

February 6, 2009

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
SOUTHERN NUCLEAR OPERATING CO. ) Docket No. 52-011-ESP  
 )  
(Early Site Permit for Vogtle ESP Site) )

NRC STAFF REBUTTAL STATEMENT OF POSITION  
ON JOINT INTERVENORS' CONTENTIONS EC 1.2, EC 1.3, and EC 6.0

Pursuant to 10 CFR § 2.1207(a)(2) and the Licensing Board's Memorandum and Order (Revised General Schedule) (November 13, 2008), the U.S. Nuclear Regulatory Commission ("NRC") staff ("Staff") submits its rebuttal written statement of position with written testimony, supporting affidavits, and exhibits<sup>1</sup> in response to the Joint Intervenors' direct testimony and direct statement of position.<sup>2</sup> For the reasons discussed below and in the testimony filed herewith, the Staff continues to submit that the contentions are without merit and that the Staff's environmental review, as documented in NUREG-1872, "Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site," August 2008 ("FEIS"), complies with the requirements of the National Environmental Policy Act ("NEPA").

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<sup>1</sup> In addition to the five additional exhibits that the Staff is submitting with its rebuttal testimony, the Staff is submitting an updated version of NRC000035. For the purpose of its rebuttal testimony, the Staff is referencing pages of that source that it did not reference in its prefiled direct testimony and that were therefore not included in the exhibit as initially filed. On the re-filed exhibit, the Staff has indicated that this exhibit has been refiled on this date. The additional exhibits and the update to NRC000035 have been added to the Staff's exhibit list, a copy of which is attached.

<sup>2</sup> Joint Intervenors include the Center for a Sustainable Coast, Savannah Riverkeeper, Southern Alliance for Clean Energy, Atlanta Women's Action for New Directions, and Blue Ridge Environmental Defense League.

## BACKGROUND

In accordance with the Licensing Board's November 13, 2008, scheduling Order, the Joint Intervenors, Southern Nuclear Operating Co. ("Applicant" or "Southern") and the Staff each submitted prefiled direct testimony and exhibits on January 9, 2009.<sup>3</sup> The Applicant and Staff filed motions *in limine* to strike portions of the Joint Intervenors' direct testimony on January 14, 2009. The Joint Intervenors responded to these requests on January 21, 2009, and the Board issued its ruling granting the Applicant and Staff's Motion on January 23, 2009.

## DISCUSSION

### I. Legal Requirements

All three contentions at issue in this case arise under the National Environmental Policy Act ("NEPA"), and the NRC's regulations that implement that statute. 43 USC §§ 4321 *et seq*; 10 C.F.R. Part 51. Under NEPA, the NRC is required to take a "hard look" at the environmental impacts of a proposed action, as well as reasonable alternatives to that action. See *Louisiana Energy Servs., L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 87-88 (1998). This "hard look" is tempered by a "rule of reason" that requires agencies to address only impacts that are reasonably foreseeable – not remote and speculative. See, e.g., *Long Island Lighting Co.* (Shoreham Nuclear Power Station, Unit 1), ALAB-156, 6 AEC 831, 836 (1973).

In determining what impacts an agency must consider in an environmental analysis, the Supreme Court has held that NEPA does not call for a "worst-case" inquiry, a standard the Commission has emphasized. *Private Fuel Storage* (Independent Spent Fuel Storage Facility), CLI-02-25, 56 NRC 340, 352 (2002) ("PFS"), *citing Robertson v. Methow Valley Citizens*

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<sup>3</sup> A more thorough recitation of the background of this case is set forth in the Staff's Initial Statement of Position.

*Council*, 490 U.S. 332, 354 (1989). Focusing on a worst-case analysis “simply creates a distorted picture of a project’s impacts and wastes agency resources.” *PFS*, CLI-02-25, 56 NRC at 352. In contrast, focusing the EIS on reasonably foreseeable impacts “will generate information of greatest concern to the public and of greatest relevance to the agency’s decision, rather than distorting the decisionmaking process by overemphasizing highly speculative harms.” *Id.*, quoting *Robertson*, 490 U.S. at 356. In its environmental analysis, therefore, it is appropriate for the Staff to focus on conditions that can reasonably be expected, rather than on highly unlikely scenarios.

II. The Inadequacies Asserted by the Joint Intervenors’ Contentions Lack Merit.

In its initial statement of position and prefiled direct testimony, the Staff demonstrated that its review in the FEIS complied with NEPA and with Commission regulations. In its prefiled rebuttal testimony,<sup>4</sup> the Staff demonstrates why various challenges raised by the Joint Intervenors in their prefiled direct testimony lack merit. In particular, the Staff explains why many of the assertions made by the Joint Intervenors amount to claims that the Staff should have evaluated worst-case conditions in its environmental review. Such claims are inconsistent with the aforementioned principle that NEPA does not require worst-case analysis, a standard confirmed by Supreme Court and Commission precedent. The Staff’s rebuttal testimony provides additional support for the Staff’s position that all three contentions should be denied.

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<sup>4</sup> See “NRC Staff Rebuttal Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2” (“Staff EC 1.2 Rebuttal Testimony”); “NRC Staff Rebuttal Testimony of Lance W. Vail Concerning Environmental Contention EC 1.3” (“Staff EC 1.3 Rebuttal Testimony”); and “NRC Staff Rebuttal Testimony of Anne R. Kuntzleman Concerning Environmental Contention EC 6.0” (“Staff EC 6.0 Rebuttal Testimony”).

A. Contention EC 1.2

As explained below, none of the arguments in the Joint Intervenors' direct testimony would change the conclusions stated in the FEIS and described in the Staff's direct testimony. Thus, the Staff's rebuttal testimony continues to demonstrate that the Board should deny Contention EC 1.2.

One response contained in the Joint Intervenors' direct testimony did lead the Staff to revisit an input to its cumulative impacts analysis described in the FEIS and in its direct testimony. With respect to the water withdrawal values the Staff used for "normal" withdrawals from the existing Units 1 and 2, the Staff compared its figures with those used in the Final Supplemental Environmental Impact Statement ("FSEIS") issued in connection with Southern's application for renewal of the Units 1 and 2 licenses. Staff EC 1.2 Rebuttal Testimony at A4; Exhibit JTI000022 at 4-13, 4-14. The Staff determined that the higher FSEIS value was a more appropriate input and that the Staff should therefore have used that withdrawal rate for Units 1 and 2 when determining cumulative impacts. Staff EC 1.2 Rebuttal Testimony at A4; Exhibit NRC000051. In making that determination, however, the Staff does not agree with the Joint Intervenors' assertion that using even higher withdrawal values for Units 1 and 2, such as the maximum daily recorded withdrawal (136 cubic feet per second (cfs)), would be an appropriate basis for a cumulative impacts analysis. Staff EC 1.2 Rebuttal Testimony at A4. The Staff also determined that the consumptive use rates used for Units 1 and 2 in the cumulative impacts analysis would not change as a result of this revision. *Id.*

In its rebuttal testimony, the Staff has described the revised cumulative water withdrawal values and specified how they would alter the water withdrawal rates and percentages in the context of combined withdrawals of all four Vogtle Units. *Id.* at A6; Exhibit NRC000052. However, the Staff concluded that the increases in cumulative water withdrawals associated with these corrected values are small in comparison to the Savannah River flows, and that they

therefore do not affect the cumulative impact conclusions made in the FEIS and supported in the Staff's direct testimony. Staff EC 1.2 Rebuttal Testimony at A4, A6. Accordingly, the inconsistencies alleged by the Joint Intervenors regarding the Staff's water use calculations do not demonstrate any material inadequacy in the Staff's analysis. Furthermore, as explained below, while the Staff has revised its analysis in response to this specific concern, other key assertions by the Joint Intervenors are either without support or have been addressed by the Staff's direct testimony.

1. Description of Aquatic Species and Habitat.

The testimony of Dr. Shawn P. Young<sup>5</sup> concerning EC 1.2 asserts that the FEIS contains insufficient data to analyze impacts on fish species on the Savannah River (Young EC 1.2 Testimony at A12), but this claim is without merit. As the Staff discussed in its direct testimony, the FEIS followed the guidance in ESRP Sections 2.4.2 and 5.3.1.2, presented adequate site-specific information in the FEIS, and used appropriate sources of information to determine impacts to the aquatic biota of the Savannah River. Staff EC 1.2 Rebuttal Testimony at A7.

Similarly, the Staff rebuts Dr. Young's assertion that the Staff must articulate the cause of population decline of certain species of fish in order to accurately evaluate impacts. Young EC 1.2 Testimony at A12. First, the Staff does in fact describe the causes of population decline of several species in the FEIS, and while Dr. Young refers to "other fish species," he does not specify those species or identify what factors he believes should be considered in assessing them. Staff EC 1.2 Rebuttal Testimony at A8. The Staff followed the guidance in ESRP

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<sup>5</sup> "Revised Pre-Filed Direct Testimony of Shawn P. Young in Support of EC 1.2" (Feb. 2, 2009) ("Young EC 1.2 Testimony").

Section 2.4.2 by identifying and discussing in detail those species meeting the definition of “important.” *Id.*

Dr. Young challenges studies of the Academy of Natural Sciences of Philadelphia (“ANSP”) as “not an adequate indicator” of impacts on fish species and argues that the Staff should not have relied on them to substantiate its impact conclusions. Young EC 1.2 Testimony at A13. As the Staff explains, however, the Staff used the ANSP studies to provide an understanding of the river ecology and the fish and molluscs present in the vicinity of the VEGP site, as well as to demonstrate that the Savannah River has been studied extensively upstream and downstream of the VEGP site and at different seasons throughout the year. Staff EC 1.2 Rebuttal Testimony at A9. The ANSP studies were only one of several sources used by the Staff in its analysis, and the Staff did not rely on the ANSP studies as the source for life history information, migration timing or population numbers; the FEIS clearly references the other studies used for this information. *Id.* Thus Dr. Young’s testimony inaccurately characterizes both the content of the ANSP studies and how the Staff considered these studies in the FEIS. *Id.*

## 2. Analysis of Impacts from Intake Structure.

Dr. Young argues that data for early life history of fish that pass by VEGP as part of the community of drift is of “paramount importance when analyzing entrainment.” Young EC 1.2 Testimony at A14. However, the Staff’s analysis used a conservative assumption that fish eggs and larvae have no independent mobility, and that if they enter the hydraulic zone of influence they will be entrained and will suffer mortality. Staff EC 1.2 Rebuttal Testimony at A10. The Staff discussed the factors considered in its entrainment analysis in its direct testimony, and demonstrated that there are several factors that are in most cases more important than the capacity for avoidance of entrainment in the overall assessment of entrainment impacts. *Id.*

Dr. Young further argues that species and life stages of certain fish cannot endure an intake velocity of 1 ft/sec. Young EC 1.2 Testimony at A15. The Staff agrees that at least some individual organisms, particularly those in early developmental stages (egg, larvae, and post-larvae, and in some cases juvenile fish), and including those from species identified as “important species,” will not be able to overcome the through-screen intake velocity and will be entrained and lost from the fishery. Staff EC 1.2 Rebuttal Testimony at A11. However, the Staff provides several reasons why those concerns are already accounted for in the FEIS analysis, and why at a population level such entrainment losses would only have a SMALL impact on the species. *Id.* The Staff’s conclusions in this respect have been supported by the results of the Applicant’s entrainment study conducted during 2008. *Id.*

The Staff also rebuts Dr. Young’s assertion that it is unreasonable to assume a uniformly distributed drift community. Young EC 1.2 Testimony at A17. While the Staff does not disagree with the results of sampling studies cited by the Intervenors, the Staff discussed in its direct testimony why assuming a uniform drift community is consistent with Staff guidance and is a conservative approach to assessing entrainment impacts. Staff EC 1.2 Rebuttal Testimony at A12; Staff EC 1.2 Direct Testimony at A28. The Staff believes the uniform distribution assumption is conservative with respect to impacts at the Vogtle site in particular primarily due to the design of the intake structure, which preferentially removes water from the middle of the water column where the density of drift organisms is generally lower than near the surface or bottom. Staff EC 1.2 Rebuttal Testimony at A12. Further, the Staff’s assumption that entrainment is generally proportional to the percentage of river flow withdrawn is both intuitive and confirmed by the statement of considerations to the EPA’s Final Rule instituting Regulations Addressing Cooling Water Intake Structures for New Facilities. *Id.* In any event, although the Staff’s consideration of water withdrawals assumes proportional entrainment, the percentage withdrawn was not the only relevant consideration in reaching impact conclusions. *Id.*

The Staff also rebuts Dr. Young's assertion that the FEIS failed to provide sufficient baseline data and did not take into account Paller's 1995 study of the horizontal distribution of American shad eggs in the drift near VEGP. Young EC 1.2 Testimony at A18. The FEIS provided appropriate information to develop a baseline, and it included information specific to American shad populations. Staff EC 1.2 Rebuttal Testimony at A13. The Paller study is not an appropriate set of data to extrapolate specifically to ichthyoplankton entrainment at the location of the proposed VEGP site because of its distance from the proposed VEGP site, and the differences in habitat and current at the two locations. *Id.* Factors including the smaller water withdrawal rates at VEGP (compared to plants with once-through cooling) and the amount of available information made it unnecessary to perform additional site-specific studies. *Id.* Similarly, Dr. Young's criticism of the Staff's consideration of data regarding fish productivity in oxbows in the river is misplaced. The Staff was merely pointing out in the FEIS that American shad are more prevalent in the river as opposed to oxbows, but that there were higher larval densities for other fish in oxbows. *Id.* at A14. The Staff did not use this observation as a determining factor for the impact of the proposed VEGP units on the environment. *Id.* Instead, the Staff viewed the location of the cooling water intake structure as one of many factors that went into the Staff's conclusion that entrainment impacts would be SMALL. *Id.*

Dr. Young also states that ichthyoplankton-net collection is the "most effective method to determine current ichthyoplankton species composition, distribution, and vulnerability to entrainment in the vicinity of the VEGP site[.]" Young EC 1.2 Testimony at A19. The Staff agrees that that under most situations, the use of ichthyoplankton nets is an effective method of collecting the early life stages of most fish species. Staff EC 1.2 Rebuttal Testimony at A15. However, in light of other considerations in its analysis of impacts at the Vogtle site, the Staff determined that already-available information provides a reasonable understanding of the indigenous biota in the Savannah River. *Id.* In any event, subsequent to the Staff's analysis,

the applicant did conduct an ichthyoplankton sampling program, employing the sampling gear identified by Dr. Young as being appropriate. *Id.* The results of the Applicant's study are consistent with the Staff's impact conclusions. *Id.*

Dr. Young also criticizes the Applicant's hydraulic zone of influence study at Units 1 and 2, asserting that the study was conducted while the existing units were operating at only 56% capacity and during a limited range of flows. Young EC 1.2 Testimony at A23. The Staff acknowledges that changing the pumping rate and the river flow rates would affect the hydraulic zone of influence in the Savannah River. Staff EC 1.2 Rebuttal Testimony at A16. However, the hydraulic zone of influence study was conducted when the intake withdrawal rate was 110 cfs, which is a conservative number relative to both the maximum observed average monthly withdrawal rate in 2006 (104 cfs) and the typical daily withdrawal rate (98 cfs). *Id.* Because of the likely infrequency and temporary nature of withdrawals at the maximum pumping rate, it is the normal withdrawal rate that is important in assessing the hydraulic zone of influence. *Id.* Conducting the study at a time when withdrawals were even higher would not result in a more reasonable and realistic assessment of impact. *Id.*

In the applicant's study, the area of hydraulic influence at a withdrawal rate of 110 cfs and a river flow of 4,482 cfs was determined to be 0.14 acres in the Savannah River and extended about one-sixth of the way across the river in the vicinity of the VEGP site. *Id.* Although lower flows would result in an increase in the hydraulic zone of influence, the Staff's opinion is that the resulting increase in the hydraulic zone of influence would not extend all the way across the river, and also would be less likely to occur in the spring and early summer during the spawning season when flows in the river have been historically higher. *Id.* Therefore, the Staff believes that this information provides additional support for its conclusions in the FEIS, because it demonstrates that only a fraction of the Savannah River is influenced by

the kinds of water withdrawals associated with the closed-cycle cooling system for Units 1 and 2. *Id.*

Dr. Young's assertion that the FEIS lacks sufficient data and analysis to support the conclusion that fish and shellfish are adapted to survival in varying flow regimes and velocities is also misplaced. Young EC 1.2 Testimony at A20. The Staff reiterates its view that fish found in southeastern rivers that drain to the Atlantic are preadapted to tolerate large variations in flow, as evidenced by the persistence of fish despite the historic fluctuations in flow on the Savannah River. Staff EC 1.2 Rebuttal Testimony at A17. Dr. Young asserts that, while fish and shellfish can adapt to natural variability, "human-induced variability produces different results," (Young EC 1.2 Testimony at A20) but the exhibits he cites in support of this proposition do not address impacts related to impingement, entrainment or thermal effects due to water withdrawals or discharges. Staff EC 1.2 Rebuttal Testimony at A17. Accordingly, they provide no support for his assertion that these species will be more affected by man-made variations in flow versus natural variations in flow. *Id.* Indeed, flow variation in rivers and streams draining the Atlantic coast is considered necessary and important to maintain a healthy riverine fishery; periodic planned releases to benefit downstream biota by resource agencies have been instituted in a number of river basins. *Id.* Further, any variation in flow attributable to the proposed new Vogtle units would be minor compared to upstream releases from Thurmond Dam and compared to natural variations in flow between the dam and the VEGP site. *Id.*

3. Flow Considerations and Water Withdrawals.

In his discussion of the flows considered by the Staff, Dr. Young makes several incorrect assertions. First, Dr. Young asserts that the Staff only considered flows of 8830 cfs, 4200 cfs, 4000 cfs, and 3800 cfs. Young EC 1.2 Testimony at A24. The FEIS, however, considered not only the flows delineated by Dr. Young, but also the very-low flows of 3000 cfs and 2000 cfs. Staff EC 1.2 Rebuttal Testimony at A18. Second, Dr. Young asserts that the area is currently

experiencing extreme drought conditions – below Drought Level 3 – “not contemplated” by the FEIS. Young EC 1.2 Testimony at A24. However, the FEIS did evaluate flows lower than Drought Level 3 flows (3800 cfs); it considered very-low flows of 3000 cfs and 2000 cfs. Staff EC 1.2 Rebuttal Testimony at A19. Third, Dr. Young states that the FEIS lacks sufficient analysis of entrainment and impingement during low flows. The FEIS considered impingement and entrainment at the very-low flows of 3000 cfs and 2000 cfs. Staff EC 1.2 Rebuttal Testimony at A21.

With respect to consideration of flows, the testimony of Barry W. Sulkin<sup>6</sup> concerning EC 1.2 asserts that “actual Savannah River discharge has consistently been below 3,800 cfs since November 2007” and he characterizes “current flow” as 3100 cfs. Sulkin EC 1.2 Testimony at A14. While Mr. Sulkin appears to be referring to flows at Thurmond Dam, the Staff reiterates that while the Staff used Thurmond Dam releases in the FEIS as a method of estimating flows at the site, tributaries and groundwater do contribute to the Savannah River between Thurmond Dam and VEGP site. Staff EC 1.2 Rebuttal Testimony at A20. The FEIS analysis using a streamflow of 3800 cfs for low flow conditions is appropriate and thereby provides conservative estimates of what fractional withdrawals and consumptive use of the Savannah River flows will be at the VEGP site. *Id.* In any event, as explained previously, the flows under the current drought conditions would be bounded by the flows of 3000 cfs and 2000 cfs analyzed in the FEIS. *Id.*

Mr. Sulkin calculates withdrawal percentages based on a flow of 957 cfs, which he defines as “Drought Level 4, the hypothetical unimpaired minimum flow if there were no dams or

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<sup>6</sup> “Revised Prefiled Direct Testimony of Barry W. Sulkin in Support of EC 1.2” (Feb. 2, 2009) (“Sulkin EC 1.2 Testimony”).

reservoirs[.]” Sulkin EC 1.2 Testimony at A15. However, such extreme conditions are considered as part of the safety analysis for the site, but not as a representative scenario for an environmental analysis. Staff EC 1.2 Rebuttal Testimony at A22. Such extreme design bases for safety reviews are not appropriate for a NEPA review. *Id.* Mr. Sulkin also argues that the Staff consideration of withdrawal percentages “does not capture the time dimension – the frequency of extremely low flows and their duration.” Sulkin EC 1.2 Testimony at A25. While droughts may exist over extended periods of time, the Staff still does not believe that flows of 3000 cfs and 2000 cfs are representative of anticipated drought conditions, whereas 3800 cfs is a better representation of such conditions. Staff EC 1.2 Rebuttal Testimony at A24. The streamflow values used in the FEIS assumed releases at Thurmond Dam, but flows are likely to be higher at the VEGP site as a result of runoff between Thurmond Dam and the VEGP site and, therefore, withdrawals from the proposed Vogtle units would result in even smaller impacts than those analyzed for 3800 cfs. *Id.* The Staff thus did not consider it necessary to elaborate on the expected frequency of flow departures from this conservative condition. *Id.*

In his direct testimony, Mr. Sulkin alleges that the Staff relied on a 5% “threshold of significance” for water withdrawals and he asserts that “there is no scientific or regulatory basis for setting the threshold of significance for withdrawals at 5% of the total flow.” Sulkin EC 1.2 Testimony at A11. However, while the Staff did consider the proportional flow requirements of the EPA’s Phase I regulations (including the 5% limit in 40 CFR § 125.84(b)(3)(i)), the Staff did not use them as a “threshold of significance” for its analysis. Staff EC 1.2 Rebuttal Testimony at A26, A28. Instead, the Staff’s conclusions regarding impingement and entrainment are based on several factors, only one of which is the percentage of water withdrawn. Staff EC 1.2 Rebuttal Testimony at A26. The Staff did not rely on a “threshold of significance” in making its conclusions that the impact of impingement and entrainment from the operation of VEGP Units 3 and 4 on the Savannah River fishery would be SMALL. *Id.*

Mr. Sulkin also states that with respect to the 5 percent proportional withdrawal requirement, the Staff failed to assess the condition in which 1) all four reactors are operating in their maximum capacity mode and 2) one or more of the reactors is operating in the maximum water withdrawal mode while the remainder are in normal mode. Sulkin EC 1.2 Testimony at A21. The Staff acknowledges that there could be periods in which one or more units are withdrawing at or near their maximum rates; however, such conditions would be infrequent and of short duration. Staff EC 1.2 Rebuttal Testimony at A29. Nevertheless, as noted above, the Staff has reconsidered the withdrawal rates for Units 1 and 2 for its cumulative impacts analysis and found that using higher withdrawal rates for Units 1 and 2 (104 cfs) in its assessment of cumulative impact would be more appropriate. *Id.* The Staff evaluated that change in the Units 1 and 2 withdrawal value and, because it resulted in only a small change in the total percentage of water withdrawn, concluded that the change was not significant for its impact conclusions. *Id.*

Mr. Sulkin asserts that “short term maximum withdrawal conditions can result in significant cumulative impacts on water resources and aquatic species.” Sulkin EC 1.2 Testimony at A21. However, he offers no explanation for this assertion. Staff EC 1.2 Rebuttal Testimony at A30. While the Staff acknowledges that increasing the withdrawal rate for one or more units could result in some increased mortality to aquatic organisms, such maximum withdrawals would be infrequent and would be of short duration. *Id.* Accordingly, such transient conditions will have no lasting effect on aquatic populations. *Id.*

#### 4. Thermal Impacts.

Dr. Young states that reduced river flow “places more of the drift community at danger of thermal impacts due to river channel confinement,” and that low flow reduces “the ability for the heat to be dissipated across time and space.” Young EC 1.2 Testimony at A26. However, the Staff’s analysis in the FEIS accounts for these considerations. Staff EC 1.2 Rebuttal Testimony at A31. The Staff found that even at flows as low as 2000 cfs, the extent of the plume relative to

the width of the river would be small. *Id.* Further, any low flow conditions would be offset by the fact that they are most unlikely to occur during spawning period and would be of only temporary duration. *Id.*

The Staff disagrees with Dr. Young's statement that the FEIS should consider "all river conditions" as opposed to "conservative river conditions." Young EC 1.2 Testimony at A27. It is not necessary to consider "all possible" river conditions when evaluating thermal stress at the VEGP site, particularly when the Staff's initial analysis, developed with conservative inputs, resulted in a thermal plume with a very small areal extent. Staff EC 1.2 Rebuttal Testimony at A32. To the extent Dr. Young is advocating even more conservative conditions, NEPA does not require analyzing the worst-case scenario, *PFS*, CLI-02-25, 56 NRC at 352. In any event, the Staff considered thermal impacts even under very-low flows of 2000 cfs and found that even at these low rates the impacts to aquatic biota would be minor. Staff EC 1.2 Rebuttal Testimony at A32.

The Staff also disagrees with Dr. Young's assertion that the FEIS does not provide sufficient data and analysis of thermal stress and mortality for fish species in the Savannah River. Young EC 1.2 Testimony at A27. The Staff followed the guidance in ESRP Section 5.3.2.2 for its analysis of thermal impacts to fish. Staff EC 1.2 Rebuttal Testimony at A33. Using this guidance, the Staff found that the areal extent of the thermal plume would be so small and the transit time through the plume would be so short, fish populations would remain stable even if some eggs and larvae would be affected by the plume. *Id.* Consequently, the Staff determined that a review of additional thermal tolerance and mortality data was not necessary. *Id.* For these same reasons, it was not necessary for the Staff to analyze the impacts to ichthyoplankton drift in the vicinity of the thermal plume in more detail. Staff EC 1.2 Rebuttal Testimony at A34.

5. EC 1.2 Conclusion.

In each of the subject areas described above, the Staff's rebuttal testimony supports the Staff's position that Board should deny Contention EC 1.2.

B. Contention EC 1.3

The Staff's direct testimony has explained why the Staff's analysis of dry-cooling in the FEIS was sufficient. In their Statement of Position, the Joint Intervenors argue that the Staff's analysis is inadequate because it does not meet the "requirements" in Regulatory Guide 4.2. Joint Intervenors' Statement of Position at 16-17. Regulatory guides, however, "serve as guidance and do not prescribe requirements. They are not binding authority." See e.g., *USEC, Inc. (American Centrifuge Plant)*, LBP-07-6, 65 NRC 429, 440 fn. 31 (2007) citing *Curators of the University of Missouri (TRUMP-S Project)*, CLI-95-1, 41 NRC 71, 98 (1995). Consequently, there is no "requirement" that the Staff comply with Regulatory Guide 4.2. In any event, by following the guidance in ESRP Section 9.4.2, the Staff has confirmed that the Applicant's Environmental Report was consistent with the guidance in Regulatory Guide 4.2. Staff EC 1.3 Rebuttal Testimony at A3.

In his direct testimony, William Powers<sup>7</sup> criticizes the Staff for following the EPA's § 316(b) regulation, and he challenges the basis for that regulation. Powers EC 1.3 Testimony at A25. The Staff cannot analyze Mr. Powers' claims in depth, however, because he pointed to no factual support for his assertions. Staff EC 1.3 Rebuttal Testimony at A4. Further, the Joint Intervenors do not specify what authority the NRC has to reconsider the regulations of another agency in an NRC proceeding. See, e.g., *Hydro Resources, Inc. (292 Coors Road, Suite 101,*

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<sup>7</sup> Revised Pre-Filed Direct Testimony of William Powers in Support of EC 1.3" (Feb. 2, 2009) ("Powers EC 1.3 Testimony").

Albuquerque, NM 87120), CLI-98-16, 48 NRC 119, 122 n.3 (1998) (“[O]ur adjudicatory tribunal is not the proper forum for litigation and resolution of controversies about other agencies’ permitting authority.”). As discussed in the Staff’s EC 1.3 Direct Testimony, the Staff found that a dry cooling system would not be environmentally preferable to the proposed wet cooling system, and that there would only be small impacts to any extremely sensitive biological resources; thus, the Staff’s analysis of the dry-cooling alternative was sufficient. Staff’s EC 1.3 Direct Testimony at A25. For the reasons above, the Staff’s rebuttal testimony further demonstrates why the Board should deny Contention EC 1.3.

C. Contention EC 6.0

As explained below, none of the arguments in the Joint Intervenors’ direct testimony regarding Contention EC 6.0 would change the conclusions reached in the FEIS and described in the Staff’s direct testimony. The Joint Intervenors’ assertion that the FEIS fails to sufficiently assess and analyze the potential impacts of dredging of the Savannah River Federal navigation channel (“FNC”) on aquatic species in the Savannah River ecosystem is without merit. Thus, the Board should deny Contention EC 6.0.

In his EC 6.0 Testimony, Donald F. Hayes<sup>8</sup> states that “the FEIS does not estimate the duration of the dredging project or the volume of sediment that will need to be dredged and placed outside of the river.” Hayes EC 6.0 Testimony at A13. However, as noted in the direct testimony of the USACE and the Staff, no formal request or application for dredging of the FNC is before the U.S. Army Corps of Engineers (“Corps” or “USACE”). USACE EC 6.0 Direct

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<sup>8</sup> Revised Pre-Filed Direct Testimony of Donald F. Hayes in Support of EC 6.0” (Feb. 2, 2009) (“Hayes EC 6.0 Testimony”).

Testimony at A8; Staff EC 6.0 Direct Testimony at A18. Thus, the scope and duration of any potential dredging project are unknown.

Mr. Hayes states that “[d]espite the lack of specific data, the FEIS could provide a range of estimates for sediment volume and dredging duration based upon some reasonable assumptions and ranges of conditions.” Hayes EC 6.0 Testimony at A14. However, each dredging project is unique and must be evaluated by the physical, chemical, and biological conditions present at the dredging and disposal sites. Staff EC 6.0 Rebuttal Testimony at A4. Many parameters define such projects, including proposed dredging depths, the quantity of sediments to be removed, sediment type and quality, habitats within and adjacent to the dredging and disposal areas, specific information regarding the locations of spawning and nursery habitats of aquatic biota, and fish migration patterns. *Id.* In preparing the FEIS, these details were not before the Staff, and it was not reasonable for the Staff, lacking any dredging and dredged material disposal parameters, to assume specific project details and develop a bounding analysis. *Id.* Without project-specific information for such a potentially large-scale dredging project, the Staff could not conduct a meaningful quantitative assessment. *Id.* Thus, the Staff’s qualitative analysis was an appropriate method to disclose the potential impacts associated with an as-yet undefined dredging project. *Id.* To require the Staff to have quantitatively analyzed the environmental impacts of potential dredging in the FEIS would require them to “do the impractical.” *Wetlands Action Network v. U.S. Army Corps of Eng’rs*, 222 F.3d 1105, 1119 (9th Cir. 2000), *cert. denied* 534 U.S. 815 (2001) (the Corps was not required to complete NEPA analysis of all phases of a construction project within a single EA or EIS when details and planning decisions of all phases had not been completed).

Mr. Hayes states that “[c]onducting a comprehensive environmental analysis of dredging would require substantial environmental, ecological, physical, and hydrologic data not presented in the FEIS.” Hayes EC 6.0 Testimony at A19. The Staff agrees that a large-scale dredging

project would involve a comprehensive environmental analysis, but the project parameters to do so were not available because the Corps has neither developed a plan nor received a formal request or authorization for dredging of the FNC in the near future to facilitate barge traffic as far upstream as the VEGP site. Staff EC 6.0 Rebuttal Testimony at A5. If a formal plan is developed or an application is submitted for approval of such a dredging project, that action will be reviewed by the Corps pursuant to its regulatory process. *Id.*; USACE Direct Testimony at A9, A10, A12.

In his EC 6.0 testimony,<sup>9</sup> Dr. Young identifies several potential effects of dredging activities, including impacts on “food web dynamics” and spawning of fish species. Young EC 6.0 Testimony at A12. In the FEIS and in its direct testimony, the Staff identified a range of potential environmental effects associated with dredging of the river and also discussed some potential mitigation measures. Staff EC 6.0 Rebuttal Testimony at A7.

Dr. Young states that “[t]he FEIS mentions the potential for benthic organism (i.e. the freshwater mussel) relocation, yet surprisingly provides no detail concerning this proposal.” Young EC 6.0 Testimony at A12. Dr. Young also states that “[w]ith the large-scale dredging, a thorough freshwater mussel survey for the entire affected area should be completed.” Young EC 6.0 Testimony at A13. However, it was not appropriate for the Staff to provide details in the FEIS concerning mussel relocation because Federal and state resource agencies are responsible for identifying recommendations or requirements for mussel relocation. Staff EC 6.0 Rebuttal Testimony at A8. Mussel surveys would only be conducted after the areas proposed for dredging have been identified, after there is a formal request or permit application

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<sup>9</sup> Revised Pre-Filed Direct Testimony of Shawn P. Young in Support of EC 6.0” (Feb. 2, 2009) (“Young EC 6.0 Testimony”).

before the Corps, and after the Federal and state resource agencies have completed their reviews. *Id.* at A9. It is thus premature for the Staff to speculate on the details of what Federal and state resource agencies would recommend or require for any mussel relocation efforts. *Id.* at A8.

In summary, the Staff performed a qualitative analysis of the potential impacts of dredging of the Savannah River Federal navigation channel utilizing the data available at the time of the FEIS. The Joint Intervenors' direct testimony provides no additional information which would change the Staff's analysis or conclusions. Their assertion that the FEIS fails to sufficiently assess and analyze dredging impacts on aquatic species in the Savannah River ecosystem is therefore without merit, and the Board should deny Contention EC 6.0.

CONCLUSION

For the reasons discussed above, the Staff reiterates its position that the Joint Intervenors' contentions are without merit and that the Staff's environmental review, as documented in the FEIS, complies with the requirements of NEPA. Accordingly, Joint Intervenors' contentions should be denied.

Respectfully submitted,

**/signed (electronically) by/**

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Dated at Rockville, Maryland  
This 6<sup>th</sup> day of February, 2009

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of )  
 )  
SOUTHERN NUCLEAR OPERATING CO. ) Docket No. 52-011-ESP  
 )  
(Early Site Permit for Vogtle ESP Site) )

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC Staff Rebuttal Statement of Position on Joint Intervenors' Contentions EC 1.2, EC 1.3, and EC 6.0" together with Exhibit List, Attachments, and Exhibits NRC000051 through NRC000055 and Refiled Exhibit NRC000035 have been served upon the following persons by Electronic Information Exchange this 6<sup>th</sup> day of February, 2009:

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