the tables identifies that relative to impacts to Waters of the U.S. *on the site itself,* EASTALCO would be the LEDPA site. However, further evaluation of associated off-site impacts required for water line and transmission line right-of-way (ROW) construction associated with the Alternative Sites, supports Calvert Cliffs Unit 3 as the LEDPA site.

A LEDPA analysis, by regulation, should help identify a site with the least impact to Waters of the U.S. *and with no significant adverse impacts to other environmental resources* as the Least Environmentally Damaging Practicable Alternative Accordingly, based upon a comprehensive evaluation, including 41 other environmental impact criteria used to evaluate the four sites, Calvert Cliffs Unit 3 Alternative Site Evaluation Report (ASER) and supporting materials clearly demonstrate that the Calvert Cliffs Unit 3 site has the smallest overall impact to environmental resources and therefore is the environmentally preferred location for construction of the EPR within the defined Region of Interest, Maryland.

The dredging for barge access is unique to Calvert Cliffs due to its location and existing nuclear facilities. The proposed tidal wetland impact is approximately 5.7 acres (4.5 acres due to the barge slip restoration and the balance of 1.2 acres is associated with the intake structure, discharge pipe, and fish return). The barge facility restoration work to access the pier and improve navigation would have eventually been necessary to service the existing facilities at Units 1 and 2. The tidal work does not impact the overall LEDPA conclusion, as Calvert Cliffs was selected based on a comprehensive evaluation as described below.

The Alternative Sites Bainbridge and EASTALCO share a similar navigable riverine environment where in-water Cooling Water Intake Structure (CWIS) components are proposed. Similar methods of in-water work and identical impacts below Ordinary High Water (OHW) or Mean High Water shoreline (MHW) were assumed. Certain assumptions were used in the calculations of impacts associated with in-water work, estimated at 0.23 acre (100'x100'). These assumptions are based on understanding of the physical environment, based on screening level data and experience of the UniStar Nuclear Energy team with similar projects. Primary factors included the following: an assumption that 0.23 acre would accommodate the cooling water intake system components and any necessary turbidity curtain array or coffer dam; work within the 0.23 acre disturbance footprint could accommodate dredging, blasting, drilling, or any other typical construction methods; the use of horizontal directional drilling (HDD) could be employed to avoid open cut or surface lay pipeline impacts; the pump house and support structures can be sited outside of any regulatory resource area.

The Thiokol Alternative Site is located along the Patuxent River. Because of the soft muddy substrate documented to be in the river at the location of the cooling water intake and discharge locations and a shallow shelf along the southern shoreline that must be spanned to reach suitable water depths, the following assumptions were included in the calculation of impacts presented here: 1) HDD will not be an effective technology, 2) dredging must be employed for the pipe trench and CWIS component locations, 3) the CWIS would need to be located 1000' or greater offshore. Under this scenario, work would be proposed to impact approximately 2.25 acres of waters below MHW, and require approximately 8,000 cubic yards of (in-place) sediment.

Table 9.3-12 Comparison of Wetland and Waterway Impacts from Alternative Sites Evaluation (Reconnaissance Level Data)

	Proposed Site		Alternative Sites					
	Calvert Cliffs 3[16]		Bainbridge		EASTALCO		Thiokol[17]	
Property Acreage	2057.2		1068.6		1742.1		620.0	
Wetlands – Total Property[1] (ac)	173.2		4.6		22.0		49.8	
Wetlands – Site[2] (ac)	6.6		0.0		0.0		34.5	
Streams – Total Property[3] (LF)	21805		8654		32944		7055	
Streams – Site[4] (LF)	3604		1557		1311		3435	
Wetlands Affected – Site[5] (ac)	6.6		0.0		0.0		34.5	
Streams Affected – Site[6] (LF)	3604		1557		1311		3435	
Section 10 Waters: Tidal (ac)	5.7[7]		NA		NA		2.25[8]	
Navigable Riverine (ac)	N/A		0.23[9]		0.23[9]		NA	
Off-Site Wetlands/Waterways Affected –ROWs and Interconnects (ac/LF)[7]	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams
CWIS (in-water components)(ac)[11]	0.23	0	0.23	0	0.23	0	0.23	0
CW Pump House (ac.)[12]	NA	NA	0	0	0	0	0	0
Water Line ROW (ac)[13]	NA	NA	1.3	0	3.2	865	0.4	0
Transmission Line ROW (ac)[14]	0	0	5.2	3517	0.2	1820	26.6	4051
RR Spur/Improvements (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Access Roadways (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Other Off-Site Uses (ac)[15]	NA	NA	NA	NA	NA	NA	NA	NA

[1] "*Total Property*" includes the entirety of the alternate site facility contiguous land holdings (black outline).

[2] "*Site*" includes the 420 parcel on the Total Property selected for EPR development (red outline).

[3] Describes the total length of all streams on the Total Property in linear feet. Includes both mapped perennial and intermittent waterways and obvious drainage ways observed during site inspections or interpreted from desktop mapping.

[4] Describes streams within the 420 EPR Site, calculated in the same manner as streams for "Total Property".

[5] An assumption has been made that any wetlands within the 420 acre Site would be affected.

[6] An assumption has been made that any streams within the 420 acre Site would be affected by construction.

[7] The actual, not estimated, proposed impacts to Sec. 10 regulated tidal waterways below ordinary high water (OHW) or mean high water shoreline (MHW) is approximately 5.7 acres.

[8] The Thiokol site cooling water intake and discharge structures are located within the Patuxent River. Directional drilling would not be possible based on soft mud substrate, and suitable water depths are located 1000' feet into the river channel seaward of OHW or MHW. Accordingly, dredging of a 1000' x 45' pipe trench (4' deep) in addition to 0.5 acres for aquatic structures is proposed, totaling approximately 2.25 acres. Dredging volume (in place) is estimated to be approximately 8,000 cubic yards.

[9] For both the Bainbridge and EASTALCO Alternative Sites, 0.23 acre (100'x100') of wetland disturbance below OHW is assumed. This estimation of impact is based upon prior experience in similar environments, and assumes use of directional drilling to approach intake sites, and the ability to contain the intake and discharge structures within a coffer dam or turbidity curtain array with area 0.23 acres.

[10]An assumption has been made that any wetlands or streams within the ROWs or interconnects would be affected by construction. Impacts associated with ROW construction and some in-water construction activities are temporary in nature.

[11]An assumption has been made to allow a 100'x100' area of impact for in-water cooling water intake system (CWIS) components. No alternate sites are proposed to use shoreline intake structures; all intake/discharge structures are proposed to be sited at a depth of -20' MLW or greater. Horizontal directional drilling (HDD) is proposed to access off shore locations.

[12]A cooling water pump house would be located alongshore to the selected cooling water source, and would occupy 0.5 acre total area.

[13]For the purposes of this evaluation, it has been assumed that any water line ROW would require a 120' width for construction to allow installation of 2-60" pipes.

[14]For new transmission line construction or reconductoring of existing circuits to accommodate the EPR, a 300' wide cleared ROW is assumed to be required. The Transmission Corridor for the Thiokol site is different from the one in the March 2009 Requests for Additional Information Responses (UN#09-140)

[15]Other off-site uses include any required parking, laydown, staging requiring land alteration.

[16]ER Section 4.1.1.1 (Rev. 5) states the CCNPP3 and supporting facilities will be located on 2,070 acres; ER Section 4.3.1.3 (Rev. 5) states the construction of CCNPP3 will permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas. This table provides data primarily for the approximate 420-acre EPR Site (see Footnote 2) for consistent comparison with the alternative sites and, therefore, some data in this table will be different from quantities of affected acreage stated in the ER Rev. 5.

[17] ER Section 9.3.2.4.5 (UN#09-319) states that the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream within the 619 ac Thiokol site. This table provides data primarily for an approximate 420-acre EPR site within the overall property boundary. Therefore the data on affected wetlands and streams in this table will differ from the data presented in ER Section 9.3.2.4.5 (UN#09-319).

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.
MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Table 9.3-13 Summary of Wetlands on Alternate Sites

	Number of discrete wetlands or systems	Wetland types (NWI classification)	Description
Calvert Cliffs 3	5	1. Freshwater Forested/Shrub Wetland 2. Freshwater Pond 3. Freshwater Pond 4. Freshwater Forested/Shrub Wetland 5. Freshwater Pond	1. 4.7 ac of PFO[1] 2. 0.5 ac of PUB[2] 3. 0.02 ac of PUB 4. 0.5 ac of PFO 5. 0.9 ac of PUB
Bainbridge	5	1. Freshwater Forested/Shrub Wetland 2. Freshwater Pond 3. Riverine 4. Riverine 5. Freshwater Forested/Shrub	1. 3.7 ac 2. 0.9 ac 3. 1.3 ac 4. 3.2 ac 5. 0.7 ac
EASTALCO	10	1. Freshwater Emergent Wetland 2. Freshwater Emergent Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Emergent Wetland 7. Riverine 8. Freshwater Emergent Wetland 9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland	1. 0.2 ac 2. 0.4 ac 3. 0.1 ac 4. 0.3 ac 5. 0.9 ac 6. 0.03 ac 7. 1.3 ac 8. 0.2 ac 9. 0.3 ac 10. 0.7 ac

Table 9.3-13 Summary of Wetlands on Alternate Sites

	Number of discrete wetlands or systems	Wetland types (NWI classification)	Description
Thiokol	14	1. Freshwater Forested/Shrub Wetland 2. Freshwater Forested/Shrub Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Forested/Shrub Wetland 7. Freshwater Forested/Shrub Wetland 8. Freshwater Pond 9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland 11. Freshwater Emergent Wetland 12. Estuarine and Marine Wetland 13. Estuarine and Marine Deepwater 14. Freshwater Emergent Wetland	1. 2.5 ac of PFO 2. 31.9 ac of PFO 3. 0.08 ac 4. 0.3 ac 5. 4.3 ac 6. 0.1 ac 7. 0.1 ac 8. 0.5 ac 9. 1.9 ac 10. 5.2 ac 11. 1.1 ac 12. 6.3 ac 13. 6.8 ac 14. 0.3 ac

[1] PFO is a palustrine forested wetland
[2] PUB is a palustrine unconsolidated bottom wetland

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.

MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Table 9.3-14 Summary of Waterways on Alternate Sites

	Number of/names of streams	Stream type	Description
Calvert Cliffs 3	A. Johns Creek	A. Perennial	A. 4661 LF
	B. Tributary to the Bay	B. Perennial	B. 2093 LF
	C. Tributary of Johns Creek	C. Perennial	C. 7400 LF
	D. Goldstein Branch	D. Perennial	D. 2051 LF
	E. Tributary of Perrin Branch	E. Intermittent	E. 4517 LF
	F. Tributary of Perrin Branch	F. Perennial	F. 1083 LF
Bainbridge	A. Tributary of Susquehanna River	A. Perennial	A. 2638 LF
	B. Happy Valley Branch	B. Perennial	B. 6016 LF
	C. Tributary of Susquehanna River	C. Perennial	C. 1279
	D. Tributary of Susquehanna River	D. Perennial	D. 312 LF
	E. Tributary of Susquehanna River	E. Perennial	E. 308 LF
	F. Octoraro Creek	F. Perennial	F. 1433 LF
	G. Tributary to Octoraro Creek	G. Perennial	G. 185 LF
EASTALCO	A. Tributary of Tuscarora Creek	A. Perennial	A.2693 LF
	B. Tuscarora Creek	B. Perennial	B. 12319 LF
	C. Tributary of Tuscarora Creek	C. Intermittent	C. 6001 LF
	D. Tributary of Tuscarora Creek	D. Perennial	D. 3399 LF
	E. Tributary of Tuscarora Creek	E. Intermittent	E. 4634 LF
	F. Horsehead Run	F. Intermittent	F. 3898 LF
	G. Tributary of Tuscarora Creek	G. Intermittent	G. 120 LF
	H. Tuscarora Creek	H. Perennial	H. 745 LF
	I. Tributary of Tuscarora Creek	I. Perennial	I. 395 LF
	J. Tributary of Tuscarora Creek	J. Perennial	J. 327 LF
	K. Tributary of Tuscarora Creek	K. Perennial	K. 378 LF
	L. Tributary of Tuscarora Creek	L. Perennial	L. 403 LF
	M. Tributary of Tuscarora Creek	M. Perennial	M. 317 LF
Thiokol	A. Tributary of Burnt Mill Creek	A. Perennial	A. 5430 LF
	B. Rich Neck Creek	B. Perennial	B. 2250 LF
	C. Tributary of Burnt Mill Creek	C. Perennial	C. 312 LF
	D. Horse Landing Creek	D. Perennial	D. 486 LF
	E. Tributary of Persimmon Creek	E. Perennial	E. 332 LF
	F. Persimmon Creek	F. Perennial	F. 324 LF
	G. Tributary of Killpeck Creek	G. Perennial	G. 300 LF
	H. Killpeck Creek	H. Perennial	H. 300 LF
	I. Tributary of Patuxent Creek	I. Perennial	I. 445 LF
	J. Tributary of Patuxent Creek	J. Perennial	J. 354 LF
	K. Tributary of Patuxent Creek	K. Perennial	K. 308 LF
	L. Tributary of Patuxent Creek	L. Intermittent	L. 201 LF
	M. Tributary of Patuxent Creek	M. Perennial	M. 310 LF
	L. Swanson Creek	L. Perennial	L. 379 LF

Sources:
USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed June 17, 2009.
MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.