April 10, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

NRC STAFF'S WRITTEN STATEMENT OF POSITION

INTRODUCTION

Pursuant to the Atomic Safety and Licensing Board's ("Board") Orders of January 4 and March 20, 2007,[1] the Staff of the Nuclear Regulatory Commission ("Staff") herein provides its written statement of position, together with written testimony and supporting exhibits. In addition, the Staff herein provides the responses to three questions posed by the Board in its March 20 Order.

For the reasons set forth below, the Staff respectfully requests that the Board determine that the Staff's review of Dominion Nuclear North Anna, LLC's ("Dominion" or the "Applicant") application for an early site permit ("ESP") at the North Anna ESP site has been adequate to

[1] *See* Dominion Nuclear North Anna, LLC (Early Site Permit for North Anna ESP Site), Second Revised Scheduling Order, slip op. January 4, 2007; Dominion Nuclear North Anna, LLC (Early Site Permit for North Anna ESP Site), Order (Instructions for Submission of Written Materials and Setting of Topics and Procedures for Evidentiary Hearing), slip op. March 20, 2007 ("March 20 Order").

support a negative finding on Safety Issue 1, an affirmative finding on Safety Issue 2, and make a finding that the Staff's review pursuant to the National Environmental Policy Act of 1969 ("NEPA") has been adequate.

In addition, regarding the Board's three specific "baseline" NEPA findings, the Staff respectfully submits that: (1) it has complied with the requirements set forth in NEPA sections 102(2)(A), (C), and (E), and 10 C.F.R. Part 51, Subpart A; (2) on the record of the Staff's review before it, the Board can conclude, based on a balancing of the conflicting environmental and other factors (but excluding examination of the costs and benefits of the proposed facility, which were not considered here), that the overall balance supports issuance of the ESP; and (3) the Staff's NEPA review has been adequate, and that the facts in the record support the Staff's conclusions with respect to environmental matters, supporting the Staff's recommended issuance of the ESP, conditioned as discussed herein to protect environmental values.

BACKGROUND

On September 23, 2003, Dominion filed an application pursuant to Subpart A of 10 C.F.R. Part 52 for an ESP. The application requested that the NRC approve a site within the existing North Anna Power Station boundaries as suitable for the construction and operation of one or more nuclear power generating facilities, and issue an ESP for the proposed site. The Commission published a notice of hearing and opportunity to petition for leave to intervene in

the *Federal Register* on December 2, 2003.[2] In the Notice of Hearing, the Commission directed the Board to conduct a hearing in accordance with 10 C.F.R. Part 2, and to make certain findings required by 10 C.F.R. § 2.104(b), a so-called "mandatory hearing."

The Blue Ridge Environmental Defense League, Nuclear Information and Resource Service, and Public Citizen filed a hearing request and petition to intervene pursuant to then-applicable 10 C.F.R. § 2.714.[3] The Board admitted two contentions, EC 3.3.2, regarding impacts on striped bass in Lake Anna, and EC 3.3.4, regarding the Environmental Report's ("ER") failure to provide adequate consideration of alternatives for cooling proposed Units 3 and 4. *Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), LBP-04-18, 60 NRC 253 (2004). Ultimately, EC 3.3.4 was settled by the parties, and EC 3.3.2 was resolved via summary disposition. *See Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), Order (Approving Settlement and Dismissal of Contention EC 3.3.4), slip op. January 6, 2005; *Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), LBP-06-24, 64 NRC 360 (2006).

As indicated in the Notice of Hearing, the Staff has completed a detailed technical review of the application, and has documented its findings in a final Safety Evaluation Report ("FSER") and a final Environmental Impact Statement ("FEIS"). *See* NUREG-1835, "Safety Evaluation Report for an Early Site Permit (ESP) at the North Anna ESP Site" (September 2005)

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[2] *See* Dominion Nuclear North Anna, LLC; Notice of Hearing and Opportunity to Petition for Leave to Intervene; Early Site Permit for the North Anna ESP Site, 68 Fed. Reg. 67,489 (Dec. 2, 2003) ("Notice of Hearing").

[3] Following a motion from the Applicant to apply the then-newly promulgated hearing procedures, which became effective on February 13, 2004, the Commission directed that this proceeding, as well as two other then-pending ESP proceedings, be conducted under the "new rules." *See Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), *System Energy Resources, Inc.* (Early Site Permit for Grand Gulf ESP Site); CLI-04-8, 59 NRC 113 (2004).

(Staff Exhibit 1).[4] NUREG-1811, "Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site" (December 2006) (Staff Exhibit 3). Following completion of the Staff's FSER, Dominion submitted Revision 6 to its application, in which it proposed to (1) change its approach for cooling Unit 3 from a once-through system to a closed-cycle, combination wet and dry cooling system; and (2) increase the maximum power output per unit from 4300 MW(t) to 4500 MW(t) for Units 3 and 4. *See* NUREG-1835, Supplement 1, "Safety Evaluation Report for an Early Site Permit (ESP) at the North Anna Site" (November 2006) ("FSER Supplement"), at 1-2 (Staff Exhibit 2). Additional information regarding these changes was provided in Revisions 7 and 8 of the application, and in Revision 9, Dominion proposed to reduce the bounding value for tritium activity release. FEIS Supplement at 1-2. The Staff issued the FSER Supplement to evaluate these changes.

In addition, in accordance with 10 C.F.R. § 52.23, the Staff referred a copy of the ESP application to the Advisory Committee on Reactor Safeguards ("ACRS"), which reported on those portions of the application that concern safety. *See* Letter from G.B. Wallis, Chairman, ACRS, to Chairman Diaz, "Dominion Nuclear North Anna, LLC, Early Site Permit Application and the Associated NRC Final Safety Evaluation Report," dated July 18, 2005 (Staff Exhibit 4).[5] In addition, the ACRS subsequently considered the changes reflected in Revisions 6, 7, 8, and 9 of Dominion's application, as documented in the FSER Supplement. *See* Memorandum from

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[4] As directed by the Board, the Staff has prepared an exhibit list, which it has provided to the Board's law clerk in conjunction with this Written Statement. *See* March 20 Order at 10.

[5] The ACRS letter report is bound into the FSER. *See* FSER, Appendix E.

J.T. Larkins, ACRS, to L.A. Reyes, NRC Executive Director for Operations, "Supplement 1 to Final Safety Evaluation Report for North Anna Early Site Permit (ESP) Application," dated October 13, 2006 (Staff Exhibit 5).[6]

In addition, the Board issued written questions to the parties relating to both safety[7] and environmental[8] issues. The Board safety and environmental questions addressed both technical and legal matters, and, pursuant to Board instruction, the Staff submitted its responses to the technical questions in exhibit form, under oath or affirmation. *See* NRC Staff Legal Brief in Response to Licensing Board's Safety-Related Questions, dated February 8, 2007;[9] NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, dated March 1, 2007;[10] NRC Staff Legal Memorandum Transmitting the Staff Response to Board Environment-Related Question 2, dated March 7, 2007.[11]

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[6] The ACRS letter report regarding Supplement 1 is bound into the FSER Supplement. *See* FSER Supplement, Appendix E.

[7] *See Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), unpublished Order (Issuing Safety-Related Questions) (Jan. 18, 2007).

[8] *See Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), unpublished Order (issuing Environment-Related Questions) (Feb. 7, 2007).

[9] The Staff's Responses to the Board's Safety Questions are appended hereto as Staff Exhibit 6; the Attachment to the NRC Staff's Response to Board Safety Question 86 is appended hereto as Staff Exhibit 7; the Attachment to the NRC Staff's Response to Board Safety Question 90 is appended hereto as Staff Exhibit 8; and the Staff's Affidavits and Statements of Professional Qualifications supporting its Responses to the Board's Safety Questions are appended hereto as Staff Exhibit 9.

[10] The Staff's Responses to the Board's Environmental Questions are appended hereto as Staff Exhibit 10; and the Staff's Affidavits and Statements of Professional Qualifications supporting its Responses to the Board's Environmental Questions are appended hereto as Staff Exhibit 11.

[11] On February 20, 2007, the Staff requested reconsideration and clarification of Board Environmental Question 2; the Board granted the Staff's motion and directed the parties to answer the Board Question in accordance with the clarification requested by the Staff. *See Dominion Nuclear North Anna, LLC* (Early Site Permit for North Anna ESP Site), unpublished Order (Reconsideration of Two Environmental Questions and Grant of Extension). The Staff's Response to Board Question 2 is appended hereto as Staff Exhibit 12; the Staff's Affidavits supporting its Response are appended hereto (continued. . .)

Thereafter, the Board issued the March 20 Order, directing the parties to file their respective written statements of position, written testimony, and supporting exhibits. With regard to the written statement, the Board stated:

> The written statement should be in the nature of a trial brief that provides a precise road map of the party's case, setting out affirmative arguments and applicable legal standards, identifying witnesses and evidence, and specifying the purpose of the witnesses and evidence (*i.e.*, stating with particularity how the witness, exhibit, or evidence supports a factual or legal position. . . . . It would be useful if the written statement, written testimony, and exhibits cover each of the six fundamental questions, one-by-one.

March 20 Order at 2.

DISCUSSION

A. The Mandatory Findings

The Board has set forth the issues in this uncontested proceeding as follows:

> (1) *Safety Issue 1*: The Director of NRR is obligated to propose a *finding* as to whether issuance of the ESP will be inimical to the common defense and security or to the health and safety of the public.
>
> The Board must decide whether the application and the record of the proceeding contain sufficient information, and the review of [the] application by the NRC Staff has been adequate to support a finding that the issuance of the ESP will NOT be inimical to the common defense and security or to the health and safety of the public.
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> *(2)* *Safety Issue 2*: The Director of NRR is obligated to propose a *finding* as to whether, taking into consideration the site criteria contained in 10 C.F.R. Part 100, a reactor, or reactors, having the characteristics that fall within the parameters for the site, can be constructed without undue risk to the health and safety of the public.
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> The Board must decide whether the application and the record of the proceeding contain sufficient information, and the review of [the] application by the NRC Staff

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(. . .continued)

as Staff Exhibit 13.

> has been adequate to support a finding that, taking into consideration the site criteria contained in 10 C.F.R. Part 100, a reactor, or reactors, having the characteristics that fall within the parameters for the site, can be constructed without undue risk to the health and safety of the public.
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> (3) NEPA [National Environmental Policy Act] Issue: The Director of NRR is obligated to propose a finding as to whether, in accordance with the requirements of subpart A of 10 C.F.R. Part 51, the ESP should be issued as proposed.
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> (4) *NEPA Baseline Issue 1*: The Board must decide whether the requirements of Section 102(2)(A), (C), and (E) of NEPA and Subpart A of 10 C.F.R. Part 51 have been complied with in the proceeding.
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> (5) *NEPA Baseline Issue 2*: The Board must independently consider the final balance among the conflicting factors contained in the record of the proceeding and must determine the appropriate action to be taken.
>
> (6) *NEPA Baseline Issue 3*: The Board must determine, after considering reasonable alternatives, whether the ESP should be issued, denied, or appropriately conditioned to protect environmental values.

March 20 Order, Attachment A (emphasis in original); *see* 10 C.F.R. §§ 2.104(b)(1)(iv); 2.104(b)(1)(i)(d)(2); 2.104(b)(3); 51.105(a)(3); Notice of Hearing, 68 Fed. Reg. at 67,489. Recently, in connection with the mandatory findings in this and other pending cases involving mandatory hearings, the Commission held, among other things, that "as a general matter . . . *de novo* review of uncontested issues is prohibited, whether the issues arise under [the Atomic Energy Act of 1954, as amended] or NEPA." *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-05-17, 62 NRC 5, 39 (2005).

In view of these requirements and Commission direction, the Staff considers each mandatory finding below. Safety Issues 1 and 2 are considered together, in a unified discussion of the Staff's FSER.

1. Safety Issues 1 and 2

a. Regulations and Regulatory Guidance

Pursuant to the Notice of Hearing, if, as here, the proceeding is not a contested proceeding, the Board will determine whether the application and the record of the proceeding

contain sufficient information, and the review of the application by the Staff has been adequate to support a negative finding on Safety Issue 1, and an affirmative finding on Safety Issue 2. With regard to the adequacy of the Staff's review, the Board's resolution of both Safety Issues may be guided largely by the FSER, which documents the Staff's review of the ESP application. The FSER presents the conclusions of the Staff's review of relevant portions of the ESP application and its supplements. *See* Prefiled Direct Testimony of George F. Wunder on Health and Safety Issues in the North Anna ESP Proceeding at 2, response to Q5 (appended hereto as Staff Exhibit 15).

10 C.F.R. §§ 52.17(a)(1) and (c) set forth the required content of an ESP application with regard to health and safety matters. As such, the application addressed, and the Staff considered, the following issues:

- The earthquake engineering criteria in 10 C.F.R. Part 50, Appendix S (*see* 10 C.F.R. §§ 52.17(a)(1); 50.34(a)(12));
- Physical characteristics unique to the proposed site, such as egress limitations from the area surrounding the site, that could pose a significant impediment to the development of emergency plans (*see* 10 C.F.R. § 52.17(b)(1));
- Major features of the emergency plans, such as the exact sizes of the emergency planning zones, that can be reviewed and approved by NRC in consultation with [the Federal Emergency Management Agency] in the absence of complete and integrated emergency plans (*see* 10 C.F.R. § 52.17(b)(2)(i));
- A description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 10 C.F.R. § 50.34(a)(1) (*see* 10 C.F.R. § 52.17(a)(1)).
- Whether site characteristics comply with 10 C.F.R. Part 100 (*see id.*).
- The eight items described in 10 C.F.R. § 52.17(a)(1)(i), including, among other things, seismic, meteorological, hydrologic, and geologic characteristics of the proposed site.

In addition, the Staff evaluated whether the Applicant's quality assurance measures were equivalent in substance to the measures discussed in Appendix B, "Quality Assurance Criteria

for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 C.F.R. Part 50. Finally, pursuant to 10 C.F.R. § 52.17(c), the Applicant proposed a plan for redress of the site in the event that it performs the site preparation and limited construction activities allowed by 10 C.F.R. § 50.10(e)(1).

NRC Review Standard 002, "Processing Applications for Early Site Permits" ("RS-002"), issued in May 2004 (appended hereto as Staff Exhibit 14), provides detail concerning the scope and bases of the Staff's review of the radiological safety and emergency planning aspects of a proposed nuclear power plant site. Prepared specifically to address the evaluation of ESPs, RS-002 contains regulatory guidance derived from NUREG-0800, Revision 3, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," issued in July 1981 ("SRP").[12]

b. Discussion

Chapter 1, "Introduction and General Description"

Chapter 1 of the FSER presents the Staff's overview of the ESP review process, as well as the procedural background of the Dominion application, and a general description of the Applicant and the proposed site. FSER at 1-1 – 1-5.

As noted in the application, no specific plant design has been chosen for the new unit(s) that would be located at the proposed ESP site. Rather, Dominion provided a list of postulated values of design parameters, referred to as the plant parameter envelope ("PPE"). *Id.* at 1-5.

[12] Certain topics in SRP Sections 1.8, 2.4.8, and 2.4.10 relate to design and are not material to a decision on an ESP application. Accordingly, they were omitted from RS-002, as were other SRP chapters related to design.

Based on its review of the application, the Staff found that the Applicant's PPE values were not unreasonable, based on data from various reactor designs that are either certified by the NRC, are in the certification process, or may be submitted for certification in the future. *Id.* at 1-6.[13]

Chapter 2, "Site Characteristics"

In FSER Chapter 2, the Staff reviewed the site characteristics proffered in the application. In particular, the Staff considered the following issues:

- Site location and description (FSER § 2.1.1).[14]
- Exclusion area authority and control (FSER § 2.1.2).[15]
- Population distribution (FSER § 2.1.3).[16]
- Nearby industrial, transportation, and military facilities. In this area, the Staff considered the Applicant's identification of potential hazards in the vicinity of the site, and evaluated potential accidents (FSER § 2.2).[17]
- Meteorology, including regional climatology, local meteorology, the Applicant's onsite meteorological measurements program; atmospheric dispersion estimates for postulated accidental airborne releases of radioactive effluents to the exclusion area boundary ("EAB") and low population zone ("LPZ"); and atmospheric dispersion estimates for

[13] The Board posed two questions to the parties regarding FSER Chapter 1, regarding the expected high water level of Lake Anna, and the thermal power limits proposed by the Applicant. *See* Staff Exh. 6, responses to Board Questions 1 and 65.

[14] The Board posed one question regarding this section, relative to Dominion's right, title or interest in the proposed ESP site. *See* Staff Exh. 6, response to Board Question 2.

[15] The Board posed one question regarding this section, relative to Dominion's authority over the exclusion area. *See* Staff Exh. 6, response to Board Question 3.

[16] The Board posed several questions regarding the Staff's evaluation of population distribution, relative to estimates of an aging population, the growth model used, and growth rates. *See* Staff. Exh. 6, responses to Board Questions 4-6.

[17] The Board posed three questions regarding the Staff's evaluation of external hazards. *See* Staff. Exh. 6, responses to Board Questions 7-9.

routine releases of effluents to the atmosphere (FSER § 2.3). Additional evaluation with respect to local meteorology was performed in conjunction with Revisions 6 through 9 of the application (FSER Supplement § 2.3).[18]

- Hydrology, including information pertaining to floods, the probable maximum flood, potential dam failures, the probable maximum surge and seiche flooding, probable maximum tsunami flooding, and ice effects; cooling water canals and reservoirs; flooding protection requirements; low-water considerations; groundwater; and accidental releases of liquid effluents to ground and surface waters (FSER § 2.4). The FSER supplement provided the Staff's evaluation of safety-related aspects of the site affected by the Applicant's proposed changes to the design of the Unit 3 cooling system (FSER Supplement § 2.4).[19]

- Geology, seismology, and geotechnical engineering, including vibratory ground motion; surface faulting; stability of subsurface materials and foundations; stability of slopes; and embankments and dams (FSER § 2.5).[20]

For each of the issues considered, the Staff determined that applicable regulations in 10 C.F.R. Parts 50, 52 and 100 were met.

10 C.F.R. § 52.24 authorizes the inclusion of limitations and conditions in an ESP. In the FSER, the Staff identified eight permit conditions, all associated with FSER Chapter 2. *See generally* FSER Appendix A, Section A.1. In connection with exclusion area control, the Staff proposes to include two conditions in any ESP that might be issued for the North Anna ESP site. Proposed Permit Condition 1 would require that approvals called for by State law for, among other matters, agreements providing for shared control of the North Anna ESP exclusion area be obtained and the agreements executed before construction of a nuclear power plant

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[18] The Board posed twelve questions regarding the Staff's meteorology review. *See* Staff Exh. 6, responses to Board Questions 10-31; NRC Staff Legal Brief in Response to Licensing Board's Safety-Related Questions, at 2-3 (response to Board Question 27).

[19] The Board posed twenty-two questions regarding the Staff's hydrology review. *See* Staff Exh. 6, responses to Board Questions 32-51, 112-113; NRC Staff Legal Brief in Response to Licensing Board's Safety-Related Questions, at 3-5 (response to Board Question 50D).

[20] The Board posed eighteen questions related to the Staff's geology and seismology review. *See* Staff Exh. 6, responses to Board Questions 52-64, 67-71.

begins under a CP or COL referencing the ESP. FSER at 2-6 – 2-7. Proposed Permit Condition 2 would require that the permit holder obtain the right to implement the site redress plan before initiating any activities authorized by 10 C.F.R. § 52.25. *Id.* at 2-7.

Two proposed conditions were identified with respect to hydrology. Proposed Permit Condition 3 would require that an applicant referencing a North Anna ESP in an application for a fourth proposed unit use a dry cooling tower system during normal operation. FSER at 2-66. Proposed Permit Condition 4 would require that an applicant referencing such an ESP design any new unit's radwaste systems with features to preclude accidental releases of radionuclides into any potential liquid pathway.[21] FSER at 2-136.

Finally, the Staff identified four proposed permit conditions relative to geology, seismology, and geotechnical engineering. Proposed Permit Condition 5 would require that an ESP holder and/or an applicant referencing such an ESP replace weathered or fractured rock at the foundation level with lean concrete before initiation of foundation construction. FSER at 2-166. Proposed Permit Condition 6 would prohibit the ESP holder and/or applicant referencing such an ESP from using an engineered fill with high compressibility and low maximum density, such as saprolite. *Id.* at 2-167 – 2-168. Proposed Permit Condition 7 would require that the ESP holder, or an applicant referencing the ESP, perform geologic mapping of future excavations for safety-related structures, evaluate any unforeseen geologic features that are encountered, and notify the NRC no later than 30 days before any excavations for safety-related structures are open for NRC's examination and evaluation. FSER at 2-240.

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[21] If an ESP is ultimately granted for the North Anna ESP site, the Staff plans to conform the wording of this proposed permit condition to that addressed by the Commission in its recent decisions regarding identical proposed permit conditions in the *Grand Gulf* and *Clinton* ESP proceedings. *See System Energy Resources, Inc.* (Early Site Permit for Grand Gulf ESP Site), CLI-07-14, 65 NRC __ (March 27, 2007), slip op. at 2-3; *Exelon Generation Co., LLC* (Early Site Permit for Clinton ESP Site), CLI-07-12, 65 NRC __ (March 8, 2007), slip op. at 3-4.

Finally, Proposed Permit Condition 8 would require that the ESP holder and/or an applicant referencing such an ESP improve Zone II saprolitic soils to reduce any liquefaction potential if safety-related structures are to be founded on them. FSER at 2-242 – 2-243.

In addition, the Staff identified twenty-eight COL action items related to the areas reviewed in Chapter 2. *See* FSER Appendix A, Section A.2.[22] Overall, the Staff concluded that this portion of the application conformed with applicable regulations in 10 C.F.R. § 52.17, regarding consideration of factors relating to the size and location of a site; and 10 C.F.R. Part 100, insofar as it requires the applicant's submission of information needed to evaluate factors involving the characteristics of the site environs.

Chapter 3, "Design"

FSER Chapter 3 includes the Staff's analysis of the application with respect to aircraft hazards, to ensure that the risks associated with such hazards are sufficiently low. FSER § 3.5.1.6. In its review, the Staff independently verified the Applicant's assessment of aircraft hazards at the site and concluded that the probability of an accident having the potential for radiological consequences in excess of the exposure criteria found in 10 C.F.R. § 50.34(a)(1) is less than about 10^{-7} per year. *Id.* at 3-4.

[22] As stated in the FSER, "The combined license (COL) action items set forth in the SER and incorporated herein identify certain matters that shall be addressed in the final safety analysis report (FSAR) by an applicant who submits an application referencing the North Anna ESP. These items constitute information requirements but do not form the only acceptable set of information in the FSAR. An applicant may depart from or omit these items, provided that the departure or omission is identified and justified in the FSAR. In addition, these items do not relieve an applicant from any requirement in 10 CFR Parts 50 and 52 that govern the application. After issuance of a [CP] or COL, these items are not controlled by NRC requirements unless such items are restated in the preliminary safety analysis report or FSAR, respectively." FSER at A-4.

Chapter 11, "Radiological Effluent Release Dose Consequences from Normal Operations"

In FSER Chapter 11, the Staff reviewed the information in the application concerning gaseous and liquid radiological effluents that would be generated as a normal byproduct of nuclear power operations at a future facility at the North Anna ESP site, to determine whether site characteristics are such that the radiation dose to members of the public would be within regulatory requirements. FSER at 11-1; *see* 10 C.F.R. §§ 52.17(a)(1)(iv); 100.21(c)(1). The Staff performed an additional evaluation of gaseous effluents following Revision 9 of the application. FSER Supplement, Chapter 11.1. In its review, the Staff concluded that radiological doses to members of the public from radioactive gaseous and liquid effluents resulting from the normal operation of up to two new nuclear units, as defined by the Applicant under the PPE approach, do not present an undue risk to the health and safety of the public; that, with respect to radiological effluent release dose consequences, the proposed site is acceptable for constructing a plant falling within the Applicant's PPE, and that the site meets the relevant requirements of 10 C.F.R. Parts 52 and 100. FSER at 11-4; FSER Supplement at 11-6 – 11-7. The Staff also identified one COL action item associated with this issue. *See* FSER Appendix A at A-8.[23]

Chapter 13, "Conduct of Operations"

FSER Chapter 13 addresses both emergency planning and industrial security. With respect to the former, an ESP application, pursuant to 10 C.F.R. § 52.17(b) must identify any physical characteristics unique to the proposed site that could pose a significant impediment to

[23] The Board posed sixteen questions related to the Staff's assessment of radiological effluent release dose consequences from normal operations. *See* Staff Exh. 6, response to Board Questions 72-87; NRC Staff Legal Brief in Response to Licensing Board's Safety-Related Questions, at 5-9 (responses to Board Questions 77-84).

the development of emergency plans. FSER at 13-1. In addition, the application may propose major features of emergency plans, as described in Supplement 2 to NUREG-0654/FEMA-REP-1, Revision 1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants – Criteria for Emergency Planning in an Early Site Permit Application – Draft Report for Comment," issued April 1996 ("Supplement 2"). FSER at 13-1.

The Applicant elected to present and seek NRC approval of major features of the emergency plans. As such, the Staff's evaluation addressed the three aspects of that submission. First, the Staff considered physical characteristics that could pose a significant impediment[24] to the development of emergency plans. FSER § 13.3.1. *See* 10 C.F.R. §§ 52.17(b)(1); 52.18. The Staff reviewed portions of the existing North Anna Power Station ("NAPS") emergency plans, including an evacuation time estimate ("ETE"), and concluded that the Applicant's use of the ETE for the NAPS site in the application was acceptable and appropriate. FSER at 13-5. Further, the Staff concluded that the Applicant demonstrated, through use of the ETE, that no physical characteristics unique to the proposed ESP site could pose a significant impediment to the development of emergency plans. *Id.* at 13-5 – 13-6.

Second, the Staff also determined that the Applicant provided an acceptable description of contacts and arrangements made with Federal, State, and local government agencies with emergency response planning responsibilities. *See* 10 C.F.R. § 52.17(b)(3); FSER § 13.3.2.

Third, the Staff considered the following major features: emergency planning zones (FSER § 13.3.3.1); assignment of responsibility – organization control (FSER § 13.3.3.2); onsite

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[24] A "significant impediment" is defined by Supplement 2 as a "physical characteristic or combination of physical characteristics that would pose major difficulties for an evacuation or the taking of other protective actions."

emergency organizations (FSER § 13.3.3.3); emergency response support and resources (FSER § 13.3.3.4); the emergency classification system (FSER § 13.3.3.5); notification methods and procedures (FSER § 13.3.3.6); emergency communications (FSER § 13.3.3.7); public education and information (FSER § 13.3.3.8); emergency facilities and equipment (FSER § 13.3.3.9);[25] accident assessment (FSER § 13.3.3.10); protective response (FSER § 13.3.3.11); radiological exposure control (FSER § 13.3.3.12); medical and public health support (FSER § 13.3.3.13); radiological emergency response training (FSER § 13.3.3.14); and responsibility for the planning effort – development, periodic review, and distribution of emergency plans (FSER § 13.3.3.15). In each case (with the exception of emergency facilities and equipment, as discussed above), the Staff concluded that the proposed major feature was consistent with the guidelines in RS-002 and Supplement 2, and therefore met the requirements of 10 C.F.R. §§ 52.17(b)(2)(i) and 52.18, as well as the applicable section of 10 C.F.R. Part 50, Appendix E. FSER at 13-10 – 13-11, 13-13, 13-15, 13-20, 13-21—13-22, 13-25, 13-28, 13-31, 13-38, 13-45, 13-49, 13-52, 13-55, 13-58 – 13-59.[26]

In addition, in FSER Section 13.6, "Industrial Security," the Staff evaluated the physical security aspects of the ESP application, to determine whether site characteristics are such that adequate security plans and measures can be developed. *See* 10 C.F.R. §§ 100.21(f), 73.55. The Staff also conducted an onsite visit. FSER at 13-60. The Staff considered pedestrian and vehicular land approaches, railroad approaches, water approaches, potential "high-ground"

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[25] The applicant withdrew its request that this major feature be evaluated as part of the ESP application; as such, the Staff reached no conclusion regarding the acceptability of this feature. FSER at 13-34.

[26] The Board posed nine questions relative to the Staff's emergency planning analysis. *See* Staff Exh. 6, responses to Board Questions 89-97; NRC Staff Legal Brief in Response to Licensing Board's Safety-Related Questions, at 10-13 (response to Board Questions 95-97).

adversary advantage areas, nearby road transportation routes, nearby hazardous materials facilities, nearby pipelines, and culverts that could provide a pathway into the protected area. *Id.* at 13-60. The Staff ultimately concluded that these ESP site characteristics would allow a CP or COL applicant to develop adequate security plans and measures for a reactor or reactors that it might construct and operate on the ESP site.[27]

Chapter 15, "Accident Analyses"

The Applicant analyzed and provided the radiological consequences of design-basis accidents ("DBAs") to demonstrate that one or more nuclear units could be sited at the proposed North Anna ESP site without undue risk to the health and safety of the public, in compliance with 10 C.F.R. § 52.17 and 10 C.F.R. Part 100. The Applicant selected DBAs based on the then-proposed AP1000 reactor design (the "surrogate" AP1000) and the certified ABWR reactor design, stating that it chose these designs because they have (or are based on) previously certified standard reactor designs and have recognized bases for postulated accident analyses. FSER at 15-4. The Staff concluded that the selected DBAs are consistent with the DBAs listed and analyzed in the SRP and in NRC Regulatory Guide ("RG") 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," issued July 2000. FSER at 15-4. The Staff also indicated that conclusions drawn regarding the site's acceptability based on the AP1000 and ABWR designs are likely to be valid for the other reactor designs the Applicant is considering; however, at the CP or COL stage, the Staff will evaluate whether the analyses considered here bound the design proposed in the CP or COL application. *Id.* Therefore, the staff concluded that the Applicant provided an

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[27] The Staff identified one COL Action Item with respect to industrial security. *See* FSER at 13-62.

acceptable DBA selection for evaluating the compliance of the proposed ESP site with the dose consequence evaluation factors specified in 10 C.F.R. § 50.34(a)(1). *Id.*

To support its accident analyses based on the certified ABWR design, the Applicant used the assumed atmospheric dispersion factors (χ/Q values) in the certified ABWR design control document ("DCD"). For the AP1000, the Applicant used those χ/Q values in the proposed AP1000 DCD that were under review by the Staff at the time the North Anna ESP application was submitted. FSER at 15-5. Those values were subsequently changed by Westinghouse (the applicant for design certification), but the Staff determined that the PPE values used by the Applicant are not unreasonable, and are, therefore, adequate for the purpose of demonstrating that a reactor with design characteristics similar to an AP1000 could be sited at the proposed ESP site. *Id.*

The Staff reviewed the Applicant's site-specific χ/Q values, and performed an independent evaluation of atmospheric dispersion in accordance with the guidance in RS-002, concluding that the values are acceptable, and will be included in any ESP that is issued for the North Anna ESP site. *Id.* Further, the Staff found that the Applicant's dose consequence evaluation methodology is acceptable. As such, based on its evaluation of the Applicant's analysis methodology and its inputs, the Staff found correct the Applicant's conclusion that the dose consequences for the chosen surrogate designs comply with the dose consequence evaluation factors of 10 C.F.R. § 50.34(a)(1). *Id.* at 15-7. Therefore, in the FSER, the Staff concluded that the Applicant demonstrated that the proposed site was suitable for power reactors with source term characteristics bounded by those of the 4386 MW(t) ABWR and AP1000 without undue risk to the health and safety of the public, and that the Applicant complies with 10 C.F.R. § 52.17 and 10 C.F.R. Part 100. *Id.* at 15-8.

In the FSER Supplement, the Staff documented additional evaluation performed in all of these areas, in connection with the Applicant's revision of the application to change the cooling

system for proposed Unit 3, and to increase the power level of both proposed units. *See* FSER Supplement, Chapter 15. In particular, the Applicant added a version of the Economic Simplified Boiling Water Reactor ("ESBWR") as a surrogate design. FSER Supplement at 15-1. Review of the ESBWR design certification by the Staff is under way. For the purpose of this review, ESBWR DBA dose calculations were performed using a modified source term (125 percent of proposed DCD values) and site-specific χ/Q values. Using these χ/Q values, the Staff determined that the proposed ESBWR design meets the radiological consequence evaluation factors identified in 10 C.F.R. § 50.34(a)(1). FSER Supplement at 15-8.

The Staff concluded that the PPE values for source terms included as inputs to the radiological consequence analyses were not unreasonable, and that the site-specific χ/Q values and dose consequence methodology are acceptable. FSER Supplement at 15-1. The Staff ultimately concluded that the Applicant demonstrated that the proposed site was suitable for power reactors with source term characteristics bounded by those of the ABWR (at 4386 MW(t)), AP1000, and ESBWR without undue risk to the health and safety of the public, and that the Applicant complies with 10 C.F.R. § 52.17 and 10 C.F.R. Part 100. FSER Supplement at 5-10.[28]

Chapter 17, "Early Site Permit Quality Assurance Measures"

FSER Chapter 17 evaluated the quality assurance ("QA") measures employed by the Applicant and its contractors in preparing its ESP application.

Current NRC regulations do not require ESP holders or applicants to implement a QA program compliant with the requirements of 10 C.F.R. Part 50, Appendix B, "Quality Assurance

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[28] The Board posed ten questions relating to the Staff's evaluation of design-basis accident analyses. *See* Staff Exh. 6, response to Board Questions 66, 99-107.

Criteria for Nuclear Power Plants and Fuel Reprocessing Plants." FSER at 17-1. However, the Applicant is expected to implement QA measures equivalent in substance to the measures described in Appendix B, in order to provide reasonable assurance that any information derived from ESP activities that could be used in the design and/or construction of SSCs important to safety will support satisfactory performance of such SSCs once they are in service. FSER at 17-1.

The Staff's review focused on the Applicant and its primary contractor, Bechtel, as well as subcontractors involved in Dominion ESP activities. FSER at 17-1 – 17-2. In particular, the Staff reviewed the following QA measures: organization (FSER § 17.1); quality assurance program (FSER § 17.2); design control (FSER § 17.3); procurement document control (FSER § 17.4); instructions, procedures and drawings (FSER § 17.5); document control (FSER § 17.6); control of purchased material, equipment and services (FSER § 17.7); identification and control of materials, parts, and components (FSER § 17.8); control of special processes (FSER § 17.9); inspection (FSER § 17.10); test control (FSER § 17.11); control of measuring and test equipment (FSER § 17.12); handling, storage and shipping (FSER § 17.13); inspection, test and operating status (FSER § 17.14); nonconforming materials, parts or components (FSER § 17.15); corrective action (FSER § 17.16); quality assurance records (FSER § 17.17); and audits (FSER § 17.18).

The Staff concluded, based on its review and evaluation of the QA measures contained or referenced in the SSAR, that (1) the organization and persons performing QA functions have the independence and authority necessary to effectively carry out QA measures without undue influence from those directly responsible for costs and schedules; (2) when properly implemented, the QA measures and procedures are equivalent in substance to the criteria of 10 C.F.R. Part 50, Appendix B, and conform to the guidance in RS-002, Section 17.1.1; and (3) the Applicant applied QA measures to all ESP activities that established information regarding

the design and construction of SSCs important to safety that might be constructed on the proposed site, or the establishment of site characteristics for comparison to the values of site parameters postulated in a certified design or to serve for evaluation of design basis for a custom design. FSER at 17-42. The Staff concluded that these measures provide adequate confidence that information in the ESP application and accepted by the NRC is reliable, and, when used for evaluation of the design or construction of SSCs important to safety, would not adversely impact their ability to perform satisfactorily in service. FSER at 17-42. Therefore, the Staff concluded that the Applicant implemented acceptable QA measures for ESP activities associated with this application. FSER at 17-42.

Based on the Staff's review, as indicated in the record by the FSER, the FSER Supplement, the ACRS letter report, and the Staff's responses to the Board's safety questions, the Staff respectfully submits that it had a reasonable basis for drawing each of its safety conclusions, that those conclusions and their reasoned support logically flow from the facts provided. The Staff, therefore, submits that is has reasonable bases for its stated conclusions on safety matters. As such, the Staff believes the Board may make the findings that (1) the issuance of an ESP will not be inimical to the common defense and security or to the health and safety of the public (a negative finding on Safety Issue 1); and (2) taking into consideration the site criteria contained in 10 C.F.R. Part 100, a reactor, or reactors, having characteristics that fall within the parameters for the site, can be constructed and operated without undue risk to the health and safety of the public (an affirmative finding on Safety Issue 2).

2. NEPA Issue

a. Regulations and Regulatory Guidance

As set forth in the Notice of Hearing, the Director of NRR will propose findings on "whether, in accordance with the requirements of subpart A of 10 CFR part 51, the ESP should be issued as proposed." Notice of Hearing, 68 Fed. Reg. at 67,489; 10 C.F.R. § 2.104(b)(2)(ii). The regulations at 10 C.F.R. §§ 52.17(a)(2) and 52.18 require that the environmental report, and associated EIS, "focus on the environmental effects of construction and operation of a reactor, or reactors, which have characteristics that fall within the postulated site parameters, and provided further that the statement need not include an assessment of the benefits (for example, need for power) of the proposed action." Further, 10 C.F.R. § 52.18 requires that the Staff's EIS "include an evaluation of alternative sites to determine whether there is any obviously superior alternative to the site proposed."

Guidance for the Staff's preparation of the EIS is contained in RS-002, Attachment 3. The review standard primarily draws from the previously published NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," as well as from the SRP.[29] FEIS at 1-4. In addition, the Staff also considered the information and analyses provided in the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (1996) in its review. FEIS at 1-4.

To guide its assessment of environmental impacts of a proposed action or alternative action, the NRC established a standard for quantifying environmental impacts using the

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[29] The Staff also provided to the Board a description of "the general process the Staff applied in treating areas in which information called for by the ESRP was lacking." *See* Staff Exh. 12, response to Board Question 2.

guidance of the Council on Environmental Quality. FEIS at xxv. Using this approach, the NRC established three significance levels – SMALL, MODERATE, or LARGE[30] -- that the Staff applied to its findings throughout the FEIS. FEIS at xxv-xxvi.

b. Discussion

The Staff's FEIS addresses (1) the results of the Staff's analyses, which consider and weigh the environmental effects of the proposed action (issuance of the ESP) and of constructing and operating one or more new nuclear units at the ESP site, (2) mitigation for reducing or avoiding adverse effects, (3) the environmental impacts of alternatives to the proposed action, and (4) the Staff's recommendation regarding the proposed action based on its environmental review. FEIS at xxv. *See generally* Prefiled Direct Testimony of John S. Cushing on Environmental Issues in the North Anna ESP Proceeding (appended hereto as Staff Exhibit 16).

As a general matter, in conducting its review, the Staff evaluated environmental impacts based on the PPE provided by Dominion as a surrogate for a nuclear power plant design and its

[30] The Staff's definitions of these significance levels are as follows:

> SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.
>
> MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.
>
> LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

associated facilities. A list of these values is reproduced in Appendix I to the FEIS. In any CP or COL application referencing a North Anna ESP, the Staff would review the actual design selected to determine whether the design fits within these bounding parameter values.[31]

As required by 10 C.F.R. § 51.45(d), Dominion provided a list of environmental approvals and consultations associated with the North Anna ESP. FEIS at 1-10. The Staff determined that, with the exception of Clean Water Act and Coastal Zone Management Act certifications, the authorizations Dominion will require for construction and operation are not yet necessary and have not been obtained. FEIS at 1-10. Dominion stated that it was unable to obtain the necessary Clean Water Act Section 401 certification at the ESP stage; however, the Commonwealth of Virginia agreed to a permit condition prohibiting discharges to navigable waters until a Section 401 certification is obtained or waived by the Commonwealth. FEIS at 1-10 – 1-11. The Staff has, therefore, proposed a permit condition prohibiting an ESP holder from performing any site preparation or preliminary construction activities until the permit holder obtains the required Section 401 certification or, in the alternative, obtains a determination from the Commonwealth that no certification is required. *See* FEIS Appendix J, Table J-4, "Recommended Permit Conditions for the Early Site Permit."

Similarly, in response to a request from the Virginia Department of Game and Inland Fisheries, Dominion requested a permit condition that would require Dominion to conduct a comprehensive Instream Flow Incremental Methodology ("IFIM") Study. The Staff recommends that the permit condition be included in the ESP. FEIS at 1-11.[32]

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[31] The Board posed three questions related to the Staff's review of the PPE. *See* Staff Exh. 10, response to Board Questions 1-3; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 2-17 (response to Board Questions 1-3).

[32] The Board posed one question as to the status of the IFIM Study. *See* Staff Exh. 10, response to Board Question 8.

Chapter 2.0, "Affected Environment"

In FEIS Chapter 2, the Staff reviewed the application's description of the affected environment and provided the Staff's characterization of the site conditions. In particular, the Staff reviewed the site location (FEIS § 2.1);[33] land-related issues, including existing power transmission rights of way and offsite areas (FEIS § 2.2);[34] meteorology and air quality (FEIS § 2.3); geology (FEIS § 2.4); the radiological environment (FEIS § 2.5);[35] the hydrological processes governing the movement and distribution of water in the existing environment at the site (FEIS § 2.6);[36] terrestrial and aquatic ecology (FEIS § 2.7);[37] socioeconomics, including demographics and community characteristics (FEIS § 2.8);[38] historic and cultural resources (FEIS § 2.9); environmental justice[39] (FEIS § 2.10);[40] and related Federal projects (of which

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[33] The Board posed four questions regarding the site location. *See* Staff Exh. 10, responses to Board Questions 10-13.

[34] The Board posed one question regarding transmission lines. *See* Staff Exh. 10, response to Board Question 14.

[35] The Board posed two questions regarding the radiological environment. *See* Staff Exh. 10, responses to Board Questions 15-16 (referencing Dominion's responses to these questions).

[36] The Board posed four questions regarding the hydrological environment. *See* Staff Exh. 10, responses to Board Questions 17-20.

[37] The Board posed three questions regarding the description of terrestrial and aquatic ecology. *See* Staff Exh. 10, responses to Board Questions 21-23.

[38] The Board posed one question regarding demographics. *See* Staff Exh. 10, response to Board Question 24.

[39] As an independent agency, the NRC is not subject to Executive Order 12898 ("Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, 59 Fed. Reg. 7629 (Feb. 11, 1994), which directs Federal executive agencies to consider environmental justice under NEPA. However, the Commission has voluntarily committed to undertake environmental justice reviews. *See* Letter from Chairman Selin to President Clinton, dated March 31, 1994 (ADAMS accession number ML033210526); Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions, 69 Fed. Reg. 52,040 (Aug. 24, 2004).

[40] The Board posed one question regarding Environmental Justice (affected environment). *See* (continued. . .)

there were none identified) (FEIS § 2.11). The Staff is of the view that the facts described and referenced in FEIS Chapter 2 include all factors relevant to the Staff's characterization of the affected environment at the North Anna ESP site. Further, the discussion provides reasonable support for the Staff's findings in later chapters of the FEIS.

Chapter 3.0, "Site Layout and Plant Parameter Envelope"

In FEIS Chapter 3, the Staff reviewed the application's description of the site layout and power transmission system, and provided the Staff's characterization of the PPE. The Staff is of the view that the facts described and referenced in FEIS Chapter 3 are adequate to support the Staff's characterization of the site layout and PPE for the proposed North Anna ESP site. Further, the Staff's characterization provides reasonable support to the Staff's findings elsewhere in the FEIS.[41]

Chapter 4.0, "Construction Impacts at the Proposed Site"

In Chapter 4 of the FEIS, the Staff analyzed the potential impacts of construction on land use (FEIS § 4.1), meteorology and air quality (FEIS § 4.2), water (FEIS § 4.3), terrestrial and aquatic ecosystems (FEIS § 4.4),[42] socioeconomics (FEIS § 4.5),[43] historic and cultural

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Staff Exh. 10, response to Board Question 25.

[41] The Board posed twelve questions related to the site layout and PPE. *See* Staff Exh. 10, responses to Board Questions 26-37; NRC Staff Legal Brief in Response to the Board's Environment-Related Questions at 20-21 (response to Board Question 35).

[42] The Board posed one question related to construction impacts on the aquatic ecosystem. *See* Staff Exh. 10, response to Board Question 38.

[43] The Board posed two questions related to impacts on education. *See* Staff Exh. 10, responses to Board questions 39-40.

resources (FEIS § 4.6), environmental justice (FEIS § 4.7),[44] and non-radiological and radiological health effects (FEIS §§ 4.8 and 4.9),[45] as well as applicable measures and controls that would limit the adverse impacts of station construction (FEIS § 4.10). In making its impact assessments, the Staff relied on compliance with the required Federal, State and local permits and authorizations presented in the ER, as well as representations regarding mitigation measures made by the Applicant therein. FEIS at 4-1.

In the areas of land-use, air quality, water, terrestrial and aquatic ecosystems, threatened and endangered species, socioeconomics (in the areas of physical impacts and public services), historic and cultural resources, environmental justice, and radiological and non-radiological impacts, the Staff assigned an impact level of SMALL. FEIS § 4.12. In the socioeconomic areas of economy and taxes, the Staff assigned an impact level of SMALL BENEFICIAL to MODERATE BENEFICIAL. FEIS § 4.12. Finally, in the socioeconomic areas of transportation, housing and education, the Staff assigned an impact level of SMALL to MODERATE. FEIS § 4.12.

As previously noted, in its ESP application, Dominion requested that it be allowed to conduct site preparation and preliminary construction activities at the North Anna ESP site, as authorized by 10 C.F.R. § 52.17(c) and 10 C.F.R. § 52.25, and delineated in 10 C.F.R. § 50.10(e)(1). Section 52.25 permits these activities, provided that the FEIS prepared for the ESP "has concluded that the activities will not result in any significant adverse environmental impact which cannot be redressed." As such, Dominion provided a site redress plan as part of

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[44] The Board posed one question regarding construction impacts in the area of environmental justice. *See* Staff Exh. 10, response to Board Question 41.

[45] The Board posed three questions related to radiological health impacts. *See* Staff Exh. 10, responses to Board Questions 42-44.

its application. In FEIS § 4.11, the Staff reviewed the site redress plan and made the finding required by 10 C.F.R. 52.25(a), *i.e.*, "the activities will not result in any significant adverse environmental impact which cannot be redressed."[46]

Based on the evaluation set forth in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 4 include all factors relevant to the assessment of environmental impacts of construction at the proposed North Anna ESP site, including the assessment of the Applicant's plan for site redress. Further, the evaluation documented in FEIS Chapter 4 provides reasonable support for the Staff findings in that chapter.

Chapter 5.0, "Operational Impacts at the Proposed Site"

In FEIS Chapter 5, the Staff analyzed the potential impacts of operation on land use (FEIS § 5.1), meteorology and air quality (FEIS § 5.2), water (FEIS § 5.3),[47] terrestrial and aquatic ecosystems (FEIS §§ 5.4.1, 5.4.2),[48] threatened and endangered species (FEIS § 5.4.3); socioeconomics (FEIS § 5.5),[49] historic and cultural resources (FEIS § 5.6), environmental justice (FEIS § 5.7), and non-radiological and radiological health effects (FEIS §§ 5.8 and 5.9).[50] The Staff also considered the radiological consequences on the human

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[46] In addition, the Staff proposes to include the site redress plan in any ESP that is issued for the North Anna ESP site. *See* FEIS Appendix J, Table J-4.

[47] The Board posed seven questions related to operational impacts in the area of hydrology. *See* Staff Exh. 10, responses to Board Questions 45-51, 125; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 21-23 (response to Board Question 45). In addition, the Board posed four questions related to the "Staff's Independent Review of Water Budget Impacts," set forth in FEIS Appendix K. *See* Staff Exh. 10, responses to Board Questions 129-132.

[48] The Board posed five questions related to noise, lake level, downstream flow, and shoreline development. *See* Staff Exh. 10, responses to Board Questions 52-56.

[49] The Board posed two questions related to socioeconomics. *See* Staff Exh. 10, responses to Board Questions 56-57.

[50] The Board posed twelve questions related to non-radiological and radiological health effects. (continued. . .)

environment of potential accidents, including design basis and severe accidents, at the proposed new nuclear units at the North Anna ESP site (FEIS § 5.10).[51] In making its impact assessments, the Staff relied on compliance with the required Federal, State and local permits and authorizations presented in the ER, as well as representations regarding mitigation measures made by the Applicant therein (FEIS § 5.11).[52]

In the areas of land use, air quality, water (including hydrological alterations and water use during normal years), terrestrial and aquatic ecosystems, threatened and endangered terrestrial and aquatic species, socioeconomics (including physical impacts to workers and the public, buildings and roads, demography, transportation, housing, public services, and education), environmental justice, non-radiological health impacts (those impacts monitored in accordance with Occupational Safety and Health Administration regulations), radiological health impacts, and design basis and severe accidents, the Staff assigned an impact level of SMALL. FEIS § 5.12. With respect to water-related impacts in drought years, the Staff assigned an impact level of MODERATE. FEIS § 5.12. In the socioeconomic areas of aesthetics and recreation, the Staff assigned an impact level of SMALL to MODERATE. FEIS § 5.12. In the socioeconomic areas of economy, the Staff assigned an impact level of SMALL BENEFICIAL to

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See Staff Exh. 10, responses to Board Questions 59-72; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 23-24 (response to Board Question 69). In addition, the Board posed three questions related to the Staff's "Supporting Documentation on Radiological Dose Assessment," included as FEIS Appendix H. *See* Staff Exh. 10, responses to Board Questions 126-128.

[51] The Board posed twenty-five questions related to the consequences of potential design-basis and severe accidents. *See* Staff Exh. 10, responses to Board Questions 73-97.

[52] The Board posed one question regarding ER Table 5.10-1, "Summary of Impacts and Measures and Controls to Limit Adverse Impacts During Operations." *See* Staff Exh. 10, responses to Board Question 98; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 24-25 (response to Board Question 98).

MODERATE BENEFICIAL. FEIS § 5.12. In the socioeconomic area of taxes, the Staff assigned an impact level of SMALL BENEFICIAL to LARGE BENEFICIAL. FEIS § 5.12. In two areas, water quality and non-radiological impacts (chronic health impacts of electromagnetic fields) the impact assessments were not resolved. FEIS § 5.12.

Based on the evaluation presented in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 5 include all factors relevant to the assessment of environmental impacts of operation of two new power reactors at the proposed North Anna ESP site. Further, the evaluation documented in FEIS Chapter 5 provides reasonable support for the Staff findings in that chapter.

Chapter 6.0, "Fuel Cycle, Transportation, and Decommissioning"

In FEIS Chapter 6, the Staff evaluated the environmental impacts from (1) the uranium fuel cycle and solid waste management (FEIS § 6.1),[53] (2) transportation of radioactive material (FEIS § 6.2),[54] and (3) decommissioning for the proposed North Anna ESP site (FEIS § 6.3).[55] FEIS at 6-1.

Regarding the uranium fuel cycle and solid waste management, the Staff evaluated the Applicant's assessment of both light-water reactor ("LWR") and gas-cooled reactor designs. With respect to LWRs, the PPE for the North Anna ESP site used input parameters from five LWR designs that use uranium dioxide fuel. FEIS at 6-1 – 6-2. As a result, the Staff

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[53] The Board posed ten questions regarding the environmental impacts from the fuel cycle and solid waste management for LWR and gas-cooled designs. *See* Staff Exh. 10, responses to Board Questions 99-108.

[54] The Board posed two questions regarding transportation impacts. *See* Staff Exh. 10, responses to Board Questions 109-110.

[55] The Board posed one question related to decommissioning. *See* Staff Exh. 10, response to Board Question 111.

determined that Table S-3, "Table of Uranium Fuel Cycle Environmental Data" (codified at 10 C.F.R. § 51.51(b)), which sets forth key uranium fuel cycle data calculated by the NRC, can be used to assess environmental impacts. In addition, the Staff considered the effects of radon-222 and technetium-99. Finally, the Staff also considered the environmental impacts of the uranium fuel cycle as set forth in Section 6.2.3 of the GEIS analysis. FEIS at 6-6.[56] Using this information, the Staff concluded that the environmental impacts of the uranium fuel cycle (appropriately scaled for the 1000 MW(e) LWR scaled model used in the application) would be SMALL. FEIS § 6.1.1.9.

Regarding waste management in particular, based on the values in Table S-3 (taking into account low-level, high-level, and transuranic wastes), and notwithstanding some uncertainty with respect to the Commission's Waste Confidence Rule (10 C.F.R. § 51.23), the Staff concluded that the impacts of radioactive wastes are acceptable, because the impacts would not be sufficiently great to require the conclusion that the construction and operation of new units at the North Anna ESP site should be denied. FEIS at 6-13 – 6-14. The Staff ultimately concluded that impacts would be SMALL. FEIS at 6-15.

With respect to gas-cooled reactors, the Staff considered issues related to reactors based on other-than LWR designs are not resolved because there is insufficient design information at this time to validate values and impacts. FEIS at 6-15. The Staff nevertheless attempted to estimate the impacts using data provided by the Applicant, with respect to the Gas Turbine Modular Helium Reactor ("GT-MHR") and the Pebble Bed Modular Reactor ("PBMR"). FEIS at 6-15. Dominion sought to demonstrate in its ER that the impacts for the gas-cooled

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[56] As stated in the FEIS (at 6-6), "Although [the GEIS] is specific to the impacts related to license renewal, the information is relevant to this review because the advanced LWR designs considered here use the same type of fuel . . ."

designs were comparable to the environmental impacts identified for LWRs in WASH-1248, "Environmental Summary of the Uranium Fuel Cycle," and its Supplement 1 (NUREG-0116) for Table S-3 (1976). FEIS at 6-16.

As with its evaluation of the LWR designs, the Staff used the 1000 MW(e) scaled model to compare impacts. FEIS at 6-16. The Staff expects that the environmental impacts from uranium fuel cycle and solid waste management activities for the proposed gas-cooled reactors would be SMALL; however, due to the uncertainty in the final design of gas-cooled reactors, this issue was not resolved. FEIS at 6-20. Should a CP or COL applicant reference one of these designs, additional reviews would be needed for fuel fabrication, enrichment, and solid low-level waste operation during decontamination and decommissioning. FEIS at 6-20.

Regarding the transportation of radioactive materials, the Staff evaluated impacts from normal operating and accident conditions resulting from (1) shipment of unirradiated fuel to the North Anna ESP site, (2) shipment of spent fuel to a monitored retrievable storage facility or a permanent repository, and (3) shipment of low-level radioactive waste and mixed waste to offsite disposal facilities. FEIS § 6.2. Transportation was considered for both advanced LWR designs and gas-cooled designs.

In order to make comparisons to Table S-4, "Environmental Impact of Transportation of Fuel and Waste to and From One Light-Water-Cooled Nuclear Power Reactor" (codified at 10 C.F.R. § 51.52), the Staff normalized environmental impacts to a reference reactor year (an 1100 MW(e) reactor with an 80 percent capacity factor). FEIS at 6-21. The Staff concluded that the environmental impacts of transportation of fuel and radioactive wastes to and from advanced LWR designs would be SMALL, and consistent with the risks associated with transportation of fuel and radioactive wastes from current-generation reactors presented in Table S-4. FEIS at 6-39. With respect to gas-cooled designs, the Staff concluded that impacts are likely to be small, but the issue was not resolved, due to lack of information on these

designs. FEIS at 6-39 – 6-41. At the CP or COL stage, an applicant referencing a gas-cooled design would be required to provide necessary data in order for the Staff to validate the assumptions used in the transportation analysis. FEIS at 6-41.

Regarding decommissioning, ESP applicants are not required to submit information regarding the decommissioning process. FEIS at 6-42. Dominion did not provide such information in its application. As such, the Staff concluded that the impacts from decommissioning are not resolved, and will be assessed at the CP or COL stage. FEIS at 6-42.

Based on the evaluation presented in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 6 include all factors relevant to the assessment of environmental impacts (where those impacts are assessed) from the uranium fuel cycle and solid waste management, transportation of radioactive material, and decommissioning. Further, the evaluation documented in FEIS Chapter 6 provides reasonable support for the Staff findings in that chapter.

Chapter 7.0, “Cumulative Impacts”

In FEIS Chapter 7, the Staff evaluated the potential cumulative impacts of constructing and operating one or more nuclear power units at the North Anna ESP site. To determine cumulative impacts, the Staff examined the impacts of the proposed action in combination with other past, present, and reasonably foreseeable future actions in the vicinity of the North Anna ESP site that would affect the same resources impacted by the current NAPS Units 1 and 2. FEIS at 7-1. These combined impacts are defined as “cumulative” pursuant to 40 C.F.R. § 1508.7, and include individually minor, but collectively significant, actions taking place over a period of time. FEIS at 7-1.

In particular, the Staff reviewed the cumulative impacts associated with land use (FEIS

§ 7.1); air quality (FEIS § 7.2); water use and quality (FEIS § 7.3);[57] the terrestrial ecosystem (FEIS § 7.4); the aquatic ecosystem (FEIS § 7.5); socioeconomic, historic and cultural resources, and environmental justice (FEIS § 7.6);[58] non-radiological health (FEIS § 7.7); radiological impacts of normal operation (FEIS § 7.8); and fuel cycle, transportation and decommissioning (FEIS § 7.9).

For the range of impact areas it evaluated, the Staff concluded that potential cumulative impacts from construction and operation are generally SMALL, although it determined that a few areas have the potential for a MODERATE impact, most of which would occur under temporary circumstances, such as drought conditions. However, the Staff concluded that further mitigation (beyond the actions identified in FEIS sections 4.10 and 5.10) is not warranted because of the temporary nature of the impacts. FEIS § 7.10.

Based on the evaluation presented in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 7 include all factors relevant to the assessment of cumulative impacts of construction and operation of new units at the North Anna ESP site. Further, the evaluation documented in FEIS Chapter 7 provides reasonable support for the Staff findings in that chapter.

Chapter 8.0, "Impacts of the Alternatives"

In FEIS Chapter 8.0, the Staff evaluated alternatives to the proposed action, and the environmental impacts of those alternatives. In particular, the Staff addressed the no-action

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[57] The Board posed two questions regarding cumulative impacts on water use and quality. *See* Staff Exh. 10, responses to Board Questions 112-113; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 25-26 (response to Board Question 112).

[58] The Board posed one question regarding the consideration of socioeconomic benefits of the proposed ESP. *See* Staff Exh. 10, response to Board Question 114; NRC Staff Legal Brief in Response to Licensing Board's Environment-Related Questions, at 26-28 (response to Board Question 114).

alternative (FEIS § 8.1),[59] system design alternatives (FEIS § 8.2);[60] and alternative sites (FEIS §§ 8.3 – 8.8).[61]

Regarding the no-action alternative, Appendix A to 10 C.F.R. Part 51, "Format for Presentation of Material in Environmental Impact Statements" states: "The alternative of no action will be discussed." The Staff reviewed the no-action alternative, which would entail denial of the ESP request. The Staff noted that, in that scenario, no impacts from site preparation and preliminary construction activities would occur, and, because no construction or operation would occur, the impacts addressed in the FEIS would not occur. FEIS at 8-2. However, the no-action alternative would also preclude all benefits from the ESP process, including early resolution of siting issues prior to large resource investments in new plant design and construction, and early resolution of issues on the environmental impacts of construction and operation. FEIS at 8-2.

FEIS Sections 8.2.1 through 8.2.3 contain information regarding alternative plant cooling systems (once-through cooling systems, wet cooling heat-dissipation systems, and dry cooling heat dissipation systems) for the proposed Unit 3 at the North Anna ESP site. A dry cooling tower has been proposed for Unit 4, as water and energy balance studies of Lake Anna suggest that it would be difficult for the lake to support a once-through system, a wet cooling tower

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[59] The Board posed one question related to the no-action alternative. *See* Staff Exh. 10, response to Board Question 116.

[60] The Board posed two questions related to system design alternatives. *See* Staff Exh. 10, response to Board Questions 117-118.

[61] The Board posed seven questions related to the evaluation of alternate sites. *See* Staff Exh. 10, responses to Board Questions 115, 119-124.

system, or a combination wet and dry cooling system for Unit 4. FEIS at 8-2; *see* FEIS, Appendix K, "Staff's Independent Review of Water Budget Impacts." As such, none of these alternatives is considered for proposed Unit 4.

Regarding Unit 3, the Staff concluded that a combination wet and dry cooling system (proposed by the Applicant) is preferable to a once-through system due to the former's expected smaller impact on the aquatic environment. FEIS § 8.2.1. Similarly, the Staff determined the combination system to be preferable to wet cooling towers, based on the expected smaller impact on the lake level and downstream flows. FEIS § 8.2.2. Finally, the Staff concluded that, based on its analysis that Lake Anna could support proposed Unit 3 using a combination wet and dry cooling system, and given the environmental impact of increased use of resources needed by using a less efficient dry cooling system, a combination wet and dry system is preferable to a dry cooling system for Unit 3. FEIS § 8.2.3.

With respect to alternate sites, the need to compare the proposed North Anna ESP site with other alternative sites arises from the NEPA requirement that the NRC evaluate alternatives to issuance of an ESP for the North Anna site. *See* NEPA Section 102(2)(c)(iii), 42 U.S.C. § 4332(c)(iii). The test to be employed in assessing whether a proposed ESP site is to be rejected in favor of any of the alternative sites considered is based on whether the alternative site is "obviously superior" to the site proposed by the applicant. *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 & 2), CLI-77-8, 5 NRC 503, 526 (1977), *aff'd*, *New England Coalition on Nuclear Pollution v. NRC*, 582 F.2d 87 (1st Cir. 1978). An alternative site is "obviously superior" to the proposed site if it is "clearly and substantially" superior to the proposed site. *Rochester Gas & Electric Corp.* (Sterling Power Project Nuclear Unit No. 1), ALAB-502, 8 NRC 383, 397 (1978), *aff'd*, CLI-80-23, 11 NRC 731 (1980).

As stated in *New England Coalition*, the standard of obvious superiority "is designed to guarantee that a proposed site will not be rejected in favor of a substitute unless, on the basis of

appropriate study, the Commission can be confident that such action is called for." 582 F.2d at 95. In this vein, the standard is appropriate for two reasons. First, the cost-benefit analysis performed by the NRC in evaluating alternative ESP sites is necessarily imprecise. Key factors considered in the alternative site analysis, such as population distribution and density, hydrology, meteorology, aquatic and terrestrial ecological resources, aesthetics, land use, and socioeconomics are difficult to quantify in common metrics. Given this difficulty, any evaluation of a particular site must necessarily have a wide margin of uncertainty. Second, the Applicant's proposed ESP site has been analyzed in detail, with the expectation that most adverse environmental impacts associated with the site have been identified. The alternative sites have not undergone a comparable level of detailed study. For these reasons, a proposed ESP site may not be rejected in favor of an alternative site when the alternative is "marginally 'better'" than the proposed site, but only when it is obviously superior. *See Sterling*, ALAB-502, 8 NRC at 393. NEPA does not require that a nuclear plant be constructed on the single best site for environmental purposes. Rather, "all that NEPA requires is that alternative sites be considered and that the effects on the environment of building the plant at the alternative sites be carefully studied and factored into the ultimate decision." *New England Coalition*, 582 F.2d at 95.

The NRC Staff review of alternative sites consists of a two-part sequential test for obvious superiority. *See* NUREG-1555, Section 9.3, "Alternative Sites." The first part of the test determines whether there are "environmentally preferred"[62] sites among the candidate ESP sites. The staff considers whether the applicant has (1) reasonably identified alternative sites,

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[62] An "environmentally preferred" alternative site is a site for which the environmental impacts are sufficiently less than for the proposed site so that environmental preference for the alternative site can be established. *See* NUREG-1555, Section 9.3, at 9.3-1.

(2) predicted the environmental impacts of construction and operation at these sites, and (3) used a logical, reproducible means of comparing sites that has led to the applicant's selection of the proposed site. Based on this review, the staff determines whether an alternative site is environmentally preferable to the applicant's proposed ESP site.

In its evaluation of alternative sites, if the staff determines that one or more alternative ESP sites is an environmentally preferred site, it will then conduct a cost-benefit balance and comparison of the estimated costs (environmental, economic, and time) of completing construction of the proposed plant at the proposed site and at the environmentally preferable site or sites. NUREG-1555, Section 9.3, at 9.3-11. To find an alternative site obviously superior, the staff must determine that (1) one or more important aspects, either singly or in combination, of a reasonably available alternative site are obviously superior to the corresponding aspects of the applicant's proposed site, and (2) the alternative site does not have offsetting deficiencies in other important aspects. A staff conclusion that an alternative site is obviously superior to the applicant's proposed site should normally lead to a recommendation that the application for the ESP be denied.

The Staff considers that the impact levels that were assigned for the resource areas are defined sufficiently to be used for the purposes of a comparison between the proposed and the alternative sites. The Staff relied on reconnaissance-level information to make its comparisons in the alternatives analysis, but the Staff considers them to be informed comparisons, for the reasons set forth in FEIS § 8.3, and has concluded that they are sufficient for making the determination concerning the existence of an obviously superior site. FEIS at 8-5.

The Staff examined Dominion's region of interest ("ROI") for the possible siting of a new nuclear plant, as well as its alternative site selection process. FEIS at 8-7 – 8-8. Dominion ultimately selected three alternate sites for examination in detail, and these three sites are examined in the FEIS: Dominion's Surry Power Station site in Surry County, Virginia; the

U.S. Department of Energy's ("DOE") Portsmouth Gaseous Diffusion Plant site in Pike County, Ohio; and DOE's Savannah River Site, located in Aiken and Barnwell Counties, South Carolina.

The Staff's detailed evaluation of the alternative sites is presented in FEIS sections 8.3.3, 8.3.4, 8.4, 8.5, 8.6, and 8.7, with a summary of the impacts of construction and operation on each of the three alternative sites selected by Dominion. A comparison of the alternative site impacts with impacts at the proposed North Anna ESP site is presented in Chapter 9, which is discussed *infra.*

Based on the evaluation presented in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 8 include all factors relevant to the assessment of environmental impacts of alternatives to the North Anna ESP site, including the no-action alternative, plant design alternatives, the alternate site selection process, and the three identified alternative sites. Further, the evaluation documented in FEIS Chapter 8 provides reasonable support for the Staff findings in that chapter.

Chapter 9.0, "Comparison of the Impacts of the Proposed Action and Alternative Sites"

In FEIS Chapter 9.0, the Staff compared the environmental impacts of constructing and operating two new nuclear units at the proposed ESP site and alternative site within the revised PPE presented by Dominion in the ER, in order to determine (1) whether any of the alternative sites are environmentally preferable, and (2) if so, whether there is a site that is obviously superior to the proposed site. FEIS at 9-1 – 9-2.

To determine whether a site was environmentally preferable, the Staff compared construction and operational impacts of the alternative sites with the North Anna site, and concluded that, (1) while there are minor differences in most of the construction impacts at the four sites, none of these differences is sufficient to determine that any of the alternative sites is environmentally preferable to the proposed North Anna ESP site (FEIS § 9.2.1); and (2) similarly, while there are some differences in the environmental impacts of operation at the

four sites, none is sufficient for the Staff to determine that any of the alternative sites is environmentally preferable to the proposed North Anna ESP site (FEIS § 9.2.2). Therefore, the Staff concluded that none of the alternative sites is obviously superior to the proposed North Anna site. FEIS § 9.3.

Finally, the Staff compared the proposed action with the no-action alternative. FEIS § 9.4. As previously stated, the Staff noted that denial of the ESP application would prevent early resolution of safety and environmental issues for the site, and further found that, although Dominion could follow any of several paths to satisfy its electric power needs, each of the paths would have associated environmental impacts. FEIS at 9-9. The Staff additionally concluded that, because any site preparation and preliminary construction activities could be redressed by the site redress plan described in FEIS § 4.11, the impacts of the proposed action and the no-action alternative would be similar. FEIS at 9-9.

Based on the evaluation presented in the FEIS, the Staff concludes that the facts described and referenced in FEIS Chapter 9 include all factors relevant to the assessment of whether, any of the alternate sites constitutes an environmentally preferable, or obviously superior, site. Further, the evaluation documented in FEIS Chapter 9 provides reasonable support for the Staff findings in that chapter.

Chapter 10.0, “Conclusions and Recommendations”

In reaching its ultimate findings and recommendation concerning the ESP application, the Staff provided its conclusions on a number of determinations required by NEPA. These determinations included analysis of any unavoidable adverse environmental impacts during construction and operation (FEIS § 10.2), any irreversible and irretrievable commitments of resources (FEIS § 10.5), and the relationship between short-term uses and long-term productivity of the human environment (FEIS § 10.4).

With respect to unavoidable adverse environmental impacts (*see* NEPA Section 102(2)(C)(ii), 42 U.S.C. § 4332(2)(C)(ii)), the Staff determined that there would be no unavoidable adverse impacts associated with the granting of the ESP, with the exception of impacts associated with site preparation and preliminary construction activities. FEIS at 10-5. However, the application demonstrated that there is reasonable assurance that redress carried out under Dominion's site redress plan will achieve an environmentally stable and aesthetically acceptable site suitable for whatever non-nuclear use may conform with local zoning laws. FEIS at 10-6. Further, the impacts associated with the site preparation and preliminary construction activities are bounded by the overall construction activities. FEIS at 10-6. In this vein, the Staff noted that there are unavoidable adverse impacts related to construction, as discussed in FEIS Chapter 4.0, and to operation, as discussed in FEIS Chapter 5.0.

With respect to irreversible and irretrievable commitments of resources (NEPA section 102(2)(C)(v), 42 U.S.C. § 4332(2)(C)(v)), the Staff again concluded that the only such resource commitments that would be expended if the proposed action is implemented would be resources used for site preparation and preliminary construction activities. FEIS at 10-10. Indeed, if not used during the duration of the permit, these resource commitments would be used at the CP or COL stage, or could potentially be used for other activities, even if the ESP is issued, but not referenced in a CP or COL application. FEIS at 10-10. The Staff stated that it expects the use of construction materials in the quantities associated with those expected for the two new units, while irretrievable, would be of small consequence with respect to the availability of such resources. FEIS at 10-10. The Staff also determined that uranium for fuel and, ultimately, offsite storage space for spent fuel assemblies would likewise be of small consequence with respect to the availability of such resources. FEIS at 10-10.

Regarding the relationship between short-term uses and long-term productivity of the human environment (NEPA section 102(2)(C)(iv), 42 U.S.C. § 4332(2)(C)(iv)), the Staff

concluded that the only short-term use of the environment that could occur if the ESP is issued would be site preparation and preliminary construction activities, and that any such activities are unlikely to adversely affect the long-term productivity of the environment. FEIS at 10-9. Furthermore, the Staff concluded that, because no assessment of the benefits of the proposed action was included in Dominion's ER (or evaluated in the FEIS), the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity for the construction and operation of the two units would be performed at the CP or COL stage, should the ESP be granted and referenced by a CP or COL applicant. FEIS at 10-10; *see Grand Gulf*, CLI-07-14, slip op. at 3-4 (permitting deferral of this issue until the CP or COL stage).

In light of its findings and conclusions, the Staff's recommendation to the Commission related to the environmental impacts described in the FEIS was that an ESP for the North Anna site should be issued. FEIS § 10.6.

The Staff submits that the evaluation documented in FEIS Chapter 10 provides reasonable support for the Staff findings in that chapter, including its recommendation that the ESP should be issued.

Based on the Staff's review, as indicated in the record by the FEIS and the Staff's responses to the Board's environmental questions, the Staff respectfully submits that it has a reasonable basis for drawing each of its environmental conclusions, and that those conclusions and supporting reasoning logically flow from the facts provided. The Staff, therefore, submits that it has a reasonable basis for its stated conclusions on environmental matters. As such, the Staff believes the Board may make the finding that, in accordance with the requirements of 10 C.F.R. Part 51, Subpart A, the ESP should be issued as proposed.

3. NEPA Baseline Issues

As was noted previously, regardless of whether a proceeding is contested or uncontested, in accordance with the Notice of Hearing, the Board is required to make the following "baseline" determinations regarding NEPA issues:

- Determine whether the requirements of Section 102(2)(A), (C), and (E) of NEPA and 10 C.F.R. Subpart A have been complied with in the proceeding (Baseline Issue 1);
- Independently consider the final balance among the conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken (Baseline Issue 2); and
- Determine, after considering reasonable alternatives, whether the ESP should be issued, denied, or appropriately conditioned to protect environmental values (Baseline Issue 3).

Notice of Hearing, 68 Fed. Reg. at 67,489. In its response to the questions certified to it by the Chief Administrative Judge, providing guidance to licensing boards regarding the appropriate standard of review to be used when making these "baseline" NEPA determinations, the Commission stated:

> [L]icensing boards must reach their own independent determination on uncontested NEPA "baseline" questions – *i.e.*, whether the NEPA process "has been complied with," what is the appropriate "final balance among conflicting factors," and whether the "construction permit should be issued, denied or appropriately conditioned." [Citations omitted.] But in reaching those independent judgments, boards should not second-guess underlying technical or factual findings by the NRC Staff. The only exceptions to this would be if the reviewing board found the Staff review to be incomplete or the Staff findings to be insufficiently explained in the record.

Clinton ESP, CLI-05-17, 62 NRC at 45. The Commission further directed licensing boards to follow the approach set forth in *Calvert Cliffs' Coordinating Comm., Inc. v. AEC*, in which the U.S. Court of Appeals for the District of Columbia Circuit stated:

> The Commission's regulations provide that in an uncontested proceeding the hearing board shall on its own determine whether the application and the record of the proceeding contain sufficient

> information, and the review of the application by the Commission's regulatory staff has been adequate, to support affirmative findings on various environmental factors. NEPA requires at least as much automatic consideration of environmental factors. In uncontested hearings, the board need not necessarily go over the same ground covered in the detailed [environmental impact] statement. But it must at least examine the statement carefully to determine whether the review . . . by the Commission's regulatory staff has been adequate. And it must independently consider the final balance among conflicting factors that is struck in the staff's recommendation.

449 F.2d 1109, 1118 (D.C. Cir. 1971) (footnote and internal quotation marks omitted). The Staff provides the following discussion to assist the Board in making its determinations on the three "baseline" NEPA issues.

(a) Baseline Issue 1

This finding requires that the presiding officer determine whether the requirements of NEPA sections 102(2)(A), (C), and (E) and the regulations in 10 C.F.R. Part 51, Subpart A have been met. 10 C.F.R. § 51.105(a)(1). NEPA Section 102(2)(A) requires all Federal agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment." 42 U.S.C. § 4332(2)(A). For the reasons set forth below, the Staff is of the view that it has met this requirement.

First, as evidenced by the thorough review process summarized in the Prefiled Testimony of John S. Cushing (at A5), the Staff utilized a "systematic, interdisciplinary approach" in its review of the ESP application and associated preparation of a draft EIS, supplemental draft EIS, and FEIS. *See* FEIS Appendix D, "Scoping Meeting Comments and Responses," and FEIS Appendix E, "Comments and Responses on the Draft Environmental Impact Statement and the Supplement to the Draft Environmental Impact Statement."

Second, the FEIS documents the Staff's environmental review, in which it considered the potential environmental impacts of the proposed action, *i.e.*, issuance of an ESP, as well as the

potential environmental impacts of construction and operation of two new nuclear units on the proposed North Anna ESP site. Specifically, the Staff considered numerous subjects, including: purpose and need for the proposed action, alternatives to the proposed action (including a comprehensive review of alternative sites), meteorology and air quality, geology, the radiological environment, water resources and water use, local ecology (both aquatic and terrestrial), socioeconomics, aesthetics, cultural and historic resources, environmental justice, threatened and endangered species, transportation, noise, land use, public and worker health, design-basis and severe accidents, waste management and fuel cycle impacts, decommissioning, cumulative impacts, and resource commitments. *See* FEIS Table of Contents, at v-xvi. Further, with respect to "the integrated use of the natural and social sciences and the environmental design arts" in performing its review, the Staff relied on the expertise of professional scientists, engineers, and social scientists. *See* FEIS Appendix A, "Contributors to the Environmental Impact Statement Related to Dominion Nuclear North Anna, LLC's Application for an Early Site Permit at the North Anna ESP Site."

NEPA section 102(2)(C) requires a Federal agency to address in its EIS:

> (i) the environmental impact of the proposed action,
>
> (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
>
> (iii) alternatives to the proposed action,
>
> (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
>
> (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(2)(C). As summarized in this Written Statement, FEIS Chapters 1.0, 8.0 and 9.0 describe the proposed action and examine reasonable alternatives, including the no-action

alternative. *See* FEIS §§ 1.2, 1.3, 1.4, 8.1, 8.2, 8.3, 8.4, 8.5 -- 8.7, 8.8, 9.1 -- 9.4. FEIS Chapters 4, 5, and 6 discuss in detail the potential impacts associated with the construction and operation of a reactor or reactors which have characteristics that fall within the site parameters, including the impacts of the uranium fuel cycle and transportation of unirradiated and spent fuel. FEIS Chapter 7 addresses cumulative impacts. With respect to irreversible and irretrievable commitments of resources, as discussed above, the Staff appropriately concluded that the only such resource commitments that would be expended if the proposed action is implemented would be resources used for site preparation and preliminary construction activities, that would otherwise be used, and that it expects the use of construction materials in the quantities associated with those expected for the two new units, while irretrievable, to be of small consequence. The Staff also determined that uranium for fuel and, ultimately, offsite storage space for spent fuel assemblies would likewise be of small consequence. Finally, as noted above, consideration of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity for the construction and operation of the two units is appropriately deferred to the CP or COL stage, should the ESP be granted and referenced by a CP or COL applicant.

Section 102(2)(C) also requires that an agency "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved." FEIS Appendix B, "Organizations Contacted" lists the Federal, state, regional, Tribal and local agencies, as well as other persons, consulted during the Staff's review. *See* FEIS Appendix F, "Key Correspondence."

Finally, NEPA section 102(2)(E) requires a Federal agency to "study, develop, and describe appropriate alternatives to recommend courses of action in any proposal which

involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(2)(E). The FEIS includes a detailed discussion of alternatives to the proposed action. *See* FEIS Chapters 8.0 and 9.0.

For these reasons, the Staff respectfully submits that it has complied with the requirements set forth in NEPA sections 102(2)(A), (C), and (E), and 10 C.F.R. Part 51, Subpart A.

b. Baseline Issue 2

This finding requires that the Board independently consider the final balance among the conflicting factors contained in the record of the proceeding and must determine the appropriate action to be taken. 10 C.F.R. § 51.105(a)(2). Regarding the Board's independent consideration of the final balance among conflicting factors, two other Boards that recently approved issuance of ESPs pursuant to 10 C.F.R. Part 52, Subpart A, considered this issue. *E.g., Exelon Generation Co, LLC* (Early Site Permit for Clinton ESP Site), LBP-06-28, 64 NRC 460, 487 (2006), *aff'd*, CLI-07-12, 65 NRC __ (slip op. March 8, 2007); *System Energy Resources, Inc.* (Early Site Permit for Grand Gulf ESP Site), LBP-07-1, 65 NRC __ (January 26, 2007), slip op. at 98-101,[63] *aff'd*, CLI-07-14, 65 NRC __, slip op. March 27, 2007. Consistent with this approach, the Staff notes the following regarding its FEIS analysis.

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[63] In particular, this Licensing Board stated (at 98):

> In the Board's view, the conflicting factors include: (1) the relative magnitude of the environmental impacts of the proposed action (*i.e.*, construction and operation of one or more ESP base load nuclear plants at the Grand Gulf site) as compared to other energy, plant design, and site alternatives; (2) unavoidable adverse environmental impacts during construction and operation of the plant or plants and the mitigative actions proposed to minimize their effects; (3) potential cumulative impacts in the context of past, present, and future actions at [the] site; (4) the magnitude of the irreversible and irretrievable commitment of resources; and (5) the relationship between short-term uses and long-term productivity of the human environment.

Plant design alternatives, the alternative site selection process, and three alternative sites are considered in FEIS Chapters 8 and 9. As discussed therein, the Staff submits that its determination regarding plant design alternatives, that a combination wet and dry cooling system is the preferred cooling system for Unit 3, and that dry cooling towers are the preferred cooling system for Unit 4, are reasonable. Regarding alternative sites, as discussed in FEIS Sections 8.3 – 8.8, the Staff submits that its determination that none of the alternative sites is obviously superior to the North Anna site is likewise reasonable.

Regarding cumulative impacts, the Staff is of the view that, as set forth in FEIS Chapter 7, its assessment of cumulative impacts is reasonable, and supported by the information contained in the record. Similarly, as discussed above with respect to FEIS Chapter 10, and NEPA Baseline Issue 1, regarding irreversible and irretrievable commitments of resources, as discussed above, the Staff appropriately concluded that the only resource commitments that would be expended if the proposed action is implemented would be resources used for site preparation and preliminary construction activities (which would otherwise be used). The Staff expects the use of construction materials in the quantities associated with those expected for the two new units, as well as uranium and offsite fuel storage space, while irretrievable, to be of small consequence. Finally, as noted above, consideration of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity for the construction and operation of the two units is appropriately deferred to the CP or COL stage, should the ESP be granted and referenced by a CP or COL applicant.

For these reasons, the Staff respectfully submits that, based on the record of the Staff's review before it, the Board can conclude, based on a balancing of the conflicting environmental and other factors (but excluding examination of the costs and benefits of the proposed facility, which were not considered here), that the overall balance supports issuance of the ESP.

(c) Baseline Issue 3

Finally, the Board must determine, after considering reasonable alternatives, whether the ESP should be issued, denied, or appropriately conditioned to protect environmental values. 10 C.F.R. § 51.105(a)(3). For this finding, one Board has stated that it will undertake an independent evaluation of the ESP application "without substituting its judgment for that of the Staff regarding its specific technical and factual findings, and instead relying upon the Staff's technical expertise absent manifest error." *Clinton*, LBP-06-28, 64 NRC at 487. For the reasons discussed herein with respect to NEPA Issue 1 and Baseline Issues 1 and 2, the Staff respectfully submits that its NEPA review has been adequate, and that the facts in the record support the Staff's conclusions with respect to environmental matters. The Staff therefore recommends that the ESP be issued, conditioned as discussed herein to protect environmental values. *See* FEIS at 1-10 – 1-11, 4-48.

For all of these reasons, the Staff respectfully recommends that the early site permit be issued to Dominion.

B. Written Answers To Additional Questions

In its March 20 Order, the Board directed that the parties submit short written answers addressing three questions. Each question is addressed in turn below.

1. Legal Question. Dominion is seeking to build up to sixteen new reactors on a site where a different licensee currently operates two reactors. The parties argue that the Board's questions related to whether NRC's limits on the routine radiological effluents from the existing reactors and the proposed ESP apply on a per reactor, per license, per unit, or per site basis are "in large measure a moot point because the more restrictive requirements in Appendix I and 40 C.F.R. Part 190 would apply." *See* Dominion's Response to the Licensing Board's February 7, 2007 Order (Issuing Environmental-Related Questions) at 13.

    a. Please provide the legal authority for the proposition that "Under 40 CFR Part 190 compliance with dose limits is assessed against the entire site and all sources of radioactivity and external radiation, regardless of the number of power plants." *See* Staff Answers to Environmental Questions: Exhibit B at 28.

Staff Response to Board Question 1A:

40 C.F.R. § 190.10(a) provides that operations which are part of a nuclear fuel cycle shall be conducted in such a manner as to provide reasonable assurance that:

> The annual dose equivalent does not exceed 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public as the result of exposures to planned discharges of radioactive materials, radon and its daughters excepted, to the *general environment* from uranium fuel cycle operations and to radiation from these operations.

Emphasis added. "General environment" is defined in 40 C.F.R. § 190.02(c) as "the total terrestrial, atmospheric and aquatic environments outside *sites* upon which any operation which is part of a nuclear fuel cycle is conducted." (Emphasis added.) In turn, "site" is defined as "the area contained within the boundary of a location under the control of persons possessing or using radioactive material on which is conducted one or more operations covered by [Part 190]." As such, the Staff considers the 25 mrem limit to apply to the entire *site*, rather than to any particular nuclear power plant located on a site.

> b. If there are two licensees on a single site and if each of them maintains its own radiological effluents *below* the requirements of Appendix I and 40 C.F.R. Part 190, but the total radiological effluents from the site *exceed* one or both of those site requirements, please explain the law as to whether and how either of the licensees is in violation of the regulations or their license.

Staff Response to Board Question 1B:

The NRC has addressed this circumstance with respect to current-generation reactors, at sites with plants owned and/or operated by different entities. For example, at the Indian Point Site, Unit 2 and Unit 3 were at one time operated by Consolidated Edison Company and the Power Authority of the State of New York, respectively. Currently, Nine Mile Point, Units 1 and 2, and the James A. FitzPatrick plant are operated by Constellation Nuclear and Entergy Nuclear Operations, respectively.

In such a case, typically the operating entities agree to apportion, based on operating histories, specific allocations to effluent releases and offsite doses, which become part of methods implemented in their respective Offsite Dose Calculation Manuals ("ODCM"), and Radiological Effluent Technical Specifications/Standard Radiological Effluent Controls ("RETS"/"SREC"). Although the details of implementation of the RETS/SREC will vary from plant to plant, the allocations typically are expressed as release rates (*e.g.*, uCi per second of noble gases) and fractions of doses allowed under 40 CFR Part 190 and multiples of Part 50 Appendix I dose objectives. For implementation, the ODCM and/or RETS/SREC identify conditions that trigger a mandatory evaluation of compliance with 40 CFR Part 190 when offsite doses due to liquid and gaseous effluents and external radiation exceed a jointly agreed-upon multiple value of Appendix I dose objectives. This step is performed as part of requirements that mandate that dose projections be performed monthly and compared to quarterly and annual dose objective limits from Appendix I to Part 50. Based on the results of such evaluations, the operating entities jointly determine whether further constraints should be imposed, and, if so, how existing constraints should be modified and re-apportioned among plants, given the cumulative dose reached to date and projected plant operations and maintenance activities for the balance of the year. In this way, licensees typically avoid exceeding the Appendix I objectives and the requirements of 40 C.F.R. Part 190.

If overall regulatory limits in 40 C.F.R. Part 190 were nevertheless exceeded for the site, all licensees co-located on that site would be considered to be in violation of Part 190, and, pursuant to 40 C.F.R. § 190.11, the Staff would expect to be notified by each licensee.[64]

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[64] The NRC informed power reactor licensees of its responsibility for implementation of this standard for licensed power reactors soon after the initial implementation of Part 190. *See* Letter from W.P. Gamill, NRC, to All Power Reactor Licensees, dated September 17, 1979
(continued. . .)

As required by Section 190.11(b), that notice should delineate the nature of any unusual operating conditions, the degree to which this operation is expected to result in levels in excess of the standards, the basis for any variance requested by the licensee, and the schedule for achieving conformance with the standards. Existing informal Staff guidance directs that the Staff grant a variance until action has been taken on the formal request for variance. Proposed enforcement action could be considered during the pendency of such a review.[65]

2. Legal Question. The NRC Environmental Justice policy states "*If* the percentage in the impacted area significantly exceeds that of the State or the County percentage for either the minority or low-income population *then* EJ will be considered in greater detail." 69 Fed. Reg. 52,040, 52,048 (Aug. 24, 2004) (emphasis added). Here however, although the percentage of minority or low-income population in the impacted area appears to exceed the norm significantly, the Staff's Final Environmental Impact Statement does *not* consider EJ in greater detail. *See* Staff Answer to Board Environmental Questions: Exhibit B at 22. Please explain whether and how this complies with Executive Order 12898 and the NRC Policy.

Staff Response:

The Staff is of the view that it conducted a detailed analysis as required by the Environmental Justice Policy Statement. The Staff interpreted the NRC Environmental Justice policy to mean that, if locations or populations are identified that meet the numerical "minority" or "low income" criteria in NRC environmental justice guidance,[66] or are otherwise identified during scoping and public comments, then these potentially affected specific locations and

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(. . .continued)

(ADAMS Accession No. 7910250215) ("By agreement, NRC is responsible for the implementation of this standard for licensed power reactors.").

[65] *See* "Response to Questions Concerning Enforcement of 40 CFR 190," dated July 29, 1981 (ADAMS Accession No. 9111210096).

[66] *See* NRR Office Instruction LIC-203, "Procedural Guidance for Preparing Environmental Assessments and Considering Environmental Issues," Rev. 1, Appendix D, "Environmental Justice Guidance and Flow Chart" (May 24, 2004) (ADAMS Accession No. ML033550003).

populations will be examined to see if any of the environmental pathways or conditions and practices of these populations would be likely to lead to disproportionately high and adverse negative health or environmental impacts. The Staff identified in both the FEIS and Staff Exhibit 10 (*see* Staff Response to Board Question 25A) that several minority and low income populations that met the NRC criteria were located and were mapped in Figures 2-6 and 2-7. FEIS at 2-78 and 2-79.

In addition, as part of the detailed EJ analysis, the analyst who conducted the socioeconomic interviews showed local officials, including directors of social services and other contacts in the thee counties surrounding the North Anna ESP site, the maps reproduced in Figures 2-6 and 2-7 and asked: (a) whether the contact knew of any *other* areas containing minority and low income populations that were not reflected in the maps; and (b) whether the contact knew of anyone who was practicing subsistence fishing or subsistence agriculture.[67] No additional minority and low-income populations were identified, and no subsistence activities were identified in this process. Accordingly, none were mentioned in the site audit report. Moreover, no additional populations, resource dependencies, or activities such as subsistence fishing or agriculture, and no populations of special interest, such as migrant farm workers, were identified in the scoping meetings, two full rounds of public meetings and public comments, or in responses to letters sent to the list of contacts in Appendix B to the FEIS. Thus, while the Staff continued to look for and consider any new information concerning environmental justice matters, the Staff assumed as a working hypothesis that the census block groups identified in Figures 2-6 and 2-7 marked the locations of the relevant minority and low income populations.

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[67] This process is documented in the memorandum from J. Cushing, NRR, to M.C. Nolan, NRR, "North Anna ESP Site Audit Trip – Socioeconomics," dated August 1, 2006 (ADAMS Accession no. ML062130542). This report is cited in the FEIS as Jaksch and Scott (2005).

In the environmental justice impact analyses discussed in sections 4.7 and 5.7 of the FEIS, the Staff considered whether any of the environmental pathways examined elsewhere in Chapters 4 and 5 of the FEIS would be likely to be disproportionately and adversely affected by plant construction and/or operation. With regard to construction, the only adverse impacts that were shown as greater than SMALL under any conditions for any offsite population (including minority and low-income populations) in the area affected by the proposed units were local traffic, housing and education. Traffic congestion in the immediate vicinity of the plant could increase, but this would not have a disproportionate and adverse impact on poor and minority populations, since they live at some distance from the plant site and not on the main commuting routes (as shown on Figures 2-6 and 2-7). Housing costs of rental housing in Orange and Louisa Counties might escalate if construction workers (against expectations) crowded into those counties, but it is doubtful that the impact would disproportionately fall on the diffuse (unmapped) poor and minority individuals in these counties; rather, if it happened at all, all population groups would be affected to some extent, and the distribution of impact would be uncertain. If large numbers of construction workers' children (against expectations) crowded into Orange and Louisa County public schools, these schools could become more crowded, but this would proportionately affect the entire population. After this detailed consideration, as stated in FEIS § 4.7 (at 4-36), the Staff concluded that there were no environmental pathways by which the identified minority or low-income persons were likely to suffer disproportionate and adverse environmental or health impacts as a result of construction.

During plant operations, as shown in FEIS Chapter 5, the only environmental effects during normal operations that might adversely affect any offsite population and that were greater than SMALL were water use, visual aesthetics, and recreation. The MODERATE water use impact (only during severe drought) could adversely affect customers of the Hanover County water utility, but this impact would fall proportionately on all customers. Visual aesthetics could be

adversely affected by the proposed additional units, cooling, towers, and plumes, but most of the residents of the affected view shed are not minority (based on Figure 2-6 and the scoping process) or low-income (based on Figure 2-7 and Lake Anna lakeside housing prices). Based on the Staff's interviews with the local officials and other contacts in the area, adverse impacts on recreation during severe drought at Lake Anna and the North Anna River downstream of the dam would not fall disproportionately on any particular population group. Although some minority and low-income populations live along the Pamunkey River farther downstream, impacts on fisheries that far downstream would be expected to be small, and are not expected to adversely affect those populations. If an accident were to occur, based on the relatively distant location of minority and low-income populations, if there were any offsite impact at all, it is likely that majority and moderate to high-income populations would be disproportionately affected. Accordingly, the Staff concluded, as stated in Section 5.7 of the FEIS, that there were no environmental pathways by which minority and low-income populations would suffer disproportionately high and adverse impacts during plant operations.

For these reasons, the Staff is of the view that it has complied with Executive Order 12898 and NRC policy concerning environmental justice.

3. Factual Question: The original notice of hearing in this proceeding stated that "the Director, Office of Nuclear Reactor Regulation (NRR), NRC, will propose findings on the following issues" and proceeded to specify two issues pursuant to the Atomic Energy Act and one issue pursuant to the National Environmental Policy Act. 68 Fed. Reg. 67,489 (Dec. 2, 2003). The NRR staff issued a final safety evaluation report and a final environmental impact statement, neither of which seem to be signed by the Director or state that they represent his findings. Please cite and provide the documents whereby the Director of NRR made or proposed the three specified findings.

Staff Response:

Because the Staff's response to this question contains primarily legal elements, its answer is provided here. Tr. at 557-58, 568-69.

The three specified findings will be made in the permit itself, which, if issued, will be signed by the Director, Office of New Reactors ("NRO").[68] At the time of issuance of the Notice of Hearing, and during the time the Staff prepared the FSER and FEIS, the responsibility for issuance of ESPs had been delegated exclusively to NRR. Due to recent internal reorganization of the NRC which involved, among other things, the creation of NRO, some of the NRR's delegated responsibilities are in the process of being transferred to NRO, including new reactor licensing. As of November 17, 2006, ESP program responsibilities are shared between NRR and NRO until the reorganization is completed.[69] As such, the Director of NRO has been delegated the authority to issue any ESP for the North Anna ESP site.

The Director's required safety and environmental findings are supported by the safety and environmental reviews documented in the Staff's FSER and FEIS, respectively. The Director of NRR has delegated authority for issuance of documents and correspondence, as outlined in NRR Office Instruction ADM-200.[70] As relevant here, the NRR Division Director (or, at the time of issuance of the FSER, the NRR Program Director, has the authority to issue safety evaluation reports, environmental impact statements, and supplements thereto for,

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[68] The Staff has appended its most recent draft of the proposed ESP hereto as Staff Exhibit 17. It should be noted that the portion of Appendix B involving the controlling values of accident source term plant parameters are not included with this draft, but would be included in any permit issued.

[69] *See* Memorandum to R. William Borchardt and J.E. Dyer from Luis A. Reyes, EDO, "Delegation of Authority to the Director of the Office of New Reactors" (Nov 17, 2006), at 3 (delegating to the NRO Director, among other things, the authority to "[i]ssue and amend licenses, certifications, permits, and limited work authorizations for nuclear power facilities under 10 CFR Part 52, prior to initial commencement of operation . . ." (ADAMS Accession No. ML062900300).

[70] *See* NRR Office Instruction ADM-200, "Delegation of Signature Authority" Attachment 1 at 1 ((Jan. 29, 2007). Previous revisions containing a substantively similar delegation were in effect at the time of the issuance of the FEIS (Revision 9, Oct. 31, 2005) and FSER (Revision 8, June 27, 2005). *See* ADAMS Accession Nos. ML070050008 (Rev. 10), ML052760080 (Rev. 9), ML043080029 (Rev. 8).

among other things, construction permits.[71] *See* NRR Office Instruction ADM-200, Rev. 8, Att. 1 at 1; NRR Office Instruction ADM-200, Rev. 9, Att. 1 at 1, NRR Office Instruction ADM-200, Rev. 10, Att. 1 at 1. As such, the FEIS was approved by the Director, Division of Siting and Environmental Reviews, NRO.[72] The FSER was approved by the Director, New, Research and Test Reactors Program, NRR,[73] and the FSER Supplement was approved by the Director, Division of New Reactor Licensing, NRR.[74]

CONCLUSION

For the reasons set forth above, the Staff respectfully requests that the Board determine that the review of the application by the NRC staff has been adequate to support a negative finding on Safety Issue 1, an affirmative finding on Safety Issue 2, and that the review conducted by the Commission pursuant to NEPA has been adequate.

In addition, regarding the Board's three specific "baseline" NEPA findings, the Staff respectfully submits that: (1) it has complied with the requirements set forth in NEPA sections 102(2)(A), (C), and (E), and 10 C.F.R. Part 51, Subpart A; (2) based on the record of the Staff's review before it, the Board can conclude, on a balancing of the conflicting environmental and

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[71] An ESP is considered a partial construction permit. 10 C.F.R. § 52.21.

[72] *See* Letter from J.E. Lyons, Director, Division of Siting and Environmental Reviews, NRO, to U.S. Environmental Protection Agency, "Final Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site," dated December 14, 2006 (ADAMS Accession No. ML063110096).

[73] *See* Letter from W.D. Beckner, NRR, to D.A. Christian, Dominion Resource Services, Inc., "Final Safety Evaluation Report for the North Anna Early Site Permit Application," dated June 16, 2005 (ADAMS Accession No. ML051610267).

[74] *See* Letter from T. Bergman for D.B. Matthews, NRR, to D.A. Christian, Dominion Resource Services, Inc., "Supplement 1 to Final Safety Evaluation Report for the North Anna Early Site Permit Application," dated September 28, 2006 (ADAMS Accession No. ML062650007).

other factors (but excluding examination of the costs and benefits of the proposed facility, which were not considered here), that the overall balance supports issuance of the ESP; and (3) the Staff's NEPA review has been adequate, and that the facts in the record support the Staff's conclusions with respect to environmental matters, supporting the Staff's recommendation to issue the ESP, conditioned as discussed herein to protect environmental values.

Respectfully submitted,

/RA/

Brooke D. Poole
James P. Biggins
Counsel for the NRC Staff

Dated at Rockville, Maryland
this 10th day of April, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the '"NRC STAFF'S WRITTEN STATEMENT OF POSITION," together with its associated exhibits, the "NRC STAFF EXHIBIT LIST," and notices of appearance for James P. Biggins and Jerry Bonanno, have been served on the following through as indicated: deposit in the NRC's internal mail system, with copies (exclusive of exhibits) by electronic mail, as indicated by an asterisk; or by express mail (exhibits in electronic format) and deposit in the U.S. mail, first class, with copies (exclusive of exhibits) by electronic mail, as indicated by double asterisk, this 10th day of April, 2007:

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/RA/

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC.	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

NOTICE OF APPEARANCE

Notice is hereby given that the undersigned attorney herewith enters an appearance in the captioned matter in accordance with 10 C.F.R. § 2.314(b).

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Admissions:	State of Illinois State of Texas State of Missouri U.S. District Court for the Northern District of Illinois
Name of Party:	NRC Staff

Respectfully submitted,

James P. Biggins
Counsel for the NRC Staff

Dated at Rockville, Maryland
this 5th day of April, 2007

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
DOMINION NUCLEAR NORTH ANNA, LLC.	)	Docket No. 52-008-ESP
	)	
(Early Site Permit for North Anna ESP Site)	)	

NOTICE OF APPEARANCE

Notice is hereby given that the undersigned attorney herewith enters an appearance in the captioned matter in accordance with 10 C.F.R. § 2.314(b).

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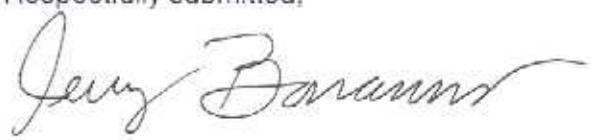
Respectfully submitted,



Jerry Bonanno
Counsel for the NRC Staff

Dated at Rockville, Maryland
this 5th day of April, 2007