

**NARRATIVE
JOINT PERMIT APPLICATION
PROPOSED UNIT 3
NORTH ANNA POWER STATION**

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**NARRATIVE
JOINT PERMIT APPLICATION
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NORTH ANNA POWER STATION**

1.0 INTRODUCTION

Virginia Electric and Power Company, doing business as Dominion Virginia Power (Dominion), operates the existing nuclear units on the North Anna Power Station (NAPS) site. NAPS is an existing nuclear power station with the capacity to generate 980 megawatts of electricity from Unit 1 and 973 megawatts of electricity from Unit 2. Unit 1 began commercial operation in June 1978 and Unit 2 followed in December 1980. The NAPS site was originally planned for four nuclear units, and construction was started under Nuclear Regulatory Commission (NRC) authorization; however, Units 3 and 4 were cancelled before construction was completed. A portion of proposed Unit 3 will occupy the footprint of the original Units 3 and 4.

NAPS is located in Louisa County, near the town of Mineral, on a peninsula on the southern shore of Lake Anna, approximately 5 miles upstream of the Lake Anna Dam (Figure 1). The North Anna River was dammed to form the 9,600-acre Lake Anna and the 3,400-acre Waste Heat Treatment Facility (WHTF). Lake Anna is approximately 17 miles long with 272 +/- miles of shoreline (Figure 1).

Dominion proposes to construct a new nuclear unit (Unit 3) at the NAPS site to provide additional baseload electric service to meet growing demand (see Section 3.2 for information on primary and secondary purposes). An Early Site Permit (ESP) from the NRC was received in November 2007 indicating that the site is suitable for new nuclear generation. This Joint Permit Application (JPA) relates to wetland impacts associated with construction of Unit 3. In support of this project, Dominion submitted an ESP Environmental Report (ER) and Combined License Application (COLA) ER. NRC has completed a Final Supplemental Environmental Impact Statement (SEIS) issued in February 2010 (see Section 11.0 for references to these documents). The proposed Unit 3 will be a U.S. Advanced Pressurized Water Reactor (US-APWR). The ancillary components of proposed Unit 3 which will be addressed in a permit from the U.S. Army Corps of Engineers (USACE) (Proposed Project) are the cooling towers, stormwater management facilities, Site Separation Activities (i.e., construction of parking lots, bypass road, and new facilities to replace the existing paint shop, vehicle maintenance shop, workshops, hazardous waste storage facility, communications tower, and sally port/security building), excavated spoils and construction laydown areas, raising the lake elevation by three inches, breaching of an existing berm at the water intake structure, and a large component transport route (LCTR). A detailed description of the Proposed Project is provided in Section 3.0 of this Narrative.

Dominion submitted a federal Coastal Zone Management Act consistency certification to the Virginia Department of Environmental Quality (VDEQ) on March 21, 2005 in

connection with activities authorized by the ESP. Dominion determined that impacts to Virginia coastal resources would be small and would be further mitigated through use of Best Management Practices in accordance with the Virginia Erosion and Sediment Control Handbook. VDEQ issued its conditional concurrence on November 21, 2006. Agency correspondence is provided in Attachment B. Dominion plans to submit a new consistency certification to VDEQ in 2010 to support this application.

Permanent and temporary wetland and stream impacts will occur as a result of the Proposed Project. Section 7.0 within this Narrative details the wetland and stream impacts and mitigation associated with the construction of Unit 3. These impacts are associated with both direct and indirect activities at on-site and off-site locations that comprise a single and complete construction project with respect to wetland and stream impacts. The permanent impacts to wetlands and streams which fall within USACE jurisdiction result from the construction of the proposed cooling towers, stormwater facilities, parking lots, roadways, soil spoils and construction laydown areas, and breach of the berm for the cooling water intake structure. Dominion is committed to avoiding wetland and stream impacts where practicable, and minimizing potential impacts to wetlands where no practicable avoidance alternative exists. The analysis provided includes efforts to avoid, minimize, and mitigate these impacts. The Proposed Project will result in the permanent and unavoidable loss of 0.40 acres of emergent wetlands and 4.14 acres of forested wetlands.

As part of the state's Coastal Zone Management Act consistency review for the ESP, VDEQ and the Virginia Department of Game and Inland Fisheries (VDGIF) required that Dominion complete an Instream Flow Incremental Methodology (IFIM) study to evaluate the potential downstream impacts of the operation of Unit 3. This IFIM study was designed and conducted in close coordination with the Commonwealth of Virginia resource agencies to evaluate dam releases to the North Anna River, and to determine the impacts on aquatic habitats and recreation, especially under low flow conditions. The water withdrawal associated with the operation of Unit 3 would increase the frequency of low flow conditions in the river during droughts. The IFIM concluded that increasing the lake level by three inches would adequately mitigate this impact on downstream areas (Attachment H). Therefore, Dominion proposes to raise the normal full-pool elevation of Lake Anna by three inches to a target of 250.25 feet (ft) mean sea level (msl). Similarly, the WHTF's water level would increase by 3-inches with the resulting level dependent on the configuration of stop logs at dike 3 and the number of operating circulating water pumps at the existing Units 1 and 2. Increasing the surface water elevation within Lake Anna and the WHTF will result in the inundation and unavoidable, temporary loss of 8.14 acres of wetland function along the shoreline to be replaced by an approximately equivalent increase in new wetlands after the shoreline adjusts to the increased elevation. Because the inundation is caused by the VDEQ's determination under its CZMA and Virginia Water Protection (VWP) authorities and will result from the operation of the preexisting dam without any discharge of fill material into waters of the U.S., Dominion believes that the lake level rise neither requires a Section 404 permit nor triggers any analysis under Section 404. Nevertheless, at the request of the USACE and for completeness, the shoreline wetland inundation-related impacts and associated mitigation

are described in this application. Water withdrawal activities associated with operation of Proposed Unit 3 will be addressed in a separate VWP permit application to VDEQ.

An off-site and on-site review of alternatives was conducted to determine the Least Environmentally Damaging Practicable Alternative (LEDPA). Section 3.4 provides a detailed alternatives analysis that was conducted in an effort to determine relative impacts to wetlands and streams, impacts to other environmental resources, and the practicality of each alternative, taking into account such factors as availability, logistics, cost, and meeting the overall project purpose. As documented in Section 3.4, the Proposed Project has been carefully designed to avoid and minimize impacts to the aquatic ecosystem, wherever practicable, and thus represents the LEDPA.

The total design plan will result in unavoidable, permanent impacts (and temporary functional impacts associated with the proposed increase in surface water elevation of Lake Anna and the WHTF) to 12.93 acres of wetlands subject to USACE and/or VDEQ jurisdiction. Permanent stream impacts include approximately 6,380 lf of stream channel. An additional 0.05 acres of temporary wetland impacts and 115 lf of temporary stream impacts are associated with the proposed off-loading facility along the shoreline of the Mattaponi River in Walkerton.

The narrative is organized to follow the sections outlined in the JPA. Attachments are included at the end of Volume 1 and Volume 2 to support the information required in the application.

2.0 JPA SECTION 1, PAGE 7 – PROJECT LOCATION INFORMATION

The Proposed Project site is located within several localities. The NAPS site and adjacent properties, owned by Dominion and referred to as the Route 700 Parcels, are located in Louisa County. Lake Anna is bordered by Louisa, Hanover, Spotsylvania, and Orange Counties. The transmission line corridor traverses Louisa, Spotsylvania, and Caroline Counties. The LCTR traverses King William, Caroline, Hanover, and Louisa Counties. Figure 2 depicts the Proposed Project site within the counties listed above. Impacts to wetlands associated with a proposed 3-inch rise in target lake level elevation will be located in Louisa, Spotsylvania, and Orange Counties. Wetland and stream impacts will be located in Hydrologic Unit Codes (HUC) 2080105 and 2080106. The roll-off location within the LCTR is located in HUC 2080105 (King William County) and the remaining project components are located in HUC 2080106 (Louisa, Orange, Spotsylvania, and Hanover Counties). There are no wetland or stream impacts associated with the transmission line that crosses into Caroline County (HUC 2080104).

The Unit 3 site is not located in Tidewater Virginia; however, other components of the project (Transmission Line and LCTR) are located within Tidewater Virginia. Spotsylvania County, located across Lake Anna from the NAPS site, is located within the Virginia coastal zone. The proposed LCTR corridor is located within the Coastal Zone counties of Caroline, Hanover, and King William. The proposed Transmission Line will be located within an existing transmission line corridor located within the Coastal Zone counties of Spotsylvania and Caroline.

In general, floodplains are defined as the lowland and relatively flat areas adjoining inland and coastal waters. A 100-year floodplain, as defined by the Federal Emergency Management Agency (FEMA), includes at a minimum, that area subject to a one percent or greater chance of flooding in any given year. For the Proposed Project, the only construction activities to occur within the 100-year floodplain at the NAPS site include activities associated with breaching the existing berm for the water intake structure. The remainder of construction activities on the NAPS site would occur outside of the FEMA 100-year flood zone (Figure 3). For additional information, please refer to the Final ESP EIS, Section 4.1.1 (NRC 2006).

3.0 JPA SECTION 3, PAGE 8 – DESCRIPTION OF THE PROJECT

3.1 Project Description

The project components that affect wetlands and streams (Proposed Project) include the construction of cooling towers and an associated stormwater facility; breaching an existing berm for the construction of the water intake structure; Site Separation Activities (paint shop, bypass road construction, parking lots, and stormwater facilities); soil spoils and laydown areas in the Route 700 Parcels; alterations to existing roadways associated with the proposed LCTR from Walkerton to NAPS; the construction of a temporary off-loading facility along the shoreline of the Mattaponi River in Walkerton; and an increase in lake elevation by three inches. The construction of Unit 3 also includes construction of a transmission line on the NAPS and along the Ladysmith corridor; however, the construction of the transmission line will not have impacts on wetlands or streams.

Prior to construction activities, a Virginia Stormwater Management Program construction stormwater permit will be obtained and a Stormwater Pollution Prevention Plan will be developed and implemented to minimize erosion and sedimentation during construction. Detailed descriptions of the Proposed Project components and the transmission lines are presented below.

An IFIM study was designed and conducted in close coordination with the Commonwealth of Virginia resource agencies to evaluate dam releases to the North Anna River and to determine the impacts on aquatic habitats and recreation, especially during low flow conditions.

Recreation within Lake Anna includes boating, fishing, the use of commercial marinas, and guide services. Recreational opportunities within Lake Anna and the downstream North Anna River would increase as a direct result of increasing the lake level elevation, as proposed by this project. For example, as contemplated by the IFIM Study, recreational flows to the North Anna River from the dam (i.e., 177 cfs) will be provided each Saturday during June and July when lake elevations exceed 250.0 ft to accommodate swift water kayaking.

3.1.1 Cooling Towers

Proposed Unit 3 will utilize the US-APWR technology and the proposed cooling towers for Unit 3 will be located to the west of the existing Units 1 and 2 (Figure 4). The footprint of the proposed cooling tower complex is approximately 1.7 million square feet (approximately 38 acres). Within this footprint are approximately 13,505 square feet (0.31 acres) of wetlands and 1,803 linear feet of stream that will be filled for construction of the cooling towers. These impacts are depicted as Impact # 8 and 9 located on Grid Sheet # 7 and 9. Impact #8 and #9 located on Grid Sheets #6 and #8 also depict approximately 18,686 square feet (0.43 acres) of wetland impacts associated with road crossings.

The cooling system for the proposed Unit 3 will be a closed-cycle, combination dry and wet cooling tower system for the circulating water system (CWS) with makeup water supplied from Lake Anna. The dry tower will be designed with the capability to reject a minimum of 1/3 of the condenser heat duty at design ambient conditions. This fraction of the heat rejection duty would increase with decreasing ambient air temperature. The dry tower will operate in a manner to conserve water when lake level is below normal resulting in a negligible impact on Lake Anna water levels. During periods when lake water level is at normal levels, operation of the dry section will be restricted to minimize the auxiliary power demand of the cooling tower and maximize electrical output available to consumers. As proposed, the plant cooling water systems of the new unit would have an insignificant impact on the WHTF or Lake Anna temperatures, resulting in no additional thermal impact to aquatic life.

A separate essential service water system would use a closed cycle, wet cooling tower for dissipation of waste heat from auxiliary heat exchangers not cooled by the CWS. The essential service water cooling system would have minimal makeup water requirements compared to that of the CWS.

3.1.2 Water Intake Structure

To establish the water source from Lake Anna into the water intake structure, breaching of the existing cofferdam berm is required (Figure 4). The channel was originally cut for the original planned Units 3 and 4, and the outer berm provided a dry area for construction of the Unit 3 and 4 water intake structure. Based on the conceptual design for penetration of the berm, the approximate quantity of dredged material will be 637 cubic yards (CY) (17,199 cubic feet (CF)). An additional 1,388 CY (37,476 CF) of material will be excavated from the berm. The material to be removed during the breaching of the existing cofferdam berm will be a mix of rip-rap and original berm material. The berm will provide a dry area for the construction of the new Unit 3 water intake structure; however, it will eventually be breached by multiple pre-cast culverts to allow flow of the lake water into the water intake structure. Each of the pre-cast culverts will be approximately 10 feet by 12 feet. The top elevation of the box culvert openings will be below the design lake low water level of 242.0 ft msl to prevent floating debris from entering the water intake structure. The proposed construction concept for the berm penetration involves a sheet pile cofferdam and silt curtain to allow dry installation of the culverts. On the west side of the cofferdam, material will be removed to align the bottom of the culverts with the bottom of the lake. VDEQ considers the existing intake area to be an "open water" that will be temporarily impacted. The USACE - Norfolk District has reviewed this area and has not taken jurisdiction. The intake structure is depicted as Impact #13 within Grid Sheet #12. The majority of the material removed will be from the berm cross-section with minimal lakeside impact. The material not used to reconfigure the berm for vehicle access over the culverts will be placed as spoil on the property. The material may be staged near the point of removal to allow drainage before trucking to the final spoils location. Best management practices will be employed to prevent sediment laden water from the dewatering process to enter the lake. The breaching of the berm will result in 10,620 square feet (0.24 acres) of jurisdictional

impacts to open water shown as Impact #13 depicted on Grid Sheet #12. The remaining open water impacts depicted on Grid Sheet #12 are associated with a proposed rip-rap stormwater outfall structure. The proposed activity may need to comply with time of year restrictions for spawning and recreational fish on Lake Anna. The time of year restriction is during the period of 15 March through 30 June. Please refer to the ESP ER, Revision 9, Section 3.4.2.1 (Dominion 2006) for additional information.

Water withdrawal activities for Unit 3 will be addressed under a separate application through the VWP permit process. The water withdrawal from Lake Anna for Unit 3 operation will be made by pumps submerged in the lake water and housed in the intake structure constructed at the end of the intake channel. The intake channel is fed by a series of culvert penetrations in the existing berm at the lake's edge, as discussed above. Water withdrawal from Lake Anna will be for the CWS, the Essential Service Water System (ESWS), Cooling Tower Makeup Water and Blowdown System, Station Water System, and the Fire Protection Water Supply System usage. In addition, water from Lake Anna will be used for various construction related activities associated with constructing Unit 3 (e.g., dust control, concrete batch plant, rock crushing/washing, and fill placements). Dominion will file a minor water withdrawal application with VDEQ for this withdrawal.

3.1.3 Site Separation Activities

Site Separation is a multi-phase project that includes activities that will separate the Units 1 and 2 support facilities from the proposed construction area for the new Unit 3. It will replace existing facilities and utilities that will be displaced by the construction of Unit 3. The projects listed below are included in the Site Separation Activities and will affect wetlands and/or streams. Figure 4 depicts the location of the Site Separation Activities.

3.1.3.1 Paint Shop

An existing paint shop at NAPS will be isolated from Units 1 and 2 use as a result of constructing the proposed Unit 3 project. The re-established paint shop and the associated stormwater facility will impact wetlands. The construction of the stormwater facility will have jurisdictional impacts to 15,625 square feet (0.36 acres) of wetlands. The stormwater facility is discussed below.

3.1.3.2 Parking Lots

A component of the Proposed Project includes the construction of two gravel parking lots to replace existing parking capacity to be lost as a result of constructing Unit 3. These proposed parking lots are located within the south/southwest portion of NAPS. Parking Lot #1 will provide approximately 353 new parking spaces and Parking Lot #2 will provide approximately 153 new parking spaces. Together Parking Lot #1 and Parking Lot #2 will have a footprint of 348,864 square feet (8.01 acres). An off-line stormwater basin is associated with each parking lot (Basin SS#2 and SS#5).

The construction of the parking lot will have jurisdictional impacts to approximately 3,122 square feet (0.08 acres) of forested wetland. These impacts are depicted as Impact # 10 and # 11 as shown on Grid Sheet 10.

3.1.3.3 Bypass Road

A new bypass road parallel to the existing Unit 1 and 2 access road, located to the west of the discharge canal, will be constructed in addition to new roadways to accommodate the new facilities. A portion of the existing access road includes a grade too excessive for transporting spent fuel casks. Therefore, the bypass road will provide a reduced grade access route for heavy haul to and from Units 1 and 2 including spent fuel transport. Impact # 12, depicted on Grid Sheet # 11 provides detail of the 0.36 acres of wetland impact associated with the bypass road and the adjacent stormwater management basin.

3.1.4 Stormwater Management Basins

The Proposed Project includes the construction of 11 stormwater management basins located throughout the NAPS site and the Route 700 Parcels (Figure 5). Of the 11 basins, seven are associated with the Site Separation Activities (SS#1, SS#2, SS#3, SS#4A, SS#4B, SS#5, and SS#6) and one is associated with the Cooling Towers (#2). The remaining basins (#1, #3, and #4) will be built during the construction phase of Unit 3. The stormwater management basins are sized to meet Virginia stormwater management ordinances to maintain peak discharge rates at or below pre-development rates for the 2-year and 10-year, 24-hour storm at the basin outlet. Additionally, each of the basin's volume provides detention storage of the first 1 inch of runoff, the water quality volume, from the drainage area. The water quality volume will be slowly released from the basins with a minimum drawdown time of 30 hours for each of the basins, except SS #5. The actual retention time for SS #5 is 10 hours. Maximum storage volumes for the eleven stormwater management basins are located in Table 1. Attachment G provides detailed information on each basin.

The stormwater management basin located adjacent to the proposed paint shop (SS#3) will be located in an existing emergent wetland area east of Units 1 and 2 Service Water Reservoir. Approximately 15,625 square feet (0.36 acres) of emergent wetland will be impacted by SS#3 and the bypass road. The wetland area impacted is depicted as Impact #12 on Grid Sheet # 11. There is an existing culvert beneath the plant access road, east of the Service Water Reservoir that provides discharge for surface runoff, groundwater, and possible seepage from the reservoir. The existing culvert discharges to an existing concrete lined channel that travels to the Discharge Canal.

Table 1. Estimated Storage Volume for the Eleven Stormwater Management Basins

Basin Number	Maximum Storage Volume (CF) Available Within Basin*	Discharge Area
1	1,302,600	Lake Anna
2	1,015,000	Tributary to Harris Creek
3	340,000	Tributary to Harris Creek
4	414,800	Tributary to Harris Creek
SS#1	100,300	Tributary to Waste Heat Treatment Facility
SS#2	104,600	Tributary to Waste Heat Treatment Facility
SS#3	152,500	Discharge Canal to Waste Heat Treatment Facility
SS#4A	239,800	Tributary to Waste Heat Treatment Facility
SS#4B	206,800	Tributary to Waste Heat Treatment Facility
SS#5	134,500	Tributary to Waste Heat Treatment Facility
SS#6	134,430	Tributary to Harris Creek

*Maximum storage volume available within each basin has been rounded.
Note: "SS" stands for Site Separation Activities. Site Separation is a multi-phase project that includes activities that will separate the existing Units 1 and 2 from the proposed construction area for the new Unit 3.

The stormwater management facility associated with the proposed cooling towers (#2) is located to the north of the cooling towers (Figures 4 and 5). The off-line stormwater facility is sized to meet both water quality and quantity control requirements. The basin is sized to maintain post-development peak discharge rates at or below pre-development peak discharge rates for rainfall events up to and including the 25-year, 24-hour storm. The basin detains the runoff from the cooling tower area and releases it to the existing stream east of the cooling tower area. The emergency spillway is sized to pass the peak discharge from the 100-year, 24-hour storm. The proposed basin is 11 feet deep with a bottom elevation at 273.0 feet and a top of embankment elevation at 284.0 feet. The crest of the emergency spillway is located at elevation 282.0 feet. The principal spillway

consists of a riser and pipe outlet structure. The riser is equipped with an outlet orifice. The surface area of the basin is approximately 2.78 acres at elevation 284.0 feet, the crest of the emergency spillway.

3.1.5 Route 700 Parcels

Dominion owns property adjacent to the NAPS site, referred to as the Route 700 Parcels. The Route 700 Parcels are located southwest of NAPS, near the entrance to the NAPS site. The Route 700 Parcels are adjacent to Haley Drive and Kentucky Springs Road (Figure 4) and are the proposed location for placement of a portion of the spoils from the construction of Unit 3, and will be developed into a suitable laydown area to support placement of construction support facilities and materials in addition to providing secure construction related access. Clear cutting of a portion of the site occurred approximately 4 years ago, prior to purchase by Dominion. The construction of the new Unit 3 and associated facilities will require excavation of approximately two million CY (54 million CF) of soil and organics. The Route 700 Parcel will provide sufficient area to permanently store the spoil material without hauling the material off-site. In addition, the property will provide alternate access to reduce disruption to operating Unit 1 and Unit 2 and will relieve congestion of construction facilities previously limited to NAPS site property limits.

Approximately 139,853 square feet (3.21 acres) of forested wetlands, 1,653 square feet (0.04 acres) of emergent wetlands, and 3,809 linear feet of stream will be permanently impacted. These areas are depicted as Impacts # 1 through #6 and shown on Grid Sheet # 1 through # 5. An approved erosion and sediment control plan will be in place prior to land disturbing activities within the Route 700 Parcels area. The erosion and sediment control plan will comply with all applicable Virginia State and Louisa County regulations and requirements. The plan will also consider the steep slopes shown on the Construction Facilities Rough Grading Plan and the time required to establish stabilized surfaces via vegetation or other engineered means on these slopes to prevent sediment from migrating offsite. As the erosion and sediment control plan will be developed as part of the construction plan, current grading drawings do not depict these erosion and sediment control plan measures.

Once construction is complete, the area will be inspected to ensure that all stabilization measures have been installed and that ground surfaces are stable before the removal of erosion and sediment control measures. The final surface condition of the area will be a vegetative cover similar to the existing vegetative cover. Storm water measures including basins, vegetated swales and ditches, culverts, and rip rap energy dissipaters have been designed to maintain peak discharges at or below pre-development levels. Thus, the downstream channels will be protected against both sediment deposition and erosion as a result of grading alterations associated with the placement of soil and the spoils piles on the Route 700 Parcels.

3.1.6 3-Inch Increase in Surface Water at Lake Anna and WHTF

While unrelated to the construction of North Anna 3, the operation of cooling towers for Unit 3 will require makeup water supply provided by Lake Anna. As described in Section 1.0, to offset this consumptive use, Dominion proposes to raise the normal full-pool elevation of Lake Anna by 3 inches to 250.25 ft msl to mitigate the effect on lake level and downstream flow, particularly during drought conditions. Similarly, the WHTF's water level would increase by 3-inches with the resulting level dependent on the configuration of stop logs at dike 3 and the number of operating circulating water pumps at the existing Units 1 and 2. Increasing the surface water elevation within Lake Anna and the WHTF could result in the unavoidable, temporary loss of 354,578 square feet (8.14 acres) of wetland function along the shoreline to be replaced by an approximately equivalent increase in new wetlands after the shoreline adjusts to increased elevation. Many of these wetlands are inundated periodically as the result of normal dam operation and weather conditions. Raising the water level and any resulting impacts are not the result of any discharge of dredged or fill material. Dominion plans to mitigate the temporary loss of wetland function as outlined in the attached mitigation plan in accordance with VDEQ requirements under a VWP permit. This impact is not considered a loss of wetland area, but will be mitigated for a temporary change in wetland function. These areas are depicted in Attachment D-2.

3.1.7 Large Component Transport Route

The LCTR is the road network proposed to transport the reactor pressure vessel and other oversized/overweight equipment required to construct Unit 3. Certain areas and existing facilities will require modifications to safely unload and transport the large components. The proposed roll-off site is located in King William County, adjacent to the Walkerton Bridge. The Walkerton Bridge traverses the Mattaponi River. The proposed route includes unloading equipment from a barge at the roll-off location and traveling west on Route 30. The proposed route will cross over I-95 by using an existing entrance ramp at Exit 98. The route will travel north on I-95, turning at an emergency crossing and using an existing off-ramp at Exit 98. The off-ramp will require new construction and improvements to the existing ramps and roads. From Route 30, the proposed route follows Route 1, turning east on Doswell Road following an unnamed road north to Verdon Road. From Verdon Road, the proposed route follows State and County Roads to NAPS (Figure 2). Portions of the proposed route were used previously for heavy haul to support the construction and operation of Units 1 and 2.

The equipment will be barged to the roll-off location. The loads to be rolled-off will be too large to facilitate a typical operation where the barge is beached and the load rolled off the end. To facilitate the offloading operations, the barge will be moored offshore with a short bridge connecting the barge to the shore. The proposed roll-off location will require a temporary cofferdam within the Mattaponi River and construction of a temporary roll-on/roll-off ramp. Approximately 2,051 square feet (0.05 acres) of temporary emergent wetland impacts are expected at the roll-off location. These impacts are depicted as Impact # 14-16 as shown on Grid Sheet # 13. The construction of the

cofferdam may need to comply with time of year restrictions for spawning and recreational fish on the Mattaponi River. The time of year restriction is during the period of 15 February through 30 June.

A temporary structure will be constructed north of an existing bridge to span the North Anna River at Route 30. After the equipment has been hauled, the structure will be demolished and removed. Existing roadway culverts and pipes along the proposed LCTR have been surveyed and evaluated. In locations where culverts and pipes require additional protection to support the loads, steel plating or crane mats will be used. Replacement or improvement of existing culverts and pipes is not expected.

3.1.8 Transmission Line

Currently, NAPS has three 500-kilovolt (kV) transmission lines and one 230-kV transmission line leaving the site from the switchyard. Each transmission line occupies a separate right-of-way. After reviewing the existing lines with the new unit's power contribution, it was determined that an additional 500-kV transmission line would be required along with other system reinforcements to maintain grid reliability with the interconnection of the proposed Unit 3 into the existing transmission system.

The proposed 500-kV transmission line would be constructed from the NAPS substation to the Ladysmith switching substation, located east of the NAPS site (Figure 2). The proposed transmission line will be constructed within an existing corridor that travels east for 15 miles and is approximately 275 feet wide. Wetland and stream impacts will be avoided during construction of the transmission line. The proposed towers will be located to avoid wetland and stream impacts.

Current National Electrical Safety Code (NESC) and transmission line standards will be followed in terms of tower separation, line installation, ground clearance, tower structural design parameters, number of conductors, and appearance. New towers will be constructed "tower for tower" and will be 10 to 20 feet taller than the existing towers along the corridor.

3.2 PRIMARY AND SECONDARY PURPOSES

Currently, NAPS has the capacity to generate 980 megawatts of electricity from Unit 1 and 973 megawatts of electricity from Unit 2. This production generates enough electricity to power approximately 450,000 homes. The primary purpose of the Proposed Project is to construct portions of certain ancillary components for the proposed new Unit 3, which will provide additional nuclear baseload generating capacity to supply the state's growing demand for electricity consistent with NRC authorization. Unit 3 will produce an estimated net electrical power output of 1,500 MWe to power an additional 360,000 to 380,000 homes. The secondary purposes of constructing the Proposed Project and the associated Unit 3 are to maintain fuel diversity, reduce Virginia's dependence on imported power, and promote the regional economy while not contributing to air emissions.

3.3 INTENDED USE

The intended use of the Proposed Project is construction of Unit 3 at NAPS, which will provide adequate and reliable electric service. The need for additional electricity is directly related to providing reliable service to meet the growing demand caused by increased development from residences, businesses, and government facilities.

3.4 ALTERNATIVES CONSIDERED

The CWA requires that the discharges authorized under Section 404 be determined through the application of guidelines developed by USACE and USEPA (33 U.S. Code § 1344(b)). The guidelines required by Section 404(b) are set forth at 40 C.F.R. Part 230 ("Guidelines"). The Guidelines require that an applicant demonstrate that a proposed discharge of dredged or fill material is the LEDPA (40 C.F.R. § 230.10(a)).

The Guidelines allow rejection of an alternative when it has similar or greater impacts to aquatic ecosystems, including wetlands and streams. An alternative may be evaluated to determine whether it will have an adverse impact to the aquatic ecosystem that is identifiably or discernibly less severe than the impact of the proposed discharge. The evaluation includes impacts to all types of aquatic ecosystems, and the severity of the impact will be determined by the effect on the functions of the aquatic resources of each alternative. Where there is no significant or easily identifiable difference in impact, an alternative is not considered to have less adverse impact to environmental resources. The Guidelines also allow rejection of an alternative if it has "other significant adverse environmental consequences." Such environmental consequences may encompass the full range of environmental impacts including, for example, impacts on threatened and endangered species, historic resources, air quality, or impacts on the human environment (e.g., land use or traffic impacts).

An alternative is practicable if it is "available and capable of being completed after taking into consideration cost, existing technology, and logistics, in light of overall project purposes (40 C.F.R. § 230.10(a) (2))." As an initial requirement, the definition of

practicability specifies that an alternative site must be available to the applicant. Equally important, an alternative can be found impracticable due to costs, logistics, or existing technology. For example, logistics includes a number of factors affecting the ability to develop the proposed project, including the availability of suitable access and whether the size and configuration of the site will support the proposed project. Where access or the size or configuration of the site is inadequate, for example, development of the proposed project at an alternative site is considered logistically impracticable. Finally, to be “practicable,” an alternative site must meet the overall project purposes.

This alternatives analysis evaluates a number of the criteria set forth in the Guidelines. First, it evaluates the impact of each alternative on environmental resources. Second, this alternatives analysis evaluates the practicality of each alternative, including its availability, cost, logistics, and consistency with the overall project purposes. With respect to availability, a site must be available for acquisition and use to accomplish the overall project purposes; thus, a site may be unavailable due to a variety of factors, such as restrictions on use of the site or dedication of the site to other uses, planned development by the owner, or that the site is not “reasonably obtainable” from the owner. The cost of an alternative is evaluated to determine whether it is reasonable; thus, where acquisition, construction, or operation of an alternative is unreasonably expensive, the alternative is not considered practicable. With respect to logistics, this analysis evaluates a number of factors, such as adequacy of access, topography, whether the size and configuration of the site will support the proposed project, impact on existing facilities, ability to utilize existing infrastructure, traffic congestion, constructability, and safety. Finally, the analysis evaluates whether an alternative satisfies the overall project purpose.

The scope of an alternatives analysis should be commensurate with the extent of the environmental impacts of the permitted discharge, such as the extent of the acreage of impacted waters and wetlands and the impacts to the functions of those waters and wetlands. The Guidelines specify that the USACE “must recognize the different levels of effort that should be associated with varying degrees of impact and require or prepare commensurate documentation” which “should reflect the significance and complexity of the discharge activity (*Id.* at § 230.6(b)).” In particular, with respect to the alternatives analysis, the Guidelines direct that “the compliance evaluation procedures will vary to reflect the seriousness of the potential for adverse impacts on the aquatic ecosystems posed by specific dredged or fill material discharge activities (*Id.* at § 230.10).”

Dominion has prepared an analysis of alternatives clearly demonstrating that the proposed discharges are the LEDPA. Several alternative configurations to the Proposed Project were considered during the planning process. The alternatives considered for the Proposed Project include the alternative site location of the cooling towers and associated stormwater basin; alternative location of soil spoil and laydown areas; Site Separation Activities, including alternative location of the relocated paint shop, parking lots, bypass road, and a stormwater basin; alternative methods for breaching of the berm for the water intake structure; and alternative routes for the LCTR. This JPA does not contain a separate discussion of alternative sites. The NRC’s detailed evaluation of alternative sites is documented in Chapters 8 and 9 of the ESP EIS (NRC 2006).

3.4.1 Location of Cooling Towers

The existing Units 1 and 2 use a once-through cooling system that withdraws water from a water intake structure at the Lake's shoreline and discharges into a canal, flows through the WHTF, and returns through Dike 3 to Lake Anna. A closed-loop cooling system with water conserving technology has been proposed for Unit 3. This proposed design essentially eliminates additional thermal impacts to the Lake. The dry sections of the as proposed cooling towers significantly reduce water withdrawal impacts compared with conventional wet towers and, therefore, minimize impacts to the Lake level, and reduce downstream flow impacts.

The proposed locations of the hybrid and dry cooling towers are based on a number of considerations including: limiting impacts to wetlands and streams; minimizing plume impacts to existing facilities; using the natural topography of the area to reduce excavation requirements; and maintaining small noise and visual impacts. The proposed arrangement also considered location of the towers in relation to parking lots and buildings, privately owned property and residences, electrical switchyards and transmission lines, prevailing wind direction, and tower height. The location of the wet portion of the proposed CWS cooling towers provides sufficient distance from the switchyard, power block, power transmission lines and habitable buildings to protect these facilities and electrical components from excessive salt deposition and moisture.

The elevation of the proposed cooling tower area is such that surrounding terrain provides a buffer for nearby off-site properties. This, in addition to forested areas within the NAPS site, provides screening of the cooling towers.

Alternative cooling tower locations could have posed a number of potential incremental impacts, including additional wetland/stream impacts, distance offsets, additional excavation, and transmission line rerouting.

3.4.2 Location of Stormwater Basin Associated With Cooling Towers

The proposed location for the North Anna Unit 3 CWS cooling towers will require cutting into an existing hillside to create a level area large enough to place both the hybrid and dry cooling towers. The excavation results in uphill slopes along three and a half of the four sides of the developed area. There are three surrounding areas lower in elevation than the proposed grade for the cooling towers where runoff can be directed without excavating large volumes of material to create a stormwater basin. These areas include portions of the existing stream beds and an old borrow area for Units 1 and 2.

One alternative considered the construction of two stormwater basins to manage the runoff from the Unit 3 cooling tower area. This alternative would utilize the upper portion of the two stream beds for stormwater management. The stormwater basins would occupy the headwaters and portions of the stream beds of two intermittent streams that drain the existing hill slope. The headwater portions of these streams would be permanently impacted by filling for the construction of the stormwater basins. Each

stormwater basin would be an extended detention basin with outlet flow to the existing streams. Under this alternative, the cooling tower development would divert all of the runoff from the upstream drainage areas for each stream such that placing the basin in the stream bed would not require the treatment of runoff from undisturbed areas. Additionally, placing the basins in the stream bed channel would allow the streams to continue to be fed from upstream areas and allow deposition of sediment.

Another alternative was considered that would route stormwater directly to the lake through a channel and culvert system. However, if runoff were to be routed directly to Lake Anna through a designed channel, the existing streams likely would be starved as most of the upstream runoff would be diverted from the streams.

Alternative 3, the Proposed Project, is to place a stormwater retention basin in the old borrow area for Units 1 and 2. This would allow discharge to the western stream, but discharge to the eastern stream would not occur until a point further downstream, if at all.

A fourth alternative is to create a new basin to the west. The area west of the proposed cooling tower would require the removal of approximately 35 vertical feet of material to lower the area to the cooling tower site grade with additional excavation for the basin. Creation of the new basin would result in additional spoil material and increase dusting and potential runoff sedimentation during construction. In addition, the placement of the basin would decrease inflow to the existing wetlands and streams.

Based on discussion with VDEQ and USACE, the Proposed Project has the least impact to the surrounding environment and community and will minimize impacts to the existing stream beds. Alternatives 1 and 2 were dismissed due to the greater impacts to streams that would possibly reduce water volumes and indirectly impact water quality downstream. Alternative 4 was dismissed because the site would require additional excavation resulting in additional spoil material that would be transported outside of the NAPS site. The Proposed Project includes a single stormwater basin that will collect runoff from the cooling tower areas north of the dry cooling tower. The stormwater basin will discharge into the existing wetland and stream located northeast of the dry cooling tower and east of the basin. The basin is sized to meet Virginia stormwater management ordinances that maintain peak discharge rates at or below pre-development rates for the 2-year and 10-year, 24 hours storms at the basin outlet. Additionally, the basin volume provides detention storage of the first 1 inch of runoff, the water quality volume, from the drainage area. The water quality volume is slowly released from the basin with a minimum drawdown time of 30 hours. Riprap protection is provided at the basin outlet to prevent erosion due to the velocity of the discharge exiting the outlet pipe.

3.4.3 Breaching of Berm for Water Intake Structure

To establish a water source from Lake Anna into the water intake structure, breaching of the existing berm is required. Based on the conceptual design for penetration of the berm, the quantity of material to be removed will be approximately 2,025 CY (54,675 CF). This is composed of 637 CY (17,199 CF) of sediment that will be dredged from

within the lake and 1,388 CY (37,476 CF) of material from the existing berm. The material will be a mix of rip-rap, original berm material, and lake bottom sediments. The material not used to reconfigure the berm for vehicle access over the culverts will be placed as spoil on the Route 700 Parcels. The excess material may be staged near the point of removal to allow drainage before trucking to the final spoils location. Best management practices will be employed to prevent release of sediment laden water from the dewatering process into the lake.

The alternative construction methods considered for breaching the existing berm between the channel and lake include the following:

- Option A: Installation of concrete box culverts through the berm (Proposed Project).
- Option B: Installation of corrugated metal pipe (CMP) culverts through the berm.
- Option C: Open the berm locally to establish stable slopes lined with concrete or rip rap.

Option A (Proposed Project) is to access Lake Anna utilizing concrete culverts through the existing berm. Benefits of using concrete culverts include a longer maintenance-free life span than the CMP, a greater stability than the CMP, access across the berm will be maintained, and locating the culverts below the waterline assists in preventing floating debris from entering the water intake structure and provides a level of security in front of the water intake structure.

Option B includes the use of CMP culverts through the berm. This option would have low up-front cost, but regular maintenance and potential replacement during the life of the plant is likely and may result in more frequent temporary impacts to Lake Anna in the future. Access across the berm would be maintained and the continuous portion of the berm above the culvert(s) would assist in preventing floating debris from entering the water intake structure.

Option C would require an increased level of disturbance to the existing berm and Lake Anna. This option includes opening the berm locally and establishing stable slopes lined with concrete or rip-rap. This option would have the shortest installation schedule and likely the lowest cost; however, without installing a bridge, access across the berm will no longer exist. In addition, with the berm left open, floating debris would easily pass into the water intake structure. Security is also a concern with this option.

Option B was dismissed due to the regular maintenance required on the culvert that would result in future temporary impacts to Lake Anna. Option C was dismissed due to greater impacts on the aquatic environment and the logistical problems arising from the lack of adequate access across the berm.

3.4.4 Site Separation Activities

3.4.4.1 Parking Lots

As part of the Site Separation Activities, parking areas will be built to facilitate site access for the temporary and permanent employees at the site. Potential parking areas have been investigated over the entire site. Several options were eliminated due to space requirements, required grading, and accessibility to the site.

The Proposed Project includes the construction of two parking areas located south of the warehouses and workshops. Originally, one parking lot was designed within this location, but the design was modified to include two parking lots that straddled wetland and stream areas delineated within the project area. By constructing two parking areas instead of the original one parking lot, impacts to wetland and stream areas were reduced (approximately 0.56 acres of wetlands were avoided). Approximately 0.08 acres of forested wetland will be unavoidably impacted. Avoidance of this wetland is not practical due to its location adjacent to the existing roadway. In addition, the design included a road or walkway that connected the two parking lots over the wetlands. The option of including a road or walkway was removed to reduce additional impacts to wetlands. Thus, the parking lots have been redesigned to avoid wetlands and streams to the extent practicable.

3.4.4.2 Stormwater Basin

The proposed stormwater basin adjacent to the new paint shop area (SS#3) will be located in an emergent wetland area east of the existing Units 1 and 2 service water reservoir. The existing depressed channel was man-made to collect stormwater runoff. The outlet discharges into the existing culvert under the plant access road, east of the basin. The existing culvert discharges to an existing concrete lined channel that discharges to the discharge canal. The proposed basin is sized to meet Virginia stormwater management ordinances that maintain peak discharge rates at or below pre-development rates for the 2-year and 10-year, 24-hour storms at the basin outlet. Additionally, the proposed basin volume provides detention storage of the first 1 inch of runoff, the water quality volume, from the pervious and impervious drainage area. The water quality volume will be slowly released from the proposed basin with a minimum drawdown time of 30 hours. Because the proposed basin will discharge to an existing culvert and concrete channel, no additional outlet protection is required at the proposed basin outlet.

Alternative locations for the proposed stormwater basin for the paint shop area were not considered because the existing topography did not allow for alternative placement. Thus, it was logistically impracticable for this basin to avoid wetlands.

3.4.5 Large Component Transport Route

The construction of proposed Unit 3 will require delivery of the reactor and associated oversized and overweight equipment to NAPS. The proposed route is described in Section 3.1.7 of this narrative and will impact wetlands and/or waters of the U.S., so alternative route options were evaluated as part of this alternatives analysis. The route options evaluated included alternative roll-off locations, alternative ground transportation routes, and rail transportation. The analysis included the evaluation of bridges, railroad tracks, and various other obstructions along the route (i.e., powerlines, trees, and infrastructure).

3.4.5.1 Roll-Off Locations

The reactor and oversized/overweight equipment is proposed to be delivered from an ocean-going vessel from the Port of Newport News to a barge that will navigate through the York River and Mattaponi River up to one of two proposed roll-off locations:

- Walkerton Bridge (Proposed Project) – The roll-off site is located adjacent to Walkerton Bridge on the west bank of the Mattaponi River. This is the location used previously for Units 1 and 2. A field delineation of wetlands at the Walkerton Bridge site determined that 7,972 square feet (0.18 acres) of wetland areas are located at the proposed roll-off location. This closely follows the amount of wetlands within the project area depicted on the National Wetland Inventory (NWI) maps (8,863 square feet or 0.20 acres). The construction of the roll-off location will temporarily impact 2,051 square feet (0.05 acres) of emergent wetland.
- West Point – The roll-off site is located in the northeast portion of the town of West Point, approximately 17 miles downstream of the Walkerton Bridge site. This location would require an additional bridge crossing in the town of West Point and approximately 105 powerline crossings. NWI maps were evaluated for the West Point site. The NWI maps depicted approximately 30,290 square feet (0.69 acres) of estuarine and marine wetlands and 124,536 square feet (2.85 acres) of marine deepwater habitat that would be temporarily impacted by the construction of a roll-off location at the West Point site.

Based on the above evaluation, the Walkerton Bridge site is the preferred alternative due to less impact on the aquatic environment. The West Point site was dismissed due to the greater impacts on the aquatic environments and on the logistical impracticability of interfering with existing overhead infrastructure.

3.4.5.2 Transportation Routes

Several route options were considered for transporting the oversized and overweight reactor and equipment. The proposed route was chosen based on the number of overhead obstructions, road work required, and potential impact to wetlands or streams. The Proposed Project includes using the roll-off at Walkerton Bridge; using Highway 30,

crossing the North Anna River north of an existing bridge; and crossing over I-95 by using an existing entrance ramp at Exit 98 traveling north on I-95 and turning at an emergency crossing, using an existing off-ramp at Exit 98. Two options were assessed at the Route 30 and North Anna River crossing. The first option (preferred option) includes constructing a temporary bridge north of the existing bridge that spans the North Anna River. This option is preferred due to no wetland impacts. The second option was to construct a temporary bridge south of the existing bridge that spans the North Anna River. This option was dismissed due to approximately 881 square feet (0.02 acres) of wetland impacts.

There are no fixed overhead obstructions from the Walkerton Bridge roll-off location to the NAPS.

3.4.5.3 Rail Transportation

Another option considered included transporting the equipment by tractor trailer to Ruther Glen and transferring the equipment to railcar for further transportation to NAPS. The rail siding in Ruther Glen is connected to a double main line of CSX that later turns to operation under BB&R in Doswell. Studies have been conducted on the railroad operated under CSX and under BB&R. The CSX section was surveyed using CSX's laser vehicle. The laser vehicle scans an approximate 270 degree circle perpendicular to the track. A photograph is taken at each obstruction that shows the available clearance window for railcar loads. The BB&R portion of the railroad was surveyed manually by checking the offset from the center of the track of each obstacle. The surveys conducted determined that due to the weight of the reactor, the use of rail transportation is not a practicable alternative due to substantial logistical problems. The tracks were not designed to accommodate the weight of the reactor and thus present a safety concern. The survey also found that approximately 7 miles of tracks leading to NAPS are deteriorated and would need further evaluation to determine if the tracks could withstand the heavy materials to be transported.

Alternative routes are depicted on Figure 6.

3.4.6 Transmission Line

Dominion proposes to construct a new 500-kV transmission line from the NAPS substation to the Ladysmith switching substation, located east of the NAPS site. The proposed transmission line will follow an existing corridor that travels east for approximately 15 miles and is approximately 275 feet wide. The proposed towers will be constructed adjacent to the existing towers, but will be 10 to 20 feet taller than the existing towers. The placement of the proposed towers will avoid wetland and stream impacts.

Since the proposed transmission line will follow an existing corridor and no negative impacts to aquatic resources are expected, no alternative sites were considered.

3.4.7 Excess Spoil Placement Site

The alternatives analysis conducted for impacts to streams and wetlands as a result of stockpiling spoils excavated from the reactor area considered the Route 700 Parcels (Property A) and four alternative locations (Properties B – E) noted on Figure 7: None of the four alternative locations are owned by Dominion. A desktop analysis on the constructability of the alternative locations was conducted due to the fact that the properties are not available for access. Each of the parcels included in this evaluation are larger than the Route 700 Parcels. The entirety of the alternative parcels were evaluated because it is unknown if the various owners would be willing to sell anything less than the entire parcel.

A capacity analysis was conducted for each of the alternatives to determine the geographic extent of a conceptual spoil stockpile. The possible spoil pile footprints were based on existing available topography, road access, stream location estimation, and NWI wetland data.

As part of this analysis, various characteristics were evaluated to determine the practicability and environmental impacts of using one of the four sites in lieu of the Route 700 property for stockpiling the excavation spoils, including:

- Presence of wetlands and/or streams,
- Site characterization and property restrictions,
- Estimated purchase price for the site,
- Operational costs for loading and hauling excavated spoils to each site,
- Transportation and safety concerns, and
- Air emission impacts.

3.4.7.1 Wetland and Stream Evaluation

Property A (Route 700 Parcels)

Property A (preferred alternative) includes Dominion-owned property adjacent to the NAPS site. The property is located southwest of NAPS, near the entrance to the NAPS site. The parcels are adjacent to Haley Drive and Kentucky Springs Road. There are several parcels that make up Property A and total approximately 80 acres.

The property is undeveloped and contains four unnamed tributaries to Harris Creek and associated wetland areas. According to the NWI, no wetland areas are located within Property A; however, based on a wetland delineation conducted on the property, 156,284 square feet (3.59 acres) were observed.

Property B

This property is located approximately 4.2 miles northwest of the NAPS at the intersection of Kentucky Springs Road (Route 652) and New Bridge Road (Route 208).

The property consists of three parcels; however, only two parcels could be located using the Louisa County geographic information system (GIS). One of the parcels is approximately 955 acres of undeveloped land and contains six unnamed streams leading to Contrary Creek, which discharges into Lake Anna. The second parcel is approximately 62 acres of undeveloped land located at the southeast corner of the Kentucky Springs Road and New Bridge Road intersection. The parcels are not owned by Dominion.

Property B is undeveloped and contains wetland areas that are associated with streams. The NWI maps depict approximately 62 acres of wetlands on the site, including 36 acres of forested/scrub-shrub, 4 acres of open water, and 22 acres of riverine wetlands. A formal wetland delineation was not conducted at the site.

A conceptual spoil stockpile was designed for the site using publicly available topographic, aerial, and NWI information. Based on this information, a spoil pile could potentially have a footprint of approximately 162 acres and impact 5.3 acres of possible wetland and stream channel. This footprint would contain an average fill depth of approximately 8 feet.

Property C

This property is situated approximately 5.2 miles southwest of the NAPS on the east side of Johnson Road near the intersection with Fredericks Hall Road. The property consists of three parcels totaling approximately 92 acres of land. The property is undeveloped, containing an unnamed tributary of Elk Creek. According to the NWI maps, there are no wetland areas within Property C; however aerial photographs appear to depict a defined channel with a wooded buffer leading to an off-site stream system. A formal wetland delineation was not conducted at this site.

A conceptual spoil stockpile was designed for the site using publicly available topographic, aerial, and NWI information. Based on this information, a spoil pile could potentially have a footprint of approximately 84 acres and impact 4.1 acres of possible wetland and stream channel. This footprint would contain an average fill depth of approximately 15 feet.

Property D

This site is located approximately 7.5 miles northwest of the NAPS and is comprised of approximately 400 acres of land. Approximately 395 acres of the property do not contain any structures.

The NWI maps depict approximately 6 acres of wetlands on the site, including approximately 4 acres of forested/scrub-shrub and 2 acres of open water wetlands. A formal wetland delineation was not conducted at this site.

A conceptual spoil stockpile was designed for the site using publicly available topographic, aerial, and NWI information. Based on this information, a spoil pile could potentially have a footprint of approximately 119 acres. Based on the NWI data, the conceptual spoil stockpile may not impact any wetland or stream areas. This footprint would contain an average fill depth of approximately 10 feet.

Property E

This site is situated approximately 3.2 miles southwest of the NAPS on the west side of Johnson Road approximately 2 miles past the intersection with Kentucky Springs Road. The site consists of two parcels encompassing 299 acres and a third parcel totaling 100 acres.

Property E contains an unnamed tributary to Freshwater Creek that discharges to Contrary Creek and then into Lake Anna. The NWI maps depict 10.86 acres of wetlands on the site, including 10.76 acres of forested/scrub-shrub and 0.10 acres of open water wetlands. A formal wetland delineation was not conducted at the site.

A conceptual spoil stockpile was designed for the site using publicly available topographic, aerial, and NWI information. Based on this information, a spoil pile could potentially have a footprint of approximately 136 acres and impact 3.8 acres of possible wetland and stream channel. This alternative would have the greatest impact on mature forest resources, requiring the clearing of approximately 134 acres. This footprint would contain an average fill depth of approximately 9 feet.

Summary of Wetland and Stream Evaluation

Since a wetland delineation was not conducted at the four alternative excess spoil placement sites, additional wetland areas may be present. As shown with Property A (Route 700 Parcels), no wetlands were depicted on the NWI maps, but 3.59 acres of wetlands were found during a formal wetland delineation. Fewer aquatic impacts are associated with Property A (Route 700 Parcels), when compared to conceptual spoil stockpile designs for Properties B, C, and E, based on publically available data. The conceptual spoil stockpile design for Property D may not impact wetland or stream resources, based on publically available data; however, the portion of the site within the conceptual spoil stockpile design contains an active industrial business and is not reasonably available for use by Dominion.

3.4.7.2 Operational and Land Acquisition Costs

Order of magnitude cost estimates were developed for the hauling and loading operations to transport the excavated spoils to each of the four alternative sites. The operational costs considered the cost for transporting the material to the site and the loading operations. It was assumed the unloading operations and land preparation costs would be similar to the costs associated with using Property A for spoil stockpiling operations.

To develop the trucking costs, the following assumptions regarding the operation were used:

- The construction of the new Unit 3 and associated facilities will require excavation of approximately two million CY (54 million CF) of soil and organics.
- The total volume to transport is approximately 2,500,000 CY (67,500,000 CF), based on using an expansion factor of 25 percent from the calculated volume of spoils to be removed from the excavation (1,875,000 CY (50,625,000 CF)).
- The dump truck to be used to transport the spoils will have a capacity of 14 CY (378 CF).
- On average the truck loading time would be approximately 10 minutes and the truck unloading time would also be approximately 10 minutes.
- The number of truck loading stations is four.
- The unit cost for the trucking operations was assumed to be \$75 per hour for each truck used in the operation.
- The work day for this operation was 10 hours.

Based on the above assumptions a trucking cost estimate was calculated and is presented in Table 2. The estimate shows approximately 106 calendar weeks would be required to transport the excavated spoil material to one of the alternative sites. The loading operations consist of four loading stations using a 33 to 40 metric ton excavator to load the trucks and one D5 dozer to be used in support of the loading operations. The approximate total cost for the loading operations is estimated to be \$3,591,600 for each of the sites.

Based on an estimated purchase price for the property and proximity to NAPS, an estimated cost associated with stockpiling the excavated spoils at an alternative location was developed.

As depicted in Table 2, Property A has the lowest total operational cost compared to the four alternatives. Property A is the closest property to NAPS and provides for lower trucking operational costs.

3.4.7.3 Rail Hauling Operations

NAPS has an existing rail spur located at the facility. However, the rail line is minimally used for light transportation and would need to be upgraded to meet the requirements for this project. Only two of the four properties are located next to the rail line; however, a spur track would need to be constructed onto any property to be used for spoils disposal. Based on the infrastructure costs of rehabilitating the existing rail spur at NAPS, constructing a new rail spur into a potential disposal site, and the lack of existing infrastructure for loading/unloading rail cars and performing switching operations, rail transportation of spoil material is not considered to be a practicable alternative in this analysis from a logistics and cost standpoint.

Table 2. Summary of Estimated Cost for Each Site

Alternative Property	Land value (cost/acre)	Total Land Cost	Trucking Operational Cost	Total Option Cost without Loading Operations
Property A	\$31,729	\$2,571,100	\$5,803,200	\$8,374,300
Property B	\$5,000-\$13,000	\$5,085,000-\$13,221,000	\$8,928,000	\$14,013,000-\$22,149,000
Property C	\$6,000	\$552,000	\$11,160,000	\$11,712,000
Property D	\$3,000	\$1,200,000	\$13,392,000	\$14,592,000
Property E	\$2,000-\$5,000	\$798,000-\$1,995,000	\$8,928,000	\$9,726,000-\$10,923,000

3.4.7.4 Transportation and Safety Analysis

To evaluate the impact of the additional truck traffic on the existing road network, a preliminary capacity analysis was performed for Kentucky Springs Road (Route 652) and Johnson Road (Route 700), based upon Year 2007 traffic volumes obtained from the Virginia Department of Transportation (VDOT) website. A capacity analysis provides a quality measurement for traffic flow defined as Level of Service (LOS) with six designations, A, B, C, D, E, and F. Roadways with a LOS A through C designations are considered to have an acceptable quality of measured traffic flow; a LOS D designation is considered acceptable for roadways in large urban areas; a LOS E designation for a roadway is considered to have reached its practical capacity and has an unacceptable quality of measured traffic flow; and a LOS F designation considers traffic volumes on a roadway to have exceeded its possible capacity. Kentucky Springs Road and Johnson Road, which are the roads that would be travelled by trucks using Properties B, C, D, and E, are both designated as LOS C.

To perform the capacity analysis, the Highway Capacity software (HCS), a computerized version of the Highway Capacity Manual, published by the Transportation Research Board (TRB) of the Federal Highway Administration (FHWA) was utilized. The preliminary result of this capacity analysis indicates the additional truck traffic that would occur will degrade the LOS by one designation to a LOS D, causing a decrease in the quality of traffic flow during peak periods for both Kentucky Springs Road and Johnson Road. Thus, the truck traffic necessitated by using Properties B, C, D, and E would degrade existing roadways to an unacceptable level for a non-urban area.

A safety analysis was also performed by examining the roads that would be used to access each of the alternative spoil sites. Access to the alternative sites would be via the intersection of the Kentucky Springs Road, Johnson Road, and Haley Drive. This intersection is controlled by flashing lights and advanced warning signs, with all roadways approaching at a 90 degree angle. The Haley Drive approach is channelized to allow separate right turn movements. All of these features contribute to an optimum intersection design from a safety standpoint.

The Safety Analysis indicated that Property A (Route 700 Parcels) is a practicable alternative. Property A is the closest to the NAPS site and will not require traveling on the local roads. For Property B, the intersection angle at Kentucky Springs Road and New Bridge Road does not tie in at a desirable 90 degree angle approach and restricted sight distance on New Bridge Road encourages motorists approaching from the east to protrude beyond the stop line to get a clear view of approaching traffic before turning west onto New Bridge Road, creating a potential safety problem. Property C and Property E use a road with problematic alignment for heavy truck traffic, with sections of Johnson Road existing as a winding roadway. Property D includes several intersections, including the intersection used for Property B with the potential safety concern due to restricted sight lines. All of the intersections associated with using Property D are busy intersections and the additional truck traffic would cause congestion.

From a safety standpoint, using Property A (Proposed Project) would not require the use of local roads, reducing congestion on local roadways and potential accidents. Additionally, by using Property A, there will not be a need for infrastructure (roadway) improvements and would avoid damage to local roadways. Property B is impracticable due to restricted sight distances creating potential safety problems. Property C, D, and E were dismissed due to the safety concerns using winding roadways and the potential for congestion at local intersections. The additional truck traffic associated with Properties B, C, D, and E would degrade existing roadways to an unacceptable level of service for nonurban areas.

3.4.7.5 Air Emissions

Additional impacts as a result of conducting the alternative options for stockpiling spoils would include increased air emissions. The additional trucks and heavy equipment used would increase the priority pollutant air emissions. The calculations for estimating the air emissions were based on using the published air emission factors from U.S. Environmental Protection Agency (USEPA) AP-42, Fifth Edition, Volume 1, Chapter 3: Table 3.3-1 (Emission Factors For Uncontrolled Gasoline And Diesel Industrial Engines). The emissions calculations were estimated from the dump trucks, excavators for loading the material (i.e., second handling), and a dozer for the supporting loading operations. Assumptions used for this estimation consisted of using 14 CY (378 CF) dump trucks with 350 horsepower, 40 metric ton excavator (John Deere 360 DLC) with 271 horsepower, and a D-5 Dozer (John Deere 550) with 84 horsepower. The estimated priority pollutants for the 5 alternative sites, using 24 trucks

per day, are provided in Table 3.

Based on the table above, the use of Property A will produce fewer air emissions compared to the remaining alternative properties. Property A is closer to the NAPS site and will require a shorter travel distance for trucks, resulting in lower air emissions.

Table 3. Emission Estimates

Pollutant Type	Emission Estimate (Tons/Project)			
	Property A	Property B and Property E	Property C	Property D
NOx	538	780	942	1,103
CO	116	168	203	238
SOx	36	52	62	73
PM-10	38	55	67	78
VOC	44	63	76	89

Based on an analysis of the sites evaluated for spoil placement as described above, the selection of the Route 700 Parcels is the LEDPA.

3.4.8 Lake Elevation Alternatives

In issuing the CZMA concurrence certification, the VDEQ and VDGIF noted the potential for reduced flows to the North Anna River downstream of Lake Anna Dam as a result of the water withdrawal during operation of Unit 3. To address the potential for low flow issues, an Instream Flow Incremental Methodology (IFIM) study was conducted to examine how operation of Unit 3 could be accomplished while minimizing, to the extent practical, impacts to the North Anna River and Lake Anna (see Attachment H for the IFIM report). Specific objectives included avoiding significant increases in the frequency of low flow conditions in the river, avoiding impacts to downstream habitats for fish and other aquatic organisms, maintaining lake levels to support recreation, and not adversely affecting boat docks and ramps, and ensuring that the Lake Anna Dam is not structurally compromised.

The IFIM study design, negotiated with state resource agencies, focused on comparing three station operating criteria:

- Existing Condition - the current operation of Units 1 and 2, and associated lake management practices (Lake Anna normal elevation of 250.0 ft).
- Lake Anna at 250.0 ft with Unit 3 Scenario – Dominion’s proposed operations with three units and a year around normal lake elevation of 250.0 ft. The cooling system would be operated in MWC mode below a lake elevation of 250.0 ft.
- Lake Anna at 250.25 ft with Unit 3 Scenario (Proposed Project) – An alternative operating scenario with three units and a year round target lake elevation of 250.25 ft. The cooling system would be operated in MWC mode below a lake elevation of 250.0 ft.

After extensive study and coordination with applicable State regulatory agencies, the 3-inch increase (target lake elevation of 250.25 ft) was proposed to provide more lake water to help support river and lake recreation and provide more water for downstream releases for aquatic habitat protection. The increased lake level would result in only minimal, temporary wetland function and lake shoreline changes as much of this area is already periodically inundated as a result of current conditions. Coordination with the Federal Energy Regulatory Commission (FERC) will be conducted prior to raising the lake level by 3 inches.

3.4.9 No Action Alternative

Under the No Action Alternative, construction of the Proposed Project and construction and operation of the associated proposed nuclear power reactor at the NAPS site would not occur. There would be no impacts to streams or wetlands at this site; however, under the No Action Alternative, baseload power service would still need to be provided to customers from other sources, including construction of other power plants or the potential installation of additional transmission lines to tie into other power producers’ grids. The No Action Alternative does not meet the demonstrated need of Dominion’s customers for additional baseload electricity.

4.0 JPA SECTION 4, PAGE 9 – PREVIOUS SITE VISITS AND/OR PERMITS

Previous site visits and/or permits related to the proposed work, including Federal, State and Local pre-application coordination or previous permits, are listed below in Table 4.

Table 4. Previous Site Visits and/or Permits

Agency	Activity	Permit/Project number, and explanation of non-reporting Nationwide permits previously used	Action taken and Date of Action Taken	If denied, give reason for denial
U.S. Fish and Wildlife Service (USFWS)	Section 7 concurrence (see Attachment B-1)	N/A	May 20, 2005	N/A
NRC	Site Audit	N/A	Site visit May 3-4, 2006	N/A
USACE	Wetland Boundary Confirmation (see Attachment E-1)	N/A	Site Visit September 2006	N/A
Department of Historic Resources (VDHR)	Historic Resources Concurrence (see Attachment B-3)	N/A	October 20, 2006	N/A
NRC	Public Outreach Meeting	N/A	October 24, 2007	N/A
VDHR	Historic Resources Concurrence (see Attachment B-3)	N/A	November 7, 2007	N/A
NRC	North Anna 3 Combined Operating License Application (COLA) Orientation	N/A	Site Visit November 29, 2007	N/A
NRC	2007 COLA technical Review meeting	N/A	December 13-14, 2007	N/A
NRC	NRC New & Significant Information/Environmental Review at North Anna Nuclear Information Center (NANIC) (includes NAPS and Transmission line tours)	N/A	Site Visit April 14-18, 2008	N/A

Table 4. Previous Site Visits and/or Permits (Continued)

Agency	Activity	Permit/Project number, and explanation of non-reporting Nationwide permits previously used	Action taken and Date of Action Taken	If denied, give reason for denial
NRC	Environmental Scoping Meeting - Louisa County, to receive public comments	N/A	April 16, 2008	N/A
Thomas Jefferson Soil & Water Conservation District	Site visit for Erosion and Sediment (E&S) Control plan review	N/A	Site Visit August 7, 2008	N/A
USACE and VDEQ	JPA Pre-Application Meeting	N/A	June 23, 2008	N/A
VA Department of Health	Site visit to discuss public water well permits.	N/A	Site Visit August 27, 2008	N/A
USACE and VDEQ	JPA Pre-Application Meeting	N/A	September 25, 2008	N/A
NRC	NRC site meeting at NANIC to review and discuss COLA Rev 1 changes	N/A	Site Visit February 3, 2009	N/A
NRC	NRC Draft Supplemental Environmental Impact Statement (DSEIS) meeting, Louisa County, to receive public comments	N/A	February 3, 2009	N/A
Louisa County Dept. of Community Development	Meeting to renew Land Disturbance Permit and Stormwater Prevention Plan Permit	Phase I Land Disturbing Permit, ESCP30-08	February 19, 2009	N/A
USACE and VDEQ	JPA Pre-Application Meeting and Tour of NAPS and Lake Anna	N/A	June 26, 2009	N/A
VDCR	VSMP Construction Stormwater General Permit (VAR 10)	Permit No. VAR10-10-101574 (expires June 30, 2014)	July 1, 2009	N/A

Table 4. Previous Site Visits and/or Permits (Continued)

Agency	Activity	Permit/Project number, and explanation of non-reporting Nationwide permits previously used	Action taken and Date of Action Taken	If denied, give reason for denial
Thomas Jefferson Soil & Water Conservation District	Initial meeting for Erosion and Sediment Control Permit (ESCP)	Phase I Land Disturbing Permit, ESCP30-08	September 17, 2009	N/A
Louisa County Community Development	Meeting to receive Land Disturbance Permit	Phase I Land Disturbing Permit, ESCP30-08	September 17, 2009	N/A
USACE and VDEQ	JPA Pre-Application Meeting	N/A	September 23, 2009	N/A
USACE	NAPS Site Tour	N/A	October 2, 2009	N/A
USACE and VDEQ	JPA Pre-Application Meeting and Site Visit	N/A	November 18, 2009	N/A
VDEQ and LACA	Project Status Meeting	N/A	December 14, 2009	N/A
USACE	JPA Pre-Application Meeting	N/A	March 18, 2010	N/A
USACE and VDEQ	Lake Anna Field Visit	N/A	April 6, 2010	N/A
VDEQ	Meeting to Discuss JPA for water withdrawal	N/A	May 5, 2010	N/A
USACE and VDEQ	JPA Pre-Application Meeting	N/A	May 12, 2010	N/A

5.0 JPA SECTION 7, PAGE 10 – THREATENED AND ENDANGERED SPECIES INFORMATION

The NRC initiated informal consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) in 2003 in connection with the ESP proceeding. NRC received a response from NMFS that indicated “no federally listed or proposed threatened or endangered species under the jurisdiction of National Oceanic and Atmospheric Administration (NOAA) Fisheries are known to exist in the vicinity of the existing North Anna Power Station.” No further consultation with NMFS was required. In addition, the NRC, in coordination with Dominion, has contacted state resource agencies in support of NRC’s NEPA document for the Final ESP EIS (Section 2.7.1.2, Table 4-1 and Table 5-22) (NRC 2006) and the COLA ER, Revision 3 (Appendix 4a) (Dominion 2010). Agency consultation letters can be found in Attachment B-1.

The USFWS responded to NRC in 2004 and noted that the following listed species under the jurisdiction of the USFWS may occur within the project area: dwarf wedgemussel (*Alasmidonta heterodon*), bald eagle (*Haliaeetus leucocephalus*), small whorled pogonia (*Isotria medeoloides*), sensitive joint-vetch (*Aeschynomene virginica*), and swamp pink (*Helonias bullata*). NRC responded to USFWS in 2005 with a biological assessment for these five species, and determined that the Proposed Project would not affect the dwarf wedgemussel, small whorled pogonia, sensitive joint-vetch, and swamp pink because habitats for those species are not present in the project area. NRC determined that the Proposed Project may affect, but was not likely to adversely affect the bald eagle. USFWS issued their concurrence on May 20, 2005. Attachment B-1 contains a copy of the Biological Assessment completed by the NRC and USFWS’s concurrence letter.

In a May 20, 2005 letter, USFWS stated that the Virginia Department of Game and Inland Fisheries (VDGIF) documented bald eagles to forage in areas of Lake Anna and up to 6 transient bald eagles have been observed along the forested shoreline. Two nesting territories had been located within the area, but they were significantly distanced from the proposed project site (see Attachment B-1). Dominion has consulted with the USFWS and VDGIF regarding these nests. On May 18, 2006, Dominion confirmed the presence of two bald eagle nests reported in Noah’s Landing and Contrary Creek. The closest nesting site for the bald eagle is approximately 2.5 miles north of the proposed site. In Virginia, a 660 ft buffer zone is required around all bald eagle nests. There are no bald eagle nests located on the NAPS site. The bald eagle may use or fly over the site, but it is unlikely that the bald eagle will be negatively impacted by the Proposed Project. Dominion complies with all state and federal Bald and Golden Eagle requirements, management guidelines, and conservation measures. It should also be noted that the bald eagle was federally delisted in 2007, and is no longer protected under the Endangered Species Act; however, it is protected federally by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The bald eagle continues to be listed as threatened by the Commonwealth of Virginia.

In response to Dominion’s ESP Coastal Zone Management Act consistency certification, comments were received from Virginia Department of Conservation and Recreation

(DCR) via VDEQ in a letter dated February 10, 2004 (see Page 11 of the February 10, 2004 letter within Attachment B-4). DCR searched its Biotics Data System for occurrences of natural heritage resources in the project area. “Natural heritage resources” are defined as the habitat of rare, threatened, or endangered plants and animals, unique or exemplary natural communities, significant geologic formations, and similar features of scientific interest. DCR reported that natural heritage resources have not been documented in the project area. According to DCR’s records, the Proposed Project would not affect any documented state-listed plants or insects.

In a letter dated September 29, 2009, DCR stated that it conducted a search on its Biotics Data System for occurrences of natural heritage resources within the project site, staging area (Route 700 parcels), and transmission line corridor (see Attachment B-1). According to DCR’s files, the North Anna Site and Route 700 parcels may support habitat appropriate for small whorled pogonia. In addition, DCR’s files indicated that the Blanton’s Powerline Conservation Site, located within the transmission line corridor, has been given a biodiversity significance ranking of B5, representing a site of general significance. The resource of concern at this site is the Epling’s hedge-nettle (*Stachys eplingii*). DCR recommended that Dominion conduct small whorled pogonia surveys within the NAPS site, Route 700 parcels, and within the Blanton’s Powerline Conservation Site. DCR also recommended avoidance of the Epling’s hedge-nettle during project construction and maintenance activities within the transmission line corridor.

In response to DCR’s request, a habitat investigation was conducted for the federally-listed and state-listed endangered small whorled pogonia on the NAPS site, adjacent Route 700 parcels, and within the Blanton’s Conservation Site (located in the transmission line corridor). Additionally, a habitat investigation for the Epling’s hedge-nettle was conducted within the Blanton’s Conservation Site (see Attachment B-1 for habitat investigation reports). USFWS-endorsed personnel from the Williamsburg Environmental Group, Inc. conducted the habitat surveys on November 5, 2009. The surveys were conducted in accordance with habitat criteria specific to the species. The survey found that potential habitat for small whorled pogonia and Epling’s hedge-nettle exists within the aforementioned sites. A detailed small whorled pogonia survey was conducted in 2010 during the accepted survey window (June 1 – July 20). No observations of small whorled pogonia were made during the surveys of the NAPS site or the Blanton’s Conservation Site. A detailed survey for Epling’s hedge-nettle will occur during the summer of 2010.

A rare, threatened, and endangered species habitat survey for avian species was conducted on the Route 700 parcels in May 2008. Davis Environmental Consultants, Inc. assessed four habitat types to evaluate the property for potential use by the bald eagle, cerulean warbler (*Dendroica cerulean*), upland sandpiper (*Bartramia longicauda*) and loggerhead shrike (*Lanius ludovicianus*). No suitable nesting habitat for the four avian species was found on the property and no avian species of special interest were observed during the survey (see Attachment B-1 for Davis Environmental Consultants’ Report). In a Jurisdictional Determination letter dated August 27, 2008, the USACE confirmed that a

search of DCR's data revealed that no known populations of federally-listed threatened or endangered species are located on the Route 700 Parcels (see Attachment B-2). Dominion has monitored fish populations in Lake Anna and the North Anna River for over 25 years. No federally-or state- listed fish species has been observed during the monitoring studies.

A list of agency consultation and site visits are provided in Section 4, Table 4 of this narrative.

In connection with Dominion's application to construct and operate Unit 3, the NRC Staff prepared a Draft SEIS for the COL. Comments on the Draft SEIS were solicited from other regulatory agencies and the public, and were dispositioned upon issuance of the Final SEIS in February 2010.

6.0 JPA SECTION 8, PAGE 11 – HISTORIC RESOURCES INFORMATION

Multiple surveys have been completed to locate archeological sites and historic structures on the property proposed for development as part of the Proposed Project. The Louis Berger Group (LBG) completed surveys in 2006 and 2007 and issued the following two reports:

1. *Archeological Survey, Dominion Early Site Permit, North Anna Power Station, Louisa County, Virginia (September 2006 - survey conducted May 1-6, 2006).*
2. *Supplemental Archeological Survey, Dominion Combined License Project, North Anna Power Station, Louisa County, Virginia (October 2007 –survey conducted September 4-7, 2007).*

The Commonwealth of Virginia Department of Historic Resources (VDHR) issued its concurrence with the findings of the September 2006 report and the measures proposed to avoid potential impacts to identified historic resources in a letter dated October 20, 2006.

“The Area of Potential Effect (APE) contains two known historic-era cemeteries recorded as sites 44LS221 and 44LS222. No additional archaeological resources were identified within the APE. The consultant recommends that these cemeteries are potentially eligible for listing on the National Register of Historic Places and that additional archaeological evaluation is necessary to determine eligibility. We concur with these recommendations. We further recommend that these sites be avoided. If avoided, this project would likely have no negative impact on these resources.”

Further, VDHR issued its concurrence with the findings of the October 2007 report and the measures proposed to avoid potential impacts to identified historic resources in a letter dated November 7, 2007.

“Considering our earlier comments to the Nuclear Regulatory Commission dated October 20, 2006, the results of this study, and Dominion’s letter to our office dated October 11, 2007, we concur with your conclusion that this project will not negatively impact historic properties provided that the following resources are avoided and adequately protected during construction and operation of the facility: 44LS0221, 44LS0222, 44LS0226, and 44LS0227/054-5035.”

In 2008, six potential archaeological sites were identified on the Route 700 parcels by LBG and documented the following report:

Archaeological Survey - Dominion Combined License Project-North Anna Power Station, (June 2009 – survey conducted April 1, 2008).

LBG recommended one archaeological site, 44LS0233, as eligible for inclusion in the National Register of Historic Places (National Register). They recommend avoidance and preservation in place, if feasible, for this archaeological site. This was

communicated to VDHR in a letter from E. Grecheck to K. Kilpatrick dated November 4, 2008 with a commitment to preserve and avoid this or other sites deemed eligible for inclusion in the National Register. In addition, a tree buffer will be provided for the potential archaeological site proposed as eligible for inclusion in the National Register.

In a letter dated November 9, 2009, VDHR concurred with the recommendation that site 44LS0233 is potentially eligible for listing in the National Register. VDHR re-stated that the site will be avoided and preserved in place throughout construction and operation of the new generation unit. In addition, in a previous agreement four other sites (44LS0221, 44LS0222, 44LS0226, and 44LS0227) will be avoided during construction and operation. VDHR does not recommend further evaluation at this time unless avoidance of the sites is deemed impractical (Attachment B-3).

Phase 1 surveys of the proposed NAPS to Ladysmith transmission corridor were conducted by LBG in 2008, and the findings were summarized in the following two reports:

1. *Archaeological Survey as Part of a Cultural Resource Survey of the Proposed North Anna-Ladysmith 500kV Transmission Line; Louisa, Spotsylvania and Caroline Counties, Virginia, VDHR File No. 2009-0430 (June 2009 – surveys conducted March 16-20, 2009; August 26-28, 2009).*
2. *Architectural Survey of the Proposed North Anna-Ladysmith 500kV Transmission Line; Louisa, Spotsylvania and Caroline Counties, Virginia, VDHR File No. 2009-0430 (June 2009 – surveys conducted March 16-20, 2009; August 26-28, 2009).*

The transmission line corridor surveys identified four previously unrecorded archaeological sites and three artifact locations. One of these sites has the potential to yield significant archaeological information (Site 44SP0618). If the site cannot be avoided, LBG recommended additional research to determine site eligibility for inclusion in the National Register. The LBG transmission line surveys also identified 36 previously unrecorded architectural resources. One newly surveyed resource (016-5042/ Farm, Blantons Road) was recommended by LBG as eligible for inclusion in the National Register.

In a letter dated November 9, 2009, VDHR concurred with the recommendation that site 44SP0618 is potentially eligible for listing in the National Register. No further archaeological investigations are warranted unless additional ground disturbance of intact soils occurs. In addition, VDHR concurred that the Farm, Blantons Road (DHR ID# 016-5042) is potentially eligible for listing in the National Register. VDHR stated that three properties in Spotsylvania County, adjacent to the LCTR, may be potentially eligible for listing in the National Register and warrant additional consideration. These properties include Pine Forest (DHR ID# 088-054), Llangollen property (DHR ID# 088-0126), and Bel-Air property (DHR ID# 088-0133). A copy of the VDHR letter can be found in Attachment B-3.

A viewshed impact analysis was conducted within the transmission line corridor on September 22, 2009. This analysis was prepared as an addendum to the Architectural Survey. The viewshed impact analysis was conducted for two resources located in the Architectural Area of Potential Effects (VDHR #088-0133 and #016-5042). The analysis indicated that VDHR #088-0133 would not have any visual impact due to the proposed transmission line. The visual impact to VDHR #016-5042 would be low to moderate. A copy of the letter to VDHR is located in Attachment B-3.

A cultural resource assessment was conducted along the proposed LCTR in 2009. The assessment identified multiple locations where proposed undertakings have the potential to impact cultural resources. The assessment was conducted by LBG and the findings were summarized in the following report:

Cultural Resource Assessment of a Proposed Heavy Haul Route to the North Anna Power Station ESP Site, VDHR File No. 2000-1210 (June 2009 – survey conducted May 14, 2009).

The majority of the minor modifications (e.g., temporary placement of fill and steel plates at sharp corners and narrow passes along the route) along the Haul Route have little potential to affect cultural resources. Three major modifications, however, may impact cultural resources at the following locations.

- The train depot in the town of Beaverdam. The Beaver Dam Depot (VDHR No. 042-0081) was built in 1866 and has been recommended eligible for inclusion in the National Register.
- The historic ferry landing near Walkerton. The ferry landing is immediately adjacent to a multi-component prehistoric and historic archaeological site (44KW0081). Recorded in 1991, Site 44KW0081 was evaluated in 1993 and recommended eligible for inclusion in the National Register.
- The North Anna River. The proposed construction of a bridge may impact a previously recorded archaeological site (44CE0010). Five additional archaeological sites (44CE0457, 44CE0458, 44CE0459, 44C0460, and 44CE0501) and one architectural resource (Meadow Farm, VDHR No. 016-0016) have been identified along the eastern bank of the North Anna River in the vicinity of the existing Route 30 bridges. Four of the archaeological sites (44CE0458, 44CE00457, 44CE0459, and 44CE0460) and Meadow Farm have been evaluated for National Register eligibility.

In a letter dated November 9, 2009, VDHR concurred with the recommendations regarding the need for additional cultural resource studies in support of the LCTR. VDHR stated that consultation is important in regards to the Mattaponi River and Upper Mattaponi River on impacts to the historic ferry and archaeological sites along the North Anna River. Impacts, even if temporary and reversible, to historic districts through which the LCTR should also be considered (see Attachment B-3).

Based on the surveys conducted, and in coordination with VDHR, no site listed or eligible for listing on the National Register will be negatively impacted by the construction of the facility and transmission lines. There will be no impacts to cultural resources and cemeteries as a result of the proposed Unit 3 project.

In a letter dated March 9, 2009, the USACE designated NRC as the lead federal agency to fulfill federal responsibilities under Section 106 (see Attachment B-3). This designation authorizes the NRC to conduct Section 106 coordination on the USACE's behalf.

7.0 JPA SECTION 9, PAGE 11 – WETLANDS, WATERS, AND DUNES/BEACHES IMPACT INFORMATION

Wetlands are transition areas between aquatic and terrestrial communities, and exist where the ground is saturated or inundated with water for extended periods during the growing season. An area is typically considered a jurisdictional wetland only if all three wetland criterion are met. The evaluation of these criteria includes a determination as to: (1) whether the soils have hydric characters; (2) whether the areas show evidence of wetland hydrology; and (3) whether 50 percent of the dominant plants are commonly found in wetlands. Permanent impacts to wetlands would occur as a result of constructing the Proposed Project. A total of 563,350 square feet (12.93 acres) of wetlands would be permanently affected by the construction of the cooling towers, spoil material placement, parking lots, access roads, stormwater basins, water intake structure, and 3-inch increase in lake elevation. Of the 563,350 square feet (12.93 acres), approximately 354,578 square feet (8.14 acres) associated with the 3-inch rise in water surface elevation within Lake Anna and the WHTF is considered temporary, but is being mitigated for the loss of wetland function. An additional 2,051 square feet (0.05 acres) of temporary wetland impacts are associated with the proposed LCTR. Figures 8, 9, and 10 depict the wetland areas impacted on a USGS topographic map.

Construction of the water intake structure for proposed Unit 3 would have a temporary minor effect on the open water habitat of Lake Anna. The water intake structure for proposed Unit 3 would be constructed in a dry area in the vicinity of the existing units' water intake structure. The USACE – Norfolk District did not take jurisdiction of the existing intake structure area. VDEQ considers the existing intake structure area as an open water feature that will be temporarily impacted. However, compensatory mitigation is not required for breaching the berm and flooding the existing cofferdam in the existing water intake area.

Portions of seven intermittent streams that discharge to Lake Anna via Harris Creek will be permanently impacted by fill activities associated with the construction of the cooling towers, laydown area, and construction access road for the proposed new Unit 3 (See Impact # 1-9 on Grid Sheets 1-9 in Attachment D). A proposed construction access road, internal to the Route 700 Parcels and NAPS, will cross each of the channels. Permanent culverts will be placed in the channels to carry the construction access road. The LCTR roll-off location at the Mattaponi River will temporarily impact 115 lf of tidal river (Estuarine Class II) as depicted as Impact #14-16 on Grid Sheet # 13. A total of 6,380 linear feet of streams (Non-tidal Waters Class III) would be permanently impacted by the Proposed Project as depicted as Impact # 1, 2, 3, 5, 7, 8, and 9 on Grid Sheets #1-9). During site preparation and construction activities, Dominion would employ Best Management Practices described in the Virginia Erosion and Sediment Control Handbook to control erosion and minimize the sediment load to receiving waters. Best Management Practices may include sediment basins, sediment barriers, vegetative stabilization, filter strips, rip rap, rock filter berms, and mulching. Additionally, a Stormwater Pollution Prevention Plan will be developed prior to initiation of construction activities.

Table 5 provides the total permanent and temporary wetland and streams associated with the Unit 3 project.

Table 5. Summary of Permanent and Temporary Wetland and Stream Impacts

Classification	Square Feet	Acres**	Linear Feet
Permanent Impacts			
PFO*	180,138	4.14	---
PEM*	17,278	0.40	---
Open Water	11,356	0.26	---
Shoreline Wetlands	354,578	8.14	---
Stream	---	---	6,380
Temporary Impacts			
PEM	2,051	0.05	---
Stream	---	---	115

*PFO=palustrine forested wetland; PEM=palustrine emergent wetland

**Acre values rounded to three significant digits

Wetland areas to be impacted are depicted as Impact # 1-16 on the Grid Sheet # 1-13, within Attachment D-1. Jurisdictional Determinations (JDs) and Wetland Delineation Reports for the project area are included in Attachments E-1 and E-2. Jurisdictional determination forms and the functional services assessment can be found in Attachments E-4 and E-5.

The current design plans will result in unavoidable, permanent impacts to 563,350 square feet (12.93 acres) of wetlands attributable to project components, including 17,278 square feet (0.40 acres) of emergent wetlands, 180,138 square feet (4.14 acres) of forested wetlands, and 11,356 square feet (0.26 acres) of open water impact. The unavoidable inundation of 354,578 square feet (8.14 acres) of wetland areas located along the perimeter of Lake Anna and the WHTF resulting from implementation of the IFIM study results is included in the overall impact totals. The temporary loss of wetlands functions associated with the unavoidable inundation along the perimeter of Lake Anna and the WHTF will be mitigated.

The current design plans will result in the conversion of streams to non-stream areas and therefore will alter the functions and services of those streams. As such, these streams would require compensatory mitigation according to standard stream compensation credits. Stream impacts associated with the construction of the cooling towers, laydown areas, and road crossings include permanent impacts of 6,380 lf of non-tidal streams. Stream impacts associated with the construction of the roll-off location for the proposed LCTR include temporary impacts of 115 lf of tidal streams.

The “Unified Stream Methodology” (USM) was used to determine requirements for stream mitigation. See Attachment C for a Wetland and Stream Mitigation Plan. Stream Assessment Reports for the Proposed Project area are provided in Attachment E-3.

Permanent and temporary wetland and stream impacts associated with the proposed Unit 3 project are broken out by Impact Number and detailed in Table 6.

Table 6. Permanent and Temporary Wetland and Stream Impact Details

Impact #	Grid #	Impact Description*	Wetland			Stream						Project Component
			Type	Impact Area (SF)	Impact Area (Acres) [†]	Dimensions (Length and Width (ft))	Area (SF)	Fill (CY) below OHW	Geomorphological Classification	Average Flow (cfs)	Contributing Drainage Area (Square miles)	
1	1, 2	F, EX NT, PE, IN, V	PFO	17,199	0.39	362 X 2.5	905	3-7	Slightly incised channel and eroding banks	0.032	0.033	Route 700 Parcels - Spoil Pile
2	1, 2	F, EX, NT, PE, V	PFO	36,840	0.85	1,194 X 2	2,388	1-7	Slightly incised channel and eroding banks	0.042	0.043	Route 700 Parcels - Spoil Pile
3	3	F, EX, NT, PE, IN, V	PFO	13,133	0.30	660 X 2	1,320	1-5	Slightly incised channel and eroding banks	0.038	0.039	Route 700 Parcels - Spoil Pile
4	3	F, NT, PE, V	PEM	697	0.02	---	---	---	---	---	---	Route 700 Parcels - Spoil Pile
5	4, 5	F, NT, PE, IN, V	PFO	72,681	1.67	1,592 X 2	3,184	1-9	Slightly incised channel and eroding banks	0.059	0.060	Route 700 Parcels - Spoil Pile
6	5	F, NT, PE, V	PEM	956	0.02	---	---	---	---	---	---	Route 700 Parcels - Spoil Pile
7	6	F, EX, NT, PE, IN, V	PFO	4,972	0.11	261 X 3	783	7	Incised channel, slightly eroding banks	0.090	0.092	Road Crossing
8	6, 7	F, EX, NT, PE, IN, V	PFO	14,771	0.34	295 X 2	590	5-8	Slightly to deeply incised channel and eroding banks	0.090	0.092	Road Crossing
				6,120	0.14	937 X 2	1,874	5-8				Cooling Tower

Table 6. Permanent and Temporary Wetland and Stream Impact Details

Impact #	Grid #	Impact Description*	Wetland			Stream						Project Component
			Type	Impact Area (SF)	Impact Area (Acres) [†]	Dimensions (Length and Width (ft))	Area (SF)	Fill (CY) below OHW	Geomorphological Classification	Average Flow (cfs)	Contributing Drainage Area (Square miles)	
9	8, 9	F, EX, NT, PE, IN, V	PFO	3,915	0.09	213 X 3.5	746	1-19	No incised channel or active erosion to incised channel with eroding banks	0.040	0.042	Road Crossing
				7,385	0.17	866 X 3.5	3,031	1-19				Cooling Tower
10	10	F, NT, PE, V	PFO	2,014	0.05	---	---	---	---	---	---	Site Separation - Parking Lot
11	10	NT, PE, V	PFO	1,108	0.03	---	---	---	---	---	---	Site Separation - Parking Lot
12	11	NT, PE, V	PEM	15,625	0.36	---	---	---	---	---	---	Site Separation - Paint Shop
13	12	F, EX, NT, PE, SB, NV	Open Water	10,620	0.24	---	---	---	---	---	---	Unit 3 Intake Structure - Breaching of Berm
				736	0.02							Unit 3 Intake Structure - Rip-Rap
14	13	F, T, TE, PR, V	PEM	1,497	0.03	115 X 50	5,750	45	---	---	---	Large Component Transport Route - Roll-Off Location

Table 6. Permanent and Temporary Wetland and Stream Impact Details

Impact #	Grid #	Impact Description*	Wetland			Stream						Project Component	
			Type	Impact Area (SF)	Impact Area (Acres) [†]	Dimensions (Length and Width (ft))	Area (SF)	Fill (CY) below OHW	Geomorphological Classification	Average Flow (cfs)	Contributing Drainage Area (Square miles)		
15	13	F, T, TE, V	PEM	186	0.01	---	---	---	---	---	---	---	Large Component Transport Route - Roll-Off Location
16	13	F, T, TE, V	PEM	368	0.01	---	---	---	---	---	---	---	Large Component Transport Route - Roll-Off Location
---**	---	NT, PE, V/NV	PFO, PEM/ PSS	118,483	2.72	---	---	---	---	---	---	---	Lake Anna 3-Inch Water Elevation Rise
---**	---	NT, PE, V/NV	PFO, PEM/ PSS	236,095	5.42	---	---	---	---	---	---	---	Waste Heat Treatment Facility 3-Inch Water Elevation Rise
Total Permanent Impacts				563,350	12.93	6,380	---	---	---	---	---	---	---
Total Temporary Impacts				2,051	0.05	115	---	---	---	---	---	---	---

*Note: F=fill, EX=excavation, NT=non-tidal, T=tidal, PE=permanent, TE=temporary, PR=perennial, V=vegetated, SB=subaqueous bottom, NV=non-vegetated.

**A formal wetland delineation was not conducted along the Lake Anna and Waste Heat Treatment Facility shorelines. Wetland areas are considered to be dominated by woody vegetation (i.e., forested/scrub-shrub). VDEQ and USACE performed site visits and the USACE issued a Jurisdictional Determination (JD) for the Lake Anna and Waste Heat Treatment Facility shorelines. Shoreline wetland areas are depicted in Attachment D-2. Shoreline wetlands will be mitigated as a functional loss

[†]Acre values rounded to three significant digits.

8.0 JPA SECTION 22, PAGE 20 – ROAD CROSSINGS

The Proposed Project includes road crossings over streams associated with the construction access road within NAPS and the Route 700 Parcels. Road crossings are shown on the Grid Sheets in Attachment D-1, Impact # 7 through #9 on Grid Sheets 6 and 8. Materials that are generally used to construct stream crossings include reinforced concrete pipe, 3-inch aggregate (rip-rap), hay bales, silt screening fabric with stakes, and concrete. These road crossings will be constructed to ensure the flow of the water is maintained and the stream is protected from any unnecessary soil or debris entering its boundaries by utilizing the following construction methods.

The following sequence describes a typical wetland road crossing construction effort:

- 1) Install BMPs for erosion control (i.e., silt fence, etc.),
- 2) Install temporary cofferdam and dewater as required,
- 3) Strip and grub – material may be set aside to dry or immediately transported to the organic spoils location,
- 4) Excavate,
- 5) Install pipe bedding,
- 6) Install culvert(s),
- 7) Form and place headwall(s) where indicated,
- 8) Backfill,
- 9) Stabilize slopes/swales/outfalls with geotextile and rip-rap, and
- 10) Install the road profile including geotextile and stone base course with paving, as required.

Three wetland crossing culverts (Culverts #7, #11, and B) were sized to pass the peak discharges from the 25-year, 24-hour storm without over topping the road crossings. The design for Culvert B included drop boxes that act as a weir to retain wetland elevation and to control the design storm to prevent road flooding. None of the three culverts are placed within the FEMA designated 100-year floodplains. A hydraulic study is included in Attachment F. The peak discharges for the three culverts were determined using NRCS methodologies and the computer program HEC-HMS, version 3.1.0.

9.0 JPA SECTION 24, PAGE 21 – IMPOUNDMENTS, DAMS, AND STORMWATER MANAGEMENT FACILITIES

The North Anna River was dammed to form the 9,600-acre Lake Anna and 3,400-acre WHTF. The Lake Anna Dam is an existing dam and the Proposed Project does not include any activities involving a new impoundment or dam. Prior to making proposed changes to lake levels associated with Unit 3, coordination with FERC will be conducted.

The stormwater management basins meet the requirements for Extended Detention Basins as outlined in the Virginia Stormwater Management Handbook, Volume 1 (1999). Detailed information on the stormwater management basin design criteria is found in Sections 3.1.4 and within Table 7.

Table 7. Detailed Information on Stormwater Management Basins

Stormwater Management Basin	Dimensions of SWM Basin		Designed Water Level Storage Capacity (CF)	Surface Area (acres)	Design Storm Event (year)	Retention Time (hour)	Current Average Flow (cfs)	Proposed Peak Outflow (cfs)	Drainage Area Upstream (acres)
	Height (ft)	Width (ft)							
#1 Power Block	10	575	683,221	2.61	25	30	0	75.3	60.9
#2 Cooling Tower	11	620	490,727	2.21	25	30	0	20.3	49.0
#3 Parcel 700	12	445	39,744	0.5	10	30	0	0.4	12.7
#4 Parcel 700	12	760	134,143	0.77	10	30	0	18.9	48.7
SS#1 Workshop	10.5	280	63,277	0.36	25	30	0	56.4	17.2
SS#2 Parking Lot	11	340	46,267	0.25	10	30	0	5.6	4.7
SS#3 Paint Shop	11	190	74,327	0.45	25	30	0	63.6	14.5
SS#4A	9	280	108,182	0.57	25	30	0	14.7	8.19
SS#4B	9	280	110,639	0.57	25	30	0	15.4	8.85
SS#5 Parking Lot	10	420	36,379	0.27	10	10*	0	0.4	2.7
SS#6 Switchyard	7.5	250	72,710	0.43	10	30	0	13.8	20.9

* Actual retention times are less than 30 hours. Additional settling capacity is provided with grit removal chambers upstream of storm water basin. Stormwater basins are shown on Figure 5 and the site plan grid sheets in Attachment D.

Note: "SS" Stands for Site Separation Activities. Site Separation is a multi-phase project that includes activities that will separate the existing Units 1 and 2 from the proposed construction area for the new Unit 3.

10.0 JPA SECTION 25, PAGE 22 – OUTFALLS NOT ASSOCIATED WITH PROPOSED WATER WITHDRAWAL ACTIVITIES

Table 8. Detailed Information on Outfalls Associated with the Eleven Stormwater Management Basins

Stormwater Management Basin	Type and Size of Pipe(s)*	Daily Rate of Discharge (mgd)	Contributing Drainage Area (square miles)	Daily Stream Flow at Site (cfs)	Design Storm Peak Discharge (cfs)
#1 Power Block	RCP 42" Dia.	N/A	0.10	0	75.3
#2 Cooling Tower	RCP 18" Dia.	N/A	0.08	0	20.3
#3 Parcel 700	RCP 18" Dia.	N/A	0.02	0	0.4
#4 Parcel 700	RCP 18" Dia.	N/A	0.08	0	18.9
SS#1 Workshop	RCP 30" Dia.	N/A	0.03	0	56.4
SS#2 Parking Lot	RCP 18" Dia.	N/A	0.01	0	5.6
SS#3 Paint Shop	RCP 42" Dia.	N/A	0.02	0	63.6
SS#4A	RCP 24" Dia.	N/A	0.01	0	14.7
SS#4B	RCP 24" Dia.	N/A	0.01	0	15.4
SS#5 Parking Lot	RCP 18" Dia.	N/A	< 0.01	0	0.4
SS#6 Switchyard	RCP 18" Dia.	N/A	0.03	0	13.8

*RCP = Reinforced Concrete Pipe; mgd= million gallons per day

Note: "SS" Stands for Site Separation Activities. Site Separation is a multi-phase project that includes activities that will separate the existing Units 1 and 2 from the proposed construction area for the new Unit 3.

Flow from the basins only occurs during and shortly after a rainfall event. Normal daily flow from the basins is as shown in the last column. The outlet pipes are sized to maintain post-development discharge rates at or below pre-development rates for the design storm event.

11.0 REFERENCES

Dominion. 2006. *Early Site Permit Application Environmental Report*. Revision 9. September.

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