

PART 3: ENVIRONMENTAL REPORT

Chapter 1 Introduction

This Environmental Report (ER) is submitted pursuant to 10 CFR 52.17(a)(2) and 10 CFR Part 51 to support the application of Dominion Nuclear North Anna LLC (Dominion) for an early site permit (ESP). The report provides information to the Nuclear Regulatory Commission (NRC) sufficient to facilitate the preparation of an environmental impact statement in accordance with the National Environmental Policy Act (NEPA). In preparing this ER, Dominion has relied on the NRC's guidance contained in NUREG-1555, Regulatory Guide (RG) 4.2, and reference material contained in NUREG-1437 and NUREG-1437, Supplement 7.

1.1 The Proposed Action

This section provides a description of the proposed action, the applicant, site location, the plant facilities assumed for environmental analysis, and the applicant's pre-application public involvement.

The proposed action is the issuance of an ESP approving a site (the ESP site) within the existing North Anna Power Station (NAPS) site as suitable for the construction, operation, and decommissioning of new nuclear power generation facilities (new units). The proposed action does not include any decision or approval to build the new units, which are matters that would be considered only upon the filing of an application for a combined license (COL).

The purpose and need for the proposed action is to allow the applicant, Dominion Nuclear North Anna, LLC (Dominion), to determine whether the ESP site is suitable for new units before incurring the substantial additional time and expense of designing and seeking approval to construct such facilities at the ESP site. This process allows early resolution of those safety and environmental issues relating to the ESP site, and facilitates subsequent utility decision making and NRC licensing.

While the actual construction and operation of new units is not currently proposed, this environmental report does analyze the environmental impacts that would result from the construction, operation, and decommissioning of new units at the ESP site. These impacts are analyzed in order to determine whether the ESP site is suitable for new units, and to resolve as many of those issues as is practicable.

Dominion has included a site redress plan as part of its application for an ESP. If an ESP application contains a site redress plan, the permit holder may perform certain activities described in 10 CFR 50.10(e)(1) without further authorization, provided that the environmental impact statement prepared by the NRC for the permit has concluded that the activities would not result in any significant environmental impact which cannot be redressed. The impacts of the activities described in 10 CFR 50.10(e) are addressed in this environmental report.

1.1.1 The Applicant and Owner

Dominion is the applicant for the ESP addressed in this environmental report. Dominion is an indirect, wholly-owned subsidiary of Dominion Resources, Inc. (DRI).

The NAPS site, which encompasses the ESP site for which an ESP is sought, is owned by Virginia Electric & Power Company (Virginia Power) and Old Dominion Electric Cooperative (ODEC) as tenants in common. These companies also own all land outside the NAPS site boundary that forms Lake Anna, up to the expected high-water marks. Virginia Power is the licensed operator of the existing units, with control of the existing facilities and the authority to act as ODEC's agent. Virginia Power is also a wholly-owned subsidiary of DRI, and supports this application.

If Dominion decides to proceed with the development of new units at the ESP site, it would first enter into and obtain the appropriate regulatory approvals of an agreement to purchase or lease the ESP site.

1.1.2 Site Location

The ESP site is wholly within the confines of the NAPS site, which is located on a peninsula on the southern shore of Lake Anna, approximately 5 miles upstream of the North Anna Dam. Lake Anna, developed to supply cooling water for the power station, is approximately 17 miles long, with 272 miles of shoreline. The ESP site is located in Louisa County, Virginia, near the town of Mineral.

The NAPS site was originally intended for the construction of four nuclear units. The original Units 3 and 4 were abandoned after initial construction activities were terminated. These units were to be constructed adjacent to and west of the existing Units 1 and 2. The ESP site is in the same general location as the abandoned Units 3 and 4. The NAPS site is zoned as industrial.

Geographically, the ESP site is approximately 40 miles north-northwest of Richmond, Virginia; 36 miles east of Charlottesville, Virginia; and 22 miles southwest of Fredericksburg, Virginia. Interstates 95 and 64 pass 16 miles to the east and 18 miles to the southwest of the ESP site, respectively. The portion of the NAPS site for which an ESP is sought is shown on Figure 1.1-1.

1.1.3 Reactor Information

This ESP application is intended to demonstrate the suitability of the ESP site for construction and operation of up to two new units.

No specific plant design has been chosen for the ESP site. Instead, a set of bounding plant parameters has been developed to envelop future site development. This plant parameters envelope (PPE) is based on the addition of power generation from two distinct units, to be designated as North Anna Units 3 and 4. Each unit represents a portion of the total generation capacity to be added and would consist of one or more reactors or reactor modules. These multiple reactors or modules (the number of which may vary depending on the reactor type selected) would be grouped into distinct operating units. The total nuclear generating capacity to be added would

not exceed 4500 MWt per unit. Additional information regarding reactors addressed in the PPE is provided in Chapter 3.

1.1.4 Cooling System Information

For normal plant cooling, a closed-cycle, dry and wet cooling tower system, with make-up water supply from Lake Anna, would be used for the new Unit 3, whereas closed-cycle cooling, using dry towers, would be used for Unit 4.

Lake Anna is divided into two parts separated by earthen dikes. The North Anna Reservoir is the source of water for the existing units. The Waste Heat Treatment Facility (WHTF) receives cooling water discharges from the existing units.

Make-up water for the Unit 3 closed-cycle, dry and wet tower system would be withdrawn from the North Anna Reservoir through a new intake structure located on a cove on the south shore of the lake, which was originally planned for the intake of the abandoned Units 3 and 4. This new structure would be adjacent to the existing units' intake structure. All cooling system discharges for both the existing units and the Unit 3 wet cooling tower blowdown would be sent to the WHTF via the existing discharge canal.

The new dry tower system of Unit 4 would introduce either no, or negligible, evaporative losses, and no additional heat load to Lake Anna.

Additional information on the cooling system is provided in Section 3.4.

1.1.5 Transmission System Information

The NAPS site is interconnected with the regional power grid system via three 500 kV transmission lines and one 230 kV transmission line from the station's switchyard. Any two 500 kV transmission lines, together with the 230 kV transmission line, are expected to have sufficient capacity to carry the total output of the existing units and the new units. If Dominion decides to proceed with development of new units at the ESP site, a system study (load flow) modeling these lines with the new units' power contribution would be performed at that time to confirm this conclusion. Additional information regarding the existing transmission system for the NAPS site is provided in Section 3.7.

1.1.6 Pre-Application Public Involvement

Dominion has established and maintains a positive relationship with the local population, civic leaders, and state and local governmental authorities in the area surrounding the ESP site. In a public opinion survey conducted in 2000, 86 percent of the population living in Louisa County believed that the existing units were a positive feature for the county.

In addition, Dominion has conducted an outreach program to pro-actively inform the local population of its interest in the NAPS site for purposes of early site permitting. Communications and meetings with various groups have been an ongoing practice since March 2002, when Dominion

representatives first met with the Louisa County Board of Supervisors and advised them of Dominion's interest in early site permitting. Since that time, Dominion representatives have met with a variety of state and local authorities and other members of the public. Examples of interactions with stakeholders initiated by Dominion are listed below:

- July 2002 meeting with the Lake Anna Civic Association
- February 2003 meeting with the Virginia Department of Environmental Quality (VDEQ)
- February 2003 meeting with the Virginia Department of Emergency Management
- February 2003 meeting with the Virginia Department of Game and Inland Fisheries (VDGIF)
- March 2003 meeting with the Virginia Secretary of Natural Resources
- March 2003 meeting with emergency preparedness coordinators representing counties surrounding the North Anna site
- March 2003 meeting with Louisa County Board of Supervisors
- April 2003 meeting with the Virginia Department of Conservation and Recreation (VDCR)
- May 2003 meeting with VDEQ, VDGIF, VDCR, Department of Historic Resources, Department of Health, Department of Agriculture and Consumer Affairs, and Department of Transportation
- Teleconferences with non-government environmental organizations, such as the Chesapeake Bay Foundation

On April 1, 2003, the NRC held public meetings in the vicinity of the ESP site. The purpose of those meetings was to: 1) inform the public regarding elements of NRC's Part 52 regulations involving ESPs, and 2) advise the public of its opportunities to become involved in the licensing process. Notices of those public meetings were provided in the Federal Register and in local newspapers.

1.1.7 Construction Start Date

Because the ESP does not constitute a decision or approval to build new units, there is no date established for commencement of construction. Site preparation (pre-construction) activities authorized by 10 CFR 52.25 could be initiated after receipt of the ESP at any time during the 20-year permit term. It is estimated that such site preparation activities (pre-construction) would take between 12 to 18 months to complete. If a decision were made to build new units, construction of new units is estimated to occur over a 5 to 7-year period, presuming that the start of a second unit would lag that of the first by at least 12 months, commencing after NRC issuance of a COL.

Section 1.1 References

None

1.2 Status of Reviews, Approvals, and Consultations

A Coastal Zone Management Act compliance certification was provided to the VDEQ for concurrence review. This certification of compliance with Virginia's Coastal Program is due to Lake Anna's shoreline border with Spotsylvania County and North Anna River downstream flow into tidal areas. Appropriate regulatory approvals of an agreement between Dominion and the current site owners would be necessary before Dominion conducts any site preparation activities. Consultations with other federal and state agencies in connection with the preparation of the environmental impact statement for this ESP application, including consultations under the Endangered Species Act and National Historic Preservation Act, will be necessary.

Numerous reviews, approvals and consultations would be required for the construction of the new units. Table 1.2-1 provides a list of the environmental-related authorizations, permits, and certifications potentially required by federal, state, regional, local, and affected Native American tribal agencies for activities related to the construction and operation of any new units at the ESP site (Reference 1) (Reference 2) (Reference 3) (Reference 4).

The structure of the summary table is based primarily on NUREG-1555 guidance. Because the purpose of this application is to establish the acceptability of the proposed site for future development, the permits identified as being required for construction and operation are not needed to support issuance of the ESP. Because these permits will not be obtained until Dominion makes a decision to proceed with the development of the site, numbers and expiration dates for these permits do not currently exist.

Section 1.2 References

1. NUREG-1555, *Environmental Standard Review Plan*, Section 2 "Status of Reviews, Approvals, and Consultations", U.S. Nuclear Regulatory Commission, October 1999.
2. NUREG-1437, *Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants, Supplement 7*, Section 1.5, "Compliance and Consultations," and Appendix E, Virginia Electric and Power Company's Compliance Status and Consultation Correspondence," USNRC, November 2002.
3. Virginia Department of Environmental Quality (VDEQ), www.deq.state.va.us, February 12, 2003.
4. *Lake Anna Special Area Plan*, Lake Anna Special Area Plan Committee, March 2000.

Table 1.2-1 Federal, State, and Local Authorizations

Agency	Authority	Requirement	License/ Permit No. (a)	Expira- tion Date (a)	Activity Covered
FAA	49 USC 1501	Construction Notice			Notice of erection of structures (>200 feet) potentially impacting air navigation.
Lake Anna Special Area Plan Committee		Conditional Land Use Approval	N/A	N/A	Local land use approval – Lake Overlay District.
NRC	Atomic Energy Act (AEA), 10 CFR 51, 10 CFR 52.17	EIS	N/A	N/A	Environmental effects of construction and operation of a reactor
NRC	10 CFR 52, Subpart C	Combined License			Combined construction permit and operating license for a nuclear power facility
NRC	10 CFR 52, Subpart A	Early Site Permit			Approval of the site for one or more nuclear power facilities, and approval of limited construction as per 10 CFR 50.10(e)(1)
NRC	10 CFR 30	By-product License			Approval to possess special nuclear materials
NRC	10 CFR 70	Special Nuclear Materials License			Approval to possess fuel
SCC					Approval of the purchase or lease of the site
SCC	VA Code 56-580D				Approval for construction of new generating facility
USACE	Clean Water Act (CWA)	Section 404 Permit (individual, regional, general)			Disturbance or crossing wetland areas or navigable waters
USACE	Rivers and Harbors Act	Section 10 Permit			Impacts to navigable waters of the U.S.
USFWS	Endangered Species Act	Consultation regarding potential to adversely impact protected species. Letter of Concurrence	N/A	N/A	Concurrence with no adverse impact or consultation on appropriate mitigation measures

Table 1.2-1 Federal, State, and Local Authorizations

Agency	Authority	Requirement	License/ Permit No. (a)	Expira- tion Date (a)	Activity Covered
USFWS	Migratory Bird Treaty Act	Federal or State Permit			Adverse impact on protected species (e.g., eagles, ospreys) and/or their nests
VDEQ	9 VAC 5-20-160	Registration.			Annual re-certification of air emission sources.
VDEQ	Federal Clean Air Act Amendments (CAAA) Title V9 VAC 5-80-50	Title V Operating Permit.			Operation of air emission sources.
VDEQ	9 VAC 5-80-120	Minor Source - General Permit.			Construction and operation of minor air emission sources.
VDEQ	FWCA 9 VAC 25-10	Virginia Pollutant Discharge Elimination System Permit (VPDES).			Regulated limits of pollutants in liquid discharge to surface water
VDEQ	FWCA 9 VAC 25-150	General Permit Registration Statement for storm water discharges from industrial activity (VAR5).			General permit to discharge storm water from site during operations
VDEQ	FWCA 9 VAC 25-180	General Permit NOT for storm water discharges from industrial activity (VAR5).			Termination of coverage under the general permit for storm water discharge associated with operational site activities
VDEQ	Federal Clean Water Act 9 VAC 25-180	General Permit Notice of Termination (NOT) for storm water discharges from construction activities (VAR4).			Termination of coverage under the general permit for storm water discharge from construction site activities
VDEQ	9 VAC 25-210	Virginia Water Protection Permit (Individual or General)			Permit to dredge, fill, discharge pollutants into or adjacent to surface water. Joint application with USACE Section 404 permit.

Table 1.2-1 Federal, State, and Local Authorizations

Agency	Authority	Requirement	License/ Permit No. (a)	Expira- tion Date (a)	Activity Covered
VDEQ	Federal Clean Water Act	Section 401 Certification			Compliance with water quality standards. ^b
VDEQ	Federal Clean Water Act (FWCA) 9 VAC 25-220	Surface Water Withdrawal Permit			Permit to draw water from Lake Anna (unless otherwise regulated by State Water Control Board)
VDEQ	Coastal Zone Management Act, Section 307.	Consistency determination.			Compliance with Virginia Coastal Program.
VDEQ	Virginia Coastal Resources Management Program	Consistency determination			Compliance with Virginia Coastal Program.
VDEQ	Federal Clean Water Act 9 VAC 25-180	General Permit Registration Statement for storm water discharges from construction activities (VAR10).			General permit to discharge storm water from site during construction
VDHR	National Historic Preservation Act, 36 CFR 800	Cultural Resources Survey/Review	N/A	N/A	Confirm site does not contain protected historic/cultural resources
VMRC	9 VAC 25-210	VMRC Permit			Permit to fill submerged land. Joint application with USACE Section 404 permit.

N/A - Not applicable (A license or permit is not required at the ESP stage)

- a. The information does not currently exist. Licenses and permits would be applied for and received at the appropriate time, which may not be until the COL phase.
- b. A certification under Section 401 of the Federal Water Pollution Control Act (FWPCA) is not appropriate at this time because a specific scope and schedule for pre-construction activities and determination of specific activities that would result in a discharge have not been established. To address the timing of this certification, the ESP should include a condition prohibiting Dominion from conducting any pre-construction activity that would result in a discharge into navigable waters without first submitting to the NRC a Virginia Water Protection Permit (which under Virginia's State Water Control Law at Va. Code § 62.1-44.15:5(A) constitutes the certification required under FWPCA § 401), or a determination by VDEQ that no certification is required.