RAS 7719

May 3, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

DOCKETED
USNRC

May 4, 2004 (2:45PM)

OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

In the Matter of

Dominion Nuclear North Anna, LLC

(Early Site Permit for North Anna ESP Site)

Docket No. 52-008

CONTENTIONS OF BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE, NUCLEAR INFORMATION AND RESOURCE SERVICE, AND PUBLIC CITIZEN REGARDING EARLY SITE PERMIT APPLICATION FOR SITE OF NORTH ANNA NUCLEAR POWER PLANT

I. INTRODUCTION

Pursuant to 10 C.F.R. § 2.309 and the Atomic Safety and Licensing Board's ("ASLB's") Initial Prehearing Order of March 8, 2004, Petitioners Blue Ridge Environmental Defense League ("BREDL"), Nuclear Information and Resource Service ("NIRS") and Public Citizen, hereby submit their contentions regarding Dominion Nuclear North Anna, L.L.C.'s ("Dominion's") application for an Early Site Permit ("ESP") that would allow it to build and operate one or two new nuclear power plants on the site of the North Anna nuclear power plant. As demonstrated below, these contentions should be admitted because they satisfy the NRC's admissibility requirements in 10 C.F.R. § 2.309.

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II. CONTENTIONS

Below Petitioners present their contentions, which are numbered in accordance with the ASLB's instructions in its March 8, 2004, Initial Prehearing Order. Contentions related to the Site Safety Analysis begin with 2. Contentions relating to environmental issues begin with 3. Contentions relating to emergency planning begin with 4. There are no contentions under the "administrative" or "miscellaneous" categories proposed by the ASLB in its order.

1. Administrative Contentions

Petitioners are not submitting any administrative contentions at this time.

2. Contentions Regarding Site Safety Analysis

Contention 2.1: Failure to provide adequate safety assessment of reactor interaction

Contention: The ESP application for the North Anna site fails to comply with 10 C.F.R. § 52.17 because its safety assessment does not contain an adequate analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequences evaluation factors identified in 10 C.F.R. § 50.23(a)(1). In particular, the safety assessment does not adequately take into account the potential effects on radiological accident consequences of co-locating new reactors with advanced designs next to an older reactor. The safety assessment should contain a comprehensive evaluation and analysis of the ways in which interaction of the old and new plants under accident conditions may exacerbate the consequences of a radiological accident. Without such an evaluation and analysis, the presiding officer cannot make a finding that, taking into

consideration the site criteria in Part 100 of the regulations, the proposed reactors can be operated "without undue risk to the health and safety of the public." 10 C.F.R. § 52.21.

This contention is supported by the Declaration of David A. Lochbaum, Nuclear Safety Engineer, In Support of Petitioners' Contentions (May 3, 2004), copy attached as Exhibit 2.1-1.

Basis: Pursuant to 10 C.F.R. § 52.17, an ESP application must contain:

> a description and safety assessment of the site on which the facility is to be located. The assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in § 50.34(a)(1) of this chapter.

Pursuant to 10 C.F.R. § 50.34(a)(1)(ii), an ESP application must consider such "radiological consequence evaluation factors" as whether and to what extent "generally accepted engineering standards" are used to design the new plant, whether and to what extent the new reactor design incorporates "unique, unusual, or enhanced safety features having a significant bearing on the probability or consequences" of an accident release of radiation, and plant design features that are "intended to mitigate the radiological consequences of accidents."[1]

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[1] Section 50.34(a)(1) has two subsections, (i) and (ii). Subsection (ii) presumably is the relevant provision, because it applies to post-1997 applications for construction permits, design certification, or combined licenses. The relevant portion of Subsection (ii) requires submission of the following information:

> (i) A description and safety assessment of the site and a safety assessment of the facility. It is expected that reactors will reflect through their design, construction and operation an extremely low probability for accidents that could result in the release of significant quantities of radioactive fission products. The following power reactor design characteristics and proposed operation will be taken into consideration by the Commission:
>
> (A) Intended use of the reactor including the proposed maximum power level and the nature and inventory of contained radioactive materials;

The safety assessment for the North Anna ESP application is deficient because it does not adequately consider the relationship between the design of the proposed new reactors and the design of the existing reactors on the site. The new reactor designs already certified by NRC and those currently under review by NRC are allegedly "safer" and less likely to have an accident involving significant core damage. For instance, the potential reactor designs listed in the application include the AP-1000 pressurized water reactor, the gas-turbine modular helium reactor ("GT-MHR"), and the pebble-bed modular reactor ("PBMR"). ESP Application § 1.3.2. The vendors of these reactors contend that the designs contain features which lessen the likelihood of an accident, and which also lessen the severity of an accident, should one occur. Consequently, the design basis accidents ("DBAs") and source terms resulting from DBAs for the proposed reactors are significantly less severe than for the existing operating reactors. Consequently, the new reactors are designed with fewer features to protect station

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> (B) The extent to which generally accepted engineering standards and applied to the design of the reactor;
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> (C) The extent to which the reactor incorporates unique, unusual or enhanced safety features having a significant bearing on the probability or consequences of accidental release of radioactive materials;
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> (D) The safety features that are to be engineered into the facility and those barriers that must be breached as a result of an accident before a release of radioactive material to the environment can occur. Special attention must be directed to plant design features intended to mitigate the radiological consequences of accidents. In performing this assessment, an applicant shall assume a fission product release [footnote omitted] from the core into the containment, assuming that the facility is operated at the ultimate power level contemplated. The applicant shall perform an evaluation and analysis of the postulated fission product release, using the expected demonstrable containment leak rate and any fission product cleanup systems intended to mitigate the consequences of the accidents, together with applicable site characteristics, including site meteorology, to evaluate the offsite radiological consequences. Site characteristics must comply with part 100 of this chapter. . . .

workers from radiation released during accident conditions, including loss-of-coolant accidents. An accident at the existing reactor could, therefore, have significant adverse effects on the operation of the new reactor.

There are many sites in the United States with more than one operating nuclear power reactor. Many of these multiple-unit sites feature reactors of essentially duplicate design. Some of these multiple-unit sites have reactors of different design, such as the reactors at the Arkansas Nuclear One site supplied by two distinctly different manufacturers. But the reactors at these multiple-unit sites shared the common trait of having the potential for a postulated accident causing significant amounts of radiation to be released. Placing a new reactor design at a site with one or more operating reactors of an earlier vintage creates a more difficult situation.

The interaction of control room designs for older and newer reactors provides an example of this problem. The control room design for the new reactors may be sufficient to adequately protect workers from postulated accidents at that reactor and from postulated accidents at nearby reactors of the same or similar design. But the control room design for the new reactors may not adequately protect workers from postulated accidents at nearby reactors of different design (e.g., the current fleet of operating reactors).

As required by General Design Criterion 19 of Appendix A to Part 50, a control room:

> shall be provided from which actions can be taken to operate the nuclear power unit safely under normal conditions and to maintain it in a safe condition under accident conditions, including loss-of-coolant accidents. Adequate radiation protection shall be provided to permit access and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 5 rem whole body, or its equivalent to any part of the body, for the

> duration of the accident. Equipment at appropriate locations outside the control room shall be provided (1) with a design capability for prompt hot shutdown of the reactor, including necessary instrumentation and controls to maintain the unit in a safe condition during hot shutdown, and (2) with a potential capability for subsequent cold shutdown of the reactor through the use of suitable procedures.

The reactors operating today, such as North Anna Units 1 and 2, are designed with ventilation systems that maintain the control rooms at higher pressure than outside so that in event of an accident, clean air leaks out of the control room rather than radioactive air leaking in. Some outside air must be drawn in to create the positive pressure inside the control rooms- this outside air passes through charcoal and HEPA filters to remove radioactivity before it reached the operators in the control rooms. Because these existing reactors cannot preclude the occurrence of an accident resulting in significant release of radiation, GDC-19 requires their control rooms be designed to protect workers from exposure to that radiation.

Because new reactor designs are allegedly safer, the protection for control room operators is less. Assuming the new reactor designs are safer, building one next to an existing reactor means that it will be exposed to radiation released during an accident at North Anna Units 1 and 2. Thus, it is unreasonable to protect the operators in the control room of the new reactor(s) at the North Anna site, but not the operators in the control room of the existing reactors. The applicant has not shown that the workers in the control room of a new plant or plants would be adequately protected from a design basis accident or a severe accident, as required by GDC 19.

Environmental qualification of electrical equipment provides another example of the potentially adverse interaction between old and new plant designs. Pursuant to 10 C.F.R. § 50.49 and General Design Criterion 4 of Appendix A to Part 50, nuclear power

plant electrical equipment must be qualified to withstand the severity of accident conditions that are predicted for that plant design. Because accidents at nuclear plants of relatively new design are not expected to be as severe as accidents than for older plants, electrical equipment in the new plants at the North Anna site may not be qualified to withstand levels of heat or radiation that may be generated by an accident at the existing plant. This should be of concern to the applicant because of the relatively close proximity of the new and existing plants.[2]

Contention 2.2: Failure to Evaluate Site Suitability for Below-Grade Placement of Reactor Containment

Contention: The Site Safety Analysis Report for the North Anna ESP is inadequate because it does not evaluate the suitability of the site to locate the reactor containment below grade-level. Below-grade construction is advisable and appropriate, if not necessary, in order to maintain an adequate level of security in the post-9/11 threat environment.

Basis:

a. Legal requirements. Pursuant to 10 C.F.R. § 52.17, an ESP application must contain "a description and safety assessment of the site on which the facility is to be located." Section 52.17 also requires that site characteristics "must comply with part 100 of this chapter." Part 100 requirements include the stipulation that: "[s]ite characteristics must be such that adequate security plans and measures can be developed." 10 C.F.R. § 100.21(f). The site conditions that must be evaluated include "soil and rock stability,

[2] Section 2.1.1.1 of the ESP application for North Anna reports that the proposed plant site border is within 570 feet of the Unit 1 containment building. A radiological release could therefore impact the new reactor(s).

liquefaction potential, natural and artificial slope stability, cooling water supply, and remote safety-related structure siting."

b. Rationale for requiring below-grade construction of containments. The applicant should be required to evaluate the North Anna site for below-grade construction of the containment because, as currently designed and constructed, nuclear power plants are unacceptably attractive and vulnerable targets for terrorist attacks and sabotage. The attractiveness of nuclear plants as terrorist targets is well-recognized. In his 2002 State of the Union Address, for example, President Bush stated that nuclear power plants are priority targets for terrorists. http://www.cnn.com/2002/ALLPOLITICS/01/29/bush.speech.txt/. The fact that nuclear plants are still high on Al Qaeda's target list was recently confirmed by Robert Hutchings, chairman of the National Intelligence Council (which reports to the CIA Director). Reuters, "U.S. Intelligence Official: Qaeda Posed Plane Threat," New York Times (February 17, 2004), copy attached as Exhibit 2.2-1.

The vulnerability of containment structures and associated irradiated fuel storage ponds to terrorist attack, particularly to aircraft penetration, has also been recognized in NRC documents and press articles. For example, a 1987 NRC-sponsored study found that a 12,500 pound aircraft had a 32% chance of crashing through a 6-feet thick reinforced concrete wall, and an 84% chance of penetrating through a 2-feet thick reinforced concrete wall. NUREG-/CR-5042, Evaluation of External Hazards to Nuclear

Power Plants in the United States (December 1987), relevant excerpts attached as Exhibit 2.2-2.[3]

A 1982 study by Argonne National Laboratory also concluded that U.S. reactor containments have not been adequately evaluated for effects of explosion and fire from impact associated with penetration by an aircraft. While the study is not available from the NRC's Public Document Room, it was described by the Washington Post in an October 25, 2001 article. Peter Behr, "Nuclear Plants Vulnerability Raised Attack Concerns: 1982 Report on Danger of Jet Crashes Into Reactors Was Open To Public," Washington Post at A4 (October 25, 2001), copy attached as Exhibit 2.2-3. According to the article, Argonne National Laboratory calculated the impact of various commercial aircraft at varying speeds. The study determined that the containment dome would be penetrated at the highest flight speeds. The study also determined that the ignition of a small percentage of the aviation fuel inside the containment dome would have the force of 1,000 pounds of explosives and "could lead to rather violent explosion environment and impose upon the primary containment relatively severe loads." *Id.* As quoted by the Washington Post article, the Argonne study raised the concern that:

> Based on the review of past [NRC] licensing experience, it appears that fire and explosion hazards have been treated with much less care than the direct aircraft impact and the resulting structural response.
>
> Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated.

Id. Moreover, according to NUREG-1738, "Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants," § 3.5.2 (January 2001), one

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[3] Notably, a "large" aircraft was defined as weighing 12,500 pounds, even though the report observed that a Boeing B727-200 has a maximum takeoff weight of 209,500 pounds (or roughly the equivalent of 17 "large" aircraft). *Id.*, Table 6.4 at 6-27.

out of two aircraft flying today is large enough to penetrate a 5-feet thick reinforced concrete wall, such as the side of a irradiate fuel storage pond. *Id.* Relevant pages of the report are attached as Exhibit 2.2-4.

The various advanced reactor generation designs that are being considered by Dominion in its application were developed before the terrorist attacks of September 11, and before the NRC undertook a comprehensive evaluation of its regulations to evaluate their adequacy to protect against the terrorist threat. Thus, they are not specifically designed to protect against assault by attackers with the level of determination and capability demonstrated by the September 11 terrorist attackers. In fact, the new generation of advanced reactors does not have as robust a containment as the current generation. For example, as a general matter, the containment thickness of the current generation of nuclear power plants is about 2-3 feet.[4] The containments of the allegedly new "inherently safe" reactor containment building designs are equivalent or even thinner. For example, the Westinghouse AP 600 Advanced Pressurized Water Reactor has a 3-foot thick containment wall of reinforced concrete.[5]

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[4] For example, the containment dome for the Clinton nuclear power station in Clinton, Illinois and the Grand Gulf nuclear power station in Port Gibson, Mississippi and other Boiling Water Reactor Mark III designs are 0.25-inches of steel and 2.5-feet of reinforced concrete. NUREG/CR-1037, Containment Performance Working Group Report at 2-29 (May 1985). Similarly, the thickness of the containment dome of the Davis-Besse reactor, a Pressurized Water Reactor, is 13/16-inch of steel and 2.5-feet thick reinforced concrete. NUREG/CR-5567, PWR Dry Containment Issue Characterization at 8 (August 1990). The thickness of the containment dome at the Surry nuclear power station, also a PWR, is 2.5 feet of reinforced concrete. NUREG/CR-5662, Hydrogen Combustion, Control, and Value-Impact Analysis for PWR Containments at 145 (June 1991).

[5] Declaration of Paul V. Gunter (May 3, 2004), attached as Exhibit 2.2-5.

c. Viability of below-grade construction

Below-grade construction of nuclear reactor containments is a viable design security measure that would protect the reactor containment from assault by aircraft or other high-power weapons. In fact, consideration of below-grade construction was recommended as a prudent design feature over 50 years ago by Dr. Edward Teller, one of the founders of the U.S. nuclear industry. In a July 23, 1953, letter to the Joint Committee on Atomic Energy, Dr. Teller noted:

> [t]he various committees dealing with reactor safety have come to the conclusion that none of the powerful reactors built or suggested up to the present time are absolutely safe. Though the possibility of an accident seems small, a release of the active products in a city or densely populated area would lead to disastrous results. It has been therefore the practice of these committees to recommend the observance of exclusion distances, that is, to exclude the public from areas around reactors, the size of the area varying in appropriate manner with the amount of radioactive poison that the reactor might release. Rigid enforcement of such exclusion distances might hamper future development of reactors to an unreasonable extent. In particular, the danger that a reactor might malfunction and release its radioactive poison differs for different kinds of reactors. It is my opinion that reactors of sufficiently safe types might be developed in the near future. *Apart from the basic construction of the reactor, underground location or particularly thought-fully constructed safety devices might be considered.*

Letter from Dr. Edward Teller to the Honorable Sterling Cole, Chairman of the Joint Committee on Atomic Energy, United States Congress (emphasis added), copy attached as Exhibit 2.2-6.[6]

There is no indication in the ESP application that the applicant considered the suitability of the site for below-grade construction of the reactor containment. While the application evaluates the suitability of the site for construction of a foundation for the facility, suitability for underground construction would require a much more

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[6] Petitioners note that they were unable to obtain a copy of the original letter. The copy that is attached is was retyped and posted on the website of the Nuclear Age Peace Foundation.

sophisticated and in-depth analysis of geological and hydrogeological conditions. Therefore, Petitioners contend that the applicant has not provided sufficient information within its site safety analysis to permit a finding that the propose site is suitable for new nuclear reactors.

3. Environmental Contentions

Contention 3.1: Inadequate Discussion of Severe Accident Impacts

Contention: The ER's discussion of severe accident is inadequate, because it relies on the findings and conclusions of NUREG-1437, Vol. 1, the Generic Environmental Impact Statement for License Renewal of Nuclear Power Plants (1996) ("NUREG-1437), without providing specific design information that would justify the applicability of the NUREG.

Basis: As required by NEPA, Section 7.2 of the ER for the North Anna site provides an analysis of environmental impacts of severe accidents at the proposed new nuclear reactor(s). *See* ER at 3-7-30. *See also* NUREG-1555, Environmental Standard Review Plan (1999). SERI's analysis is deficient, however, because it incorporates the findings and conclusions of NUREG-1437, without justifying the applicability of the NUREG.

In correspondence with the Nuclear Energy Institute ("NEI"), the NRC Staff has set limits on the use of NUREG-1437 to support or substitute for the severe accident analysis required of an ESP application. In early 2003, NEI wrote to the NRC, suggesting parameters for permitting reliance on NUREG-1437. Letter from Dr. Ronald L. Simard, NEI, to James E. Lyons, re: Resolution of Generic Topic ESP-10 (Use of License Renewal Generic Environmental Impact Statement (NUREG-1437) for Early Site Permits) (February 6, 2003) (hereinafter "Simard Letter"), copy attached as Exhibit

3.1-1. In responding to the Simard Letter, the NRC made it clear that ESP applicants could not make unqualified reliance on NUREG-1437, cautioning that:

> the process suggested in Items 2, 3, and 4 [of the Simard Letter], and the concluding remarks of your letter implies that the ESP applicant can adopt the conclusions of the GEIS in its application without detailed knowledge of the design and operational characteristics of a facility that may be built on the proposed site. The GEIS documents the staff's evaluation of the environmental impacts of LWR reactors of known design, locations, and operating experiences. The analysis results documented in the GEIS may not be representative of the environmental impacts of a facility that could be built on the site proposed in an ESP application. Therefore, although the environmental impacts of the construction and operation of a nuclear facility located on the proposed site may be similar to those identified in the GEIS, it is incumbent on the ESP applicant to justify its conclusion regarding these impacts.
>
> The NRC does believe that there may be useful insights in the GEIS that an ESP applicant can consider for its purposes in developing its environmental report, but, as stated above, the burden for justifying relevance and demonstrating completeness rests entirely with the applicant. In addition, the NRC retains the prerogative to utilize well-established NEPA techniques, such as tiering, cooperation and adoption, where the NRC believes that it is appropriate.

Letter from James E. Lyons, NRC, to Dr. Ronald L. Simard, NEI, re: Resolution of Early Site Permit Topic 10 (ESP-10), Use of License Renewal Generic Environmental Impact Statement (NUREG-1437) for Early Site Permits (April 1, 2003) (hereinafter "Lyons Letter I"), copy attached as Exhibit 3.1-2. In a subsequent letter, Mr. Lyons Letter further clarified that:

> [t]he NRC will perform its review on severe accident environmental impacts in accordance with ESRP Section 7.2. If specific plant design information is available (e.g., a detailed design with a Level 3 PRA), then this information would be used in the evaluation. However, even in the absence of a detailed plant design (e.g., the specific reactor type or technology is undecided), a severe accident impacts analysis is technically feasible at the ESP stage using a PPE approach and the existing guidance in ESRP [Early Site Review Plan] Section 7.2. Such a approach could involve characterizing the spectrum of credible releases from candidate future plant designs, in terms of representative source terms and their respective frequencies, and using these release characteristics in conjunction with site-specific population and meteorology to determine site-specific risk

> impacts for the surrogate design. Release characteristics could be developed through a survey of severe accident analyses for previously certified ALWRs and/or operating reactors. Risk impacts could be assessed using the same metrics as in previous plant-specific and generic EISs, such as NUREG-0974, "Limerick 1 and 1 Operating License" and NUREG-1437. These metrics include population dose, early and latent fatalities, and economic costs. The metrics would be used to determine the acceptability of the proposed site at the ESP stage.

Leter from James E. Lyons, NRC, to Dr. Ronald L. Simard, NEI, re: Response to Letter on Early Site Permit Topic 12 (EP-12, NEPA Consideration of Severe Accident Issues at 2 (June 25, 2003) (hereinafter "Lyons II Letter"), attached as Exhibit 3.1-3.

Contrary to the guidance of the Lyons I Letter and the Lyons II Letter, the ER for the North Anna site fails to justify the use of NUREG-1437 as a surrogate for a severe accident analysis for the proposed new reactor(s). Section 7.2.2, which purports to address the "Applicability of Existing Generic Severe Accident Studies," makes only broad generalizations in support of the applicability of NUREG-1437, related to the characteristics of the site, whether regulatory controls can be assumed to work, and whether plant lifetime has an effect on risk. It is not possible to find any characterization of "the spectrum of credible releases from candidate future plant designs, in terms of representative source terms and their respective frequencies," or the use of "release characteristics in conjunction with site-specific population and meteorology to determine site-specific risk impacts for the surrogate design." *See* Lyons II Letter at 2. Nor does the ER show that Dominion has developed "[r]elease characteristics . . . through a survey of severe accident analyses for previously certified ALWRs and/or operating reactors," or assessed risk impacts "using the same metrics as in previous plant-specific

assessed risk impacts "using the same metrics as in previous plant-specific and generic EISs, such as NUREG-0974, "Limerick 1 and 1 Operating License" and NUREG-1437."[7]

The ER simply makes no attempt to analyze the potential for severe accidents with respect to any of the advanced designs proposed by SERI. There is no indication in the ER that the design information used for NUREG-1437 would be applicable to the advanced designs proposed by SERI, or that the behavior of those advanced reactors under severe accident conditions would be the same or similar. Accordingly, SERI's severe accident analysis is fatally deficient.

Contention 3.2 Waste Confidence

Contention 3.2 is broken down into two contentions, 3.2.1 and 3.2.2. Contention 3.2.1 challenges Dominion's failure to evaluate whether and in what time frame spent fuel generated by the proposed new reactors can be safely disposed of. The contention rests on the premise that the Waste Confidence decision does not apply to this proceeding. Contention 3.2.2 argues that in the event the Waste Confidence Decision is found to apply, it should be reconsidered.

Contention 3.2.1: Failure to Evaluate Whether and in What Time Frame Spent Fuel Generated by Proposed Reactors Can Be Safely Disposed Of

Contention: The ER for the North Anna ESP is deficient because it fails to discuss the environmental implications of the lack of options for permanent disposal of the irradiated (*i.e,* "spent") fuel that will be generated by the proposed reactors if they are built and operated. Nor has the NRC made an assessment on which Dominion can rely regarding

[7] In fact, Section 7.2.1 of the North Anna ER appears to be a cookie-cutter discussion, as it duplicates, almost word-for-word, the discussion of severe accidents in Section 7.2.2 of the ER for the Grand Gulf ESP application.

the degree of assurance now available that radioactive waste generated by the proposed reactors "can be safely disposed of [and] when such disposal or off-site storage will be available." Final Waste Confidence Decision, 49 Fed. Reg. 34,658 (August 31, 1984), citing *State of Minnesota v. NRC,* 602 F.2d 412 (D.C. Cir. 1979). Accordingly, the ER fails to provide a sufficient discussion of the environmental impacts of the proposed new nuclear reactors.

Basis: The ER for the proposed new reactors does not contain any discussion of the environmental implications of the lack of options for permanent disposal of the irradiated fuel to be generated by two new reactors on the North Anna site. Therefore, it is fatally deficient. *State of Minnesota v. NRC,* 602 F.2d at 416-17.

While Dominion may have intended to rely on the NRC's Waste Confidence decision, issued in 1984 and most recently amended in 1999, that decision is inapplicable because it concerns plants that are currently operating, not new plants. The second finding of the Waste Confidence Decision, as amended in 1999, is that the Commission has:

> reasonable assurance that at least one mined geologic repository will be available within the first quarter of the twenty-first century, and that sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level radioactive waste and spent fuel originating in such reactor and generated up until that time. (This finding revised the finding in the original decision that a mined geologic repository would be available by the years 2007 to 2009).

Waste Confidence Decision Review: Status, 64 Fed. Reg. 68,005, 68,006 (December 6, 1999). Clearly, the Commission's finding applies to any existing reactor, including reactors whose licenses are revised or renewed. The Commission gives no indication that

it has confidence that repository space can be found for spent fuel and other high-level radioactive waste from new reactors licensed after December of 1999.

Moreover, the revised second finding in the 1999 Waste Confidence review statement conspicuously fails to assert confidence in the likelihood that more than one repository will be licensed. In fact, the Commission has backtracked on its original 1984 "Nuclear Waste Confidence Decision," in which the Commission expressed confidence that "one or more" repositories would open between 2007 and 2009. Waste Confidence Decision, 49 Fed. Reg. at 34,673. The 1999 Status Report states merely that "at least one" repository will open by 2025. 64 Fed. Reg. at 68,006.

It is also clear that the inventory of spent fuel and other high-level radioactive waste being generated by the *current* generation of nuclear reactors is far greater than what can be accommodated in the single repository in which the Commission places its confidence, Yucca Mountain, Nevada. The proposed Yucca Mountain repository can only accept 63,000 metric tons of commercial high-level radioactive waste and irradiated nuclear fuel, at least until a second national repository became operational.[8] Even

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[8] Under the Nuclear Waste Policy Act ("NWPA"), 63,000 metric tons is the legal limit for commercial waste storage that can be "disposed of" at Yucca Mountain, Nevada, at least until a second repository is operational elsewhere in the U.S. As the NWPA states at Section 114(d):

> The [NRC] decision approving the first such application [for a license to open and operate a repository] shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation..."

42 U.S.C. § 10134(d). By long-established DOE policy, the first 70,000 metric tons of irradiated nuclear fuel and solidified high-level radioactive waste "disposed of" at Yucca Mountain, Nevada would include 90% commercial nuclear reactor waste, and 10% DOE

assuming only 40 years of operations with no operating license renewals and no new nuclear reactors, the U.S. Department of Energy (DOE) has known since at least the mid-1990's – that is, since before the most recent (1999) NRC review of its "Nuclear Waste Confidence Decision" -- that by the year 2030 or so, well over 80,000 metric tons of irradiated nuclear fuel generated at commercial nuclear reactors will exist in the U.S. U.S. Nuclear Waste Technical Review Board ("NWTRB") "Disposal and Storage of Spent Nuclear Fuel: Finding the Right Balance," Figure 2 at page 11 (March 1996), copy attached as Exhibit 3.2.1-1. This is significantly in excess of the "disposal" capacity at Yucca Mountain.

NRC's now-routine approval of 20 year license extensions to old commercial nuclear reactors will only increase the quantity of high-level radioactive waste that exceeds the capacity limits at the proposed Yucca Mountain, Nevada repository. In its "Final Environmental Impact Statement for a Repository for Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada," (Feb. 2002) (hereinafter "Yucca Mountain EIS"), DOE predicted the generation of over 105,000 metric tons of commercial irradiated nuclear fuel by the year 2046. *Id.,* Table A-8, page A-16. While NRC's standard license extension term is 20 years, the DOE prediction assumed that the term of license extensions would be only 10 years. DOE also assumed no new commercial nuclear reactors in the U.S. Thus, the high-level waste and spent fuel

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waste from the nuclear weapons production complex and nuclear energy research activities. 90% of 70,000 metric tons means that only 63,000 metric tons of commercial irradiated nuclear fuel could be "disposed of" at Yucca Mountain, Nevada, at least until a second national repository is operational in the United States. *See* Yucca Mountain EIS at A-1.

generated by the *current* generation of reactors will far exceed the capacity of the single repository that the NRC has identified as feasible and likely.[9]

Accordingly, the spent fuel and other high-level radioactive wastes generated at the proposed new reactors could not be "disposed of" at Yucca Mountain unless and until a second national repository is operating. But the Commission has not expressed confidence that a second repository will open. Any spent fuel or other high-level radioactive waste generated after the year 2011 or so (after 63,000 metric tons of commercial irradiated nuclear fuel has been generated) would have nowhere to go, would lack "disposal" space at a repository, unless and until a second repository is opened and operating in the U.S. somewhere other than Yucca Mountain, Nevada – a process that could very well take many decades, based on the experience of trying to open the first repository at Yucca Mountain, Nevada.

Moreover, Congress has not given the NRC any basis for assuming that a second repository will be opened. Section 161(b) of the NWPA provides that: "[t]he Secretary [of Energy] shall report to the President and to Congress on or after January 1, 2007, but not later than January 1, 2010, on the need for a second repository." 42 U.S.C. §

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[9] Experience also shows that the NRC has been overly optimistic about the opening of the first repository. It took from 1982 (the year the Nuclear Waste Policy Act was passed) until 2002 – 20 full years -- just for the DOE to recommend Yucca Mountain as "suitable" for repository development (a recommendation, by the way, that is being challenged in federal court by the State of Nevada). Although DOE still predicts the Yucca Mountain repository will open by the year 2010, the U.S. General Accounting Office (GAO) has reported that a repository at Yucca Mountain, Nevada probably could not open to receive waste shipments till 2015. GAO-02-191, "Nuclear Waste: Technical, Schedule, and Cost Uncertainties of the Yucca Mountain Repository Project" (December, 2001). Even this date is doubtful, given the serious technical criticism of DOE's current repository design. *See, e.g.,* U.S. NWTRB, "Technical Report on Localized Corrosion" (November 25, 2003). In addition, several legal challenges have been filed against the Yucca Mountain repository and the proposed standards for operation.

10172a(b). Section 161(a) also states that: "The Secretary [of Energy] may not conduct site-specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities." 42 U.S.C. § 10172a(a). The Secretary of Energy has not made a finding that a second repository is needed, nor has Congress specifically authorized or appropriated funds for site-specific activities.

The Commission's failure to express confidence that a second repository will be opened any time soon also implicates the third and fourth findings of the Waste Confidence Decision, *i.e,* that spent fuel and other high-level radioactive waste can be safely stored at reactor sites for up to 30 years. 64 Fed. Reg. at 68,006. If the Commission has no confidence that a repository will open at some reasonable time in the future, it must be assumed that spent fuel may sit at the reactor site for an indefinite period of time. The environmental impacts of such indefinite storage must be evaluated before an Early Site Permit can be granted.

Contention 3.2.1: Even if the Waste Confidence Decision Applies to This Proceeding, It Should be Reconsidered.

Contention: Even if the Waste Confidence Decision applies to this proceeding, it should be reconsidered, in light of significant and pertinent unexpected events that raise substantial doubt about its continuing validity, *i.e.,* the increased threat of terrorist attacks against U.S. facilities.

Basis: In its 1999 "Nuclear Waste Confidence Decision" revision, NRC stated "the Commission would consider undertaking a comprehensive reevaluation of the Waste Confidence findings...if significant and pertinent unexpected events occur raising

substantial doubt about the continuing validity of the Waste Confidence findings." 64 Fed. Reg. at 68,007. Clearly, the catastrophic terrorist attacks upon the United States on September 11th, 2001 constituted significant and pertinent unexpected events that raise substantial doubts about the continuing validity of the third and fourth findings of the revised Waste Confidence Decision. These findings are:

> 3. The Commission finds reasonable assurance that high-level radioactive waste and spent fuel will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all high-level waste and spent fuel (This finding is identical to the finding in the original Waste Confidence Decision in 1984).
>
> 4. The Commission finds reasonable assurance that, if necessary, spent fuel can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor at its spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations. (This finding is basically identical to that in the original Waste Confidence Decision with the addition of the consideration of license renewal and spent fuel storage 30 years beyond the licensed life for operation of a reactor).

64 Fed. Reg. at 68,006. The terrorist threat to irradiated nuclear fuel and high-level radioactive waste – whether it is being stored on-site at commercial reactors in storage pools or dry casks; stored in away-from-reactor Independent Spent Fuel Storage Installations; or transported by truck, train, or barge between nuclear plants and off-site interim storage facilities – demands an evaluation of whether (a) it is appropriate to store spent fuel and other highly radioactive waste for 30 years or more pending availability of a permanent repository, and (b) whether nuclear power should be phased out as quickly as possible as a matter of environmental protection, national security, public safety, and common defense.

The homeland security risks posed by indefinite temporary storage of spent fuel have been recognized by Energy Secretary Spencer Abraham:

> Yucca Mountain is an important component of homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but *prudence demands we consolidate this waste from widely dispersed, above-ground sites into a deep underground location that can be better protected.*

Statement of Spencer Abraham, Secretary of Energy, Before the Energy and Natural Resources Committee, U.S. Senate (May 16, 2002), copy attached as Exhibit 3.2.1-2 (emphasis added). It is undisputed that neither fuel storage pools nor dry storage facilities are designed to withstand the type of determined and sophisticated attack that was carried out on September 11, 2001.

To protect against and mitigate the impacts of terrorist attacks, the NRC has developed a system to maintain a constant state of alert, undertaken a comprehensive review of the adequacy of its safety and security regulations, and upgraded its security requirements for all operating nuclear facilities in the United States. Clearly, under NEPA it is also appropriate to consider whether the Commission continues to have a basis for expressing confidence that stored spent fuel and other high-level radioactive waste is safe from a terrorist attack.

Petitioners are aware that the Commission has ruled that environmental impacts of terrorist attacks are not cognizable under NEPA. *See, e.g., Pacific Gas & Electric Co.* (Diablo Canyon Independent Spent Fuel Storage Installation), CLI-03-01, 57 NRC 1 (2003); *Private Fuel Storage, L.L.C.* (Independent Fuel Storage Installation), CLI-02-25, 56 NRC 340 (2002). Petitioners request that the Commission reconsider this policy, in light of (a) the obvious attractiveness and vulnerability of spent fuel to terrorist attack, (b), the Secretary of Energy's recognition of the relationship between homeland security and assured capacity for timely spent fuel disposal; and (c) the Commission's explicit

statement in the Waste Confidence status review that it would undertake a comprehensive reevaluation of the Waste Confidence findings if "significant and pertinent unexpected events" occur raising substantial doubt about the continuing validity of the Waste Confidence findings. Clearly, that condition is met here.

Contention 3.3: Failure to Adequately Address Environmental Impacts of Proposed Reactors on Lake Anna

Contention: In general, this contention asserts that the ER for the North Anna ESP application fails to adequately address the environmental impacts of the proposed new reactor(s) on Lake Anna and associated water bodies. The contention is broken into four subparts. Contentions 3.3.1 through 3.3.3 identify aspects in which Dominion Contention 3.3.1 asserts that the ER does not contain a complete or sufficient assessment of the adequacy of water supplies required for the operation of new units at the North Anna site. Contention 3.3.2 asserts that the ER does not adequately address the adverse impact of operating one or two additional reactors on the health of fish and other aquatic life in Lake Anna and the North Anna River. Contention 3.3.3 asserts that the ER does not contain a complete or adequate assessment of the potential impacts of the proposed expansion of the North Anna nuclear complex on water-based recreational uses of the lake and on homeowners who live around the lake. Contention 3.3.4 asserts that the ER fails to satisfy 10 C.F.R. § 51.45(b)(3) because it fails to consider alternatives to the use of Lake Anna water for cooling Units 3 and 4, as well as the no-action alternative.

In addition, the ER fails to discuss conflicts between Dominion's proposed use of water to cool the proposed new reactor(s), and state and federal law which protects those waters. Failure to address these conflicts violates 10 C.F.R. § 51.45(d), which requires an

applicant to address the status of its compliance with state and federal law governing the proposed project.

These contentions are supported by the expert Declaration of Barry Sulkin, attached as Exhibit 3.3-1.

General legal basis: Pursuant to the National Environmental Policy Act ("NEPA"), 42 U.S.C. § 4332, and NRC implementing regulations at 10 C.F.R. § 51.45(b)(1) and (2), Dominion's ER must describe the environmental impacts of its proposed action. As further described in the regulations of the President's Council on Environmental Quality, the impacts that must be discussed include direct and indirect impacts, and possible conflicts between the proposed action and the objectives of Federal, regional, State, and local land use plans, policies and controls for the area concerned. 40 C.F.R. § 1502.16. In addition, the ER must evaluate the cumulative impacts of the proposed reactor(s), in combination with each other and with the existing reactors. *LaFlamme v. FERC,* 852 F.2d 389, 401 (9th Cir. 1988), citing 40 C.F.R. § 1508.7.

The standard for an adequate NEPA review of environmental impacts is rigorous. The agency must "carefully consider," *i.e.,* take a "hard look" at the environmental impacts of a proposed action. *Hughes River Watershed Conservancy v. Sierra Club,* 81 F.3d 437, 443 (4th Cir. 1996), citing *Robertson v. Methow Valley Citizens Council,* 490 U.S. 332, 349 (1989).

General factual basis: Petitioners note that the primary sources of the information that is provided in these contentions consist of the results of (1) reviews conducted by the U.S. Fish and Wildlife Service ("FWS") in 2001 and 2003 of Dominion's recent application for renewal of its existing operating license for Units 1 and

2[10]; (2) a review by the Commonwealth of Virginia of Dominion's ESP application for a federal consistency certification under the Virginia Coastal Zone Management Act and the federal Coastal Resources Management Program, a process to evaluate whether the proposed operation will comply with applicable environmental requirements[11]; and (3) personal inspection of the area made by Barry Sulkin on April 5, 2004. The FWS reviews of 2001 and 2003 document significant adverse impacts from the existing reactors. The Commonwealth of Virginia's review also describes serious adverse environmental impacts of current and proposed operations. In fact, VDEQ concludes that Dominiion's ESP application does not "form an adequate basis for the preparation of an Environmental Impact Statement by the Nuclear Regulatory Commission (NRC)."[12]

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[10] *See* letter from John P. Wolflin, U.S. Fish and Wildlife Service, to Andrew Kugler, NRC, re: NUREG-1437, Final Supplement 7 to Generic Environmental Impact Statement Regarding North Anna Power Station (NAPS), Units 1 and 2 (February 4, 2003) hereinafter "FWS, February 4, 2003 letter to NRC"), copy attached as Exhibit 3.3-2; letter from John P. Wolflin, U.S. Fish and Wildlife Service, to Andrew Kugler, NRC, re: Virginia Electric & Power Company, License Nos. NPF-4 and NPF-7, North Anna Power Station, Lake Anna, Spotsylvania and Louisa Counties, Virginia (November 7, 2001) (hereinafter "FWS, November 7, 2001 letter to NRC"), copy attached as Exhibit 3.3-3.

[11] *See, e.g.,* letter from Ellie L. Irons, VDEQ, to Pamela F. Faggert, Dominion Virginia Power Company, re: Federal Consistency Certification under the Coastal Zone Management Act and the Virginia Coastal Resources Management Program: North Anna Early Site Permit Application, DEQ-03-223F (February 10, 2004) (hereinafter "VDEQ letter to Dominion, February 10, 2004"), and attachments, copy attached as Exhibit 3.3-4. The attachments to VDEQ letter to Dominion, February 10, 2004, include several pieces of correspondence, two of which are separately marked as exhibits for the convenience of the ASLB and parties: letter from Gary Martel, Virginia Department of Game and Inland Fisheries, to Ellie Irons, VDEQ (January 27, 2004) (hereinafter "VDGIF, January 27, 2004 letter to VDEQ"), (Exhibit 3.3-5); and Memorandum from Joseph P. Hassell, VDEQ, to Ellie Irons, VDEQ (January 15, 2004) (hereinafter "VDEQ, January 15, 2004 memo to Ellie Irons") (Exhibit 3.3-6).

[12] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 1.

Dominion withdrew its request of the Commonwealth of Virginia for a federal consistency certification review on January 12, 2004.[13]

Sub-contentions:

Contention 3.3.1: Inadequate Discussion of Impacts on Water Quantity in Lake Anna and Downstream

Contention: The ER does not contain a complete or sufficient assessment of the adequacy of water supplies required for the operation of new units at the North Anna site. In particular, the ER does not sufficiently address the adequacy of water supplies in Lake Anna for the proposed new Units 3 and 4, and fails to identify the supplementary external water source for Unit 4. The ER also fails to account for the impact of an additional unit or units on the river flow downstream.

Basis:

a. Background on Lake Anna water supply. Lake Anna is a man-made lake, which was constructed in 1971 by damming the North Anna River in order to provide cooling water for the North Anna Power Station ("NAPS"). ER at 3-2-20. Lake Anna is about 27 kilometers (17 miles) long, with a total volume of 550,000 acre-feet. Three dikes divide Lake Anna into two sections. The larger section, with an area of 9,600 acres, is used as the source for cooling water for the two existing units. The smaller impoundment, referred to as the Waste Heat Treatment Facility ("WHTF"), or locally as the "hot side" of the lake, has an area of about 3,400 acres and is used as a waste treatment unit for the hot water discharge from the two existing units. The water partially

[13] VDEQ letter to Dominion, February 10, 2004, page 1.

cools before entering the larger portion of the lake by transferring heat to the atmosphere and by mixing with the ambient waters in that portion of the lake. The hot water remains in the WHTF either 7 days (ER at 3-5-42) or 14 days (ER at 3-2-71). Approximately half of the heat is dissipated from the water before the water enters the larger section of the lake. ER at 3-5-42.

When the two currently existing units of the NAPS are operating, the reactors draw 1.9 million gallons per minute (gpm) (4,246 cubic feet per second (cfs)) from Lake Anna, circulate it through the condensers, and discharge it to the WHTF. ER § 5.3.1.1. This represents 2.8 % of the total volume of Lake Anna when the lake level is 250 feet (ft) above mean sea level (msl). ER § 5.3.1.2. An additional 28,725 gpm (64 cfs) are withdrawn for other plant uses. ER § 5.3.1.1. The average annual flow to Lake Anna is 166,000 gpm (370 cfs). ER § 5.2.1. All of the water withdrawn from the lake is returned at a higher temperature. ER § 5.3.1.2.

Water flows out of the lake through the Lake Anna Dam, which is required by the Commonwealth of Virginia to discharge at least 40 cfs. However, this value was re-negotiated after the recent drought (1989-2002) to allow the lake discharge flow to go as low as 20 cfs under drought conditions, defined as when the water level in Lake Anna is equal to or less than 248 ft msl. The State Water Control Board recommended 80 cfs in 1971, but was overruled by the State Corporation Commission.[14]

Dominion proposes that the new Unit 3 would be a once-through system, like the two existing units, in which water is withdrawn from Lake Anna, circulated through the condensers, and returned to the lake via the WHTF. The new Unit 4 would use a closed-

[14] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 4.

cycle system with cooling towers for plant cooling and heat dissipation. A once-through Unit 3 would require an additional 1.14 million gpm (2,540 cfs) and a closed-cycle Unit 4 would require up to 31,418 gpm (70 cfs). ER § 5.3.1.

Dominion intends to use Lake Anna to supply most of the water for the proposed two new units, including plant cooling, initial fill and make-up water for the cooling tower, demineralized water system, and fire protection. Up to 9,874 gpm (22 cfs) for the two units would also be required for "incidental plant water usage." ER § 5.3.1. Water for the cooling towers of Unit 4 would be supplemented from an unspecified "outside source" to replace water that had evaporated. ER § 5.3. According to the VDEQ, the state permit for Unit 3 cooling water would be the "single largest consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program."[15]

b. Insufficiency of ER to address water supplies or identify supplementary external water source for Unit 4. The ER has does not sufficiently address the adequacy of water supplies in Lake Anna for the proposed new Units 3 and 4 and fails to identify the supplementary external water source for Unit 4.

The operation of the NAPS requires a Virginia Pollutant Discharge Elimination System ("VPDES") permit for the discharge of thermally polluted water, according to the Clean Water Act ("CWA") regulations that require permits to contain requirements to protect state standards. 40 C.F.R. § 122.44(b) and (d). These regulations include the intake of water as well as the release. The addition of two new reactors would increase the amount of water withdrawn from Lake Anna by more than 60% when the lake level is

[15] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 3. The Virginia Water Protection Permit Regulation (9 VAC 25-210) program regulates water withdrawals.

250 ft msl, which would be insufficient to protect state standards and thus contrary to the CWA. 40 C.F.R. § 122.44(b) and (d).

Dominion asserts that "the available water supply from the Lake Anna watershed is adequate to meet plant water needs for the existing units plus Unit 3 alone, or the existing units plus Units 3 and 4, on a long-term average basis." ER § 5.2.1.5. This is in direct contradiction with the conclusion reached by the VDEQ analysis of the ESP application, which concluded that "The site is probably not suitable for the construction of two new reactors of the size proposed due to a lack of sufficient water resources."[16]

According to the ER, additional sources of water could be required for Unit 4 on short-term bases during droughts. ER § 5.2.1. Dominion proposes three options for minimizing the adverse hydrologic impacts of reducing the Lake Anna water levels. ER § 5.2.1.3. Two of the options would require the "use of an external source of water." *Id.* The third depends on the type of plant chosen for Unit 4. ER § 5.2.1.3. The ER fails to include any proposals for the origin of this external source of water. ER § 5.2.1.3. Analyses by both the VDEQ and the VDGIF conclude that the water source for Unit 4 is likely to be Lake Anna, because no other options, such as groundwater or nearby surface water, would be capable of producing the large quantities of water that would be needed.[17]

Dominion intends to delay evaluating "the requirement of the external water supply and the environmental impact of bringing this water to Unit 4" until it submits the combined construction and operation license ("COL") application. ER § 3.4.1.1 and ER at 3-5-21. Failure to identify the source of water for Unit 4 makes it impossible to

[16] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 6.
[17] VDEQ, February 10, 2004 letter to Dominion, page 3.

adequately assess the impact of the proposed expansion. Moreover, this issue relates directly to whether the site is appropriate for any additional units and should be fully addressed before site redress is permitted and the COL application is submitted.

Based on available information, it must be assumed for the purposes of impact evaluation that the proposed expansion of additional units at NAPS would result in all needed cooling water coming from the same source of Lake Anna. Indeed, VDGIF concludes that Unit 4's "water consumption should be addressed as if water were being withdrawn from the lake (or Unit 4 should not be part of the permitting process)."[18] VDEQ also recommends that if Dominion does not identify a water source for Unit 4, NRC should consider denying the ESP application for a new fourth reactor.[19]

c. Failure to account for impacts on river flow downstream. The addition of one or two new units to the North Anna Power Station would have significant impacts on downstream resources by increasing the frequency of reduced river flows from the North Anna Dam. The State of Virginia's regulations governing water withdrawals require that a minimum release of 40 cubic feet per second ("cfs") be maintained out of the North Anna Dam to maintain instream flows and water quality below the dam. However, revised provisions in the VPDES permit allow flows out of the dam to go even lower to 20 cfs when Lake Anna water surface elevation falls below 248 feet above mean sea level (msl) due to drought conditions.[20] At the lowest flow rates, only 5.4% of the natural flow is released from the dam. According to the Tennant method for flow

[18] VDGIF, January 27, 2004 letter to VDEQ, page 2
[19] VDEQ, February 10, 2004 letter to Dominion, page 3.
[20] VPDES Permit No. VA0052451, Part I.F (Lake Level Contingency Plan).

recommendations, the resulting flow downstream is rated "severe degradation." Even at 40 cfs, the downstream flow is considered "poor."[21]

Under natural or pre-dam conditions (1929-1971), drought flow frequency (< 20 cfs) in the river below the present dam location occurred 4.2% of the time. Currently, drought flows occur 5.3% of the time. With a third reactor, the frequency would increase to 11.8%. In its comments on the ESP application, the VDEQ states that it is concerned that "nearly perennial conditions of severe degradation will likely be created each fall" with an additional reactor.[22]

A fourth reactor would further increase the frequency of drought flows, but Dominion fails to calculate the frequency in its flow analysis in Section 5.2.2, stating instead that it would be addressed in the COL application.

Under current operating conditions with the two existing units, it is apparent that there is already inadequate water in the system. When the lake level falls below 244 ft msl, the existing plants are required to shut down. During the 2002 drought, lake levels dropped to 245.1 ft msl. With an additional Unit 3, the level would have fallen 2.5 feet lower to 242.6 ft msl, which would have required that the reactors be shut down.[23] With the addition of Unit 3, lake levels would fall to or below 244 ft msl 1.1% of the time. ER § 5.2.2.2.

The ER fails to detail the water budget analysis for the lake levels if both Units 3 and 4 are built. ER § 5.2.2. However, in Section 3.4.1.3.3, Dominion states that with all four reactors, the lake level could be below 244 ft msl about 3% of the time. The

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[21] VDGIF, January 15, 2004 memo to VDEQ, page 2-3.
[22] VDEQ, January 15, 2004 memo to VDEQ, page 4.
[23] VDEQ, February 10, 2004 letter to Dominion, page 12;

Northern Virginia Regional Office ("NVRO") of the VDEQ estimates that with the addition of both Units 3 and 4, the water level could decrease even further to 242 ft msl during drought conditions.[24] Dominion states that it could lower the shutdown elevation for the existing units to 242 ft msl. ER § 5.2.2.2. This is 6 ft lower than the level at which the lake contingency plan goes into effect, which means flows from the dam would be reduced to as low as 20 cfs.

Thus, the ER fails to adequately account for the impact of an additional unit or units on the river flow downstream.

Contention 3.3.2: Impacts on Fish and Other Aquatic Life in Lake Anna and Downstream

Contention: The ER does not adequately address the adverse impact of operating one or two additional reactors on fish and other aquatic life health in Lake Anna and the North Anna River. In particular, the ER does not adequately consider the four primary impacts of the proposed reactors to the fish and other aquatic life at Lake Anna and downstream: increased water temperature, impingement, entrainment, and downstream flow rates.[25] In addition, the ER does not address conflicts between Dominion's proposals for water use and the requirements of the Clean Water Act ("CWA") and its implementing regulations. Finally, the ER does not address the cumulative impacts of proposed Units 3 and 4 on the already-stressed aquatic systems in Lake Anna and the North Anna River.

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[24] NVRO, February 2004 memo to Ellie Irons (VDEQ).

[25] Impingement is the accumulation of fish and other aquatic life caught against the cooling water intake screen. Entrainment is the forced influx of aquatic life into the cooling system through the cooling water intake screen, resulting in the death of the aquatic life.

Basis:

a. Background: fish and aquatic life in North Anna and downstream. As background, Lake Anna is an important recreational fishing locale in Virginia. The most important species for recreational fishing at the lake include largemouth bass, striped bass, and black crappie. ER § 2.4.2.2.2. Since 1972, the VDGIF has stocked four non-native species in the lake, including striped bass, walleye, threadfin shad, and blueback herring. ER at 3-2-73.

The North Anna River downstream of the North Anna Dam is also used for recreational fishing, usually from shore or from small boats, such as canoes. ER § 2.4.2.3.2. The primary fishing species include largemouth bass, smallmouth bass, and redbreast sunfish. ER § 2.4.2.3.2.

b. Thermal impacts. In Section 5.3.1, the ER recognizes that adding an additional reactor or two will increase the lake temperature, but fails to fully acknowledge the impacts of the existing operations or to adequately assess the increased impacts of additional reactors on the health of fisheries on Lake Anna and downstream in the North Anna River with the addition of one or two new units. ER § 2.4.2 and § 5.3.2. In Section 2.4.2.2 of the ER, for instance, Dominion states that "Fisheries monitoring [by Virginia Power] over a recent six-year period (1995-2000) reveals a balanced reservoir fish community comprised of healthy populations of top-of-the-food-chain predators (e.g., largemouth bass and striped bass) and the forage species on which they feed ..." This assertion fails to acknowledge the significant stress that the NAPS has already

placed on fish in Lake Anna and the North Anna River, and is contradicted by the results of reviews conducted by the FWS in 2003 and the VDGIF in 2004.

Currently, stratification of Lake Anna, layers of different temperature water between the top and bottom of the lake, occurs infrequently and is weak, often less than 1.8 degrees Fahrenheit in the late summer and early fall.[26] Striped bass, one of the most thermally-sensitive fish species in the lake, prefer temperatures in the range of 65-70 degrees Fahrenheit and avoids temperatures in the range of 77-81 degrees Fahrenheit (ER Table 5.3-22). According to VDGIF, "Adult striped bass [in Lake Anna] grow slowly, exhibit reduced fitness (condition), and have low maximum sizes as a result of the marginal habitat conditions now present..."[27] VDEQ calls the current conditions at Lake Anna "a tenuous situation" for the health of the population.[28]

With the addition of one reactor with once-through cooling, the maximum daily surface temperature is expected to increase by 3.6 degrees Fahrenheit near the dam and 2.8 degrees near the intake pipe. ER at 3-5-46. The maximum daily surface temperature at the dam is expected to be 90 degrees for 13 % of the time, which is well above the preferred range for striped bass. ER at 3-5-46. With the existing reactors, a maximum daily surface temperature above 90 degrees at the dam is predicted 1% of the time. ER at 3-5-46.

Increasing the heat input into the lake will force the striped bass to move to the upper portion of the lake with cooler waters, at least in the summer and fall, which could further affect growth if the fish are not able to feed normally. Dominion states that

[26] VDGIF, January 27, 2004 letter to Ellie Irons (VDEQ), page 3
[27] VDGIF, January 27, 2004 letter to Ellie Irons (VDEQ), page 3.
[28] VDEQ, February 10, 2004 letter to Dominion, page 5.

"Thermal impacts on striped bass would be moderate and could warrant mitigation." ER § 5.3.2.2.2. However, according to VDGIF, "it is likely that even a small increase in reservoir water temperature would have a dramatic effect – further reducing the already limited habitat and perhaps jeopardizing the entire striped bass fishery."[29]

In order to be eligible for a thermal variance from the state water quality standard for temperature under Section 316(a) of the CWA [33 U.S.C. 1326(a)], it must be shown that there will be no adverse impact. The CWA states in relevant part:

> (a) Effluent limitations that will assure protection and propagation of balanced, indigenous population of shellfish, fish, and wildlife.
>
> With respect to any point source otherwise subject to the provisions of section 1311of this title or section 1316 of this title, whenever the owner or operator of any such source, after opportunity for public hearing, can demonstrate to the satisfaction of the Administrator (or, if appropriate, the State) that any effluent limitation proposed for the control of then thermal component of any discharge from such source will require effluent limitations more stringent than necessary to assure the [protection] and propagation of a balanced, indigenous population of shellfish, fish, and wildlife in and on the body of water into which the discharge is to be made.

Id. Considering the above documentation of existing impacts, it follows logically that doubling the number of units and coincident use and discharge of heated water, the impacts will increase as well. Such an opinion is also stated in the VDEQ and VDGIF comments. This would result in additional impacts that prevent the existence of a healthy and balanced population of aquatic communities as required by the CWA, and specifically prohibited by Section 316(a) of the act [33 U.S.C. 1326(a)]. While the current 316(a) thermal variance that is in place is questionable based on failure to achieve the requirements, clearly additional thermal pollution could not be permitted.

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[29] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 3.

c. Impingement and entrainment. In Section 5.3.1.2.2 and Section 5.3.1.2.4, the ER recognizes that adding an additional reactor or two will increase the number of impinged and entrained fish, but fails to adequately consider adverse impacts of increased impingement and entrainment of fish and other aquatic life in the NAPS water intake system with the addition of one or two new units.

Increasing the water withdrawal for an additional reactor or two will increase the mortality of fish and other aquatic species in the lake due to impingement or entrainment. The current annual impingement from six "representative" species is estimated to be 182,440 fish per year, based on data collected from 1979 to 1983. ER § 5.3.1.2.1. Dominion calculated that the number of impinged fish would increase to 422,027 with an additional Unit 3 using once-through cooling system. ER § 5.3.1.2.1. This is a 230% increase from existing impingement levels, with more than two times as many impinged striped bass, which is the most important game species in the lake.[30] The number of impinged fish would increase further to 426,887 if both Unit 3 using once-through cooling system and Unit 4 using cooling towers with make-up water from the lake are built. ER § 5.3.1.2.1. The ER fails to discuss the size and age distributions of the impinged fish, which is important because these distributions affect the structure and viability of a population.

Dominion states that there would be "no significant impacts due to impingement" because "fish impinged most frequently are prolific, exhibit a high reproductive potential, and compensatory responses of the fish population [the capacity of a population to offset, to some extent, reductions in numbers caused by some disturbance] would occur to offset

[30] VDGIF, January 27, 2004 letter to VDEQ, page 1.

losses due to impingement, and therefore would not require mitigation." ER at 3-5-32. This assertion is in conflict with the DGIF's position that, even with improved technology on the intake system, the fish would not be expected to be fully protected.[31]

The current annual entrainment from five "representative" species is estimated to be about 149 million fish larvae per year, based on data collected from 1979 to 1983. ER § 5.3.1.2.3. Dominion calculated that the number of entrained fish larvae would increase to about 297 million per year with an additional Unit 3 using once-through cooling system. ER § 5.3.1.2.3. Over 63% of the entrained fish larvae would be gizzard shad, which are primary forage fish in the lake. The number of entrained fish larvae would increase further to over 300 million per year if both Unit 3 using once-through cooling system and Unit 4 using cooling towers with make-up water from the lake are built. ER § 5.3.1.2.3. According to the VDGIF, the number of entrained fish with 4 operating reactors would be 468 million annually, 63% of which would be the important forage species, gizzard shad.[32]

Dominion asserts that doubling the number of entrained fish larvae "would have a small impact on the fishery community and would not require mitigation." ER at 3-5-38. Such an increase is in violation of Section 316(b) of the CWA [33 U.S.C. 1326(b)] that requires the use of best available technology, and prohibits such impacts as would result from the project as proposed.

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[31] VDGIF, January 27, 2004 letter to VDEQ, page 1.
[32] VDGIF, January 27, 2004 letter to VDEQ, page 1.

Review by VDGIF describes the current operation impacts as significant and failing to meet the minimum criteria of best available technology, which violates Section 316(b) [33 U.S.C. 1326(b)] of the CWA.[33]

Both FWS and VDGIF have suggested mitigation measures to address the impacts of the current operations of Units 1 and 2, which have not been taken by Dominion. The NAPS design currently includes an intake velocity of 0.7 feet per second ("FPS") with a 9.5 mm screen mesh. In response to the Final EIS for NAPS license renewal application, FWS recommended that the intake system entrance velocities should be less than or equal to 0.5 feet per second (FPS) with screen mesh no larger than 1 millimeter (mm).[34] VDGIF recommended that the intake criteria at NAPS should have a velocity of 0.25 FPS with a screen mesh of 1.0 mm screen mesh.[35] FWS also recommended a mesh screen with a spray wash system that removes fish and other aquatic life from the screens and returns them back to the lake.[36] The current system at NAPS discards the impinged biota. ER § 5.3.1.2.

d. Reduced stream flow. The ER fails to adequately evaluate the adverse impact of the increased frequency of reduced stream flow on the health of fish and other

---

[24] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), pages 1 and 2.
Section 316(b) of the CWA [33 U.S.C. 1326(b)] provides that for cooling water intake structures:

> Any standard established pursuant to section 1311 of this title or section 1316 of this title and applicable to a point source shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impact.

[34] FWS, February 4, 2003 letter to NRC, page 2.
[35] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 1.
[36] FWS, February 4, 2003 letter to NRC, page 2.

aquatic species downstream of the Lake Anna Dam with the addition of one or two new units.

Dominion asserts that "the North Anna River continues to support a healthy, well-balanced community of aquatic organisms." ER at 3-2-80. This claim is contradicted by the state and FWS analyses. Downstream of the dam, current minimum flows from the North Anna Dam (20 cfs) are inadequate for a healthy aquatic habitat. According to the VDEQ, the current evaporation rate and withdrawal for the existing two reactors reduce the flow of the North Anna River downstream of the dam to 10% or less "much of the time."[37] Adding an additional unit would increase the frequency and duration of low flow on the North Anna River downstream of the dam, potentially impacting spring spawning. According to the FWS, "the reduction in river flow from Lake Anna during the Spring spawning migration may limit the range of anadromous and riverine species of fish in the river."[38] The ER fails to address the question of increased frequency of reduced flow and the impact on spawning. The VDEQ recommends in-stream analysis of usable habitat to determine the impact to fish, including indigenous fish species, in the North Anna River.[39]

The VDEQ and VDGIF concluded that the addition of the new units would result in significant adverse impacts to an already stressed fishery both in the lake and in the river downstream of the dam. Such impacts would be from the increase in temperature and increase frequency of the already inadequate minimum flows.

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[37] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 3.
[38] FWS, November 7, 2001 letter to NRC, page 3.
[39] VDEQ, February 10, 2004 letter to Dominion, page 13/

The ER also fails to address the question of aquatic species passage through North Anna Dam. In its reviews of the NAPS relicensing application, the FWS expressed concern about the adverse impacts to the aquatic species, including the distribution of native fish and mussels, in the North Anna River due to lack of passage through the dam and diminished flows.[40] The FWS comments in 2003 further discuss adverse impacts of North Anna Dam regarding the blockage of anadromous, cataromous, and native fish, and the adverse impact to mussels from the lack of passage of host fish at the dam.[41]

Failure to provide for a healthy fish and aquatic habitat as the result of the operation of a regulated activity is in violation of the CWA, which requires that permits can only be issued to allow for activities that protect the environment. *See* CWA implementing regulation 40 C.F.R. § 122.44(d), which requires that conditions of National Pollution Discharge Elimination System permits (and in this case, the VPDES permits) must include requirements that protect water quality standards (which includes stream uses such as fisheries and recreation). 40 C.F.R. § 122.4(a) also prohibits permits that do not provide for compliance with the CWA. A new intake structure for Units 3 and 4 would be built with the proposed new reactors. ER § 1.1.4. 40 C.F.R. 122.4(i) prohibits permits to a new source or discharger (which the expansion would be) if the discharge from its construction or operation will cause or contribute to violations of water quality standards. The NAPS operates under the CWA permit program, and it would be in conflict to allow for additional impacts through such a permit. The ER should address this conflict.

---

[40] FWS, November 7, 2001 letter to NRC, pages 2, 3, 4, and 8.
[41] FWS, February 4, 2003 letter to NRC, page 2.

Contention 3.3.3: Impacts on Public and Classified Uses of Lake Anna

Contention: The ER does not contain a complete or adequate assessment of the potential impacts of the proposed expansion of the NAPS on water-based recreational uses of Lake Anna and on homeowners who live around the lake.

Basis:

a. Background: Recreational Use of Lake Anna. Lake Anna is an important recreational boating, fishing, and swimming area in Virginia. There are 6 marinas and 7 public landings with ramps on the lake, in addition to numerous private docks. ER Table 2.5-26. Most of the estimated 43,000 people who fish in Lake Anna each year access the lake by boat from commercial ramps or via Lake Anna State Park.[42] DGIF estimates that there are 10-15 times more recreational boats on Lake Anna than fishing boats.[43]

Virginia Power and Dominion own the land within the NAPS site boundary, as well as all of the land under Lake Anna, up to the high-water mark (255 ft msl). ER § 2.2.1.1. There are permanent and vacation homes bordering the lake. The total number of people living around the lake is not specified in the ER, but it does infer that 500 people live along the WHTF. ER Table 2.5-17. The public must get permission from Virginia Power to build docks or other recreational structures that enable access to the lake. The larger section of the lake is open to public boaters, but only private boaters are permitted access to the WHTF. ER § 2.2.1.1.

b. Impacts of reduced lake levels on recreation. The ER fails to adequately evaluate the adverse impact of reduced lake levels on water-based recreational uses of Lake Anna and on homeowners who live around the lake. In Section 5.1.1.1, Dominion

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[42] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 2.
[43] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 2.

concludes that "The expected increase in discharge water volume and the small increase in temperature at the discharge point of the WHTF due to operation of the new units would not significantly impact the current or future recreational uses of the lake." However in Section 5.2.2.2, the ER states that "The additional drawdown that occurs during drought years with an added Unit 3 could adversely affect the recreational use." ER at 3-5-14.

According to the VDEQ, regardless of a drought, the decreased water level necessary for additional units "would adversely affect lake access, and local economic conditions in the process."[44] The VDEQ criticizes the ER for failing to analyze fully the impact of the increased drawdowns on water-based recreational activities on Lake Anna.[45]

As discussed in Contention 3.2.1, one or two additional units on Lake Anna would reduce lake levels due to increased water withdrawals from the lake, especially in the summer and fall when demand for power and evaporation are higher. This was evidenced during the 2002 drought when the lake level dropped to 245.1 ft msl. According to the VDEQ, boats could not be launched from most ramps when the water level was this low.[46]

Permitting use of the public waters so as to adversely impact recreational uses is in conflict with the stated goals and policy of the CWA (CWA Section 101 [33 U.S.C. 1251]) and its regulations (40 C.F.R. § 122.44 (d)) and the associated state law (State

[44] VDEQ, February 10, 2004 letter to Dominion, page 11.
[45] VDEQ, January 15, 2004 memo to Ellie Irons (VDEQ), page 5.
[46] VDGIF, January 27, 2004 memo to Ellie Irons (VDEQ), page 2.

Water Control Law § 62.1-44.2 and § 62.1-44.15:5.[47] The ER should address this conflict.

c. Conflict between private and public use of Lake Anna. Moreover, the ER fails to address the conflict between using Lake Anna to cool the new reactor units and providing public access to the lake as a navigable waterway. The public (except homeowners along the WHTF) is not allowed full access the WHTF portion of the lake. ER § 2.2.1.1. The three dikes, which were built to contain the WHTF, restrict access to otherwise navigable waters, and create what is in effect private use of a public resource. Dominion uses a significant portion of the public waters of Lake Anna for its waste treatment unit for thermally polluted water. Declaring such waters to be private is in conflict with the Section 101 of the CWA, 33 U.S.C. 1251, and the Virginia State Water Control Law § 62.1-11.[48] >. While the lake was created primarily to provide a source of cooling water for the NAPS, the CWA states that all navigable waters are protected for the public for all legitimate uses. *See* CWA Sections 101, 303 and 402 and related regulations including 40 C.F.R. § 130.3. There are named and unnamed flowing streams that lead into the WHTF that are clearly public waters and become part of Lake Anna.

Under the CWA, all waters must be given classified uses and those uses are protected through permits and other programs. If NAPS is expanded, there will be severe impacts that interfere with the legitimate and protect uses of boating and fishing, beyond what has already been experienced. When a state is delegated the administration of the

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[47] The statute can be found on the web at http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC6201000.

[48] The statute is available at http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+62.1-11.

CWA and its permit programs, the state must have the equivalent provisions in its act and state standards. The ER fails to address this conflict with the CWA.

Contention 3.4: Failure to Provide Adequate Consideration of Alternatives for Cooling Units 3 and 4

Contention: The ER fails to satisfy 10 C.F.R. § 51.45(b)(3) because it fails to consider alternatives to the use of Lake Anna water for cooling Units 3 and 4, as well as the no-action alternative.

Basis: As described in Contentions 3.2.1, 3.2.2, and 3.2.3 above, use of Lake Anna water to provide cooling water for Units 3 and 4 is likely to have significant impacts on fish and other aquatic life, as well as recreation on Lake Anna and downstream waters. Such impacts can be avoided by not adding Units 3 and 4 to the North Anna operation (no-action alternative), or potentially by implementing alternatives that would mitigate the impacts of the proposed operation.

Alternate technologies to avoid in-stream treatment have not been adequately described in the ER. For example, the ER does not evaluate any alternatives for Unit 3 other than a once-through cooling system. Additionally, in accordance with NEPA, the no-action alternative of no additional in-stream treatment and no expansion of NAPS must be considered. The ER states that "This subject [No-Action Alternative] is not addressed in the ESP application." (ER § 9.1).

Consideration of alternatives for using Lake Anna to cool Units 3 and 4 is also required by CWA regulations at 40 C.F.R. § 125.3(f), which prohibit in-stream treatment methods, except in very limited cases, and only after certain required demonstrations have been made including the lack of alternative technologies. Further, the CWA states

that the impoundment or storage of water "...shall not be provided as a substitute for adequate treatment or other methods of controlling waste at the source" CWA Section 102(b)(1).

III. CONCLUSION

For the foregoing reasons, the ASLB should admit Petitioners' contentions.

Respectfully submitted,

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May 3, 2004

CERTIFICATE OF SERVICE

I hereby certify that on May 3, 2004, copies of the foregoing CONTENTIONS OF BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE, NUCLEAR INFORMATION AND RESOURCE SERVICE, AND PUBLIC CITIZEN REGARDING EARLY SITE PERMIT APPLICATION FOR SITE OF NORTH ANNA NUCLEAR POWER PLANT were served on the following by e-mail and overnight or first-class mail:

G. Paul Bollwerk, III, Chair Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: GPB@nrc.gov) Also by Federal Express 301/415-7393	Dr. Anthony J. Baratta Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: ajb5@nrc.gov) Also by Federal Express 301/415-7393
Dr. Paul B. Abramson Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: pba@nrc.gov) Also by Federal Express 301/415-7393	Office of the Secretary ATTN: Docketing and Service Mail Stop: 0-16C1 U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 (E-mail: HEARINGDOCKET@nrc.gov) Also by Federal Express 301/415-1675
Robert M. Weisman, Esq. Margaret J. Bupp, Esq. Office of General Counsel Mail Stop O-15-D21 U.S. Nuclear Regulatory Commission 11545 Rockville Pike Rockville, MD 20852 rm2@nrc.gov, mjb5@nrc.gov Also by Federal Express 301/415-3722	David R. Lewis, Esq. Shaw Pittman 2300 N Street N.W. Washington, D.C. 20037 david.lewis@shawpittman.com Also by Federal Express 202/663-8474
Office of Commission Appellate Adjudication Mail Stop O-16 C1 U.S. Nuclear Regulatory Commission Washington, D.C. 20555 Also by first-class mail	Michele Boyd Legislative Representative, Public Citizen 215 Pennsylvania Avenue, SE Washington, D.C. 20003 (E-mail: mboyd@citizen.org) Also by first-class mail

Paul Gunter Director, Reactor Watchdog Project Nuclear Information and Resource Service 1424 16th Street, N.W. #404 Washington, D.C. 20036 (E-mail: pgunter@nirs.org) Also by first-class mail	Janet Marsh Zeller, Executive Director Blue Ridge Environmental Defense League P.O. Box 88 Glendale Springs, NC 28629 E-mail: BREDL@skybest.com Also by first-class mail

Diane Curran

EXHIBIT 2.1-1

May 3, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

Dominion Nuclear North Anna, LLC

(Early Site Permit for North Anna ESP Site)

Docket No. 52-008

DECLARATION OF DAVID A. LOCHBAUM,
NUCLEAR SAFETY ENGINEER,
IN SUPPORT OF PETITIONERS' CONTENTIONS

Under penalty of perjury, I, David A. Lochbaum, make the following declaration:

1. My name is David A. Lochbaum. I reside in the state of Maryland. I am employed by the Union of Concerned Scientists as its nuclear safety engineer. I have been so employed since October 1996. I have the following responsibilities: a) direct and coordinate UCS's nuclear safety program; b) monitor developments in nuclear industry to assess and respond to impact; c) serve as technical authority and spokesperson on nuclear issues; and d) initiate legal action to correct safety problems.

2. I am a graduate of the University of Tennessee with a bachelor of science in nuclear engineering. I have worked in the field of nuclear engineering since June of 1979. My seventeen years of employment experience in the nuclear industry are described in more detail in my resume, which is attached as Exhibit A to this declaration. I am qualified by training and experience to evaluate nuclear power plant designs and their interactions.

3. I have reviewed portions of Dominion Nuclear North Anna, LLC's ("Dominion's") Early Site Permit Application for two new reactors on the site of the North Anna nuclear power plant. I am also generally familiar with most of the advanced reactor designs that Dominion is considering for the North Anna site. In addition, I am familiar with the U.S. Nuclear Regulatory Commission's ("NRC's") regulations and regulatory practice.

4. I participated in the preparation of Petitioners' contentions regarding the inadequacy of Dominion's safety assessment and environmental report to consider the

interaction between the design of the existing North Anna reactors and the proposed reactor(s).

5. The technical factual assertions in those contentions are true and correct to the best of my knowledge, and all expressions of technical opinion therein are based on my best professional judgment.

Executed May 3, 2004

David A. Lochbaum

EXHIBIT A

David A. Lochbaum

Experience Summary

10/96 to date *Nuclear Safety Engineer, Union of Concerned Scientists*

Responsible for directing UCS's nuclear safety program, for monitoring developments in the nuclear industry, for serving as the organization's spokesperson on nuclear safety issues, and for initiating action to correct safety concerns.

11/87 to 09/96 *Senior Consultant, Enercon Services, Inc.*

Responsible for developing the conceptual design package for the alternate decay heat removal system, for closing out partially implemented modifications, reducing the backlog of engineering items, and providing training on design and licensing bases issues at the Perry Nuclear Power Plant.

Responsible for developing a topical report on the station blackout licensing bases for the Connecticut Yankee plant.

Responsible for vertical slice assessment of the spent fuel pit cooling system and for confirmation of licensing commitment implementation at the Salem Generating Station.

Responsible for developing the primary containment isolation devices design basis document, reviewing the emergency diesel generators design basis document, resolving design document open items, and updating design basis documents for the James A. FitzPatrick Nuclear Power Plant.

Responsible for the design review of balance of plant systems and generating engineering calculations to support the Power Uprate Program for the Susquehanna Steam Electric Station.

Responsible for developing the reactor engineer training program, revising reactor engineering technical and surveillance procedures and providing power manuevering recommendations at the Hope Creek Generating Station.

Responsible for supporting the lead BWR/6 Technical Specification Improvement Program and preparing licensing submittals for the Grand Gulf Nuclear Station.

03/87 to 08/87 *System Engineer, General Technical Services*

Responsible for reviewing the design of the condensate, feedwater and raw service systems for safe shutdown and restart capabilities for the Browns Ferry Nuclear Plant.

08/83 to 02/87 *Senior Engineer, Enercon Services, Inc.*

Responsible for performing startup and surveillance testing, developing core monitoring software, developing the reactor engineer training program, and supervising the reactor engineers and Shift Technical Advisors at the Grand Gulf Nuclear Station.

David A. Lochbaum

Experience Summary (continued)

10/81 to 08/83 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for performing core management functions, administering the nuclear engineer training program, maintaining ASME Section XI program for the core spray and CRD systems, and covering STA shifts at the Browns Ferry Nuclear Plant.

06/81 to 10/81 *BWR Instructor, General Electric Company*

Responsible for developing administrative procedures for the Independent Safety Engineering Group (ISEG) at the Grand Gulf Nuclear Station.

01/80 to 06/81 *Reactor Engineer / Shift Technical Advisor, Tennessee Valley Authority*

Responsible for directing refueling floor activities, performing core management functions, maintaining ASME Section XI program for the RHR system, providing power maneuvering recommendations and covering STA shifts at the Browns Ferry Nuclear Plant.

06/79 to 12/79 *Junior Engineer, Georgia Power Company*

Responsible for completing pre-operational testing of the radwaste solidification systems and developing design change packages for modifications to the liquid radwaste systems at the Edwin I. Hatch Nuclear Plant.

Education

June 1979 Bachelor of Science in Nuclear Engineering, The University of Tennessee at Knoxville

May 1980 Certification, Interim Shift Technical Advisor, TVA Browns Ferry Nuclear Plant

April 1982 Certification, Shift Technical Advisor, TVA Browns Ferry Nuclear Plant

Professional Affiliations

Member, American Nuclear Society (since 1978).

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EXHIBIT 2.2-1

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U.S. Intelligence Official: Qaeda Posed Plane Threat

By REUTERS
Published: February 17, 2004

Filed at 3:26 p.m. ET

WASHINGTON (Reuters) - Al Qaeda has deployed operatives to hijack planes and fly them into targets in an echo of the Sept. 11 attacks and is looking at derailing trains possibly carrying hazardous material, according to a top U.S. intelligence official.

Robert Hutchings, chairman of the National Intelligence Council which reports to the CIA director, did not give details of the plots but provided the most recent public outline from an intelligence official of the al Qaeda threat.

The network, blamed for the Sept 11, 2001, attacks that killed 3,000 people, seeks targets that would strike a blow to the U.S. economy, Hutchings said in a Jan. 14 speech to the International Security Management Association in Arizona, the text of which was posted on Feb. 4 on the NIC's Web site.

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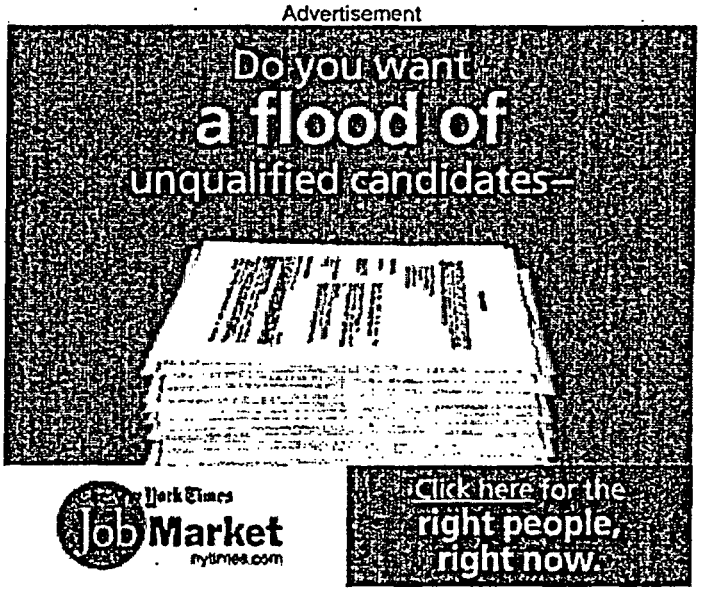

"Soft targets, including the U.S. stock market, banks, major companies, and tall buildings are a primary focus of active al Qaeda planning," he said.

Those targets are seen as easier to hit than U.S. government buildings and major infrastructure, which have higher security, Hutchings said.

Al Qaeda has looked at derailing trains, perhaps carrying hazardous materials, to attack U.S. interests, he said.

Nuclear power plants, water treatment facilities, and other public utilities are high on al

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Qaeda's target list, he said.

The U.S. government is concerned that al Qaeda will try to take its ability to build truck bombs as demonstrated by past attacks in Kenya, Saudi Arabia, and Turkey, and marry it with toxic or radioactive material to increase the damage and psychological impact of an attack, Hutchings said.

``My biggest worry, however, is how far al Qaeda might have progressed in being able to deploy a chemical, nuclear, or biological weapon against the United States or its allies," he said.

U.S. authorities have found several examples of al Qaeda adjusting its tactics to circumvent increased airline security, Hutchings said, without providing details.

``Although we have disrupted several airline plots, we have not eliminated the threat to airplanes," he said. ``There are still al Qaeda operatives who we believe have been deployed to hijack planes and fly them into key targets."

The United States has beefed up security at airports and on airlines. There were a spate of flight cancellations since late December because of potential threats.

U.S. authorities have succeeded in disrupting the network, Hutchings said. ``We have disrupted scores of plots at home and abroad -- plots that were audacious in terms of the numbers of attacks under consideration and their global scope," he said.

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EXHIBIT 2.2-2

NUREG/CR-5042
UCID-21223

Evaluation of External Hazards to Nuclear Power Plants in the United States

Manuscript Completed: October 1987
Date Published: December 1987

Prepared by
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Office of Nuclear Regulatory Research
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Washington, D.C. 20555
NRC FIN No. A0448 Task 8
NRC FIN No. A0815 Task 1

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Table 6.4.2

Probability of Penetration as a Function of Plant Location and Concrete Thickness [Ref. 6.4.10]

Plant Location	Aircraft Type	Probability of Penetration — Thickness of Reinforced Concrete: 1 foot	1.5 feet	2 feet	6 feet
<= 5 miles from airport	Small, <= 12,500 lbs.	0.003	0	0	0
	Large, < 12,500 lbs.	0.96	0.52	0.28	0
>= 5 miles from airport	Small, <= 12,500 lbs.	0.28	0.06	0.01	0
	Large, > 12,500 lbs.	1.0	1.0	0.84	0.32

< = defined as less than or equal to.
> = defined as greater than or equal to.

The Washington Post

http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&contentId=A48190-2001Oct24&notFound=true

Nuclear Plants' Vulnerability Raised Attack Concerns 1982 Report on Danger of Jet Crashes Into Reactors Was Open to Public, Despite Terrorism Fears

By Peter Behr
Washington Post Staff Writer
Thursday, October 25, 2001; Page A04

A government study indicating that a direct, high-speed hit by a commercial jetliner could penetrate a nuclear reactor's protective dome was available to the public for nearly 20 years until it was removed after the Sept. 11 terrorist attacks, regulators confirmed yesterday.

The document remained public even though there have been warnings going back to 1995 that terrorists had included nuclear power plants among their potential targets, based on testimony in the investigation of the 1993 World Trade Center bombing.

A spokesman for the Nuclear Regulatory Commission said the agency would not discuss the contents of the report or its potential value to terrorists.

The study, by the Energy Department's Argonne National Laboratory, was prepared to assess the risks of an accidental airliner crash at a power plant.

It calculated the impact of objects as large as a commercial aircraft, traveling at various speeds, on the reinforced concrete containment dome protecting the reactor core of a common power-plant design. The study concluded that the dome would be penetrated at the highest flight speeds, according to the D.C.-based National Whistleblower Center, which provides legal representation for nuclear plant workers in whistle-blower lawsuits.

The ignition of a small percentage of an aircraft's jet fuel inside the containment dome would have the force of a 1,000 pounds of explosives and "could lead to a rather violent explosion environment and impose upon the primary containment relatively severe loads," according to the report.

"Based on the review of past [NRC] licensing experience, it appears that fire and explosion hazards have been treated with much less care than the direct aircraft impact and the resulting structural response," the study said.

"Therefore, the claim that these fire/explosion effects do not represent a threat to nuclear power plant facilities has not been clearly demonstrated."

The Whistleblower Center included excerpts of the report in a letter yesterday to Tom Ridge, head of the Office of Homeland Security.

The center also filed a petition with the NRC yesterday calling for further security measures to protect against an attack on nuclear power plants and a widespread release of radiation that could result if the reactor containment dome and core were destroyed.

At least one nuclear plant -- the Three Mile Island facility south of Harrisburg, Pa. -- was designed to withstand the impact of a Boeing 707, industry officials note.

But none of the nation's 103 nuclear power plants was built to withstand the direct, full-speed impact by today's commercial jetliners, NRC officials say.

Another advocacy organization, the Nuclear Control Institute, said its analysis shows that a reactor containment vessel could be penetrated by a jetliner's direct hit.

Nuclear industry officials have emphasized the strength of the reactor containment domes and the difficulty in steering a high-speed jetliner into a dome in the most damaging way. "I think there's a high likelihood that that aircraft would not penetrate the containment," Ralph Beedle, senior vice president of the Nuclear Energy Institute, said in an Oct. 14 television interview.

The 1982 study was mentioned in a Sept. 24 report by the publication Platts Inside NRC.

The Whistleblower Center said it found the document in the NRC's Bethesda public reading room on Oct. 2. "We asked a volunteer to look around the public reading room and see what was there on airplane crashes. And there it was," said Michael Kohn, the organization's general counsel.

NRC spokesman Victor Dricks said the NRC staff also found the study during a review of its public records following the Sept. 11 attacks and removed it on Oct. 11. He said he did not know whether it had ever been available over the NRC's public Internet documents service, but it is not on the agency's Web site now.

The risk of a terrorist attack in a hijacked aircraft has not been part of the NRC's safety regulation, officials confirm. "We never considered that a credible threat prior to September 11," Dricks said.

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EXHIBIT 2.2-4

Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants

October 2000

3.5.2 Aircraft Crashes

The staff evaluated the likelihood that an aircraft crashing into a nuclear power plant site would seriously damage the spent fuel pool or its support systems (details are in Appendix 2D). The generic data provided in DOE-STD-3014-96 (Ref. 6) was used to assess the likelihood of an aircraft crash into or near a decommissioning spent fuel pool. Aircraft damage can affect the structural integrity of the spent fuel pool or the availability of nearby support systems, such as power supplies, heat exchangers, or water makeup sources, and may also affect recovery actions. There are two approaches to evaluating the likelihood of an aircraft crash into a structure. The first is the point target model, which uses the area (length times width) of the target to determine the likelihood that an aircraft will strike the target. The aircraft itself does not have real dimensions in this model. In the second approach, the DOE model modifies the point target approach to account for the wing span and the skidding of the aircraft after it hits the ground by including the additional area the aircraft could cover. The DOE model also takes into account the plane's glide path by introducing the height of the structure into the equation, which effectively increases the area of the target.

In estimating the frequency of catastrophic PWR spent fuel pool damage from an aircraft crash (i.e., the pool is so damaged that it rapidly drains and cannot be refilled from either onsite or offsite resources), the staff uses the point target area model and assumes a direct hit on a 100 x 50 foot spent fuel pool. Based on studies in NUREG/CR-5042, "Evaluation of External Hazards to Nuclear Power Plants in the United States," it is estimated that 1 of 2 aircrafts are large enough to penetrate a 5-foot-thick reinforced concrete wall. The conditional probability that a large aircraft crash will penetrate a 5-foot-thick reinforced concrete wall is taken as 0.45 (interpolated from NUREG/CR-5042). It is further estimated that 1 of 2 crashes damage the spent fuel pool enough to uncover the stored fuel (for example, 50 percent of the time the location of the damage is above the height of the stored fuel). The estimated range of catastrophic damage to the spent fuel pool resulting in uncovery of the spent fuel is 1.3×10^{-11} to 6.0×10^{-8} per year. The mean value is estimated to be 4.1×10^{-9} per year. The frequency of catastrophic BWR spent fuel pool damage resulting from a direct hit by a large aircraft is estimated to be the same as for a PWR. Mark-I and Mark-II secondary containments generally do not appear to have any significant structures that might reduce the likelihood of aircraft penetration, although a crash into 1 of 4 sides of a BWR secondary containment may be less likely to penetrate because other structures are in the way of the aircraft. Mark-III secondary containments may reduce the likelihood of penetration somewhat, since the spent fuel pool may be protected on one side by additional structures. If instead of a direct hit, the aircraft skids into the pool or a wing clips the pool, catastrophic damage may not occur. The staff estimates that skidding aircraft are negligible contributors to the frequency of fuel uncovery resulting from catastrophic damage to the pool because skidding decreases the impact velocity. The estimated frequencies of aircraft-induced catastrophic spent fuel pool failure are bounded by other initiators.

The staff estimated the frequency of significant damage to spent fuel pool support systems (e.g., power supply, heat exchanger, makeup water supply) for three different situations. The first case is based on the DOE model including the glide path and the wing and skid area and assumes a structure 400 x 200 x 30 feet (i.e., the large building housing the support systems) with a conditional probability of 0.01 that one of these systems is hit (the critical system

EXHIBIT 2.2-5

May 3, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

Dominion Nuclear North Anna, LLC

(Early Site Permit for North Anna ESP Site)

Docket No. 52-008

DECLARATION OF PAUL V. GUNTER

Under penalty of perjury, I, Paul V. Gunter, make the following declaration:

1. My name is Paul V. Gunter. I am director of the Reactor Watchdog Project at the Nuclear Information and Resource Service ("NIRS"). I have worked in that position since 1991.

2. My responsibilities as director of the Reactor Watchdog Project include monitoring NRC meetings and correspondence regarding safety and environmental issues affecting nuclear power plants.

3. On May 9, 2002, I attended a meeting at the headquarters of the U.S. Nuclear Regulatory Commission ("NRC"), regarding design certification of the AP 1000 advanced reactor design. I asked a member of the NRC Staff what was the thickness of the containment of the proposed AP 1000 design. He informed me that the thickness was 3 feet. To my knowledge, this information is not written in commonly available documents regarding the AP 1000 design.

Paul V. Gunter

May 3, 2004

EXHIBIT 2.2-6

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Edward Teller to Sterling Cole, July 23 1953

The Honorable Sterling Cole
Chairman
Joint Committee on Atomic Energy
The Congress of the United States
Washington, D. C.

Dear Sir:

In response to your invitation to make a statement in connection with the development of atomic energy by private enterprise, I should like to discuss two topics concerning which I have some specific experience. These are the safety of nuclear reactors and the connection between power production and military application.

Briefly, my opinion can be stated as follows. First, nuclear power-producing units will be dangerous instruments and careful thought will have to be given to their safe construction and operation and, second, there is a great and increasing need for fissionable materials in the military field.

I should like to recommend:

First, that an advisory committee should be set up to review planned reactors and supervise functioning reactors under the control of private enterprise. Instead of setting up a new committee, the present Advisory Committee on Reactor Safeguards of the Atomic Energy Commission might serve this purpose, and Second, that the Government stimulate power production by private enterprise by guaranteeing to buy militarily useful by-products at a pre-determined price and in limited but large quantities for a period of five or ten years.

Safety of Nuclear Reactors
For the past six years I have served as the Chairman of the Reactor Safeguard Committee. Recently, this committee and the Industrial Committee on Reactor Location problems have been merged into the Advisory Committee on Reactor Safeguards, and I am participating in the work of this new committee.

Up to the present time we have been extremely fortunate in that accidents in nuclear reactors have not caused any fatalities. With expanding applications of nuclear reactions and nuclear power, it can not be expected that this unbroken record will be maintained. It must be realized that this good record was achieved to a considerable extent because of safety measures which have necessarily retarded development.

The main factors which influence reactor safety are, in my opinion, reasonably well understood. There have been in the past years a few minor incidents, all of which have been caused by neglect of clearly formulated safety rules. Such occasional accidents can not be avoided. It is rather remarkable that they have occurred in such a small number of instances. I want to emphasize in particular that the operation of nuclear reactors is not mysterious and that the irregularities are no more unexpected than accidents which happen on account of disregard of traffic regulations.

In the popular opinion, the main danger of a nuclear pile is due to the possibility that it may explode. It should be pointed out, however, that such an explosion, although possible, is likely to be harmful only in the immediate surroundings and will probably be limited in its destructive effects to the operators. A much greater public hazard is due to the fact that nuclear plants contain radioactive poisons. In a nuclear accident, these poisons may be liberated into the atmosphere or into the water supply. In fact, the radioactive poisons produced in a powerful nuclear reactor will retain a dangerous concentration even after they have been carried downwind to a distance of ten miles. Some danger might possibly persist to distances as great as 100 miles. It would seem appropriate that Federal regulations

should apply to a hazard which is not confined by state boundaries. The various committees dealing with reactor safety have come to the conclusion that none of the powerful reactors built or suggested up to the present time are absolutely safe. Though the possibility of an accident seems small, a release of the active products in a city or densely populated area would lead to disastrous results. It has been therefore the practice of these committees to recommend the observance of exclusion distances, that is, to exclude the public from areas around reactors, the size of the area varying in appropriate manner with the amount of radioactive poison that the reactor might release. Rigid enforcement of such exclusion distances might hamper future development of reactors to an unreasonable extent. In particular, the danger that a reactor might malfunction and release its radioactive poison differs for different kinds of reactors. It is my opinion that reactors of sufficiently safe types might be developed in the near future. Apart from the basic construction of the reactor, underground location or particularly thought-fully constructed safety devices might be considered.

It is clear that no legislation will be able to stop future accidents and avoid completely occasional loss of life. It is my opinion that the unavoidable danger which will remain after all reasonable controls have been employed must not stand in the way of rapid development of nuclear power. It also would seem that proper legislation at the present time might make provisions for safe construction and safe operation of nuclear reactors. In case an accident should occur which involved the lives of many people, pressure for such legislation would become overwhelming. Proper steps taken at the present time could reasonably prepare for accidents and minimize the suffering that is caused, when and if they should occur.

It would seem reasonable to extend the Atomic Energy Commission procedures on reviewing planned reactors and supervising functioning reactors to nuclear plants under the control of private enterprise. To what extent these functions should be advisory or regulatory is a difficult question. I feel that ultimate responsibility for safe operation will have to be placed on the shoulders of the men and the organization most closely connected with the construction and the operation of the reactor.

Power Production and Military Application

The first and best known military application of atomic energy was con-nected with strategic bombing. In the popular mind, such strategic bombing has been identified with the destruction of cities. The belief is widely held that a relatively limited number of atomic bombs can not only cause terrifying destruction but would produce saturation, that is, only a limited number of atomic bombs would be needed. It is my conviction that this opinion is based on a misconception and that indeed a great stockpile of fissionable material could be usefully applied in warfare. Furthermore, it seems to me that a more general use of fission weapons will not result necessarily in a more thorough destruction of cities but might rather be used against military targets of the more conventional type. It seems to me therefore that a less expensive source of fissionable materials would be desirable. Such a less expensive source could be obtained if atomic reactors were constructed for the dual purpose of providing power and producing fissionable materials.

Strategic targets include industrial plants and military installations far behind the enemy's lines. Depending on the vulnerability of these targets and on their contribution to the enemy's war effort, one may well be justified in using atomic bombs against these targets. The size of the target need not be decisive and the number of such targets may be quite appreciable.

The possible tactical targets are even more numerous. Any concentration of fighting forces or of material near the fighting lines constitutes tactical targets. Strongly defended positions might be attacked by atomic bombs. Atomic weapons could be used against beachheads or against enemy forces attempting to cross a natural obstacle. Conversely, atomic weapons could be employed to prepare a landing on a beachhead or the attack of a parachute force. The vulnerability of naval vessels to atomic bombs has been demonstrated in the Bikini tests. Vehicles less expensive than naval units may present atomic bomb targets, particularly if the cost of the bomb is lower than the cost of the vehicle which one attempts to destroy. An enemy bomber or even an enemy fighter plane might be considered as a possible target for an atomic bomb.

It might seem extravagant to use atom bombs for all these different types of targets. The question of extravagance or of sound economy must be considered, however, in connection with the ease of delivery, with the expense of delivery and with the expense of the fissionable materials. I can think of no exception to the rule that the cost of delivery will be less if one produces a certain damage by atomic weapons rather than by more conventional means. It is therefore the cost of fissionable materials which will decide how extensively one can use atomic weapons in warfare. The more the cost of atomic weapons can be reduced, the greater will be the number of applications where relatively cheap delivery systems can replace the much more expensive conventional methods. Increase in our

stockpile of fissionable materials may therefore reduce the military expenditure without reducing military potential.

It seems to be doubtful whether, on the basis of present technology, atomic energy can produce power in an economically profitable manner. Power production can, however, be conducted in such a manner as to produce militarily useful materials. It would seem to me reasonable to stimulate the construction of power-producing reactors by guaranteeing a price at which the Government will buy the militarily useful by-products. This price should of course be set lower than the price at which the Atomic Energy Commission is producing fissionable materials at the present time. It probably will be necessary to set a limit to the amount of fissionable material which the Government is prepared to purchase and also to set a limit to the time during which such purchases will be made at the fixed price. Nevertheless, it seems probable that if a fair price is guaranteed for a period like five or ten years, this will be an effective stimulant to the nation's atomic power industry. This industry is likely to become a factor in national defense which may not be second even to the steel or aircraft industries.

The above contains the substance of the testimony which I have prepared for the joint Congressional Committee. I should like to express my very great regret that at the date set for the hearing it was completely impossible for me to leave Livermore. It would be a great pleasure to appear before the joint Congressional Committee at any time to amplify the above statements or else to help in any other way that you can think of.

Yours very truly,
Edward Teller

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EXHIBIT 3.1-1

NUCLEAR ENERGY INSTITUTE

Dr. Ronald L. Simard
SENIOR DIRECTOR BUSINESS
SERVICES DEPARTMENT
BUSINESS OPERATIONS DIVISION

February 6, 2003

Mr. James E. Lyons
Director, New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Resolution of Generic Topic ESP-10 (Use of License Renewal Generic Environmental Impact Statement (NUREG-1437) for Early Site Permits)

Project No. 689

Dear Mr. Lyons:

In a public meeting with the NRC staff on September 25, 2002, we discussed generic topic ESP-10, which concerns the use of applicable information from NUREG-1437 (the license renewal GEIS) for the purposes of preparing environmental reports required for early site permit applications.

Our ESP-10 discussion focused primarily on applying to ESP the logic used by the NRC staff in evaluating the environmental issues associated with operating plant license renewal. We request that, by reply to this letter, the NRC confirm the understandings and expectations identified below that resulted from this discussion. To ensure timely resolution of generic issues and continued progress toward ESP applications in 2003, we request that NRC respond within 30 days.

1. The license renewal GEIS (NUREG-1437), as well as other NRC and industry reference material, may be used by ESP applicants, where applicable, to support NUREG-1555 guided evaluations. It is incumbent on ESP applicants to demonstrate the relevance of previously developed material (e.g., analyses, conclusions) to the evaluation of environmental issues in the ESP Environmental Report (ER).

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2. NRC regulations and NEPA focus on significant issues and direct the NRC to determine the significance of impacts to public health and safety and the environment (10 CFR 51.45(b)(1), 40 CFR 1502.1). To the extent that the Plant Parameters Envelope (PPE) and the site characteristics are consistent with environmental impact initiators that the NRC evaluated in NUREG-1437, conclusions regarding impact significance may be used as a guide in determining the level of analytical effort and detail necessary for the ESP ER. Where an ESP-related impact is bounded by a GEIS evaluation, the ESP ER will provide information sufficient to understand the basis for applicability and comparison, and may, as appropriate, adopt GEIS conclusions as to the significance of the impact.

3. Beyond guidance provided in NUREG-1555, the GEIS (including supporting rationale) provides operating experience bases, and may be used as a starting point for impact analysis. It is acknowledged, however, that new plant designs and changes in environmental management capabilities may require additional analyses when preparing an ESP ER.

4. License renewal GEIS evaluations and conclusions are not a substitute for evaluating issues for ESP purposes. In particular, the ESP ER must consider impacts of new plant construction and full term operation that the GEIS did not. Moreover, results from cost-benefit evaluations of mitigation strategies may be different for license renewal versus new plants. For purposes of early site permits, impacts of new plant construction and operation will be considered, and evaluation of mitigation strategies will be included at a level of detail commensurate with the significance of the environmental impact. The license renewal GEIS will be used as an input to these evaluations, as described in items 1, 2, and 3 above.

As identified in our November 26, 2002, issue resolution letter on ESP-20, "Use of Existing Site/Facility Information," the industry recognizes that the NRC's review of an ESP application is a new review. Applicant use of existing information will allow the NRC staff to minimize the resources it expends re-examining previously reviewed and approved information. Appropriate use of the license renewal GEIS and other existing information is expected to result in more efficient NRC reviews by allowing the staff to focus on changes since the existing information was previously compiled or reviewed, and on new information.

Enclosed for your use is an updated list and status of generic ESP topics that have been identified for discussion during the pre-application period.

We look forward to your confirmation of the understandings and expectations described above related to ESP-10. If you have any questions concerning this request, please contact Russ Bell (rjb@nei.org or 202-739-8087).

Sincerely,

R. Simard

Ron Simard

Enclosure

cc: Ronaldo V. Jenkins, NRC/NRR
Document Control Desk

Enclosure – 2/6/03

Status of Generic ESP Interactions and Plans for Remaining Issues

ESP Topic Higher priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Resl'n Letter
1. ESP application form & content and ESP review guidance	8/22	3/5					• Preliminary industry comments on RS-002 to be discussed on 1/29 • Stakeholder comments due by 3/31 • RS-002 Review/Comment/Revision process to provide resolution vehicle for ESP-1	Later
2. ESP inspection guidance	4/24	3/5					• IMC-2501 to be conformed to resolution of ESP-3 (QA) • NEI to provide additional comments on IMC-2501 for discussion on Mar. 5 • ESP inspection procedures to be completed to support June submittals	Mar. or April
2a. Pre-application interactions (voluntary nature, plans for local public mtgs & review fee structure)	4/24		11/26	1/10			Resolved	
3. QA requirements for ESP information	5/28		12/20	2/3		2/03	Evaluating NRC response	
4. Nominal NRC review timeline	10/17	3/5					• Industry timeline provided to NRC on 4/1/02 • NRC review timeline provided on 1/29 • Note ESP review process description in draft RS-002	Mar. or April
5. Mechanism for documenting resolution of ESP issues	5/28		9/10	11/5			Resolved	
6. Use of plant parameters envelope (PPE) approach	7/16		12/20	2/5		2/03	Evaluating NRC response	

Enclosure – 2/6/03

ESP Topic Higher priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Res'n Letter
7. Guidance for satisfying §52.17(a)(1) requirements	7/16		12/20	2/5		2/03	Evaluating NRC response	
8. Fuel cycle and transportation impacts (Tables S-3 & S-4)	9/25					3/03	• Preliminary industry assessment of current Tables S3 and S4 discussed w/NRC on Jan. 29	Feb
9. Criteria for assuring control of the site by the ESP holder		3/5					• To be discussed w/NRC on Mar. 5	Mar. or April
10. Use of License Renewal GEIS for ESP	9/25		2/6				Resolution Pending	Jan. or Feb.
11. Criteria for determining ESP duration (10-20 years)	12/5		12/20	2/5			Evaluating NRC response	
12. Guidance for evaluating severe accident mitigation alternatives under NEPA	8/22		12/20			2/03	Resolution Pending	
13. Guidance for ESP seismic evaluations	6/13	3/5					• Applicants proceeding as described on Oct. 16 • Remaining issues, if any, to be identified for discussion on Mar. 5	Mar. or April
14. Applicability of Federal requirements concerning environmental justice	–	–					• Commission action pending in response to Dec. 20 NEI letter • No ESP-specific discussion of EJ or ESP-14 resolution letter necessary*	*No letter needed
15. Appropriate level of detail for site redress plans	9/25		11/26	1/16			Resolved	
16. Guidance for ESP approval of emergency plans	1/29						Resolution pending	Feb.

Enclosure – 2/6/03

ESP Topic Higher priority topics shaded	Initial Discussion	Next Discussion	NEI Resolution Letter	NRC Response	Potential Snr. Mgmnt Issue	ESP Schedule Impact if not Resolved by	Status/Remarks	Target Date for Resl'n Letter
17. Petition to eliminate duplicative NRC review of valid existing site/facility information	–	–					• Commission action pending on petition PRM-52-1 • No ESP-specific discussion or ESP-17 resolution letter necessary*	*No letter needed
18. Petition to eliminate reviews for alternate sites, sources and need for power	–	–					• Supplemental industry comments on PRM-52-2 provided on Dec. 18 • Staff recommendation and Commission action pending • No ESP-specific discussion or ESP-18 resolution letter necessary*	*No letter needed
18a Alternative site reviews	12/5		12/20			3/03	Resolution Pending	
18x Need for alternative energy source evaluation and review	1/29						• Industry to provide additional input to NRC	Mar. or April
19. Addressing effects of potential new units at an existing site		3/5					• To be discussed w/NRC on Mar. 5	Mar. or April
20. Practical use of existing site/facility information	9/25		11/26	12/18			Resolved	
21. Understanding the interface of ESP with the COL process.		3/5					• Purpose is clarity of expectations regarding reference to an ESP by a COL applicant • Analogous to "COL Items" identified as part of the design certifications	Mar. or April
22. Form and content of an ESP	8/22	3/5					• NEI Aug. 21 draft under consideration by NRC (also included as enclosure with 12/20 ESP-6 letter) • Revisions under consideration and will be identified in ESP-22 letter	Mar. or April

EXHIBIT 3.1-2

June 25, 2003

Dr. Ronald L. Simard
Nuclear Energy Institute (NEI)
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: RESPONSE TO LETTER ON EARLY SITE PERMIT TOPIC 12 (ESP-12), NEPA CONSIDERATIONS OF SEVERE ACCIDENT ISSUES

Dear Dr. Simard:

The purpose of this letter is to respond to your second letter on the subject early site permit (ESP) topic dated April 28, 2003. In this letter, NEI outlined the approach that the prospective ESP applicants are going to use in preparation of their respective applications. NEI states that the approach was based on the March 26, 2003, public meeting to discuss the issue and is consistent with the staff position contained in the February 12, 2003 letter and SECY-91-041. This letter does not change any of the understandings and expectations stated in our letter dated February 12, 2003 regarding consideration of severe accidents. We confirm the understandings and expectations cited in your letter for the prospective ESP applicants with the clarifications as listed below:

Understandings and expectations:

1. The staff agrees. With respect to severe accident mitigation alternatives, the staff recognizes that if sufficient design information is not available at the ESP stage, then the NRC review and findings will be deferred to the COL stage.

2. The staff agrees. The staff expects the ESP applicants to include a discussion of severe accident impacts in their environmental reports.

3. The staff agrees. Draft ESP Review Standard RS-002 references ESRP Section 7.2 as one acceptable methodology for reviewing an applicant's severe accident impacts assessment.

4. The prospective ESP applicants have proposed to address the environmental impacts of severe accidents through a "comparative discussion" of the candidate sites with the evaluations and conclusions contained in generic NRC severe accident studies, and to demonstrate that the site-specific populations and meteorological characteristics are consistent with sites considered in the generic studies. Although a comparative discussion may provide insights into population and meteorological differences relative to previous studies, based on the level of information provided in the NEI letter it is not clear that this discussion will provide an adequate basis for concluding that the site contains no characteristics which make it unsuitable for construction and operation of a nuclear power plant.

The staff analyses of severe accident impacts would be similar in scope and content to the site-specific analyses of environmental impacts typically addressed in more recent site-specific final environmental impact statements and generic environmental impact statements (such as NUREG-1437, "Generic Environmental Impact Statement for License Renewal of Nuclear Plants"). These studies typically considered multiple exposure pathways (i.e., airborne releases, releases to groundwater, and fallout onto open bodies of water) and assessed impacts in terms of population exposure, early and latent fatalities, and economic costs. If the staff needs additional information to perform these analyses, then the staff will request that ESP applicants provide supplementary information as described above.

5. NEI states that the NRC will base its finding related to severe accident environmental impacts on the expectation that severe accident impacts of future nuclear plants will be bounded by those of existing plants, which have been determined to be "small." This expectation would be based on the Commission's 1985 Policy Statement on Severe Reactor Accidents Regarding Future Designs and Existing Plants.

   The NRC will perform its review on severe accident environmental impacts in accordance with ESRP Section 7.2. If specific plant design information is available (e.g., a detailed design with a Level 3 PRA), then this information would be used in the evaluation. However, even in the absence of a detailed plant design (e.g., the specific reactor type or technology is undecided), a severe accident impacts analysis is technically feasible at the ESP stage using a PPE approach and the existing guidance in ESRP Section 7.2. Such an approach could involve characterizing the spectrum of credible releases from candidate future plant designs, in terms of representative source terms and their respective frequencies, and using these release characteristics in conjunction with site-specific population and meteorology to determine site-specific risk impacts for the surrogate design. Release characteristics could be developed through a survey of severe accident analyses for previously certified ALWRs and/or operating reactors. Risk impacts could be assessed using the same metrics as in previous plant-specific and generic EISs, such as NUREG-0974, "Limerick 1 and 2 Operating License" and NUREG-1437. These metrics include population dose, early and latent fatalities, and economic costs. The metrics would be used to determine the acceptability of the proposed site at the ESP stage.

6. With respect to the provisions of 10 CFR 52.39, the staff expects that the COL application would demonstrate that the severe accident analysis performed for the ESP is bounding for the proposed facility. If a COL applicant adequately makes such a demonstration, then the applicant may avail themselves of 10 CFR 52.39.

Please contact Stephen Koenick at 301-415-2985, if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 689

cc: See next page

Please contact Stephen Koenick at 301-415-2985, if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 689

cc: See next page

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ESP-Generic

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EXHIBIT 3.1-3

April 1, 2003

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1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: RESOLUTION OF EARLY SITE PERMIT TOPIC 10 (ESP-10), USE OF LICENSE RENEWAL GENERIC ENVIRONMENTAL IMPACT STATEMENT (NUREG-1437) FOR EARLY SITE PERMITS

Dear Dr. Simard:

This letter confirms our understandings and expectations regarding the use of information contained in NUREG-1437, "Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants," for the purpose of preparing early site permits (ESP) issued under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Subpart A. This topic, which is identified as ESP-10 on the list of Nuclear Energy Institute (NEI) generic ESP issues, was discussed during public meetings on January 10, July 16 and September 25, 2002 (Meeting Summary - ADAMS Accession Nos. ML020390320, ML021830280, and ML022900341 respectively). Subsequently, NEI documented its position on this topic in a letter dated February 6, 2003.

The Nuclear Regulatory Commission (NRC) has assessed the environmental impacts associated with granting a renewed operating license for a nuclear power plant to a licensee that holds either an operating license or construction permit as of June 1995. The GEIS is not directly applicable to any licensing action other than license renewal, but may be used just as any other technical resource, such as those that may be considered under ESP-20, "Practical use of existing site/facility information".

The GEIS identified 92 environmental issues and reached generic conclusions related to environmental impacts during the renewal term for 69 of these issues (known as Category 1 issues) that apply to all light-water-reactor (LWR) plants or to LWR plants with specific design or site characteristics. As discussed during the public meetings on this issue, the staff emphasized that there is a different technical basis and regulatory structure necessary for the evaluation of environmental impacts for ESP purposes. Therefore, all of the relevant environmental issues addressed in the GEIS will require detailed review as described in the Draft ESP Review Standard, which references NUREG-1555, "Environmental Standard Review Plan."

The NRC staff offers the following observations and clarifications to NEI's February 6, 2003, letter.

1. The NRC staff agrees with Item 1 of the subject NEI letter.

2. The NRC staff agrees with the text of the first sentence of Item 2 of the subject NEI letter in that "NRC regulations and the National Environmental Policy Act (NEPA) focus on significant issues and direct the NRC to determine the significance of impacts to public health and safety and the environment..."

However, the process suggested in Items 2, 3 and 4, and the concluding remarks of your letter implies that the ESP applicant can adopt the conclusions of the GEIS in its application without detailed knowledge of the design and operational characteristics of a facility that may be built on the proposed site. The GEIS documents the staff's evaluation of the environmental impacts of LWR reactors of known design, locations, and operating experiences. The analysis results documented in the GEIS may not be representative of the environmental impacts of a facility that could be built on the site proposed in an ESP application. Therefore, although the environmental impacts of the construction and operation of a nuclear facility located on the proposed site may be similar to those identified in the GEIS, it is incumbent on the ESP applicant to justify its conclusions regarding these impacts.

The NRC staff does believe that there may be useful insights in the GEIS that an ESP applicant can consider for its purposes in developing its environmental report, but, as stated above, the burden for justifying relevance and demonstrating completeness rests entirely with the applicant. In addition, the NRC retains the prerogative to utilize well-established NEPA techniques, such as tiering, cooperation and adoption, where the NRC believes that it is appropriate.

Please contact Ronaldo Jenkins, the ESP Senior Project Manager, at 301-415-2985 if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 689

cc: See next page

However, the process suggested in Items 2, 3 and 4, and the concluding remarks of your letter implies that the ESP applicant can adopt the conclusions of the GEIS in its application without detailed knowledge of the design and operational characteristics of a facility that may be built on the proposed site. The GEIS documents the staff's evaluation of the environmental impacts of LWR reactors of known design, locations, and operating experiences. The analysis results documented in the GEIS may not be representative of the environmental impacts of a facility that could be built on the site proposed in an ESP application. Therefore, although the environmental impacts of the construction and operation of a nuclear facility located on the proposed site may be similar to those identified in the GEIS, it is incumbent on the ESP applicant to justify its conclusions regarding these impacts.

The NRC staff does believe that there may be useful insights in the GEIS that an ESP applicant can consider for its purposes in developing its environmental report, but, as stated above, the burden for justifying relevance and demonstrating completeness rests entirely with the applicant. In addition, the NRC retains the prerogative to utilize well-established NEPA techniques, such as tiering, cooperation and adoption, where the NRC believes that it is appropriate.

Please contact Ronaldo Jenkins, the ESP Senior Project Manager, at 301-415-2985 if you have any questions on this matter.

Sincerely,

/RA/

James E. Lyons, Director
New Reactor Licensing Project Office
Office of Nuclear Reactor Regulation

Project No. 689

cc: See next page

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DATE	3/7/03	3/10/03	3/11/03	3/31/03	3/31/03

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ESP-Generic

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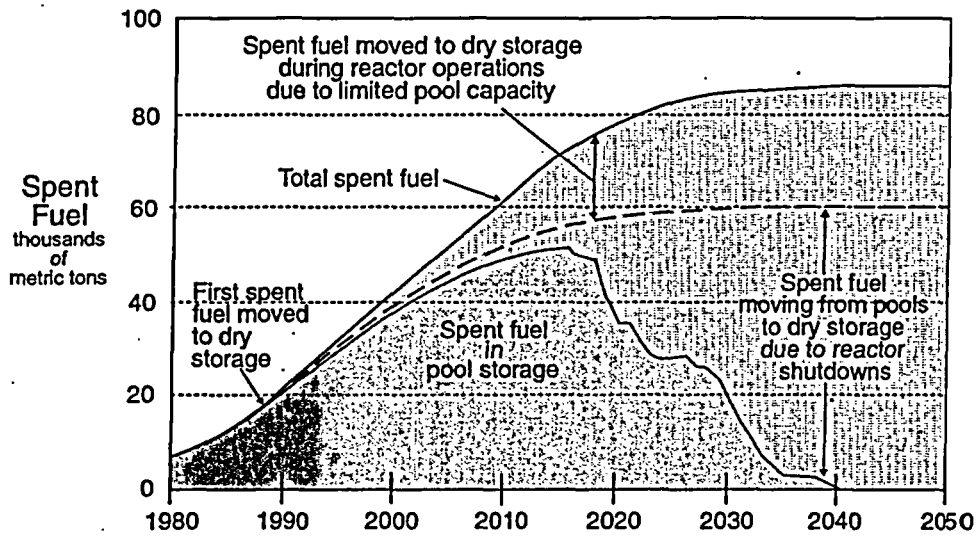
EXHIBIT 3.2.1-1

Disposal and Storage of Spent Nuclear Fuel — Finding the Right Balance

A Report to Congress
and
the Secretary of Energy

Nuclear Waste Technical Review Board
March 1996

Figure 2:
Movement of spent fuel from pools to dry storage under a no-repository scenario



Note: The figure showing spent fuel in pool storage assumes the movement of all spent fuel from pools to dry storage approximately five years after plant shutdown. Assumptions include: 40-year operating licenses with no renewals and no new plant orders; all spent fuel remains at reactors.

Source: Adapted from DOE, Spent Fuel Storage Requirements: 1992–2036, *Dec. 1993 and DOE,* Spent Fuel Storage Requirements: 1993–2040, *Sept. 1994.*

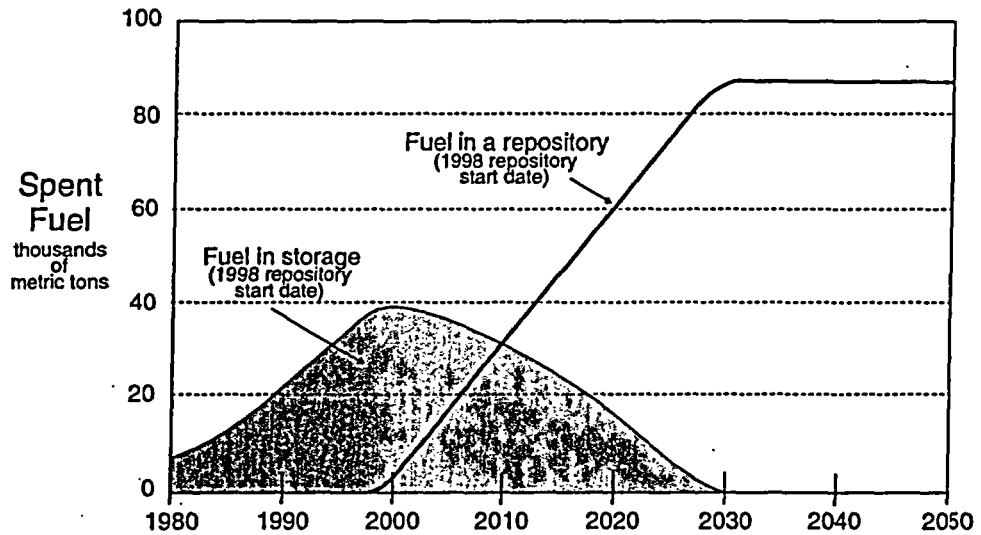
By the year 2000 alone, 25 plants are estimated to require additional spent fuel storage capacity (DOE 1993). Beginning in 2015, much of the fuel moving into dry storage probably will be at shutdown reactors. (See Figure 2.)

Planning for storage

As Figure 3 shows, in the early 1980s when repository operation was expected to begin in 1998, a maximum of about 40,000 metric tons of spent fuel were projected to require storage. Moreover, assuming the DOE's planning number of 3,000 metric tons shipped per year, all of the backlog could have been disposed of by the mid-2020s. On the other hand, if repository operations do not begin until sometime between 2015 and 2020,[4] nearly 80,000 metric tons of spent fuel will require storage. The spent fuel would not be disposed of completely until approximately 2050. As Figure 4 illustrates, each decade of delay

4 The Secretary of Energy projected in testimony submitted to the U.S. Senate that repository operations probably would not begin before 2015 (DOE 1995c).

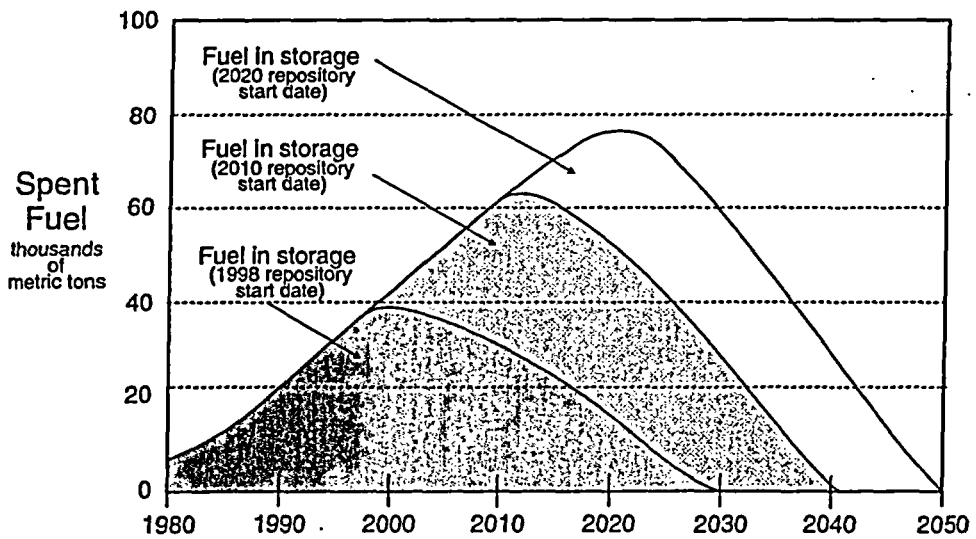
Figure 3:
Storage expectations in early 1980s when the repository start date was 1998



Note: Disposal curve based on 3,000 metric tons/year acceptance rate in a repository after a five-year ramp up. Curves assume 40-year operating licenses with no renewals and no new plant orders.

Source: Storage curves adapted from DOE, Spent Fuel Storage Requirements: 1993–2040, *Sept. 1994.*

Figure 4:
Repository delays increase storage needs by about 20,000 metric tons each decade



Note: Assumes 3,000 metric tons/year acceptance rate in a repository after a five-year ramp up. Curves assume 40-year operating licenses with no renewals and no new plant orders. Recent DOE estimates put repository start date at around 2015.

Source: Storage curves adapted from DOE, Spent Fuel Storage Requirements: 1993–2040, *Sept. 1994.*

EXHIBIT 3.2.1-2

May 16, 2002

Energy and Natural Resources Committee

Statement of Spencer Abraham
Secretary of Energy Before the
Energy and Natural Resources Committee
United States Senate

Mr. Chairman and Members of the Subcommittee, I am pleased to appear before you today.

On February 14, I forwarded a recommendation to the President, based on approximately 24 years of federal research, that Yucca Mountain, Nevada, is suitable for development as the nation's geologic repository for spent nuclear fuel and high-level radioactive wastes. The President officially recommended the site to Congress on February 15, and pursuant to the Nuclear Waste Policy Act of 1982 (NWPA), the State of Nevada has exercised a disapproval of the President's recommendation.

I am greatly encouraged that on May 8 the House of Representatives voted, by an overwhelming margin, to pass the Joint Resolution before you today. The expeditious manner in which the House acted, and the wide margin and bipartisan manner by which the Joint Resolution passed, clearly signal this Nation's confidence and readiness to take the next step toward resolving the challenges of permanent waste disposal. Without delay, I ask that the Senate also pass the Joint Resolution, so that the Department may enter the next phase of repository development an expert and independent scientific and technical examination of the safety of the site by the Nuclear Regulatory Commission.

Passing this Joint Resolution, thus overriding the State of Nevada's disapproval, hardly needs emphasis. Twenty years ago, Congress established in law the Federal government's responsibility for the disposal of spent nuclear fuel and high-level radioactive waste. In doing so, Congress foresaw the fundamental national security and energy policy considerations that weigh heavily in favor of proceeding with a geologic repository, and mandated that a repository program be based upon a thorough scientific evaluation of several candidate sites. In 1987, Congress limited that evaluation to the site we consider today: Yucca Mountain.

In formulating this recommendation, I first considered whether sound science supported a determination that the Yucca Mountain site was scientifically and technically suitable for the development of a repository. The scientific evaluation of the Yucca Mountain site had been conducted over a 24-year period; as part of the study, some of the world's best scientists examined every aspect of the natural processes—past, present, and future—that could affect the ability of a repository beneath Yucca Mountain to isolate radionuclides released from any spent fuel and radioactive waste disposed of there.

The Department's scientific inquiries and modeling clearly demonstrate that a repository at Yucca Mountain can meet the Environmental Protection Agency's standards for protecting the health and safety of our citizens. These extremely stringent standards were based on the recommendations of the National Academy of Sciences. What they mean, in terms of the Yucca Mountain site, is that a person living 11 miles away from the site cannot receive more annual radiation exposure during the 10,000-year regulatory period than a traveler receives today from natural sources in three round trip flights from Las Vegas to New York.

In evaluating whether the repository can comply with the Agency's standards, our scientists employed extremely conservative assumptions and considered the impact of events with extremely low probability of occurrence, all erring on the side of public safety. For example, earthquakes were assumed to occur, and volcanic eruptions were evaluated–even though the likelihood of a volcanic event affecting the repository during the first 10,000 years is just one in 70 million per year. Even with these unlikely events analyzed into the Agency's 10,000 year compliance period, Yucca Mountain still meets the EPA

standards.

A review of the documentation that accompanied the recommendation clearly reveals that the Department has carefully evaluated the extent to which Yucca Mountain's substantial natural geologic barriers work in concert with the robust engineered systems. We know that Yucca Mountain is in a closed hydrologic basin, a geologic feature that greatly limits the potential migration of radionuclides. Between the emplacement tunnels and the water table, which is approximately 2000 feet below the surface, the geology provides natural adsorption retarding any potential radionuclide movement. The hydrologic features at this site suggest that more than ninety percent of the annual rainfall runs off or is evaporated, meaning less than a half an inch of water travels beneath the surface. Our studies indicate that the vast majority of water samples taken from the mountain are thousands of years old.

Even with this robust geology, our scientists again conservatively considered how engineered barriers 1,000 feet below the surface and 1,000 feet above the water table might corrode by analyzing what would happen during an ice age, if Nevada's climate changed and rainfall increased dramatically. Even including these scenarios, Yucca Mountain still meets the EPA standards.

After thoroughly examining the relevant scientific and technical materials, I have concluded that they demonstrate that the site is scientifically and technically suitable for construction of a repository. As I stated in my recommendation to the President:

> "Irrespective of any other considerations, I could not and would not recommend the Yucca Mountain site without having first determined that a repository at Yucca Mountain will bring together the location, natural barriers, and design elements necessary to protect the health and safety of the public, including those Americans living in the immediate vicinity, now and into the future."

Having reached this conclusion, I went on to evaluate whether compelling national interests counseled in favor of moving forward with a geologic repository at Yucca Mountain, and if so, whether there were countervailing arguments so strong that I should nonetheless decline to proceed. This evaluation argued strongly in favor of proceeding, and certainly that there was no basis for abandoning the policy decisions made by the Congress in enacting the 1982 Nuclear Waste Policy Act and the 1987 amendments to that Act. In short, the relevant considerations are as follows.

First, Yucca Mountain is critical to our national security. Today, over forty percent of our Navy's combatant vessels, including aircraft carriers and submarines, are nuclear powered. The additional capabilities that nuclear power brings to these platforms is essential to national security. To maintain operational readiness, we must assure disposal of spent fuel to support refueling of these vessels. We are in the midst of advancing the non-proliferation objectives that have been the welcome result of the end of the Cold War. A geologic repository is an integral part of our disposition plans for surplus weapons grade materials.

Yucca Mountain is an important component of homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but prudence demands we consolidate this waste from widely dispersed, above-ground sites into a deep underground location that can be better protected.

A repository is also important to our nation's energy security. Nuclear power provides 20 percent of the nation's electricity and emits no greenhouse gases. The reactors we have today give us one of the most reliable forms of carbon-free power generation, free from interruptions due to international events and price fluctuations. This nation must develop a permanent, safe, and secure site for disposal of spent nuclear fuel if we are to continue to rely on our 103 operating commercial reactors to provide us with electricity.

And a repository is important to our efforts to protect the environment. A repository is indispensable to implementing an environmentally sound disposition plan for high-level defense wastes, which are located in Colorado, Idaho, South Carolina, New Mexico, New York, Tennessee, and Washington. The Department must move forward and dispose of these materials, which include approximately 100 million gallons of high-level radioactive waste and 2,500 metric tons of defense production spent nuclear fuel.

Finally, I carefully considered the primary arguments against locating a repository at Yucca Mountain. None of these arguments rose to a level that

outweighs the case for going forward with the site designation.

Of these, the only one I shall address in my prepared testimony is the concern critics of the project have raised about the "transportation issue." I wish to address this issue briefly, not because I believe there is any real basis for believing these concerns are warranted, but rather, because I believe that simply by incanting the words "transportation of nuclear waste," opponents are hoping they can incite public fear, without any basis in fact, and that this hope has become the last refuge for opposition to the project. The facts, however, are these.

First, the Nuclear Regulatory Commission, working with the Departments of Transportation and Energy, has overseen approximately 30 years of safe shipment of spent nuclear fuel in this country. The Department and commercial nuclear industry have substantial experience to date –some 1.6 million miles-- without any harmful radiation release. And the successful and extensive European experience in transporting this type of nuclear material corroborates our experience. The transportation of this material will involve approximately 175 shipments per year, not the 2,800 that the opponents allege. It would also constitute 0.00006% of the annual hazardous material shipments, and 0.006% of the annual radioactive material shipments that occur in this country today.

Second, because the site has not yet been designated, the Department is just beginning to formulate its preliminary thoughts about a transportation plan. There is an eight-year period before any transportation to Yucca Mountain might occur. This will afford ample time to implement a program that builds upon our record of safe and orderly transportation of nuclear materials and makes improvements to it where appropriate. Thus any suggestion that the Department has chosen any particular route or mechanism is completely fictitious. Those decisions have not been made, and cannot possibly start to be made until the site has been designated and the Department has the opportunity to work with affected States, local governments, and other entities on how to proceed.

Third, even without a repository at Yucca Mountain, the need to find a place to put the spent fuel that is continuing to accumulate will lead to the transportation of these materials, and likely quite soon. On-site storage space is running out and not all utilities can find new adjacent land where they can put this material. Therefore, they will devise ad hoc off-site consolidated storage alternatives. Already a consortium of utilities is working on a facility that they have presented to the NRC. Whether or not this effort ultimately succeeds, it is likely that some similar effort will. Thus the transportation of nuclear materials is not a function of a repository at Yucca Mountain, but rather is a necessary consequence of the material that continues to accumulate at the 131 sites in 39 States that are running out of room for it.

Finally, Yucca Mountain critics argue that nuclear materials in transit could be a terrorist target. But they are forgetting the obvious: spent fuel in secure transit to a permanent repository is certainly less susceptible to terrorist acts than spent fuel stranded at the temporary, stationary sites -- many very close to major cities and waterways -- where it now resides.

Let me close with one last thought. The critics of this program would have Congress overturn the fundamental decisions it legislated 15 years ago -- that a single underground repository located at Yucca Mountain holds the greatest promise for the long-term safety and security for the Nation. The great body of scientific work done since then has confirmed the fundamental soundness of the Yucca Mountain site. The only issues remaining are the type that only can be resolved in a Nuclear Regulatory Commission licensing proceeding.

The critics who would upend this path to resolution of the remaining issues have a heavy burden of proof in urging that the policy decision made by Congress in 1987 and the findings of the body of scientific work that examined Yucca Mountain both be abandoned before the NRC has even had the opportunity to pass on whether a repository can safely be sited there. Given the history and the work to date, their burden would be substantial even if this project were not critical to many important national interests. But it is. Rejection of the proposed resolution would leave the country with no ultimate destination for our spent naval fuel, no adequate path for disposing of our own surplus plutonium, thereby making it hard for us to press other countries to dispose of theirs, and no means to complete the environmental cleanup of our defense complex. Utilities may have to start planning to decommission existing nuclear reactors and figuring out how to replace them. Congress would still have to formulate an alternative in view of the statutory obligation that the Government dispose of commercial spent fuel that was legislated in 1982, but that would be no easy task.

In short, a decision to oppose this project's going forward at this stage is a decision to abandon the repository program and subject the country to these consequences without ever letting neutral experts at the Nuclear Regulatory Commission decide whether that is the right course. Nothing the critics of this project have advanced comes close to meeting the burden of proof they should have to satisfy to warrant proceeding in this fashion. Opposition to nuclear power is not a sufficient ground, since we all, and the United States Government in particular, have an obligation to safely dispose of this waste regardless of any such policy view. Nor are concerns about transportation, for all the reasons outlined above. Rather, opposition to this resolution, and to submitting this question to the NRC, seems warranted only if one is convinced that there is such overwhelming evidence that a repository at Yucca Mountain cannot meet the NRC and EPA standards that it would be a waste of time and money to use the ordinary NRC processes to find out.

Support for the proposed resolution, on the other hand, does not require being convinced that the Department of Energy is right in believing that a repository at Yucca Mountain will meet the applicable standards or that the NRC will decide it should be licensed -- although in my judgment the scientific work to date provides ample basis for reaching that conclusion. Indeed, it doesn't even require being convinced that this outcome is the most likely. Rather, all that is required to support the resolution is to believe there is enough of a serious possibility that $4 billion and 24 years of scientific research have produced a sufficient basis for our conclusion that the site can be safely developed as a repository. That conclusion will then subject the extensive scientific basis for the President's recommendation to objective testing in the only official context it can be -- an NRC licensing proceeding.

I urge the Senate now to act promptly and favorably on the proposed joint resolution, as the House has done so overwhelmingly on May 8. This will allow the Department to proceed with the next stage of addressing the merits of all remaining issues, by applying the independent expertise of the Nuclear Regulatory Commission.

EXHIBIT 3.3-1

April 30, 2004

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of

Dominion Nuclear North Anna, LLC

(Early Site Permit for North Anna ESP Site)

Docket No. 52-008

DECLARATION OF BARRY WAYNE SULKIN, M.S.
IN SUPPORT OF PETITIONERS'
ENVIRONMENTAL CONTENTIONS

Under penalty of perjury, I, Barry Wayne Sulkin, make the following declaration:

1. My name is Barry Wayne Sulkin. I am a professional consultant, specializing primarily in water quality, environmental science, environmental management and regulatory matters. A copy of my curriculum vita is attached as Exhibit 1.

2. I have a Masters Degree in Environmental Engineering from Vanderbilt University, and a Bachelors Degree from the University of Virginia in Environmental Sciences. I also have over 25 years of experience in the areas of environmental and water quality assessment, water pollution control, water management, and Clean Water Act enforcement. I am qualified by training and experience to evaluate the adequacy of Dominion Nuclear North Anna, LLC's ("Dominion's") application for an Early Site Permit, with respect to its assessment of the environmental impacts of building and operating two new nuclear reactors on the North Anna site.

3. I have reviewed the portions of Dominion's Environmental Report that discuss the environmental impacts of two proposed new reactors on Lake Anna and associated water bodies, and have inspected the area. In addition, I am generally familiar with the requirements of the National Environmental Policy Act and the Clean Water Act.

4. I participated in the preparation of Petitioners' contentions regarding the inadequacy of Dominion's Environmental Report in its discussion of the environmental impacts of two new reactors on Lake Anna and associated water bodies.

5. The technical factual assertions in those contentions are true and correct to the best of my knowledge, and all expressions of technical opinion therein are based on my best professional judgment.

Barry Wayne Sulkin

Executed April 30, 2004

CURRICULUM VITA

BARRY WAYNE SULKIN, M.S.

4443 Pecan Valley Rd.
Nashville, Tennessee 37218
(615) 255-2079

EDUCATION

1987 M.S., **Vanderbilt University** - Nashville, Tennessee
Major: Environmental Engineering

Master's Thesis: "HARPETH RIVER BELOW FRANKLIN DISSOLVED OXYGEN STUDY"- A field study and computer modeling using QUAL2E of the impacts of a city sewage treatment plant discharge into a river.

1975 B.A., **University of Virginia** - Charlottesville, Virginia
Major: Environmental Science

Additional undergraduate courses at University of Tennessee - Knoxville

HONORS

Lifetime Achievement Award, Tennessee Environmental Council, 1990

Water Conservationist of the Year, Tennessee Conservation League, 1989

State of Tennessee/Vanderbilt University Environmental Engineering Graduate Scholarship, 1985 - 1987

du Pont Scholarship, University of Virginia, 1971 - 1975

Eagle Scout, 1967

PROFESSIONAL EXPERIENCE - CURRENT

Sept. 1990 - Present **Environmental Consultant**
Self-employed

Working as consultant and scientist serving clients such as attorneys, environmental/citizen organizations, cities, individuals, businesses, media, and sub-contractor for other consultants. Activities include research projects, field

studies/sampling, permit negotiations, information and file research, photography, site evaluations, and expert witness presentations concerning water quality, landfills, superfund, and other environmental issues; also TN Director of Public Employees for Environmental Responsibility (PEER).

PROFESSIONAL EXPERIENCE - PREVIOUS

1987-June 1990 and 1985

Manager
Enforcement and Compliance Section
Division of Water Pollution Control
Tennessee Dept.of Health and Environment
Nashville, Tennessee

Responsibilities: Statewide manager of enforcement investigations and legal referrals for water pollution programs under the federal Clean Water Act and the Tennessee Water Quality Act; witness for hearings before the Water Quality Control Board, and local and state courts; data processing and analysis for wastewater permit discharges; field research projects regarding water quality problems.

1989

Instructor
Graduate School of Engineering
University of Tennessee, Knoxville

Responsibilities: Assistant instructor for graduate course in environmental engineering-wastewater treatment.

Sept.-Nov.1986 and 1981

Assistant Manager
Regional Field Office
Division of Water Pollution Control
Tennessee Dept.of Health and Environment
Nashville, Tennessee

Responsibilities: Coordinated inspections, complaint investigations, field studies, and enforcement for wastewater programs in 41 county region.

Sept. 1985 - Aug. 1986 Education leave to attend graduate school

1984-1985

Special Projects Assistant
Director's Office - Elmo Lunn, Director
Division of Water Pollution Control
Tennessee Dept. of Health and Environment
Nashville, Tennessee

Responsibilities: Provided statewide coordination and technical assistance on deep well waste injection regulations, clear- cutting forestry problem investigations, animal waste problems, public relations and media presentations, state planning and policy, enforcement and field office coordination.

1982-1984 **Enforcement Coordinator**
Regional Field Office
Division of Water Pollution Control
Tennessee Dept. of Health and Environment
Knoxville, Tennessee

Responsibilities: Coordinated enforcement action in municipal and industrial drinking water and wastewater programs in 24 county region, including fish kills, spills, complaint investigations, and stream studies.

1981-1982 **Assistant Manager**
Enforcement Section
Division of Water Pollution Control
Tennessee Dept.of Health and Environment
Nashville, Tennessee

Responsibilities: Coordinated statewide investigations and legal actions for drinking water, wastewater, and safe dam programs.

1977-1981 **Water Quality Specialist**
Regional Field Office
Division of Water Pollution Control
Tennessee Department of Health and Environment
Nashville, Tennessee

Responsibilities: Inspected drinking water, and municipal and industrial wastewater systems for 41 county area; investigated spills, underground storage tanks, fish kills, and citizen complaints; conducted stream studies; coordinated enforcement program.

1976-1977 **Water Quality Specialist**
Regional Field Office
Division of Water Pollution Control
Tennessee Dept. of Health and Environment
Chattanooga, Tennessee

Responsibilities: Inspected public drinking water systems for nine county area; investigated spills and citizen complaints.

1975 **Research Assistant/Lab Technician**
Department of Environmental Science

University of Virginia
Charlottesville, Virginia

Responsibilities: Test soil and sediment from Chesapeake Bay for Corps of Engineers dredge spoils study.

1974 **Research Assistant**
Department of Environmental Science
University of Virginia
Charlottesville, Virginia

Responsibilities: Weather research project data processing.

1974 **Research Assistant/Lab Technician**
Department of Civil Engineering
Water Quality Lab
Memphis State University
Memphis, Tennessee

Responsibilities: Field sampling and lab analyses of water for study of urbanization impacts of watershed streams.

PROFESSIONAL/CIVIC ORGANIZATIONS, CERTIFICATIONS, & EXPERIENCE (Past & Present)

Davidson County Grand Jury, Oct. - Dec. 1998, Nashville, TN

Nashville and Davidson County - Floodplain Review Committee, Oct. - Dec. 1998

National Environmental Health Association
Registered Environmental Health Specialist, 1994

State of Tennessee
Registered Professional Environmentalist, 1982

American Society of Civil Engineers

Water Environment Federation

Tennessee Environmental Council - Board of Directors, 1994 -

International Erosion Control Association

Tennessee Scenic Rivers Association

ADDITIONAL TRAINING

"BASINS Training" short course of EPA supported computer mapping and water quality modeling techniques, Utah State Univ., Logan UT, August 6 - 10, 2001

"Wetland Mitigation Techniques" workshop by Tennessee Tech. Univ., Cookeville, TN April 26, 1999

"Pulp and Paper Cluster Rule and Clean Water Act Permits", by Clean Water Network with EPA, Seattle, Washington, February 18-19, 1998

"Bioengineering Techniques for Streambank and Lakeshore Erosion Control", by Wendy Goldsmith, International Erosion Control Association, April 27, 1995

"Fundamentals of Hydrogeology, Karst Hydrogeology, and the Monitoring, Containment, and Treatment of Contaminated Ground Water", by Albert Ogden and Gerald Cox, January 6-7, 1994

"Ground Water Hydrogeology and Dye Tracing in Karst Terranes", by James Quinlan, April 2, 1992

"NPDES Permit Writers Course" by the Environmental Protection Agency (EPA), April 1988

"Sediment Oxygen Demand Workshop", by EPA, U.S. Environmental Research Laboratory, Gulf Breeze, Florida, September, 1987

"Compliance Monitoring for NPDES Permits", by EPA, October, 1978

"Hazardous Materials Tactical Workshop", by Tennessee Civil Defense, April 1978

"Troubleshooting O & M Problems at Municipal Wastewater Treatment Facilities", by EPA, March, 1978

PRESENTATIONS/PUBLICATIONS

April 2002
Understanding TMDLs - Total Maximum Daily Loads; Hoosier Environmental Council Watershed Conference, Nappanee, Indiana

April 2000 - October 2001
TMDL technical issues training for Clean Water Network at workshops in Washington, DC, Kentucky, Iowa, Illinois, and Alabama

March 2001

Water Pollution and TMDL presentations, Alabama Rivers Alliance annual conference, Gulf Shores, AL

Sept. 1999 - May 2002

Clean Water Act and Permits at the State and Federal Level - Instructor for River Network of Portland, Oregon at multi-day workshops in Vermont, Georgia, Tennessee, Colorado, New Mexico, California, Alaska, Ohio, and North Carolina.

April 1999

"*U.S. Environmental Laws & Regulations Compliance - Understanding Your Obligations Under the Clean Water Act*" session on Clean Water Act, for course sponsored by Government Institutes, Inc. of Rockville, MD, given in Nashville, TN

March 1999

"*NPDES and State Water Quality Permits*" and "*The TMDL Process*", presentations at the Tenn. Clean Water Network conference; March 27, 1999, Bethany Hills Camp, Kingston Springs, TN

March 1999

"*State of the Rivers:Tennessee*" presentation at World Wildlife Fund "*State of the Rivers Conference*", March 15, 1999, Chattanooga, TN, with co-author of Tenn. section of "*A Conservation Potential Assessment of the Mobile and Tennessee/Cumberland River Basins in Alabama, Georgia, and Tennessee*" by WWF

December 1998

"*The TMDL Process*", presentation with NRDC attorney at national Sierra Club state leaders conference, Santa Fe, New Mexico, December 11,1998

October 1998

"*Clean Water Act Permits, Modeling, and TMDLs*" presentation at national conference of clean water organizations & attorneys, by Clean Water Network/NRDC, Oct. 16, 1998, Washington, DC

May 1998

"*Impacts of State Route 840 Upon the Human and Biophysical Envirnment*" NEPA, ISTEA, and Public Participation in Transportation Projects, Dept. of Environmental Geography guest lecture, Austin Peay State University, May 1, 1998, Clarksville, TN

March 1998

"*The State, EPA, Citizens - How the System Works*" Tennessee Clean Water Conference, Opening Plenary Presentation, March 28, 1998, Nashville, TN

March 1998

"*Total Maximum Daily Loads (TMDL) The Science, Process, & Controversy*" American Water Resources Association 1988 Tennessee Conference; paper presentation as part of panel with EPA representatives on TMDLs, March 3, 1998, Nashville, TN.

February 1997

International Erosion Control Association, on panel of speakers for session on piratical applications of erosion controls at annual IECA national conference, Nashville, TN

October 1994

"*Stream Ecology, BMPs, and Compliance*", presentation on the, environmental impacts of road building, Sierra Club Southern Appalachian Highlands Ecosystem Taskforce, Transportation Activist Workshop, Banner Elk, NC

June 1994

"*Fundamentals of Tennessee Environmental Law*", presentation on Water Pollution Control and Compliance Strategies, for course sponsored by Government Institutes, Inc. of Rockville, MD, given in Knoxville, TN

June 1994

University of Tennessee Law School, guest lecture on Water Pollution and the related state and federal laws, Knoxville, TN

October 1992

"*Storm Water Regulations for Saw Mills*" - Seminar sponsored by the Tennessee Association of Forestry and the Univ. of TN, Nashville.

August 1992

"*Storm Water Regulations for Industry*" - Seminars sponsored by the Tennessee Association of Business and the Univ. of TN, Chattanooga, Knoxville, Jackson, and Nashville.

July 1992

Storm Water in Tennessee - A Training Manual for Manufacturers, University of Tennessee Center for Industrial Services

April 1992

"*Dissolved Oxygen Study - Sewage Treatment Impacts and Assessments*", VA Water Pollution Control Assoc. 46th Annual Conference, Roanoke, VA

October 1990

"*The Tainted Waters of the Cumberland*"; Cumberland Journal, v.1, no. 1, pp. 16-20; Nashville, Tennessee.

November 1988

"*A Rapid Bioassessment of Richland Creek, Davidson County*", by M. Browning, B. Sulkin, T. Merritt, TN Div. of Water Pollution Control

June 1988

"*Assimilative Capacity of the Obed River at Crossville, Tennessee*"; U.S. Geological Survey 1st Annual Hydrology Symposium, Nashville, TN

March 1987 - 1994

Vanderbilt University Graduate School of Engineering and Law School; guest lectures on water quality topics and computer modeling of river waste assimilative capacity.

July 1983

Testimony on the pollution at the Oak Ridge nuclear weapons facilities before Congressional hearing chaired by then Congressman Albert Gore.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

February 4, 2003

EXHIBIT 3.3-2

COPY

Chief, Rules Review and Directives Branch
U.S. Nuclear Regulatory Commission
Mail Stop T6-D59
Washington, D.C. 21555-0001

Attention: Andrew Kugler

Re: *NUREG-1437, Final Supplement 7 to the Generic Environmental Impact Statement Regarding North Anna Power Station (NAPS), Units 1 and 2*

Dear Sir:

The U.S. Department of the Interior, Fish and Wildlife Service has reviewed the Virginia Electric and Power Company (VEPCO), Final Environmental Impact Statement (FEIS), to relicense the above referenced project and offers the following comments. The Service is responding pursuant to the Clean Water Act (33 U.S.C. § 1251 *et seq.*) and the National Environmental Policy Act (42 U.S.C. 4321-4347), and our authorities under the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e) and the Endangered Species Act (ESA) (16 U.S.C. 1531 *et seq.*).

General Comments

The U.S. Fish and Wildlife Service (FWS) has identified and assessed the potential impacts at North Anna Lake and River for VEPCO to take the necessary steps for natural resource protection and enhancement during their license renewal. According to the FEIS, no new data was collected or changes made to benefit natural resources during this relicensing period. In light of the past improvements and the current condition of the North Anna Lake and River, the FWS has provided new and significant information that applies to the operation of NAPS. When the NAPS had its' initial environmental review in 1973, certain measures such as diadromous fish surveys and fish passage were delayed because of acid mine drainage (AMD). The AMD impact is no longer a significant issue, and the FEIS describes the fish populations in the Lake as "well balanced" and "diverse and relatively stable" with "diversity of fish and mussel populations in the North Anna River". As has been achieved at hundreds of dams in the Chesapeake Bay Watershed, the reestablishment of historical spawning habitats will be a success story for fish, VEPCO, and the people in the watershed. For the NAPS management to achieve this goal of fish passage, VEPCO, the Nuclear Regulatory Commission (NRC), and FWS need to reopen our dialogue on this most important issue.

Specific Comments

The FWS reaffirms our conclusion that the North Anna operations adversely affects natural resources.

- Anadromous, catadromous, and native fish are blocked from spawning habitats in the spring and other times of the year when fish are searching for forage, refuge, or suitable habitats. Anadromous fish are documented in the North Anna River to the "Fall Hole" upstream of Interstate 95, and similar latitudes in the South Anna and Mattaponi Rivers. It is reasonable to believe that shad and herring can ascend upstream only an additional 20 miles from the Fall Hole to the North Anna Dam. For American eel passage, an Atlantic States Marine Fisheries Commission Fish Management Plan recommends restoring eels to their historical habitat and increasing their abundance in habitats where they currently reside. In addition to restoring fish to their historical and preferred habitats, freshwater mussel populations are distributed in a watershed by the movement of mussel fish host species that are native to the North Anna River. The mussels and fish host will benefit from fish passage at the dam. The starting point to address the passage issue should be a focused migration study to determine the extent of fish movements to the dam during average and high flows.

- The North Anna facility lacks a component of the cooling water intake system that VEPCO has developed at the Surry Power Station. The traveling mesh screens at the Surry Power Station include a spray wash system that removes the biota from the screens and returns them to the James River. The North Anna facility utilizes a similar technology for the screens, but fails to provide the mechanism to return the biota unharmed back to the Lake. The traveling screens and wash system at Surry clearly minimize aquatic impacts more than the North Anna facility, which discards the impinged biota into a disposal bin. A similar process, such as at Surry, could be developed to minimize the aquatic impacts by returning the impinged biota safely back to the Lake. To further minimize the impacts, in the process of replacing worn or damaged screens, the service recommends mesh less than or equal to one millimeter wide and entrance velocities less than or equal to 0.5 feet per second (Gowan and Garman 1999).

- The cooling water discharge is also a potential hazard to fish. Unlike the Surry Power Station that discharges to the mouth of the tidal James River, the North Anna Station discharges into a series of open canals that flow back to the Lake. While the thermal discharge is likely to have a greater effect in the colder months, the increased temperatures in the summer could also have an adverse effect on fish behavior and ecology in the Lake.

- The FWS agrees that the potential is low for the North Anna Power Station to adversely affect bald eagle, *Haliaeetus leucocephalus*, a federally threatened species. Our concern is for the incidental mortality to migratory birds associated with the transmission lines. In the event of migratory bird mortality, VEPCO should complete a Raptor Incident Report for the FWS and the appropriate State agencies.

Summary Comments and Recommendations

The FWS recommends that the NRC adopt the following items in order to establish up-to-date protection of fish and wildlife resources at North Anna Power Station:

1. Install upstream fish passage at the dam for diadromous and native fish;

2. Develop a method to return impinged fish from the cooling water intake screens back to the lake. When the intake screens are replaced, install a mesh size of one millimeter or less wide;

3. Minimize any impacts from the thermal discharges on fish distribution, spawning, and feeding; and

4. Maintain an efficient recording and reporting system for migratory bird mortality at the North Anna Power Station.

We appreciate the opportunity to review the environmental document and provide comment on natural resource protection. If you have any questions regarding these comments, please contact David W. Sutherland of the Service's Chesapeake Bay Field Office by phone at (410) 573-4535, or by e-mail at David_Sutherland@fws.gov.

Sincerely,

for John P. Wolflin
Supervisor

February 4, 2003
G:\PLE\DWS\NAPS013003.wpd

cc: Dominion Energy Company (Tony Banks)
5000 Dominion Boulevard
Glen Allen, VA 23060
USFWS Attn: K. Mayne
VDGIF Attn: A. Weaver
EPA Attn: D. Rigney
DOI Attn: M. Chesik

dws

bz

cc

References

Gowan, C. and G. Garman. 1999. Design criteria for fish screens in Virginia: Recommendations based on a review of the literature. *Prepared for:* Virginia Department of Game and Inland Fisheries, Richmond, VA.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

November 7, 2001

EXHIBIT 3.3-3

ER 01/869

YCC

Chief, Rules and Directives Branch
Division of Administrative Services, Office of Administration
Mailstop T-6 D 59, U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Attn: Andrew Kugler

Re: Virginia Electric & Power Company, License Nos. NPF-4 and NPF-7, North Anna Power Station, Lake Anna, Spotsylvania and Louisa Counties, Virginia.

Dear Sir:

The U.S. Department of the Interior, Fish and Wildlife Service (Service) has reviewed the Virginia Electric and Power Company (VEPCO), Appendix E Environmental Report –Operating License Renewal Stage, North Anna Power Station (NAPS) Units 1 and 2 for a new license at the above referenced project and offers the following comments. The Service is responding pursuant to the Clean Water Act (33 U.S.C. § 1251 *et seq.*) and the National Environmental Policy Act (42 U.S.C. 4321-4347), and our authorities under the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e) and the Endangered Species Act (16 U.S.C. 1531 *et seq.*).

General Comments

The Nuclear Regulatory Commission (NRC) published a notice of intent on September 4, 2001, to prepare an environmental impact statement for the North Anna Power Station license renewal. The NRC would renew the license for twenty years after the expiration of the existing forty year license in 2018. The Service recognizes the NRC for reducing the term of the license. Natural resource protection and enhancement is a rapidly advancing field and recent findings in the science have explained the variability, complexity, and importance of naturally functioning ecosystems.

The Service is providing natural resources protection comments on the Applicant's Environmental Report - Operating License Renewal Stage. The VEPCO developed a scoping document to assist NRC with their preparation of a site-specific supplement to a Generic Environmental Impact Statement. The Service has concerns in three general areas: 1. water quality and habitats, 2. fisheries issues, and 3. cumulative adverse effects in Lake Anna and North Anna River. From the NRC list of 92 potential impacts, the Service agrees with the VEPCO determination that 21 (23%) Category 2 Licence Renewal Issues require additional scientific analysis. These Category 2 impacts require analysis of alternatives to reduce adverse impacts. The Service requests an additional four issues be included in the Category 2 classification of potential impacts. These four issues (3, 5, 18, & 19) are included below.

The Service requests a copy of the VEPCO Virginia Pollution Discharge Elimination System Permit for the NAPS, as well as the most recent fisheries study, Waste Heat Treatment Facility study, North Anna River Ecosystem study, NAPS CWA 316 study, and the North Anna Hydroelectric Studies, 1986-1988. These studies will allow us to better understand the potential environmental impacts.

Specific Comments

Fisheries Issues

Page 2-2 The Service is concerned with the impacts to fish and aquatic vegetation (Issue # 3 & 19) associated with the structures described as, "In addition to the two nuclear reactors, their turbine building, intake structure, discharge canal, and auxiliary buildings." Our concerns also include the impacts of dams on the passage and distribution of fish and mussel species.

P. 2-8 What is your reference for a healthy fish population stated in, "Reservoirs like Lake Anna with healthy populations of "landlocked" small shad and herring (Lake Anna has both threadfin shad (*Dorosoma petenense*) and blueback herring (*Alosa aestivalis*), are often dominated by small-bodied zooplankters (rotifers and copepods), because larger-bodied forms are selectively preyed upon by schooling clupeids (Ref. 2.2-11)."

Page 2-9 How do you account for the reduction in abundance of yellow perch, black crappie, pumpkinseed sunfish and an increase in other species of fish as stated in "The community structure remained relatively stable over the 1975-1985 period, with some year-to-year variation in species composition caused by: (1) normal population fluctuations; (2) reservoir aging; (3) the introduction of forage species and competing predators; (4) the installation of fish attractors and artificial

habitat; and (5) the increase in *Corbicula* densities. Post-1975 changes included: (1) a decline in relative abundance of yellow perch (*Perca flavescens*) and black crappie (*Promoxis nigromaculatus)*; (2) an increase in relative abundance of white perch (*Morone americana*) and threadfin shad; and (3) an increase in redear sunfish (*Lepomis microlophus)* abundance, with a corresponding decrease in pumpkinseed (*Lepomis gibbosus*). None of these changes appeared to be related to NAPS operation."

Page 2-10 There continues to be disagreement between the scientific community as to the historical range of anadromous fish spawning habitat in the North Anna River. American shad, hickory shad, blueback herring, sea lamprey, and American eel are reported to migrate to the base of the Ashland Mill Dam on the South Anna River. The VEPCO report states, "Four non-native fish species (striped bass, walleye, threadfin shad, and blueback herring) have been stocked in Lake Anna by the Virginia Department of Game & Inland Fisheries since 1972. Striped bass were introduced in 1973, and have been stocked annually since 1975. They provide a "put-grow-and-take" fishery; streams, including the North Anna River that flow into Lake Anna lack the flow, depth, and length to support striped bass spawning runs. Studies show that striped bass grow and provide a substantial recreational fishery in Lake Anna, but adults are subject to late-summer habitat restrictions (limited to cooler-water refuge areas) and growth limitations. Walleye are also stocked annually by the Virginia Department of Game & Inland Fisheries and are highly sought-after game fish. Threadfin shad were introduced in 1983 to provide additional forage for striped bass and other top-of-the-food-chain predators. This species is vulnerable to cold shock and winter kills, and would not be able to survive in Lake Anna if it were not for NAPS operation. Threadfin shad appear to be thriving in Lake Anna and are an important source of food for game fish. Blueback herring, fish stocked by the Virginia Department of Game & Inland Fisheries in 1980 as a forage species, have not been as successful. A fifth non-native species, the herbivorous grass carp, was stocked by Dominion (with the approval of the Virginia Department of Game & Inland Fisheries) in the WHTF in 1994 to control growth of the nuisance submersed aquatic plant hydrilla (Hydrilla verticillata)."

Page 2-11. The water flow in the North Anna River System changed drastically after the impoundment was created. The reduction in river flow from Lake Anna during the Spring spawning migration may limit the range of anadromous and riverine species of fish in the river. The report describes the river as, "The North Anna River joins the South Anna River 23 miles downstream from the North Anna Dam, forming the Pamunkey River. Before 1972, when the river was impounded, flows varied considerably (1 to 24,000 cfs) from year to year and water quality was degraded by acid mine drainage from Contrary Creek. After 1972, fluctuations in flow were moderated (40 to 16,000 cfs from 1972 through 1985) and water quality was improved as a result of reclamation activities at the Contrary Creek mine site and the acid-neutralizing effect of Lake Anna's waters.

Water quality downstream from the North Anna Dam is strongly influenced by conditions in the reservoir and releases at the Dam. Water moving from Lake Anna to the North Anna River is less turbid and more chemically stable than the pre-impoundment flow. Dissolved oxygen levels are high (averaging 9.6 milligrams per liter over the 1981-1985 period) immediately downstream of the Dam and increase further downstream, presumably as a result of turbulent mixing (Ref. 2.2-3). Summer water temperatures from 1970-1985 were higher near the Dam than downstream, reflecting temperatures in the reservoir. The highest water temperature recorded in pre-operational years was 89.4°F in July 1977, at a station one kilometer below the North Anna Dam. The highest temperature recorded in operational years was slightly higher, 90.9°F, recorded in August 1983 at the same station." Each of these flow related impacts warrant additional river flow study.

Page 3-15 The Service believes the North Anna Hydroelectric project and the dam may be causing significant impacts to the North Anna River and the results from earlier studies should be reevaluated. The report states, "An exemption from licensing (Ref. 3.5-1) was filed with the Federal Energy Regulatory Commission (FERC) in March 1984; an order granting the exemption was issued in September 1984. As part of the exemption from licensing by FERC, the U.S. Fish and Wildlife Service requested that Dominion perform pre-operational and operational fish passage studies to evaluate the need for intake screening. Studies were conducted in 1986, 1987, and 1988 (Ref. 3.5-3). Results of these studies indicated that the number of fish passing from Lake Anna to the North Anna River was minimal (Ref. 3.5-4).

Page 4-6 The Service is concerned with impacts from entrainment of fish and shellfish in early life stages that occur at most power plants. In light of fish passage measures that may be prescribed to mitigate these impacts, this issue should be evaluated for the current and post restoration fish community. The report states, "Section 316(b) of the CWA requires that any standard established pursuant to Sections 301 or 306 of the CWA shall require that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available for minimizing adverse environmental impacts (33 USC 1326). Entrainment through the condenser cooling system of fish and shellfish in the early life stages is one of the adverse environmental impacts that the best technology available minimizes. Virginia State Water Control Board regulations provide that compliance with a Virginia Pollutant Discharge Elimination System (VPDES) permit constitutes compliance with Sections 301 and 306 of the CWA (Ref. 4.2-1). In response to Board requirements, Dominion submitted a CWA Section 316(b) demonstration for NAPS in May 1985 (Ref. 4.2-2). Based on this and other input, the Board issued the NAPS VPDES permit (Appendix B). Issuance of the NAPS VPDES permit indicates the Board's conclusion that NAPS, is operating in conformance

with the permit, would be in compliance with the CWA requirements. Dominion concludes that the Commonwealth regulation and the NAPS VPDES permit constitute the NAPS CWA 316(b) determination. Dominion also concludes that any environmental impact from entrainment of fish and shellfish in early life stages is small and does not require further mitigation."

Page 4-8 The Service agrees with the NRC that concludes that impingement of fish and shellfish is a significant issue. "NRC made impacts on fish and shellfish resources resulting from impingement a Category 2 issue because it could not assign a single significance level to the issue." The Service believes the impacts will likely require mitigation. The report states, "Impingement impacts are small at many plants, but might be moderate or large at other plants (Ref. 4.0-1, Section 4.2.2.1.3). Information to be ascertained includes: (1) type of cooling system (whether once-through or cooling pond), and (2) current CWA 316(b) determination or equivalent state documentation. As Section 3.1.2 describes, NAPS has a once-through heat dissipation system. Section 4.2 discusses the CWA 316(b) demonstration for NAPS, indicating compliance with the use of best available technology. Section 2.5 also states that no federally- or state listed fish species have been collected in any monitoring studies, nor has any listed species been observed in creel surveys conducted by Dominion biologists and affiliated researchers. Based on the results of the CWA 316(b) Demonstration, Dominion concludes that this environmental impact is small and does not require further mitigation."

Cooling and Auxiliary Water Systems

Page 2-6 The Service is concerned with water quality and aquatic habitat impacts from thermal discharges, the canal systems, and the Waste Heat Treatment Facilities (Issues # 5, 18, & 44). The report described the conditions as, "Since its creation, Lake Anna has developed into a reservoir with three distinct ecological zones: Upper Lake, Mid-Lake, and Lower Lake. The Upper Lake is essentially riverine, shallow (average depth of 13 feet), and shows some evidence of stratification in summer. The Mid-Lake is deeper and stratifies in summer. It receives waters from Contrary Creek that, because of years of mining in its floodplain, are sometimes low in pH and high in metals. As noted earlier in this section, creation of Lake Anna has reduced the impacts of acid mine drainage on the North Anna River. The Lower Lake is deeper (average depth of 36 feet), clearer (with more light penetration), and shows pronounced annual patterns of winter mixing and summer stratification. The epilimnion (warm layer above the thermocline) was generally eight feet deep during pre-operational years, and 26 to 33 feet deep during operational years. The increase in depth of the epilimnion appears to be related to the heated discharge entering the reservoir from Dike 3 (see Figure 3-2) and the withdrawal of cooler, deeper water at the NAPS intake (Ref. 2.2-3)."

Page 2-7 The VEPCO report continues to describe adverse thermal effect on aquatic organisms, "Results of Lake Anna temperature monitoring indicate that the shallower Upper Lake warms earlier in spring and reaches maximum temperature in summer sooner than the Lower Lake. The Lower Lake, with its greater depth and volume, warms more slowly in spring and retains its heat later in the year. It is estimated that the heat contributed by NAPS corresponds to about 10 percent of the solar heat that enters the reservoir on summer days (Ref. 2.2-3)".

Page 2-7 The Service would like to review the water temperature ranges from the report "Dominion's Environmental Policy & Compliance-Environmental Biology group submits annual reports to the Virginia Department of Environmental Quality on water temperatures and fisheries monitoring in Lake Anna and the Lower North Anna River." Specifically, the water temperature data from the month of August, 1983, when the mean water temperature was greater than 88°F (Table 4-3).

Page 4-9 As the NRC states, the Service believes heat shock impacts are important and need to be mitigated to the fullest extent possible. The report states, "NRC made impacts on fish and shellfish resources resulting from heat shock a Category 2 issue, because of continuing concerns about thermal discharge effects and the possible need to modify thermal discharges in the future in response to changing environmental conditions (Ref. 4.0-1, Section 4.2.2.1.4). Information to be ascertained includes: (1) type of cooling system (whether once-through or cooling pond), and (2) evidence of a CWA Section 316(a) variance or equivalent state documentation. As Section 3.1.2 describes, NAPS has a once-through heat dissipation system. As discussed below, Dominion has a Section 316(a) variance for NAPS discharges. Section 316(a) of the CWA establishes a process whereby a thermal effluent discharger can demonstrate that thermal discharge limitations are more stringent than necessary and, using a variance, obtain alternative facility-specific thermal discharge limits (33 USC 1326). Dominion submitted a CWA Section 316(a) Demonstration for NAPS to the Virginia State Water Control Board on June 24,1986 (Ref. 4.4-1). The Fact Sheet (Item 22) accompanying the current NAPS VPDES permit (Appendix B) refers to this submittal, indicating that effluent limitations more stringent than the thermal limitations included in the permit are not necessary to assure the protection and propagation of a balanced indigenous community of shellfish, fish, and wildlife in Lake Anna and in the North Anna River downstream of the Lake. Based on the results of the CWA Section 316(a) Demonstration and the NAPS VPDES permit, Dominion concludes that this environmental impact is small and does not warrant further mitigation."

Threatened or Endangered Species

Page 2-16 The Service commends VEPCO for their description of Federal and Sate threatened and endangered species, and the company's efforts to initiate informal

consultation on these issues. The report describes the conditions as, "Animal and plant species that are federally- or state-listed as endangered or threatened and that occur or could occur (based on habitat and known geographic range) in the vicinity of NAPS or along associated transmission lines are listed in Table 2-1. Bald eagles (*Haliaeetus leucocephalus*), state and federally classified as threatened, are occasionally observed along Lake Anna. The bald eagle forages along coasts, rivers, and large lakes. Dominion is not aware of any eagle nests at NAPS or along the transmission lines. Loggerhead shrikes (*Lanius ludovicianus*), state-classified as threatened, have been observed in the vicinity of NAPS. Loggerhead shrikes inhabit agricultural lands and other open areas. With the exception of the bald eagle and loggerhead shrike (*Lanius ludovicianus*), terrestrial species that are federally- and/or state-listed as endangered or threatened are not known to exist at NAPS or along the transmission lines. As of February 2000, there were no candidate federally threatened or endangered species that Dominion believes might occur at NAPS or along the transmission lines (Ref. 2.5-1)."

Page 2-17 The report states errors and gaps in the data regarding some fish and mussel species that need clarification. The report states, "No federally-listed fish species' range includes the North Anna River and Lake Anna. One state-listed species, the emerald shiner (*Notropis atherinoides*), appears on a Final Environmental Statement list of fish collected in the North Anna River prior to its impoundment (Ref. 2.2-1, Appendix 2.14). However, according to several authoritative sources (Refs. 2.5-3, pp. 397-401, and 2.5-4, pp. 321-409), this species is known only from the Clinch and Powell Rivers in the extreme western part of the state. It appears that the fish was misidentified. The emerald shiner is often confused with the closely-related comely shiner (*Notropis amoenus*), which occurs throughout the York River drainage and has been documented from Lake Anna and the North Anna River (Ref. 2.5-3). The comely shiner was not listed in the Final Environmental Statement, but has been collected regularly by Dominion biologists in post-operational monitoring of the lower North Anna River (Ref. 2.2-8, Tables 4.2.2 and 4.2.3). The emerald shiner has not been collected in any of the post-operational surveys or monitoring studies. Based on the Virginia Department of Game & Inland Fisheries' Fish and Wildlife Information Service database, as many as two state- and federally-listed freshwater mussel species could occur in streams in the vicinity of NAPS, or in streams crossed by NAPS transmission corridors (Table 2-1). It should be emphasized that neither of these species has actually been observed as occurring in streams in the vicinity of NAPS or in streams crossed by its transmission lines. They have, however, been collected from counties occupied by NAPS or its transmission corridors."

Page 2-18 "None of these mussel species was collected in pre-impoundment surveys of the North Anna River, and none has been collected in more recent years by Dominion biologists conducting routine monitoring surveys. Three bivalve species were collected in the North Anna basin prior to impoundment: *Elliptio complanatus*,

Elliptio productus, and *Sphaerium striatum* (Ref. 2.2-1, Appendix 2.13). None of these is a special-status species. In more recent years, the introduced Asiatic clam (*Corbicula fluminea*) has dominated collections from both Lake Anna and the lower North Anna River. Small numbers of Unionids (*Elliptio* sp.) and fingernail clams (*Sphaeriidae*) have also been collected. Acid drainage and sediment from the Contrary Creek mine site (see Section 2.2 discussion) historically depressed mussel populations downstream from the Contrary Creek-North Anna River confluence but, in the 1980s, there were indications that mussel populations (*Elliptio* sp.) were recovering in the lower North Anna River (Ref. 2.2-3, Section 6.2)."

Cumulative Impact Assessment

Page 2-12. The Service's main goal is the protection and restoration of ecosystems for people. During a license review, the Service' mitigation goal is to work with the license applicant to avoid, minimize, and compensate (in that order) to the fullest extent possible. The National Environmental Policy Act calls for past, present, and future environmental impacts be identified, as well as summarized to determine cumulative effects of the environmental impacts. The VEPCO report clearly identifies ecosystem impacts, but the Service disagrees with VEPCO's conclusion regarding fish and the ecosystem. The report states, "In pre-impoundment surveys, the fish community of the North Anna River downstream from the Contrary Creek inflow was dominated by pollution-tolerant species. In the years following impoundment (and reclamation of the Contrary Creek mine site), there was a steady increase in measures of abundance and diversity (species richness) of fish. In 1984-85, 38 species from 10 families were found in the North Anna River, compared to 25 species from eight families in the control stream, the South Anna River. When reservoir species from Lake Anna were subtracted from the North Anna River totals, the two fish communities showed striking similarities, indicating that operation of NAPS has had little or no effect on fish populations downstream from the North Anna Dam." "Based on the 1999 Annual Report for Lake Anna and the North Anna River, the North Anna River downstream of the North Anna Dam has no major changes in the ecosystem (Ref. 2.2-10). A review of the data from the 1999 monitoring studies indicate that Lake Anna and the North Anna River continue to contain healthy, well-balanced ecological communities."

Mitigation

Page 6-2 The Service believes many of the impacts discussed above will fall under the this policy. We do not agree that all impacts of license renewal are small and would not require mitigation. The current operations do include some mitigation activities that would continue during the term of the license renewal, but additional efforts in the areas of fisheries, water quality, and possibly endangered species will protect and enhance the natural resources in Lake Anna and North

Anna River. As stated, Dominion performs routine mitigation and monitoring activities associated with environmental permits to ensure the safety of workers, the public, and the environment. These activities include the radiological environmental monitoring program, continuous emission monitoring, monitoring of aquatic biota that could be affected by NAPS operation, effluent chemistry monitoring, and effluent toxicity testing." As the NRC's statutory requirements state, "The report must contain a consideration of alternatives for reducing adverse impacts...for all Category 2 license renewal issues.... 10 CFR 51.53(c)(3)(iii). The environmental report shall include an analysis that considers and balances...alternatives available for reducing or avoiding adverse environmental effects.... 10 CFR 51.45(c) as incorporated by 10 CFR 51.53(c)(2)."

Conclusion

The Service has provided comments on various parts of the ecosystem that may be adversely affected by NAPS. Our goal is to restore the North Anna River ecosystem as close to the pre-project condition as possible for the American people, while considering the utility the NAPS provides for the residents of Virginia and surrounding areas. The Service requests documents listed above and time for review. Some of our concerns may be obviated after the review of these documents, but it is unlikely that will be the case for the majority of our concerns. We welcome the opportunity to visit the NAPS in the near future, and look forward to working with the staff and representatives from VEPCO.

We appreciate the opportunity to review the preliminary environmental document and provide comment on natural resource protection. If you have any questions regarding these comments, please contact David W. Sutherland of the Service's Chesapeake Bay Field Office by phone at (410) 573-4535, or by e-mail at David_Sutherland@fws.gov.

Sincerely,

for John P. Wolflin
Supervisor
Chesapeake Bay Field Office

cc:
Dominion Generation(T. Banks)
5000 Dominion Boulevard
Glen Allen, VA 23060
USFWS (A. Hoar)
USFWS (K. Mayne)
VDGIF (A. Weaver)
VDGIF (T. Wilcox)

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jw

EXHIBIT 3.3-4

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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Secretary of Natural Resources

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February 10, 2004

Ms. Pamela F. Faggert
Vice-President and Chief Environmental Officer
Dominion Virginia Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

RE: Federal Consistency Certification under the Coastal Zone Management Act and the Virginia Coastal Resources Management Program: North Anna Early Site Permit Application
DEQ-03-223F

Dear Ms. Faggert:

Thank you for your January 12, 2004 letter (received January 20) withdrawing the above federal consistency certification pursuant to our January 7 discussion with the Nuclear Regulatory Commission staff. As you requested, I am enclosing copies of the comments developed by our reviewing agencies thus far.

As you know, the Department of Environmental Quality (DEQ), through this Office, is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also the lead agency for coordination of federal consistency reviews under the Virginia Coastal Resource Management Program and the federal Coastal Zone Management Act. The following agencies and planning district commission joined in this review (starred (*) agencies administer one or more of the Enforceable Policies of the Coastal Resources Management Program):

Department of Environmental Quality:
- Water Division*
- Air Division*
- Waste Division
- Northern Virginia Regional Office*
- Office of Environmental Impact Review* (this Office)

Department of Game and Inland Fisheries*

Department of Agriculture and Consumer Services
Department of Conservation and Recreation*
Department of Health*
Department of Mines, Minerals, and Energy
Thomas Jefferson Planning District Commission.

In addition, the following agencies and localities were invited to comment (same reference (*) as above):

Marine Resources Commission*
Department of Historic Resources
Chesapeake Bay Local Assistance Department*
Louisa County
Spotsylvania County.*

The following summary of the comments submitted by reviewers is provided to inform Dominion Virginia Power Company ("Dominion"), as applicant, and the Nuclear Regulatory Commission ("NRC"), as federal licensing agency, of issues that may merit attention as the consistency certification is reconsidered and as the Draft Environmental Impact Statement is prepared.

Project Description and Background

Dominion filed an Early Site Permit Application ("Application") with the NRC to add two units to the North Anna Power Station. The NRC is to determine whether the site is suitable for constructing new reactors using an Early Site Permit (ESP). Permits are issued for 10 to 20 years and can be renewed for 20 years. Environmental issues are addressed as part of the ESP, independent of any review of any specific reactor design. The ESP process uses a Plant Parameters Approach, which postulates an envelope of possible reactor designs; Dominion is considering seven different designs. In this Application, Dominion has postulated a maximum of two reactors of up to 4300 megawatts each of rated thermal capacity. The two reactors that Dominion formerly proposed but then cancelled each had a rated electrical capacity of 907 megawatts. Dominion postulates that the first new unit (referred to as Unit 3 herein) would use once-through cooling; the second would use a cooling tower. Issues resolved with finality under the ESP process, including environmental issues, are not re-examined in any subsequent licensing action by the NRC. The ESP process does not approve a particular reactor design, nor allow the construction of the reactor. However, it does authorize construction of all the items identified in the site redress plan, including:

- site clearing
- foundations
- intake structures
- outfall structures.

Dominion has requested that NRC issue the permit for 20 years (the maximum) and allow land clearing, stream filling, and intake structure construction to proceed under the site redress plan.

Deficiencies in the Document

The Application includes proposed Unit 4, but does not identify a source of water for that unit. The NRC regulations, at 10 CFR section 51.29, require that "information provided to the Commission by an applicant for a license, ... shall be complete and accurate in all material respects." For ESP applications, the NRC requires information on "types of cooling system intake and outflows for each facility" (10 CFR section 52.17(v)) (emphasis added). Because no water source for Unit 4 is identified in the Application, DEQ's Water Division cannot form an opinion on prospects for approval of such a project, or whether it would be consistent with state laws and regulations. The logical water source for Unit 4 would be Lake Anna. Groundwater resources are not capable of producing the large quantities of water that would be needed; nor does there appear to be any surface water source nearby, other than the Lake. Unit 4 should be withdrawn from the Application unless its water source(s) and related cumulative impacts are identified. If Dominion leaves Unit 4 in the Application, but does not identify a water source, then NRC should consider denying the application for any site redress work associated with Unit 4.

If Lake Anna were the source of water identified for Unit 4, the additional heat load and evaporative losses would result in deeper and longer drawdown periods on the Lake and longer periods of low flows in the North Anna River. Given the small watershed, with average runoff of only 370 cubic feet per second (cfs), it is probable that the additional cumulative impact of a fourth unit would have an unacceptable impact on the Lake and the River downstream of it.

Federal Consistency Certification Issues

Federally licensed or permitted activities affecting coastal uses or resources must be conducted in a manner consistent with Virginia's approved Coastal Resources Management Program ("VCP"). In order to be consistent with the VCP, the project must be consistent with the Enforceable Policies of the VCP (15 CFR Part 930, section 930.50) (first enclosure). In addition, we recommend that applicants and federal licensing agencies take the Advisory Policies of the VCP into account (second enclosure).

The VCP applies in Virginia localities bordering the seacoast and our tidal tributaries, including Spotsylvania County, which is bounded by the North Anna River and Lake Anna. As DEQ's Office of Wetlands and Water Protection indicates, operation of one or both of the proposed generating units would diminish in-stream flows on the North Anna River, directly affecting the River and the anadromous fish habitat therein.

1. Fisheries Management Concerns. As the Department of Game and Inland Fisheries (DGIF) indicates (enclosed comments), the proposed addition of two generating units to the two that are already operating at the North Anna Power Station would have a number of adverse effects upon the lake and the river downstream of it.

(a) Water Withdrawal Increases in the Lake. Increases in water withdrawals would present complications for fish populations through increased fish impingement and entrainment in water intakes. Impingement, or the collisions of fish against water intake screens, would increase by 230% over current levels with the addition of the proposed intakes, according to DGIF. Estimated impingement mortality of striped bass would nearly double; it should be mentioned that striped bass is a leading Lake Anna sportfish annually stocked by DGIF.

Similarly, the number of fish entrained by virtue of increased water withdrawals from the Lake is expected to increase. Using estimates from the applicant's six-species category, DGIF states that the number of fish lost to entrainment could exceed 468 million fish annually, 63% of which would be gizzard shad, another important North Anna River species. (Confirmed, Ellis/Odenkirk, 2/9/04. The lower estimate by DEQ's Office of Wetlands and Water Protection is a sub-set of the above estimate; it is based on losses attributable to the addition of Unit 3 only (Ellis/Hassell, 2/9/04).

Existing intake criteria at the North Anna Power Station substantially exceed DGIF recommendations, as the chart shows:

	water velocity (feet per second)	screen mesh (millimeters)
DGIF recommendation	0.25 FPS	1.0 mm
existing criteria	0.70 FPS	9.5 mm

DGIF indicates that even its recommendations, which reflect current state-of-the-art technology, are not expected to provide full resource protection. The existing screen would be expected to exclude only compressed fish (such as sunfish) larger than 50 mm and elongated fish (such as striped bass and largemouth bass) larger than 86 mm. Accordingly, DGIF recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application

that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations.

(b) Water Withdrawal Increases and the River Downstream. The addition of one or two new units to the North Anna Power Station would have significant impacts on downstream resources by reducing river flows and the frequency of higher flows. For example, the water budget presented in the Application shows that significant changes in flows have already taken place as a result of the construction of the dam; drought flow frequency (flows less than 20 cfs) occurs 5.3% of the time now, versus 4.2% of the time before the dam was built (1929-1971). Drought flow frequency would rise to 11.8% of the time with one additional unit; the flow analysis did not address what would happen with a fourth unit. The impact of a fourth unit should be addressed in this process, or else the fourth unit should be taken out of the permit application.

DGIF recommends an In-stream Flow Incremental Methodology (IFIM) Study as a means of determining flow recommendations downstream of the Lake. The study should include evaluation of a habitat time series (i.e., pre-project, current, and proposed conditions) for native and naturalized species, and may result in recommendations for different flow operating rules than currently exist for the downstream resource. The Tennant Method yields a summer flow in the range of 74 to 111 cfs for resource protection, and current minimum flows would be rated as poor to degraded in that regard. As DEQ's Office of Wetlands and Water Protection states, the addition of another generating unit, which is expected to increase the consumptive loss from the watershed by an additional 39 cfs, would create nearly perennial conditions of severe degradation every fall. See "Additional Analysis Needs," item 4, below.

(c) Water Temperature Increases. Water temperature increases resulting from the additional units are likely to affect fish habitat in Lake Anna and in the North Anna River. This issue has several aspects.

(i) Present Conditions. Dominion has documented the current situation and available literature (Application, pages 3-5-55 through 3-5-58). The current temperature and oxygen stratification patterns at the Lake limit the potential of the Lake fishery, but have not resulted in catastrophic fish kills to date. Adult striped bass grow slowly, exhibit reduced fitness, and have low maximum sizes as a result of the present marginal habitat conditions, but an important recreational fishery has nonetheless developed in this habitat. The Lake does not often stratify, but when it does the stratification is weak. Total temperature differences (top to bottom) in many cases were less than 1 degree Celsius (1.8 degrees Fahrenheit) based on DGIF samples taken in late summer and early fall at lower reservoir sites. Stratification patterns dictate striped bass habitat and are subject to much variability at Lake Anna. Accordingly, a horizontal and vertical increase in the thermal plume would exacerbate a currently tenuous situation.

(ii) Impacts of Water Temperature Increases; Mitigation. It is likely that a small increase in reservoir water temperature would have a dramatic effect, further reducing already limited habitat and perhaps jeopardizing the entire striped bass fishery. The maximum daily surface temperature is expected to rise by 7.2 degrees Fahrenheit (4 degrees Celsius) near the dam as a consequence of the proposed new generating units. Re-configuring the flow within the waste heat treatment facility (WHTF) to allow for more efficient cooling (i.e., forcing water to use the entire facility, consisting of three cooling lagoons, by sealing the lower tributary arm between Elk Creek and Millpond Creek and cutting a canal through the headwater areas; Ellis/Kauffman, 2/6/04) would expand the residence time within the WHTF and probably reduce thermal impacts to Lake Anna and the North Anna River.

(d) Alternatives. Given the scope and magnitude of aquatic resource impacts anticipated in the event of building out the two units, it seems prudent, according to the Department of Game and Inland Fisheries, to investigate alternatives to the heavily consumptive proposal of another once-through system and a new wet cooling tower. See "Additional Analysis Needs," item 2, below. One alternative, addressing the conflict between consumptive use and impingement and entrainment, would be to consider a single new reactor using a cooling tower with Lake Anna as its source water (see item 3(b)(ii), below). The Draft EIS should include a thorough analysis of this and other alternatives to the proposed project.

2. Wetland Management and Water Resources. DEQ's Water Division indicates that additional studies on the impacts to in-stream beneficial uses, water quality, and aquatic life would be needed to adequately assess the impacts of the proposed new generating units. Preservation of in-stream flows for protection of fish and wildlife habitat and resources and also recreation values is a beneficial use of state waters. Habitat and recreational uses are present in both the Lake and downstream, in the North Anna and Pamunkey Rivers. Conditions in a Virginia Water Protection Permit may include, but are not limited to, the volume of water to be withdrawn as part of the permitted activity.

(a) Consumptive Use and In-stream Flow. An additional unit of the size contemplated in the Application would be the largest single consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program. The average annual flow of Lake Anna and the North Anna River is 370 cfs. The typical recommendation to the Water Division from the Department of Game and Inland Fisheries, in processing a Water Protection Permit, is not to allow cumulative consumptive use to exceed 10% of the river's flow. The current evaporation rate and the existing two generating units very often exceed this benchmark. Accordingly, permitting of additional withdrawals, even with prescriptive conditions, cannot be guaranteed.

For these reasons, DEQ's Office of Wetlands and Water Protection has recommended that Dominion withdraw its federal consistency certification, at least until such time as a Draft Environmental Impact Statement is available. Under the present circumstance, DEQ's Office of Wetlands and Water Protection could not agree with the certification that the project would be in compliance with the Enforceable Policies of the Virginia Coastal Resources Management Program, because that Office does not have the information necessary to allow such concurrence.

(b) Impingement and Entrainment. As mentioned above (item 1(a)), a once-through cooling process for Unit 3 will result in a significant addition to the number of aquatic organisms impinged (240,000) or entrained (148,000,000) every year (see item 1(a), above, for the Department of Game and Inland Fisheries (DGIF) estimate of the total losses with all units; this number is a sub-set of the DGIF estimate). While once-through cooling represents a cost saving over cooling towers, it results in higher impingement and entrainment losses. On the other hand, it has less consumptive loss per megawatt of electricity produced, because some of the heat in once-through cooling is dissipated by processes other than pure evaporation.

(i) Permitting Questions. DEQ's Office of Wetlands and Water Protection and its Northern Virginia Regional Office would normally address impingement and entrainment through the Virginia Water Protection Permit. However, because the intake is for cooling water and will not be built for some time, the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. The new unit may be treated as an existing intake or a new intake under the section 316(b) regulations (see item 4 and also "Regulatory and Coordination Needs Summary," item 1, below).

(ii) Limiting Impingement/Entrainment versus Limiting Consumption. The proposed once-through cooling proposed for Unit 3 will raise impingement and entrainment losses as compared with a cooling tower, but it would reduce consumptive use. A cooling tower would also keep thermal conditions in the Lake tolerable for aquatic life. DEQ's Office of Wetlands and Water Protection recommends that the Draft EIS include an alternative not considered in the Application to address this matter: such an alternative would consist of a single new reactor using a cooling tower with Lake Anna as its source.

(c) Water Quantity Issues. For the purpose of this discussion, DEQ's Office of Wetlands and Water Protection assumes that only one additional unit is proposed, because proposed Unit 4 has no identifiable water source.

The proposed addition of Unit 3 would increase the frequency and duration of drawdowns in the Lake. The Application indicates, in Table 2.4.6, that the amount of time that Lake Anna would drop two feet or more would increase from 5.6% of the time to 11.6% of the time. As DEQ's Office of Wetlands and Water Protection indicates, this would mean that flow in the North Anna River below the dam is 20 cfs for 11.6% of the time. Under pre-dam conditions (1929-1971), the streamflow in the River below the dam was 20 cfs only 4.2% of the time, as the Department of Game and Inland Fisheries also points out (see item 1(b), above). This flow rate equals 5.4% of the River's mean annual flow (MAF) at the dam. Under the Tennant rating system, a stream flow of between 0 and 10% of MAF is rated as "severe degradation." Unlike natural drought, which is temporary, the addition of another generating unit which increases the consumptive loss from the watershed would create nearly perennial conditions of severe degradation every fall. For this reason, DEQ's Office of Wetlands and Water Protection is requesting additional studies; see "Additional Analysis Needs," items 1 and 2, below.

The addition of a fourth unit would cause a net loss of 35 additional cfs, according to DEQ's Northern Virginia Regional Office. This would bring the operating level of the lake down to 242 feet MSL, which is 6 feet lower than the target level at which the lake contingency plan currently goes into effect.

(d) Regulatory Authority under the Virginia Water Protection Permit Program. The Application and the request for concurrence with the consistency certification both fail to describe correctly the applicability of State laws and regulations pertaining to water withdrawals. Table 1.2.1 indicates that the Virginia Water Protection Permit regulation, 9 VAC 25-210, is only necessary for "discharge of dredge, fill, or pollutants into surface waters." In fact, since 2000, a wider range of activities in surface waters has been covered by this program, including water withdrawals in particular. Secondly, the attachment listing programs for coastal zone management consistency fails to make the connection, saying only that permits under *Virginia Code* section 62.1-44.15:5 are required to excavate in a wetland. These regulatory authorities should be clarified in the new submission of the federal consistency certification as well as in the license application and Draft EIS.

(e) Timing of NRC Action in relation to Virginia Water Protection Permit. DEQ's Office of Wetlands and Water Protection recommends that because of the lack of abundant water resources in the Lake Anna watershed and the possibility that a Virginia Water Protection Permit may not be issued, the Nuclear Regulatory Commission should consider one of the following:

- Do not issue the Early Site Permit until Dominion receives a Virginia Water Protection Permit; or

- Require that Dominion obtain a Virginia Water Protection Permit prior to conducting any work specified in the site redress plan associated with the Early Site Permit.

3. Non-point Source Water Pollution Control. Utility companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of power lines (including essential supporting activities inside and outside the utility easement, such as sub-stations, staging areas, access roads, and borrow/spoil areas) must file general erosion and sediment control specifications annually with the Department of Conservation and Recreation's Division of Soil and Water Conservation for review and approval in accordance with the Virginia Erosion and Sediment Control Law (*Virginia Code* section 10.1-563.D.). All regulated activities must comply with the Erosion and Sediment Control specifications, irrespective of whether work is undertaken on company property or on an easement owned by another party (including VDOT right-of-way).

Construction of company buildings, facilities, and other structures are not regulated by section 10.1-563.D., and must therefore comply with the requirements of the appropriate local program. Dominion should contact Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401) to ensure compliance with applicable local requirements.

Erosion and Sediment Control specifications should include, at a minimum, a description of all measures and policies that will be implemented on the project site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details and symbols) must be provided that meet the requirements of the 19 Minimum Standards in the Virginia Erosion and Sediment Control Regulations (see 4 VAC 50-30-40) that apply. Practices in the most current edition of the *Virginia Erosion and Sediment Control Handbook* must serve as minimum design criteria. Variance requests (especially those for MS-16, Trench Length) must be submitted for approval on a project-specific basis to ensure that site characteristics (soils, topography, adjacent areas) are fully considered.

Specifications covering all planned regulated activities for a given calendar year must be approved by the Department of Conservation and Recreation's Division of Soil and Water Conservation prior to initiation of the project. Questions may be addressed to the Division's central office (Lee Hill, telephone (804) 786-3998).

4. Point Source Water Pollution Control. As indicated above (item 2(b)(i)), the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. Whether the new unit would

be treated as an existing intake or a new intake under the section 316(b) regulations is not yet clear. (See "Regulatory and Coordination Needs Summary," item 1, below.)

5. Air Pollution Control.

(a) Permitting Requirements. According to DEQ's Northern Virginia Regional Office, the project does not appear to require any air pollution control permits at this time. In light of the fact that the Application mentions concrete batch plants, however, we recommend that Dominion verify this "no permits required" conclusion with DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880) following completion of the design phase of the project.

(b) Fugitive Dust Rules. The Application did not indicate a commitment to abide by fugitive emissions rules. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

(c) Open Burning Rules. If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact Louisa County officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;

- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

Advisory Policies and Other Environmental Issues

1. Natural Heritage Resources. The Department of Conservation and Recreation has 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. The Department of Conservation and Recreation (DCR) reports that natural heritage resources have not been documented in the project area.

The Department of Agriculture and Consumer Services (VDACS) has responsibility for state-listed endangered or threatened plant and insect species. VDACS indicates that the data bases maintained by the Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service, with whom Dominion consulted concerning endangered species, have incomplete records of state-protected plant and insect species. Recent changes in regulations implementing the Virginia Endangered Plant and Insect Species Act will necessitate further review of the project by VDACS or by DCR's Natural Heritage Division.

Under a memorandum of agreement between the Department of Conservation and Recreation and the Department of Agriculture and Consumer Services, DCR represents VDACS in commenting on potential impacts on state-listed threatened and endangered plant and insect species. According to DCR's records, the proposed project would not affect any documented state-listed plants or insects.

2. Recreation Impacts. The increased water withdrawal needed for new generating units would be likely to reduce lake levels during the summer and fall due to increased power plant demand and evaporation. Most of the 43,000 anglers visiting this important recreational lake every year use the ramps at the State Park or those belonging to commercial operators to gain access to the Lake. Pleasure traffic greatly exceeds angler traffic, by as much as 10 to 15 times according to DGIF wardens. Increased drawdowns proposed to serve the new units would adversely affect lake access, and local economic conditions in the process. For example, during the 2002 drought, the reservoir pool dropped from 250 feet above mean sea level to 245.1 feet, and most boat ramps could not support launches. If the third generating unit had been added in that situation,

the drawdown would have been an additional 2.5 feet, or 242.6 feet MSL. The Draft EIS should provide a full analysis of the impacts of the proposed units upon Lake recreation, along with an analysis of potential mitigation of such impacts. The analysis should include the time of year (presumably in the fall) that drawdowns occur (see "Additional Analysis Needs," item 3, below).

The project may affect the views from across the Lake as well as from Route 76, the interstate bicycle route. Designs for development of the proposed site should include efforts to minimize these visual impacts, according to the Department of Conservation and Recreation.

3. VPDES Stormwater General Permit Applicability. According to DEQ's Northern Virginia Regional Office, the disturbance of approximately 200 acres of land on the south side of Lake Anna for the proposed project will necessitate permit coverage under the Virginia Pollutant Discharge Elimination System (VPDES) permit for stormwater discharges associated with construction activity. Questions on fulfillment of this requirement may be addressed to DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880).

4. Solid and Hazardous Waste Management. The Application addressed solid and hazardous waste issues, but did not include a search of waste-related databases, according to DEQ's Waste Division. The Waste Division did a cursory review of its data files and did not find any contamination sites that might affect or be affected by the proposed project.

Any soil that is suspected of contamination, or wastes that are generated, must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. These include, but are not limited to, the Virginia Waste Management Act (*Virginia Code* sections 10.1-1400 et seq.), the Virginia Hazardous Waste Management Regulations (9 VAC 20-60), and the Virginia Solid Waste Management Regulations (9 VAC 20-80). (For additional citations, see the enclosed DEQ memo, Modena to Irons, dated January 29, 2004).

The Application addressed pollution prevention. DEQ encourages Dominion to implement pollution prevention principles in all projects, including the reduction of waste materials at the source, re-use of materials, and recycling of waste materials.

5. Alternatives Discussion. As mentioned above, the Draft EIS should demonstrate consideration and analysis of a single new unit with a cooling tower and Lake Anna as a water source (see "Federal Consistency...," items 1(e) and 2(b)(ii), above). Moreover, it should consider alternatives to the entire proposal as a means of

ensuring that significant environmental impacts do not occur to the fishery resources in and downstream of Lake Anna (see "Federal Consistency...," item 1(e), above).

6. Local and Regional Concerns. The Thomas Jefferson Planning District Commission considered this review at its regular meeting on January 8, 2004. The Commission had no comment on the project.

Additional Analysis Needs

1. Downstream Flows. DEQ's Office of Wetlands and Water Protection recommends that a range of variability study be performed, comparing the pre- and post-project Index of Hydrologic Alterations for the North Anna River immediately below the dam. The methodology for conducting such a study may be found at:

http://www.conserveonline.org/2000/12/a/en/iha_meth.pdf

DEQ's Office of Wetlands and Water Protection is interested in whether and to what extent the pre- and post-project conditions are different for the 90-day minima, creating long-term low-flow stress conditions. The range of variability analysis may not show a significant change in pre- and post-project conditions. The minimum flow release (20 cfs) is above the extreme minimum flows experienced by the river in its natural pre-dam state in the 1930 drought and similar to low flows in the 1933 drought. However, the full range of the record needs to be examined.

In addition, DEQ's Office of Wetlands and Water Protection is interested in whether the Lake and reactors have significantly changed the Julian date of annual maxima which could affect spring spawning. It is possible that the watershed and wintertime stream flows are large enough that the Lake returns to a full condition each spring, and the Julian date of annual maxima is not changed by the power plants, but the simulation modeling and range of variability analysis should be done to confirm this.

Performance of these statistical studies does not require field work, so they could be initiated immediately, and the results reported in the Draft Environmental Impact Statement ("Draft EIS").

2. In-stream Studies: Usable Habitat as a Function of Flow. DEQ's Office of Wetlands and Water Protection may also recommend further in-stream studies as a supplement to the Draft EIS or as pre-requisite to any permit issuance, depending on confirmation of the concerns expressed above regarding near-perennial low-flow conditions (see "Federal Consistency...," item 2(c), above). This work should characterize weighted usable habitat as a function of flow for the indigenous fishery species in the North Anna River.

DEQ's Office of Wetlands and Water Protection requests the daily output of the simulation models used by Dominion, if it is available in Excel worksheet format, to predict the frequency and duration of the lake drawdown, inflows, evaporation losses, and outflows that were used to develop Tables 5.2.3 and 5.2.4 in the Application.

A statistical analysis of the indicators of hydrologic alteration should be performed, and the results presented in the Draft EIS, according to DEQ's Office of Wetlands and Water Protection.

3. Impact on Recreational Uses of Lake Anna. The Application does not thoroughly address the water-based recreational uses of Lake Anna. While Table 5.2.4. demonstrates the frequency with which the Lake will fall below certain levels (see "Federal Consistency...," item 2(c) and "Advisory Policies...," item 2, above), we do not know the time of year this occurs and what impact it has on lake recreation. This information should be developed for the Draft EIS for the proposed project.

4. Submerged Intake Structure. The Department of Game and Inland Fisheries (DGIF) recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations (see "Federal Consistency...,"item 1(a), above). Results of this analysis should be provided in the Draft EIS for this project.

5. Federal Consistency Certification. Dominion's re-submission of the federal consistency certification may be accomplished separately or, as we would recommend, in conjunction with either the Draft or the Final EIS for this project but would, in any case, be subject to the requirements applicable to consistency certifications for federally licensed projects. These appear in the Federal Consistency Regulations at Title 15, Code of Federal Regulations, Part 930, sub-part D ("Consistency for Activities Requiring a Federal License or Permit," sections 930.50 through 930.66). The new consistency certification should reflect not only further development of the project proposal, but also appropriate additional analysis as detailed in this letter. Questions on consistency may be addressed to this Office (Charles Ellis, telephone 698-4488).

6. Draft Environmental Impact Statement. Although not required to satisfy the Federal Consistency Regulations, for administrative purposes we recommend that the federal consistency certification be submitted at the same time as the Draft EIS. This would allow for concurrent reviews of the two documents, and the information and analysis in the Draft EIS can support the analysis of the consistency certification. If you have questions about the interplay of the Draft EIS and the consistency certification requirement, please feel free to contact me at telephone 698-4325.

Regulatory and Coordination Needs Summary

1. Water Resources Permitting. As indicated previously, the proposed addition of either one or both of the proposed new generating units at the North Anna Power Station will require Virginia Water Protection Permits and, to the extent the land disturbance exceeds one acre, VPDES Stormwater General Permit coverage for construction activities. For water withdrawals requiring Virginia Water Protection Permits, Dominion must apply to DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone 698-4072). Results of the studies requested or recommended in regard to water resources (see "Additional Analysis Needs," items 1 and 2, above) should be submitted to that Office at 629 East Main Street, 9th floor, Richmond, Virginia 23219, Attn: Joseph P. Hassell. Copies of these study results should be submitted to the Department of Game and Inland Fisheries, attn: Gary Martel (Director, Fisheries Division), 4010 West Broad Street, Richmond, Virginia 23230.

For land disturbance involving one acre or more, Dominion should apply to DEQ's Northern Virginia Regional Office (John Bowden, Deputy Regional Director, telephone (703) 583-3880) for coverage under the VPDES Stormwater General Permit for construction activities. Similarly, the issue of impingement and entrainment effects is to be addressed under new regulations implementing section 316(b) of the Clean Water Act; advice on this matter may be obtained from the same Office or from DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone (804) 698-4072).

2. Air Permitting. Questions relating to air quality rules and air permitting, for activities ranging from open burning to operation of concrete batch plants or other fuel-burning equipment, should be addressed to DEQ's Northern Virginia Regional Office (Mr. Terry Darton, Air Permits Manager, telephone (703) 583-3845).

3. Erosion and Sediment Control; Stormwater Management. Questions relating to the fulfillment of the Erosion and Sediment Control Plan and Stormwater Management Plan requirements should be addressed to the Department of Conservation and Recreation's Soil and Water Conservation Division (Lee Hill, telephone 786-3998). Questions on fulfillment of local erosion control requirements should be addressed to Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401).

We hope this information is helpful to you.

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures

cc: Michael P. Murphy, DEQ
Joseph P. Hassell, DEQ-Water
John B. Bowden, DEQ-NVRO
Jeffrey Talbott, DEQ-NVRO
Kotur S. Narasimhan, DEQ-Air
Thomas D. Modena, DEQ-Waste
Gary Martel, DGIF
Keith R. Tignor, VDACS
Derral Jones, DCR
Catherine M. Harold, CBLAD
Gerald P. Wilkes, DMME
Alan D. Weber, VDH
Rochelle Garwood, Thomas Jefferson PDC
David Fisher, Louisa County
C. Lee Hill, DCR-DSWC
Andrew J. Kugler, USNRC
Jud White, Dominion
Tony Banks, Dominion

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JAN 29 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

January 27, 2004

EXHIBIT 3.3-5

Ms. Ellie Irons
Program Manager
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street, 6th Floor
Richmond, VA 23219

Dear Ms. Irons:

I am responding to your November 6, 2003 request for comment on the North Anna Early Site Permit (ESP) Application. Staff members have reviewed pertinent portions of the ESP submitted to the Nuclear Regulatory Commission (NRC) for development of an Environmental Impact Statement to satisfy National Environmental Policy Act (NEPA) requirements.

Fish community impacts to Lake Anna and the North Anna River and public access to Lake Anna are the primary concerns of the Department of Game and Inland Fisheries (DGIF) relating to this proposal. The operation of the two additional nuclear power units (numbers three and four) is expected to result in: (1) water withdrawal increases from the reservoir, (2) water temperature increases in the reservoir, and (3) decreased flows in the North Anna River. These issues and other concerns are discussed below.

Water withdrawal increases to accommodate a third and fourth nuclear unit present biological complications for fish populations through increased fish impingement and entrainment. Annual estimated fish impingement of six "representative important species" with build-out (defined herein as the addition of a third "once-through" and a fourth "cooling tower" unit) is 426,887 fish including 4,441 striped bass, a leading Lake Anna sportfish stocked annually by DGIF. With the proposed intakes, the number of fish impinged would increase by 230% over current levels. Estimated impingement mortality of striped bass would nearly double as the result of build-out; however, the size and age distributions of impinged fish were not provided. The number of fish entrained is expected to increase in a similar fashion with an estimated 468,886,689 fish (from the applicant's six-species category) lost annually – including about 63% gizzard shad. Existing intake criteria at North Anna Power Station (velocity of 0.7 feet per second [FPS] and screen mesh of 9.5 mm) substantially exceed our current recommendations of 0.25 FPS and 1 mm mesh. Even our current recommendations are not expected to provide full resource protection but utilize current state-of-the-art technology. The existing screen would be expected to only exclude compressed fish such as sunfish larger than 50 mm and elongated fish

such as stripers and largemouth bass larger than 86 mm. Thus, it seems appropriate for the applicant to further investigate the addition of a submerged intake structure (curtain wall as detailed on page 3-5-38) to reduce fish impingement and entrainment and align intake criteria with current DGIF recommendations.

Water withdrawal increases are also likely to result in lower lake levels during summer and fall months due to increased power plant demand and evaporation. Lake Anna is an important recreational fishery, and most of the estimated 43,000 anglers annually access the reservoir by boat from one of the many commercial ramps or via the State Park. Pleasure boat traffic greatly exceeds angler traffic, and proposed increased drawdowns could have a deleterious impact on lake access (thereby impacting local economic conditions). For example, during the drought of 2002, the reservoir pool dropped from 250' MSL to 245.1' MSL, and most ramps could not support launches. With the addition of the third unit, the drawdown would have been an additional 2.5'. Estimates from our Wardens are that recreational boating is 10-15 times that of fishing boating. The Early Site Permit review needs to fully analyze impacts and discuss potential mitigation for impacts on recreational boating.

Addition of one to two new units will have significant impacts on downstream resources by reducing flow and the frequency of higher flows. The current minimum release is 40 cubic feet per second (CFS) with 20 CFS during drought periods. Drought releases are triggered when the lake declines to elevation 248' MSL. Current minimum releases are about 10% of mean annual flow and drought releases are about 5% of mean annual flow. It is apparent from the water budget that significant changes in the flow regime have occurred with significant increases in the time flows are under 100 CFS. Preliminary analysis of drought flow frequency indicates that prior to dam construction, flows less than 20 CFS occurred only 4.2% of the time, occur now at 5.3%, and would be expected to increase with one more unit to 11.8%. A fourth unit would increase that occurrence even more, but Unit 4 fails to be addressed in the flow analysis. It is highly unlikely that an outside source of water will be used for unit 4, and its water consumption should be addressed as if water were being withdrawn from the lake (or Unit 4 should not be part of the permitting process). We recommend use of the Index of Hydrologic Analysis to compare pre-lake, current and predicted flow conditions based upon the addition of units three and four. This will quantify the changes in the hydrologic regime.

Changes in the hydrologic regime would be expected to impact the downstream aquatic resource. A common desktop method for flow recommendations is the Tennant method. Resource agency flow recommendations using that method generally are in the range of 20-30% of mean annual flow for the summer and higher levels (60-100% MAF) for the spring spawning period. Recommendations using this method would yield summer flows in the range of 74 to 111 cfs for resource protection. Current minimum releases would be rated in the poor to

degraded range of resource protection. Since this is an over allocated resource, we recommend quantifiable procedures than the Tennant desktop method. An Instream Flow Incremental Methodology study should be conducted for the impacted downstream reaches. Such a study should include evaluation of a habitat time series (pre-project, current and proposed) for native and naturalized species and may result in a recommendations for different flow operating rules than currently exists for the downstream resource.

Water temperature increases predicted to occur as a result of build-out will likely impact fish habitat in Lake Anna and in the North Anna River. Probably the greatest issue is the potential decrease in striped bass habitat within the reservoir. The applicant documented the current situation and available literature concerning the phenomena of striped bass "habitat squeeze" in southeastern reservoirs (the impacts of summer thermal stratification patterns on the habitat needs of adult striped bass) on pages 3-5-55 to 3-5-58. Current conditions (temperature and oxygen stratification patterns) at Lake Anna limit the potential of this fishery but have not resulted in catastrophic fish kills to date. Adult striped bass grow slowly, exhibit reduced fitness (condition) and have low maximum sizes as a result of the marginal habitat conditions now present, but an important recreational fishery within this habitat capacity has developed. However, it is likely that even a small increase in reservoir water temperature would have a dramatic effect – further reducing already limited habitat and perhaps jeopardizing the entire striped bass fishery. The maximum daily surface temperature is expected to increase by 7.2°F near the dam. Currently, the lake frequently does not stratify, and when it does; many times it is a weak stratification. Total temperature differences (top to bottom) in many cases were less than 1°C based on DGIF samples taken during late summer and early fall at lower reservoir sites. Stratification patterns dictate striped bass habitat and are subject to a great deal of variability at Lake Anna – a horizontal and vertical increase in the thermal plume would exacerbate a currently tenuous situation.

Reconfiguring the flow within the WHTF to allow for more efficient cooling (e.g., forcing water to use the entire WHTF by sealing the lower tributary arm between Elk Creek and Millpond Creek and cutting a canal through the headwater areas) would expand the residence time within the WHTF and probably reduce thermal impacts to Lake Anna and the North Anna River. Conflicting information was provided concerning efficiency and water residence time in the WHTF: a figure of 14 days was listed on page 3-2-71, while a figure of seven days was listed on page 3-5-42.

Additional comments concern several inconsistencies in the applicant's report. The proposed fourth unit was addressed repeatedly throughout the document as a "closed-cycle cooling water system" using towers (either wet or dry); however, on page 3-5-45 a reference is made to this unit under "Scenario 3" as a once-through cooling system (e.g., a fourth once-

through unit). This reference is particularly disconcerting since no evaluations of the dramatic increase in water consumption and heat output under this scenario were discussed. In short, it appeared the possibility of a fourth once-through unit was never mentioned either before or after this point, and no review of its environmental impact was made. Frequent references were also made throughout the document to "make-up water" replacing water lost from the cooling processes originating "from an outside source", but these sources were not readily apparent. It seems likely that "outside sources" would likely either be surface or subsurface draws from within the Lake Anna watershed exacerbating the proposed aquatic impacts. A great deal of importance was placed on the Lake Anna water budget, and a key component of this equation was reservoir inflow. This variable was estimated due to an absence of stream gauges and real data, and 370 CFS was presented in Table 5.2-1. This figure was referenced from a model in Section 5.2.2, but no calculations were given with 370 CFS as a derivative. Thus, the figure's origin remains unclear.

Due to the scope and magnitude of aquatic resource impacts anticipated with build-out, it seems prudent to investigate alternatives to the heavily consumptive proposal of another once-through system and a new wet cooling tower.

I hope that this information is helpful as you contemplate license renewal at North Anna Power Station. Please do not hesitate to contact either John Odenkirk (540-899-4169) or John Kauffman (434-296-4731) of my staff if we can be of further assistance.

Sincerely,

Gary Martel
Director, Fisheries Division

cc: J. W. Kauffman
J. S. Odenkirk
D. K. Whitehurst
W. L. Woodfin, Jr.

EXHIBIT 3.3-6

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JAN 15 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

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Fax (804) 698-4500 TDD (804) 698-4021
www.deq.state.va.us

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

Subject: North Anna Early Site Permit Coastal Zone Consistency Determination

To: Ellie Irons

From: Joseph P. Hassell *Joseph P. Hassell*

Copies: Mike Murphy, Larry Lawson, Terry Wagner, Ellen Gilinsky, DEQ; John Davy, DCR; Charlie Sledd, DGIF

Date: January 15, 2004

I. Summary

The Office of Wetlands and Water Protection and the Division of Water Resources have reviewed the Early Site Permit (ESP) Application. We believe that it is premature to concur that the issuance of this ESP would be consistent with Virginia's Coastal Zone Management Program nor does the application currently form an adequate basis for the preparation of an Environmental Impact Statement by the Nuclear Regulatory Commission (NRC). Additional studies on the impacts to instream beneficial uses from consumptive loss of water by one or both reactors would be required to adequately assess the environmental impacts of the project, particularly the impacts to the recreational use of the lake and the impacts to water quality and aquatic life downstream of Lake Anna within the North Anna River.

II. Background

Dominion Power filed an ESP application with the NRC to add two units to the North Anna Power Station. The NRC determines whether or not the site is suitable for constructing new reactors using an ESP. Permits are issued for 10 to 20 years and can be renewed for 20 years. Environmental issues are addressed as part of the ESP, independent of any review of any specific reactor design. The ESP process uses a Plant Parameters Approach, which postulates an envelope of possible reactor designs. Dominion is considering seven different designs. In this application Dominion has postulated a maximum of two reactors of up to 4300 megawatts each of rated thermal capacity. That is an extremely large outside envelope. The two reactors that Dominion formerly proposed but then cancelled each had a rated electrical capacity of 907

megawatts. Dominion postulates that the first new unit would use once through cooling. The second new unit would use a cooling tower. Issues resolved with finality under the ESP (including environmental issues) are not reexamined in any subsequent licensing action by the NRC. The ESP does not approve a particular reactor design nor allows the construction of the reactor. The ESP authorizes construction of all of the items identified in the site redress plan, in this case site clearing, foundations, intake structures and outfall structures. Dominion has requested that NRC issue the permit for 20 years (the maximum) and allow land clearing, stream filling and intake structure construction to proceed under the site redress plan.

III. Unit 4

Unit 4 is included in the ESP application, yet Dominion does not identify a source of water for Unit 4. NRC regulation, 10 CFR 51.29 requires that "information provided to the Commission by an applicant for a license,..., shall be complete and accurate in all material respects". For Early Site Permit Applications NRC regulation 10 CFR 52.17 (v), requires information on "types of cooling system intake and outflows for **each** facility" (emphasis added) Because no water source is identified in the ESP application, it is not possible to form an opinion on the prospects for approval of such a project or whether it would be consistent with State laws and regulations. The logical water source for Unit 4 would be Lake Anna. Groundwater resources are not capable of producing the large quantities of water needed, nor does there appear to be any surface water source nearby other than Lake Anna. The inclusion of Unit 4 should be withdrawn from the application unless its water source(s) and related cumulative impacts are identified. If Dominion leaves Unit 4 in the application, but does not identify a water source, then the NRC should consider denying the application for any site redress work associated with Unit 4

If the source of water for Unit 4 were Lake Anna, the additional heat load and evaporative losses would result in deeper and lengthier drawdown periods on the Lake and longer periods of low instream flows in the North Anna River. Although no analysis of the additional impacts have been provided, given the small watershed with average runoff of only 370 cfs, there is a good probability that the additional cumulative impact of a fourth unit would have an unacceptable impact on Lake Anna and the North Anna River.

IV. Coastal Zone Management Act Consistency

An applicant for a federal Permit or license shall provide in the application a certification that the proposed activity complies with the enforceable policies of the State approved program. The decision by Dominion to seek CZM consistency was appropriate. Although the power plant is located outside of the Coastal Zone proper, operation of the power plant will have a direct effect on the Coastal Zone because it will diminish instream flow on the North Anna River which is suitable anadromous fish habitat.

The Virginia Water Protection Permit is an enforceable part of the Virginia's Coastal Zone Management Program. The State Water Control Board issues Virginia Water Protection Permits

for projects impacting state waters if it has determined that the proposed activity will protect instream beneficial uses. The preservation of instream flows for purposes of the protection of fish and wildlife resources and habitat and recreation values is a beneficial use of Virginia's waters. These uses are present in both Lake Anna and downstream in the North Anna and Pamunkey Rivers. Conditions contained in a Virginia Water Protection Permit may include, but are not limited to, the volume of water which may be withdrawn as a part of the permitted activity. (§62.1 44:15.5 C, Code of Virginia).

The issuance of a permit for an additional unit of the size envisioned would constitute the approval of the single largest consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program. This consumptive withdrawal would be from a water body with an average annual flow of 370 cubic feet per second. The typical recommendation that we receive from the Department of Game and Inland Fisheries is not to allow cumulative consumptive use to exceed 10% of the river's flow. The lake's current evaporation rate and the existing two units already surpass that mark much of the time. Therefore granting of additional withdrawals, even with prescriptive conditions, can not be guaranteed.

For the above reason, the Office of Wetlands and Water Protection recommends that Dominion withdraw their request for Coastal Zone Management Program consistency at least until such time as a draft environmental impact statement is available. If Dominion does not withdraw the request, then we cannot agree with Dominion's certification that the proposed activity is in compliance with the enforceable policies of Virginia Coastal Zone Management Program, due to a lack of information to make that determination. Dominion could definitively resolve the issue by applying for a permit for the proposed withdrawal. VWP Permits for water withdrawals have long durations and are granted for up to a 15-year term.

V. Water Quantity Issues:

For the purpose of this discussion we will assume only one unit is proposed, because as we have noted earlier, the second unit, unit 4, has no identifiable water source.

The addition of Unit 3 will affect water resources by increasing the frequency and duration of drawdown on Lake Anna and increasing the frequency and duration of low flow downstream. According to Table 2.4.6 in the ESP, the amount of time that Lake Anna would drop two feet or more will increase from 5.6 % of the time to 11.6 % of the time. Assuming the modeling is correct and assuming the current minimum low flow release stays the same, this will increase the amount of time that flow in the North Anna below the dam is equal to 20 cfs to 11.6% of the time. Under pre-dam conditions dam (1929-1971), streamflow in the North Anna River below the dam was 20 cfs or less only 4.2 % of the time. That statistic is based on streamflow records from USGS North Anna near Doswell gage adjusted to reflect the smaller drainage area at the dam site.

The State Corporation Commission set the original minimum release for the North Anna dam in 1969. The State Water Control Board proposed 80 cfs. The Attorney General in 1971 opined that because of the language of the Water Power Act §62.1 – 82, the State Corporation Commission was the appropriate authority to set such a release, and that the SWCB itself could not set a higher rate. In response to the drought of 1989-2002 and complaints about low water levels by lake front property owners, legislation was created that required the development of lake level contingency plans in VPDES permits that contained minimum releases for impoundments whose primary purpose was cooling water. This legislation applies only to Dominion and Lake Anna. Thus, the 40 cfs figure that the State Water Control Board did not think was sufficient in 1971 to protect downstream water quality has been cut in half by the lake level contingency plan whenever the lake level falls to 248.0 feet above mean sea level.

A minimum release of 20-cfs equals 5.4 % of the North Anna River's mean annual flow at the dam. Donald Tennant, a U.S. Fish and Wildlife Service fishery biologist, devised a well known rating system based on percentages of mean annual flow. In the Tennant rating system, a streamflow of 0% to 10 % of the mean annual flow is rated as "severe degradation". Unlike natural drought which is temporary, our concern is that with the addition of another unit, which is expected to increase the consumptive loss from the watershed by another 39 cfs, nearly perennial conditions of severe degradation will likely be created each fall. Accordingly we are requesting that Dominion perform additional statistical studies to determine whether these concerns have merit.

A range of variability study should be performed comparing the pre and post project Index of Hydrologic Alterations for the North Anna River immediately below the dam. The following URL address contains a methodology for conducting such a study:

http://www.conserveonline.org/2000/12/a/en/iha_meth.pdf

We are particularly interested in whether or not and to what extent the pre- and post- project conditions are different for the 90-day minima, thereby creating long-term low flow stress conditions. It is quite possible that the range of variability analysis will not show a significant change in pre- and post- project conditions. The minimum flow release (20 cfs) is above the extreme minimum flows experienced by the river in its natural pre-dam state in the 1930 drought and similar to low flows in the 1933 drought. However the full range of the record needs to be examined.

We are interested in whether or not the lake and reactors have significantly changed the Julian date of annual maxima which could impact spring spawning. It is possible that the watershed and winter- time stream flows are large enough that the lake returns to a full condition each and every spring and the Julian date of annual maxima is not changed by the power plants, but the simulation modeling and range of variability analysis should be done to confirm this.

We note that the performance of these statistical studies does not require field work, so they could be initiated immediately and hopefully the results reported in the draft environmental impact statement.

Pending the results of a range of variability study we might recommend further instream work as a supplement to the draft environmental impact statement or prior to the issuance of any permits. If our concerns regarding near perennial chronic low flow conditions are confirmed, we would recommend the performance of instream work to characterize weighted usable habitat as a function of flow for the indigenous fishery species of the North Anna River. We are not requesting these studies at this time but may request them in the future.

If it is available in Excel worksheet format we would appreciate being provided with the daily output of the simulation models used by Dominion to predict the frequency and duration of the lake drawdown, inflows, evaporation losses and outflows that were used to develop Table 5.2.3 and 5.2.4.

Another instream beneficial use that has not been thoroughly addressed by the ESP is how the additional consumptive use will affect the water-based recreational uses of Lake Anna. The most useful information appears in Table 5.2.4, which demonstrates the frequency with which the lake will fall below certain levels. What is not known is what time of year this occurs, presumably predominantly in the fall, and what impact this has on lake-based recreation.

VI. Impingement and Entrainment

A once through cooling process for Unit 3 will result in a significant number of aquatic organisms impinged (240,000) or entrained (148,000,000) annually. Normally, the Virginia Water Protection Permit is used to address this issue. However, in this case, because the intake is for cooling water and will not be built for some time, the impingement and entrainment issue will fall under the new Section 316(b) regulations and be addressed in the facility's VPDES permit. The Office of Water Permits and the Northern Regional Office will be the appropriate contacts. DEQ has had preliminary discussions with NRC and EPA on whether the new units would be treated as an existing intake or a new intake under the new 316(b) regulations. DEQ has not made a decision in this regard

Dominion proposes to first build Unit 3 as a once through cooling facility. Once through cooling represents a greater cost savings over cooling towers but will result in higher impingement and entrainment losses. On the positive side, once through cooling has lower consumptive loss per megawatt of electrical energy produced than the cooling towers because some of the heat in once through cooling is dissipated by processes other than pure evaporation.

Regardless of our ultimate decision on Section 316 (b), the use of a cooling tower may eventually be required, not just to reduce impingement and entrainment, but to keep the thermal conditions in the lake tolerable to aquatic life. DEQ's preference for once through cooling (to

reduce consumptive use) will be balanced against the need to keep thermal conditions acceptable and to limit impingement and entrainment. Therefore, an alternative not considered in the ESP application, namely the construction of a single new reactor using a cooling tower with Lake Anna as it source water, may ultimately prove to be the least environmentally damaging practicable alternative. Such an alternative should be thoroughly explored in the draft EIS.

VII. Comments on Regulatory Authority under the Virginia Water Protection Permit Program

Both the ESP application (Table 1.2.1 Federal State and Local Authorizations) and the request for CZM concurrence attachment which lists the applicable programs fail to correctly characterize the applicability of State laws and regulations related to water withdrawals. Table 1.2.1 claims that the Virginia Water Protection Permit Regulation, 9 VAC 25-210 is only necessary for the "discharge of dredge, fill or pollutants into surface waters"; actually since 2000 a wider range of activities in surface waters have been covered by this program, and in particular the program regulates water withdrawals. Likewise the attachment listing programs for coastal zone management consistency fails to make this connection, saying only that permits under §62.1-44.15.5 are required to excavate in a wetland. The regulatory authority under the Virginia Water Protection Permit Program should be clarified in the application.

VIII. Timing Issues and License Term

Dominion Resources has requested that the NRC issue a permit for a maximum of 20 years. Under the regulation, NRC has the authority to issue a permit for a term of not less than 10 years nor more than 20 years. Due to the lack of abundant water resources in the basin and the possibility that a VWP permit would not be issued, we would recommend that the NRC consider the following possibilities in issuing an ESP:

- Do not issue the ESP until Dominion receives a VWP Permit, or,
- Require that Dominion obtain a VWP Permit prior to conducting any work specified in the site redress plan.

IX. Conclusions and Recommendations

The site is probably not suitable for the construction of two new nuclear reactors of the size proposed due to a lack of sufficient water resources. Two new reactors would remove an additional 78-cfs from a watershed that had an average flow of only 370 cfs even before the lake and the first two reactors were built.

The site may be suitable for the construction of one additional unit, however there is no guarantee that the appropriate permits could be obtained. We would recommend that Dominion Power seek a Virginia Water Protection Permit as early in the process as practicable to resolve water resource issues prior to investing large sums of money in site preparation.

A request for concurrence with Coastal Zone Management Consistency should only be granted to the extent that the determination is given with the caveat that a Virginia Water Protection Permit would have to be obtained for the consistency determination to be valid. Probably the same qualifying statement can be applied to any necessary amendments to the VPDES permit to accommodate the additional thermal load on Lake Anna.

Additional instream flow studies would be needed before the DEQ would grant a permit to remove an additional 39-cfs from the Lake Anna Watershed. A statistical analysis that analyzes the indicators of hydrologic alteration should be performed and the results made available as a part of the preparation of the Draft Environmental Impact Statement.

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ELLIE IRONS
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

RECEIVED
JAN 30 2004
DEQ-Office of Environmental Impact Review

Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

Statements in the project document concerning endangered species were reviewed. The document references consultation with USFWS and DGIF on federal and state listed endangered and threatened species. Databases maintained by these agencies have incomplete records of state protected plant and insect species. Recent changes in regulation of the Virginia Endangered Plant and Insect Species Act would necessitate further review of this project by the Natural Heritage Division of DCR or VDACS.

(signed) (Keith R. Tignor) (date) January 28, 2004

(title) Endangered Species Coordinator

(agency) VDACS, Office of Plant and Pest Service

PROJECT # 03-223F 8/98

February, 2004

MEMORANDUM

TO: Ellie Irons, OCS

FROM: Jeff Talbott, NVRO

COPY: Tom Faha, NVRO

SUBJECT: Early Site Permit Review – Virginia Power – North Anna Facility
VPDES No. VA0052451

Here are the main concerns that are not address in the Joe Hassell's memo. They are:
1) Water level in the cold side of the lake.
2) Water level in the hot side of the lake.
3) Temperatures in the hot and cold side of the lake.
4) Effects on down stream users.

<u>The following are facts listed in the ESP report</u>

Unit 3 will be once-through cooling water system and have the following effects:
- Increase the water temp would effect the both the hot and cold sides of Lake Anna
- The additional uptake of 29 cfs
- During drought conditions, this could result in the operating level of the lake at 245'. Stated in the report that with Unit 3 operational during the drought years of 1981 and 2002 the draw down would have been 1.5 to 2.5 feet greater. The 245' is 3' lower than the target 248' in which the lake contingency plan currently goes into effect. This will have a significant effect on the lake and it's uses.

Unit 4 will be a closed cycle cooling tower system and will have the following effects:
- A further increase in the water temp in both the hot and cold sides.
- The additional uptake of 44 cfs with 9 cfs being discharged back into the lake with a net lost of 35 cfs.
- During drought conditions, this would result in the operating level of the lake at 242'. The 242' is 6' lower than the target 248' in which the lake contingency plan currently goes into effect. This will have a huge effect on the lake and it's uses.

The following is a statement in the report: "the water supply for the lake can support the water supply needs for Unit 3 and 4 on a long-term average basis. On a short-term basis during drought conditions there may be periods when an additional source of water maybe required." There were also statements that this may effect the downstream users.

Irons,Ellie

From: Bowden,John
Sent: Friday, January 30, 2004 10:11 AM
To: Irons,Ellie
Subject: Consistency Certification #03-223F

NVRO comments regarding North Anna Early Site Permit (ESP) sponored by the Nuclear Regulatory Commission are as follows:

1. Wetlands and Water Permitting-NVRO concurs with comments by Joe Hassel, Central Office, and have coordinated this review with him.

2. Water Program Compliance-The project as described will involve land disturbance activities on approximately 200 acres of land located in Louisa County, Virginia, within the existing site of the North Anna Power Station on the south side of Lake Anna. VPDES permit coverage for stormwater discharges associated with construction activity will be required. Observance of state and local erosion and sediment control requirements should minimize short term impacts to surface water quality.

3. Air Program Compliance-The summary of the applicable regulatory framework for the proposed project discusses the attainment status of two areas: Louisa County and the Richmond Metro Statistical Area. NVRO will defer to Central Office on the accuarcy of the non-attainment discussion. While the report acknowledges in the introduction that there are air regulatory issues related to construction (e.g., concrete batch plants), I see no discussion of the issue in detail, nor a commitment to abide by the relevant regulations pertaining to fugitive emissions.

4. Air Program Permitting-In the information package, it was stated that the facility would comply with all air permittinglaws and regulation as they were derived from the Code of Federal Regulation and the Virginia Administrative Code. It went on to state the all appropriate applications would be provided once the design phase had been completed. Based on the information provided on the CD the Early Permitting Project does not require any air pollution control permits at this time.

John D. Bowden
Deputy Regional Director
Department of Environmental Quality
Northern Virginia Regional Office
(703) 583-3880
jdbowden@deq.state.va.us

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JAN 29 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.state.va.us

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

MEMORANDUM

TO: Ellie Irons

FROM: Thomas Modena TDM

DATE: January 29, 2004

COPIES: Kevin Greene

SUBJECT: Coastal Zone Management Consistency Certification
North Anna Power Station Early Site Permit

The Waste Division has reviewed the North Anna Power Station Early Site Permit Coastal Zone Management Consistency Certification, Louisa County. We have the following comments concerning waste issues associated with this project.

The report addressed solid and hazardous waste issues, but did not include a search of waste-related databases. The Central Office of the Waste Division did a cursory review of its data files, and did not find any sites that might impact or be impacted by this project.

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Parts 107, 171.1-172.558.

Finally, pollution prevention was addressed in the report. VDEQ encourages all construction projects and facilities to implement pollution prevention principles, including the

reduction, reuse, and recycling of all solid wastes generated.

If you have any questions or need further information, please let me know.

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
TDD (804) 786-2121

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MEMORANDUM

Date: 2 January 2004

To: Ellie Irons, Virginia Department of Environmental Quality

Derral Jones

From: Derral Jones, Planning Bureau Manager

Subject: DEQ#03-223F: North Anna Early Site Permit (ESP), Nuclear Regulatory Commission

The Department of Conservation and Recreation (DCR) functions to preserve and protect the environment of the Commonwealth of Virginia and advocate the wise use of its scenic, cultural, recreation and natural heritage resources. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, state unique or exemplary natural communities, significant geologic formations and similar features of scientific interest.

DCR has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. According to the information currently in our files, natural heritage resources have not been documented in the project area. This absence of data may indicate that the project area has not been surveyed rather than confirm that the area lacks natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

On page 5, under "Environmental Impacts", it indicates that the project will be undertaken in accordance with best management practices in the Virginia Erosion and Sediment Control

Handbook. The applicant also needs to be aware that utility companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of lines (including essential supporting activities within and outside the easement, such as substations, staging areas, access roads, borrow/spoil areas) must file general erosion and sediment control (ESC) specifications annually with DCR's Division of Soil & Water Conservation (DCR-DSWC) for review and approval in accordance with Section 10.1-563D of the Virginia Erosion and Sediment Control Law (VESCL). All regulated activities must comply with the ESC specifications, whether work is undertaken on company property or an easement (including VDOT right-of way) owned by another party. Construction of company buildings, facilities, and other structures are not regulated at Section 10.1-563D, and therefore, must comply with the requirements of the appropriate local ESC Program. ESC specifications should include, at a minimum, a description of all ESC measures and policies that will be implemented on site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details, symbols, etc.) must be provided that meet the requirements of the 19 Minimum Standards (MS) in Section 4VAC50-30-40 of the Virginia Erosion and Sediment Control Regulations (VESCR) that apply to company activities. Practices in the most current edition of the *Virginia Erosion & Sediment Control Handbook* must serve as minimum design criteria. Variances requests (especially those for MS-16, trench length) must be submitted for approval on a project-specific basis to ensure that site-specific characteristics (soils, topography, adjacent areas) are fully considered.

Company-specific specifications that cover all planned regulated activities for a given calendar year must be approved by DCR-DSWC prior to project initiation. Inquiries and questions regarding ESC specifications should be directed to Mr. C. Lee Hill in DCR's Central Office, at (804) 786-3998. *[Reference: VESCL§10.1-563.D; VESCR §4VAC50-30-30, §4VAC50-30-40]*

If the site is determined to be suitable, the potential exists for visual impacts to the view from across the lake as well as from Route 76, the interstate bicycle route. Designs for the development of the proposed site should make efforts to minimize these visual impacts.

Thank you for the opportunity to comment on this project.

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

TO: Ellie Irons **DEQ - OEIA PROJECT NUMBER:** 03 – 223F

RECEIVED DEC 1 0 2003 DEQ-Office of Environmental Impact Review

PROJECT TYPE: ☐ STATE EA / EIR / FONSI X FEDERAL EA / EIS ☐ SCC

X CONSISTENCY DETERMINATION/CERTIFICATION

PROJECT TITLE: NORTH ANN EARLY SITE PERMIT (ESP)

PROJECT SPONSOR: NUCLEAR REGULATORY COMMISSION

PROJECT LOCATION:
- ☐ OZONE NON ATTAINMENT AREA
- ☐ OZONE MAINTENANCE AREA
- ☐ STATE VOLATILE ORGANIC COMPOUNDS & NITROGEN OXIDES EMISSION CONTROL AREA

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:
- ☐ CONSTRUCTION
- ☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. X **9 VAC 5-40-5600 et seq. – Open Burning**
5. X **9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

Subject to obtaining necessary construction permits as applicable.

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: December 19, 2003

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ELLIE IRONS
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

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Ellie Irons
Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

No comments

(signed) Alan O. Weber (date) 1-27-04

(title)

(agency) VDH

PROJECT # 03-223F 8/98

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

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OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

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Ellie Irons
Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

NO COMMENTS CONCERNING THE VA COASTAL RESOURCES MANAGEMENT PROGRAM

(signed) [illegible] (date) 20 January 2004

(title) GEOLOGIST

(agency) DMME

PROJECT # 03-223F 8/98

Thomas Jefferson
Planning District Commission
Regional planning linking transportation, land use, economy & environment

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Norma Hutner
Grant Tate

Greene County
Jeri Allen, Chair
Philip Arins

Louisa County
William Hale
David B. Morgan, M.D.

Nelson County
Connie Brennan
Fred Boger

Executive Director
Harrison B. Rue

January 22, 2004

Ms. Ellie Irons
Virginia Department of Environmental Quality
Office of Environmental Impact Review
629 East Main St., Sixth Floor
Richmond, VA 23219

Dear Ms. Irons:

The Thomas Jefferson Planning District Commission reviewed project #03-223F, North Anna Early Site Permit, at its regular meeting on January 8, 2004. However, the Commission had no comment on this project. Thank you for the opportunity to review the project.

Sincerely,

Rochelle Garwood
Senior Planner – Environment

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