March 14, 2002

Mr. John P. Wolflin, Supervisor
Chesapeake Bay Field Office
U.S. Fish and Wildlife Service
177 Admiral Cochrane Drive
Annapolis, Maryland 21401

Dear Mr. Wolflin :

In letters dated October 26 and November 15, 2001, you provided comments to the Nuclear Regulatory Commission (NRC) regarding the North Anna and Surry Power Stations, respectively. The letters were in response to our request for comments on the scope of our environmental review of the application by Virginia Electric and Power Company (VEPCo, the licensee) for renewal of the operating licenses for the nuclear plants at these two stations. You also requested copies of some documents to assist you in your review of VEPCo's application. These documents are listed in Enclosure 1. All of the requested documents are provided as enclosures to this letter.

The NRC staff appreciates the efforts of FWS in providing comments on the scope of these reviews. Our responses to the comments are provided in Enclosure 2. We discussed the responses in general terms with David Sutherland of your staff in a telephone call on December 20, 2001. We look forward to working with you as these reviews progress and are adding you to the service lists for documents associated with the North Anna and Surry Power Stations environmental reviews. Through these lists you will receive copies of pertinent NRC documents, including the draft supplemental environmental impact statements (SEISs) when they are issued. The current schedule calls for the draft SEISs for Surry and North Anna Power Stations to be published in April and May 2002, respectively. We are also discussing the possibility of David Sutherland meeting with us at the sites during our review. If you have any questions, please contact Andy Kugler of my staff at (301) 415-2828.

Sincerely,
Original Signed By: CIGrimes
Christopher I. Grimes, Program Director
License Renewal and Environmental Impacts
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-280, 50-281, 50-338, and 50-339

Enclosure: As stated

cc w/encl: see next page

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DISTRIBUTION: See next page for Accession numbers

Environmental r/f	DMatthews/FGillespie	JTappert
CGrimes	AKugler	RPrato
OGC	EHickey (PNNL)	RIDSRGN2MAILCENTER

*See previous concurrence
Document Name:G:\Rgeb\North Anna-Surry\North Anna\Aquatic\NAPS&SPS FWS Resp.wpd

OFFICE	PM:RLEP	SC:RLEP	OGC	C:RLEP
NAME	AKugler*	JTappert*	SBrock*	CGrimes*
DATE	03/14/02	03/14/02	03/14/02	03/14/02

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** Accession nos.:

1. Ltr. to J. Wolfin, w/encl(s) 1, 2: **ML020740498**
   a. Encls 1: Documents Reqested by the US Fish & Wildlife Services for the Review of the Surry & No. Anna License Renewal Applications
   b. Encl 2: NRC Responses to US Fish & Wildlife Service Scoping Comments on the No. Anna License Renewal Applications
2. Pkg. : Comments to the Nuclear Regulatory Commission (NRC) Re: No. Anna and Surry Power Stations: **ML020230063**
   a. Environmental Study of Lake Anna and the Lower No. Anna River, Annual Report for 1988 (Prepared by: Environmental Biology, Environmental Policy & Compliance: **ML020230033**
   b. Surry Power Station, Units 1 and 2 Cooling Water Intake Studies- Environmental Services Dept. VA Electric & Power Co. POB 2666, Richmond, VA.; November, 1980: **ML020230042**
   c. Appendices and Tables: **ML020230056**
   d. File: VP0430 Fish Passage Study No. Anna Hydroelectric Project- Ltr. to: Robert D. Kelsey, US Fish & Wildlife Svc.: **ML020230069**
   e. Ltr. to Richard N. Burton, Exec. Dir. State Water Control Board- w/encl. Final Report on the No. Anna Section (316(a) Demonstration...: **ML020230087**
   f. Ltr. to Richard N. Burton, Exec. Dir. State Water Control Board- w/encl. Final Report on the No. Anna Section (316(a) Demonstration... (pages 167-342): **ML020230092**
   g. Ltr. to Richard N. Burton, Exec. Dir. State Water Control Board- w/encl. Final Report on the No. Anna Section (316(a) Demonstration... (pages 343-App. Page x): **ML020230105**
   h. Environmental Study of Lake Anna and the Lower No. Anna river - Annual Report for 1999- Prepared by Environmental Biology, Envir Policy and... : **ML020230115**

DOCUMENTS REQUESTED BY THE U.S. FISH AND WILDLIFE SERVICE FOR THE REVIEW OF THE SURRY AND NORTH ANNA POWER STATIONS LICENSE RENEWAL APPLICATIONS

NOTE

The parenthetical statements in this list represent clarifications based on a telephone conversation with David Sutherland of FWS on December 6, 2001.

Surry Power Station

3. Most recent fish entrainment and impingement studies (the 316(b) study)
4. Design information on the Ristroph traveling screens (this information exists in the 316(b) study)
5. Reference 3.1-9, a 2001 email from J.E. Olney to J. White[1]

North Anna Power Station

1. VPDES permit
2. Most recent fisheries study[2] (annual report to Virginia Department of Environmental Quality or VDEQ)
3. Waste Heat Treatment Facility study (included in the 316(a) study)
4. North Anna River Ecosystem study (included in the annual report to VDEQ)
5. 316(a) study
6. North Anna dam fish passage studies, 1986-1988
7. Annual reports to VDEQ on water temperatures and fisheries monitoring in Lake Anna and the Lower North Anna River (two most recent reports), with particular interest in August 1983 (recent data is in the annual report to VDEQ, the 1983 data is in the 316(a) study; see Table 3.5-3, Monitoring Station NALST10)

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[1] The licensee has stated that the information in this email is reiterated in an April 4, 2001, letter from Mr. Olney, Virginia Institute of Marine Science, to Mr. Banks, Dominion Generation. The letter is included in Appendix C to the Surry Environmental Report on pages C-34 through C-37. Based on this, the email is not included in this package.

[2] The most recent study issued covers data for the year 1999.

NRC RESPONSES TO U.S. FISH AND WILDLIFE SERVICE SCOPING COMMENTS ON THE SURRY AND NORTH ANNA LICENSE RENEWAL APPLICATIONS

General Response

The NRC staff is in the process of developing environmental impact statements (EISs) for the renewal of the North Anna and Surry Power Stations licenses. Your comments will be considered in our evaluation of the environmental issues. The EISs will be plant-specific supplements to the staff's *Generic Environmental Impact Statement for the License Renewal of Nuclear Power Plants* (GEIS), NUREG-1437. The findings in the GEIS are also codified in 10 CFR Part 51. We have provided a copy of the GEIS to Mr. David Sutherland of the U.S. Fish and Wildlife (FWS) staff.

The GEIS (and its Addendum 1), which went through a public comment process, identifies 92 environmental issues related to license renewal for nuclear plants. It reaches generic conclusions related to environmental impacts for 69 of these issues that apply to all plants or to plants with specific design or site characteristics. The "hard look" at these 69 issues occurred at the time the GEIS was prepared. The NRC staff does not perform detailed plant-specific reviews for these 69 issues (referred to as Category 1) when it develops a supplement to the GEIS. Rather, the staff determines for each of these issues whether there is any new and significant information related to that plant that would affect the finding in the GEIS. If the staff does not find any new and significant information, then it relies on the finding in the GEIS. The staff also determines whether there are any issues not evaluated in the GEIS that must be addressed for the plant. In addition, plant-specific reviews are performed for any of the remaining 23 issues (referred to as Category 2, or in two cases, Uncategorized) that are applicable to a given plant. License renewal applicants are required to address these issues in an environmental report that must be included in their application. The results of the staff review of these issues are included in supplements to the GEIS (SEISs) for each plant reviewed.

Thus, any specific new and significant information provided to the NRC concerning any potential environmental impacts as a consequence of continued operation of North Anna and Surry Power Stations would be considered in the preparation of the associated SEIS.

The Commission has adopted the following statement of purpose and need for license renewal from the GEIS:

> The purpose and need for the proposed action (renewal of an operating license) is to provide an option that allows for power generation capability beyond the term of a current nuclear power plant operating license to meet future system generating needs, as such needs may be determined by State, utility, and, where authorized, Federal (other than NRC) decisionmakers.

The goal of the staff's environmental review, as defined in 10 CFR 51.95(c)(4) and the GEIS, is to determine

"... whether or not the adverse environmental impacts of license renewal are so great that preserving the option of license renewal for energy planning decisionmakers would be unreasonable."

As such, this review is focused on the environmental impacts of the continued operation of the existing nuclear power plants for an additional 20 years. Environmental impacts that occurred in the past (e.g., during construction of the plants) were subject to the requirements existing at that time and are not considered within the scope of our review.

Specific Comments

NOTES

In the discussion that follows, quotes and page numbers included in the FWS comments are from the Dominion/VEPCo environmental report for the associated plant.

We will refer to the licensee as Dominion throughout our responses.

Surry Power Station (SPS)

Entrainment of Adult and Juvenile Fish and Shellfish

FWS Comment: § 3.1, 4.2,& 4.3 The Service is concerned with the impacts to fish and shellfish associated with the structures described in the report. Adverse impacts to aquatic species occur even with the best available technology. Regarding water intakes, the best technology generally minimizes the impacts to adult fish, larger than the bar width or mesh size. Any smaller life stages are provided little protection and are typically drawn into the intake tubes. Impingement of sensitive life stages of small and large fish are also a concern that may need to be mitigated.

NRC staff response: Dominion has conducted a 316(b) demonstration, and is in compliance with CWA requirements. As described in the 316(b) demonstration, Dominion developed a new type of traveling screen at the river (lower) intake structure to further reduce mortality rates among impinged fish. Dominion is required to operate Surry Units 1 and 2 under a National Pollutant Discharge Elimination System (NPDES) permit issued by the Commonwealth of Virginia. Because Surry Units 1 and 2 use a once-through cooling system, entrainment and impingement are treated as Category 2 issues in the NRC staff's environmental review, requiring a plant-specific evaluation. If FWS provides any specific information concerning these two issues, this information will be considered during the preparation of the SEIS.

FWS Comment: § 6.3 The Service believes the unavoidable adverse impacts may be significant and require mitigation. Based on studies conducted in the 1970s, impingement and entrainment impacts were identified. A survival rate of impinged fish was determined to be 94%. While this rate seems acceptable, the study design and entrainment rate are still in question. The Service anticipates recommending an entrainment study during this relicensing period.

The Service requests a copy of the most recent fish entrainment and impingement studies, as well as design information on the Ristroph traveling screen and reference 3.1-9, Olney, J.E. 2001. This information will allow us to better understand any potential environmental impacts.

NRC staff response: The NRC staff is not aware of any information that would indicate that the original study (which was reviewed by various State and Federal agencies, including NRC and FWS) is materially flawed and needs to be repeated. Any system that withdraws water from a river will have entrainment and impingement impacts. The original study concluded that the impacts were not significant. If FWS provides specific information that would indicate otherwise, this information will be considered during the preparation of the SEIS.

A copy of the 316(b) study (the most recent entrainment and impingement study) is enclosed with this letter. The study includes design information for the Ristroph traveling screen. The staff does not have a copy of reference 3.1-9 from the environmental report. However, the staff was informed by the licensee that the information in the subject email is reiterated in an April 4, 2001, letter from Mr. Olney, Virginia Institute of Marine Science, to Mr. Banks, Dominion Generation. The letter is included in Appendix C to the Surry Environmental Report on pages C-34 through C-37.

Threatened or Endangered Species

FWS Comment: § 4.1 The Service commends VEPCo for their description of Federal and State threatened and endangered species, and the company's efforts to initiate informal consultation on these issues. The Bald eagle (*Haliaeetus leucocephalus*) is a federally listed species and the SPS may impact a nest that is approximately one mile away. In addition, SPS is located within an eagle shoreline use area, as reported by the Service's Virginia Field Office. The Service recommends SPS continue their informal consultation.

NRC staff response: The staff acknowledges the comment. The SEIS will address any issues related to threatened and endangered species (a Category 2 issue).

Cumulative Impact Assessment

FWS Comment: § 6.1 & App. A The Service's main goal is the protection and restoration of ecosystems for fish and wildlife and 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. SPS's determination is premature that, "All impacts of the license renewal are small and would not require mitigation." The National Environmental Policy Act calls for past, present, and future environmental impacts to be identified, as well as summarized to determine cumulative effects of the adverse impacts. The Service's responsibilities, as described in the Fish and Wildlife Coordination Act, are to protect and enhance natural resources in cooperation with state agencies. The VEPCO report identifies potential ecosystem impacts, and we do not agree that all impacts of license renewal are small and would not require mitigation. Some mitigation activities are in place and would continue during the term of the license renewal, but additional mitigation, specifically in the areas of fisheries and endangered species, may further protect and enhance these natural resources at the SPS.

NRC staff response: The scope of the current SEIS preparation is to evaluate potential environmental impacts associated with license renewal-related refurbishment (if required) and the continued operation of Surry Units 1 and 2 for an additional 20 years beyond the current license. The staff agrees with the need to avoid, minimize and compensate for any significant adverse impacts associated with the continued operation of Surry Units 1 and 2. In particular, the staff is interested in any specific new and significant information which bears on any of the issues described in the GEIS or to be evaluated in the SEIS that FWS can provide. NRC will evaluate such information during the preparation of the SEIS.

North Anna Power Station (NAPS)

Fisheries Issues

FWS Comment: 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.

NRC staff response: The impacts to fish and aquatic vegetation as a consequence of the construction of the dam and plant facilities occurred at the times of those actions, were addressed at that time in accordance with then-applicable law, and are not within the scope of the SEIS for license renewal. Licensing for the dam and the hydroelectric unit is not within the regulatory authority of the NRC.

Issue #3 (altered current patterns at intake and discharge structures) and # 19 (distribution of aquatic organisms) were evaluated in the GEIS as Category 1 issues (see sections 4.2.1.2.1 and 4.2.2.1.6 of the GEIS). As part of the environmental scoping process, the staff is reviewing available environmental documentation from Dominion and other sources to determine if new and significant information may impact the conclusions made in the GEIS. If FWS provides any specific new and significant information concerning these two issues, such information will be considered during the preparation of the SEIS.

With respect to the North Anna Dam, the staff has concluded that the environmental impacts of the continued operation of the dam and its hydroelectric units are outside the scope of the current proposed action (renewal of the operating licenses for North Anna Units 1 and 2). The staff's conclusion is based on the following:

1. Whether the NRC renews the operating licenses for North Anna Units 1 and 2 or not will have no effect on the dam (i.e., the NRC licensing action does not include the dam)

2. The dam serves purposes in addition to supplying cooling water for North Anna Power Station (e.g., downstream flow control, maintaining lake level for homeowners and recreational users).

Therefore, the staff does not intend to evaluate any impacts associated with the continued operation of the dam in the SEIS. However, in the interest of furthering the NEPA objective of informing, the staff will include information about the environmental impacts of dam operation in

the SEIS. In addition, the staff will contact Dominion, as the owner of the dam, and ensure that they are aware of your concerns.

FWS Comment: 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)."

NRC staff response: This comment is not entirely clear to us. If the question is "what is the reference that Lake Anna has a healthy population of landlocked small shad and herring," then the various annual environmental reports from Dominion, as well as the 316(a) determination, provide the basis for a conclusion. If the question is "what is the reference that large-bodied zooplankton is selectively preyed upon by schooling clupeids," then Brooks and Dodson, 1965, Science 150:28-35, "Predation, Body Size, and Composition of Plankton," provides a basis for the conclusion. In either case, the staff is reviewing the information provided by the licensee and other sources. In addition, the copies of the licensee's fisheries monitoring information we are providing may answer this question.

FWS Comment: 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 [*Dorosoma petenense*]; 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."

NRC staff response: Full pond for Lake Anna was achieved in late 1973. Community changes during the first years of the lake's existence were expected. None of these changes are related to pumping and discharge of heated water at North Anna Power Station because Unit 1 did not achieve commercial operation until 1978. The reduction in abundance of some fish species and the increase in abundance of others during this time are related to the impoundment of Lake Anna. The construction and operation of the dam to create Lake Anna is a separate activity and is not within the scope of the SEIS for relicensing of the nuclear plants, as discussed previously. In addition, the copies of the licensee's fisheries monitoring information we are providing may answer this question.

FWS Comment: 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 [Waste Heat Treatment Facility] in 1994 to control growth of the nuisance submersed aquatic plant hydrilla (*Hydrilla verticillata*).”

NRC staff response: This comment is noted. We agree with your comment that the precise historical range of anadromous species in the York River drainage is not known. If the intent is to indicate that striped bass, walleye, threadfin shad, and blueback herring may be native (as opposed to non-native), the staff can acknowledge this disagreement in the text of the SEIS. However, in its 1973 FES for the continuation of construction and the operation of Units 1 and 2, the AEC staff did not find these species to be present in the North Anna River. In any event, as discussed previously, the staff does not consider the impacts of the construction and continuing operation of the dam to be within the scope of the current proposed action and they will not be evaluated in the SEIS.

FWS Comment: 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.

NRC staff response: As previously stated, the scope of the current review is limited to potential impacts associated with the continued operation of North Anna Units 1 and 2. Impacts associated with the construction of the dam and North Anna Power Station, and the continued operation of the dam, are beyond the scope of the current review. The impacts of lake currents and temperature regimes on the fish community were evaluated as part of the 316(a) demonstration and current conditions are permitted by the Commonwealth of Virginia. In addition, impacts from heat shock as a result of the plants' discharge is evaluated in the SEIS.

FWS Comment: 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).

NRC staff response: As previously stated, the scope of the current review is limited to potential impacts associated with the continued operation of North Anna Units 1 and 2. Impacts associated with the construction of the dam and North Anna Power Station, and the continued operation of the dam are beyond the scope of the current review.

FWS Comment: 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 (Commonwealth of Virginia 2001). 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."

NRC staff response: The staff is not clear about what FWS means by "current and post-restoration fish community" in the above comment. As the citation above indicates, Dominion has conducted a 316(b) demonstration, and has indicated that it is in compliance with CWA requirements. Annual monitoring of the upper trophic level fish community is conducted by Dominion. Significant changes in this community could suggest the need to re-evaluate entrainment and impingement studies. The staff will review these studies as part of its preparation of the SEIS. The staff is particularly interested in any specific information FWS may have concerning these issues.

FWS Comment: 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."

NRC staff response: As FWS notes, Dominion has conducted a 316(b) demonstration, and is in compliance with CWA requirements (Virginia Department of Environmental Quality Permit No. VA0052451, *Authorization to Discharge Under the Virginia Pollutant Discharge Elimination System and the Virginia State Water Control Law*). Annual monitoring of the upper trophic level fish community is conducted by Dominion. Significant changes in this community could suggest the need to re-evaluate entrainment and impingement studies. The staff will review these studies as part of its preparation of the SEIS. The staff is particularly interested in any specific information FWS may have concerning these issues.

<u>Cooling and Auxiliary Water Systems</u>

FWS Comment: 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)."

NRC staff response: Impacts associated with the construction and impoundment of the waste heat treatment facilities and associated canals were considered under previous environmental documentation (1973 FES) and are beyond the scope of the current SEIS. As described in the 316(a) demonstration, the existence of three distinct ecological zones in Lake Anna is associated with the inflow of tributary streams and increasing water depth near the dam. These zones were present during pre-operational as well as post-operational monitoring, and as such, are primarily a consequence of the impoundment of Lake Anna, and are beyond the scope of the SEIS review. The 316(a) demonstration describes the increase in depth of the epilimnion, which appears to be related to the discharge of heated water from the waste heat treatment facility into Lake Anna. In the 316(a) demonstration, Dominion concluded the thermal discharges were not detrimental to the stability of the aquatic community, and North Anna Units 1 and 2 are in compliance with the CWA. Dominion continues to monitor the upper trophic level fish community on an annual basis. These studies will be cited in the SEIS. The GEIS concluded the potential impact of thermal stratification (issue #5), eutrophication (issue #8) and thermal plume barriers to migrating fish (issue #18) to be small (GEIS sections 4.2.1.2.3 and 4.2.2.1.6). The staff is interested in any new and significant information the Service may have concerning these Category 1 issues, and will consider such information in the preparation of the SEIS.

FWS Comment: 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)".

NRC staff response: The 316(a) demonstration describes the thermal effect of North Anna Units 1 and 2 operation on the temperature distribution. However, the 316(a) demonstration concluded this temperature distribution did not have an adverse effect on the Lake Anna aquatic community. In addition, although the thermal contribution of North Anna Units 1 and 2 to Lake Anna corresponds to about 10% of the solar heat that enters the reservoir, the primary reason for the described temperature distribution is associated with water depth, and is thus related to the impoundment of Lake Anna. The upper lake is shallower, with less water volume than the lower lake. The staff is interested in any specific information FWS may have concerning these issues and will consider such information in the preparation of the SEIS.

FWS Comment: 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 88ºF (Table 4-3).

NRC staff response: These data are contained in the 316(a) demonstration, which is enclosed with this letter for FWS review.

FWS Comment: 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."

NRC staff response: North Anna Units 1 and 2 use a once-through cooling system to dissipate heat from the turbine condensers. Cooling water is drawn from Lake Anna and is circulated through condensers. The temperature of the cooling water increases by as much as 18.3 °F as it moves through the condensers. To dissipate heat from the cooling water prior to return to Lake Anna, the heated cooling water is discharged into a 3,400 acre waste heat treatment facility (WHTF). The WHTF is a recognized treatment facility by the Commonwealth of Virginia, the purpose of which is to provide mitigation for the aquatic community against heat shock. The cooling water residence time is approximately 14 days, and more than half of the station's waste heat is dissipated during this time. High-velocity jet discharge into Lake Anna maximizes the mixing of the heated effluent in the Lower Lake, resulting in nearly uniform temperatures across horizontal layers and preventing the formation of a clearly defined thermal plume in the Lower Lake. Discharges from the WHTF are in compliance with the CWA and the station's NPDES permit. The staff will review information related to this issue, including the existing mitigation, as it prepares the SEIS. The staff is interested in any specific information that FWS may have related to this issue, and will consider such information in the preparation of the SEIS.

Threatened or Endangered Species

FWS Comment: Page 2-16 The Service commends VEPCo for their description of Federal and State 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)."

NRC response: The staff acknowledges the comment, and will include information on Federal and State threatened and endangered species in the SEIS.

FWS Comment: 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."

AND

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)."

NRC staff response to comments from page 2-17 and 2-18: The staff has completed a preliminary assessment and agrees with Dominion that the North Anna Power Station FES is in error. *Notropis atherinoides* is not known in the York River drainage and is easily confused with *Notropis amoenus*. The staff will ensure that the information on the emerald shiner and the various protected mussel species are discussed in the SEIS. The staff would appreciate any specific information from FWS on the potential for these species to occur at or near North Anna Power Station.

Cumulative Impact Assessment

FWS Comment: 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."

NRC staff response: The scope of the current SEIS preparation is to evaluate potential environmental impacts associated with the continued operation of North Anna Units 1 and 2 for an additional 20 years beyond the current license. Impacts associated with the construction of the dam and North Anna Power Station, and the continued operation of the dam are beyond the scope of the current review. The staff agrees with the need to avoid, minimize and compensate for any significant adverse impacts associated with the continued operation of North Anna Units 1 and 2. In particular, the staff is interested in any specific information which bears on any of

the issues described in the GEIS or to be evaluated in the SEIS that FWS can provide. NRC will evaluate such information during the preparation of the SEIS.

Mitigation

FWS Comment: 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 [environmental] 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)."

NRC staff response: During the course of the SEIS preparation, the NRC will consider mitigation measures when there is specific information that confirms the potential for impacts associated with the continued operation of North Anna Units 1 and 2. If continued operation for an additional 20 years is considered as a whole to have significant effects, all of the specific effects on the environment (whether or not "significant") will be considered and mitigation measures will be developed where feasible. Relevant, reasonable mitigation measures that could improve the project will be identified. To ensure that environmental impacts of continued operation are fairly assessed, the probability of the mitigation measures being implemented will also be discussed. Based on its preliminary assessment (i.e., 316(b) study, licensee evaluation, NRC preliminary review), the staff expects that the measures in place at North Anna Units 1 and 2 (e.g., intake screens and the waste heat treatment facility) provide sufficient mitigation for impacts to the aquatic environment and no new mitigation measures will be needed. If FWS has any specific new or significant information which bears on any of the issues described in the GEIS or to be evaluated in the SEIS the staff will evaluate this information during the preparation of the SEIS.

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