

**UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION**

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

G. Paul Bollwerk, III, Chairman
Nicholas G. Trikouros
Dr. James Jackson

In the Matter of

SOUTHERN NUCLEAR OPERATING CO.
(Early Site Permit for Vogtle ESP Site)

Docket No. 52-011-ESP

ASLBP No. 07-850-01-ESP-BD01

February 6, 2009

**JOINT INTERVENORS' RESPONSE STATEMENT
AND PRE-FILED REBUTTAL TESTIMONY**

INTRODUCTION

Pursuant to 10 C.F.R. § 2.1207(a)(2) and the general schedule provided by the Atomic Safety and Licensing Board (the "Board") Order of July 14, 2008,¹ Joint Intervenors² submit this Response Statement to Southern Nuclear Operating Company's ("SNC") Initial Statement of Position on Intervenors' Environmental Contention 1.2 (Cooling System Impacts on Aquatic Resources) (the "SNC 1.2 Position Statement"), SNC's Initial Statement of Position on Intervenors' Environmental Contention 1.3 (Dry Cooling System Alternatives) (the "SNC 1.3 Position Statement"), SNC's Initial Statement of Position on Intervenors' Environmental Contention 6.0 (Impacts Associated

¹ *Southern Nuclear Operating Co.* (Early Site Permit for Vogtle ESP Site), Memorandum and Order (Revised General Schedule), slip op. (July 14, 2008).

² 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.

with Dredging the Savannah River Federal Navigation Channel) (the “SNC 6.0 Position Statement”),³ and the Nuclear Regulatory Commission (the “NRC”) Staff Initial Statement of Position on Joint Intervenors’ Contentions EC 1.2, EC 1.3, and EC 6.0 (the “Staff Position Statement”), each filed on January 9, 2009.

In Joint Intervenors’ Initial Written Statement of Position and Prefiled Direct Testimony, filed on January 9, 2009 (the “Intervenors Position Statement”), Joint Intervenors asserted that the Staff failed to take a “hard look” at certain environmental questions, as required pursuant to the National Environmental Policy Act of 1969 (“NEPA”).⁴ Specifically, Joint Intervenors alleged that the Final Environmental Impact Statement (the “FEIS”) for an Early Site Permit (“ESP”) at the Vogtle Electric Generating Plant Site (the “VEGP site”) was inadequate for the following reasons:

Environmental Contention 1.2 (“EC 1.2”). The FEIS fails to identify and consider direct, indirect, and cumulative impingement/entrainment and thermal effluent discharge impacts of the proposed cooling system intake and discharge structures on aquatic resources.

Environmental Contention 1.3 (“EC 1.3”). The FEIS fails to satisfy 10 C.F.R. § 51.45(b)(3) because its analysis of the dry cooling alternative is inadequate to address the appropriateness of a dry cooling system given the presence of extremely sensitive biological resources.

Environmental Contention 6.0 (“EC 6.0”). Because Army Corps of Engineers (the “Corps”) dredging of the Savannah River Federal navigation channel has potentially significant impacts on the environment, the NRC staff’s conclusion, as set forth in the “Cumulative Impacts” chapter of the FEIS, that such impacts would be moderate is inadequately supported. Additionally, the FEIS fails to address adequately the impacts of the Corps’ upstream reservoir operations as they support navigation, an important aspect of the problem.

³ The SNC 1.2 Position Statement, the SNC 1.3 Position Statement, and the SNC 6.0 Position Statement are herein collectively referred to as the “SNC Position Statement”.

⁴ 42 U.S.C. §§ 4321 (2006) *et seq.*

As further explained in this Response Statement, Joint Intervenors continue to maintain that the Staff failed to take the requisite “hard look” at significant environmental questions. Moreover, sufficient evidence has not been introduced into the record by SNC and the Staff to permit this Board to conclude that, based on the record as a whole, the NRC’s obligation under NEPA to take a “hard look” at the environmental consequences of issuing the requested ESP may be satisfied.⁵ Accordingly, Joint Intervenors respectfully request that the Board resolve each contention in favor of Joint Intervenors and deny SNC’s permit request.

JOINT INTERVENORS’ REBUTTAL WITNESSES

Joint Intervenors’ rebuttal testimony on EC 1.2, EC 1.3, and EC 6.0 will be given by the following witnesses in response to the direct testimony provided by SNC and the Staff:

Dr. Shawn Young: Dr. Young, whose qualifications were set forth in Joint Intervenors’ Pre-Filed Direct Testimony, will testify in support of EC 1.2, rebutting (i) the testimony of Mr. Moore regarding impacts of the proposed cooling intake on entrainment and impingement rates at the VEGP site, and the scientific validity of the Academy of Natural Sciences of Philadelphia (“ANSP”) studies used to establish the Savannah River baseline; (ii) the testimony of Mr. Montz and Mr. Dodd regarding the scientific validity of the SNC entrainment study conducted at the VEGP site; and (iii) the testimony of Dr. Coutant regarding the affect low river flows will have on entrainment and impingement rates, the scientific validity of ANSP studies used to establish the Savannah River baseline, the scientific validity of SNC’s entrainment study, and the impact of intake rates on

⁵ See Louisiana Energy Servs., L.P. (Claiborne Enrichment Center), LBP-06-8, 63 NRC 241, 286, stating that an agency may review the full record before it when determining whether “the aggregate is sufficient to satisfy an agency’s obligations under NEPA.” See generally, 10 C.F.R. §§ 51.102 and 51.103.

entrainment and impingement. Dr. Young will also testify in support of EC 1.3, rebutting (i) the testimony of Dr. Coutant regarding the impacts of the proposed cooling system on the sensitive biological resources in the vicinity of the VEGP site, specifically the shortnose sturgeon and the robust redhorse; (ii) the testimony of Dr. Masnik, Ms. Kuntzleman, Ms. Krieg, Ms. Caverly, and Mr. Vail (the “Staff 1.2 Expert Panel”) regarding impacts to extremely sensitive biological resources; and (iii) the testimony of the Staff 1.2 Expert Panel regarding the adequacy of the dry cooling alternative analysis. Dr. Young will also testify in support of EC 6.0, rebutting (i) the testimony of Dr. Coutant regarding the potential impacts of dredging on aquatic life, particularly rare, threatened, and endangered mussels; and (ii) the unsworn testimony of Dr. Coutant presented in his “Analysis of Impacts of Navigation Channel Maintenance for Barge Delivery of Materials for Construction of Vogtle Units 3 and 4 on the Ecology of the Savannah River” (SNC000051).

Mr. Barry Sulkin: Mr. Sulkin, whose qualifications were set forth in Joint Intervenors’ Pre-Filed Direct Testimony, will testify in support of EC 1.2, rebutting the testimony of Dr. Coutant regarding drought levels, Savannah River flow rates, and potential impacts on aquatic species.

Mr. William Powers: Mr. Powers, whose qualifications were set forth in Joint Intervenors’ Pre-Filed Direct Testimony, will testify in support of EC 1.3, rebutting the testimony of Mr. Cuchens, Ms. Caverly, and Mr. Masnik regarding the feasibility of the dry cooling alternative.

Dr. Donald Hayes: Dr. Hayes, whose qualifications were set forth in Joint Intervenors’ Pre-Filed Direct Testimony, will testify in support of EC 6.0, rebutting (i) the testimony

of Dr. Masnik, Ms. Kuntzleman, Ms. Krieg, Ms. Caverly, and Mr. Vail (the “Staff 6.0 Expert Panel”) and the testimony of Dr. Coutant regarding the adequacy under NEPA of the dredging impacts discussion in the FEIS; (ii) the testimony of Mr. Neubert, Mr. Smith, and Mr. Scott regarding the potential extent of required dredging; (iii) the testimony of the Staff 6.0 Expert Panel and Mr. Morrer regarding the conclusion in the FEIS that impacts of dredging could be MODERATE; and (iv) the testimony of Mr. Neubert, Mr. Smith, Mr. Scott, and Mr. Morrer regarding potential impacts of sediment disposal and contamination.

RESPONSE TO LEGAL ISSUES

As set forth in the Intervenor Position Statement, as well as in the SNC Position Statement and the Staff Position Statement, NEPA requires NRC to take a “hard look” at the environmental impacts of a proposed action.⁶ While SNC and the Staff correctly note that this “hard look” is tempered by a “rule of reason”,⁷ the “rule of reason” does not excuse an agency from addressing in its environmental impact statement: (i) connected actions, (ii) reasonable alternatives, and (iii) direct, indirect, and cumulative impacts.⁸ Thus, the NEPA “hard look” standard, even when tempered by the “rule of reason”, requires more than the cursory review conducted by the Staff in the FEIS, and requires more than the review the Board will be able to conduct based on the record as a whole.

⁶ See Louisiana Energy Servs., L.P. (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 87-88 (1998). See also Intervenor Position Statement at 5-6; SNC 1.2 Position Statement at 5; SNC 1.3 Position Statement at 6-8; SNC 6.0 Position Statement at 5-6; Staff Position Statement at 6.

⁷ SNC 1.2 Position Statement at 5-6; SNC 1.3 Position Statement at 7-8, 10; SNC 6.0 Position Statement at 5-6; Staff Position Statement at 6.

⁸ 40 C.F.R. § 1508.25.

EC 1.2: As further explained below, EC 1.2 contends that the FEIS fails to adequately consider the *direct, indirect, and cumulative* impacts of the proposed Units 3 and 4 on aquatic resources.⁹ In other words, Joint Intervenors assert that the FEIS fails to adequately assess the impacts of the proposed Units 3 and 4 in isolation (i.e. direct and indirect impacts), as well as the impacts of these Units when viewed in concert with the impacts of other actions (i.e. cumulative impacts). As for the latter failure, the Council on Environmental Quality (the “CEQ”) explains that a cumulative impacts analysis must consider:

... the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.¹⁰

EC 1.3: As further explained below, EC 1.3 contends that the FEIS fails to adequately consider the appropriateness of a dry-cooling alternative.¹¹ Pursuant to 10 CFR § 51.45(b)(3),

the discussion of alternatives shall be sufficiently complete to aid the Commission in developing and exploring, pursuant to section 102(2)(E) of NEPA, “appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”

While SNC is correct in noting that the “rule of reason” limits those alternatives which should be discussed in an environmental impact statement,¹² an “appropriate range of

⁹ See 40 C.F.R. § 1508.25(c).

¹⁰ 40 C.F.R. § 1508.7.

¹¹ See 40 C.F.R. §1508.25(b)(2).

¹² SNC 1.3 Position Statement at 9-10.

alternatives” must still be considered.¹³ SNC thus mischaracterizes the rule, using it as an excuse to disregard the inconvenient, instead of a mandate to consider the appropriate.

EC 6.0: As further explained below, EC 6.0 contends that the FEIS fails to adequately assess the impacts related to barging components of Units 3 and 4 to the VEGP site.

Joint Intervenors assert that certain actions related to barging – namely, dredging the Federal navigation channel of the Savannah River and releasing water from upstream reservoirs – are “connected” to the issuance of the ESP, and accordingly must be addressed in the FEIS. As explained in the CEQ regulations,¹⁴ environmental impact statements must consider:

Connected actions, which means that they are closely related and therefore should be discussed in the same impact statement. Actions are connected if they:

- (i) Automatically trigger other actions which may require environmental impact statements.
- (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
- (iii) Are independent parts of a larger action and depend on the larger action for their justification.

SNC and the Staff mistakenly assert that because the details of the dredging project have yet to be finalized, the NEPA “rule of reason” relieves the Staff from assessing the impacts of these connected actions. The “rule of reason”, however, does

¹³ *In re Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage)*, LBP-03-30, 58 NRC 454, 479 (2003) (quoting *Headwaters Inc. v. BLM*, 914 F.2d 1174, 1181 (9th Cir. 1990)).

¹⁴ 10 C.F.R. § 1508.25(a)(1). SNC states that the NRC has not specifically adopted the CEQ regulations, and thus, while such regulations may serve as guidance, they are non-binding. SNC 6.0 Position Statement at 7-8. However, it should be noted that the provisions of 10 CFR Part 51 “take account of the regulations of the Counsel of Environmental Quality ... voluntarily.” 10 CFR § 51.10(a).

not prohibit an agency from making forecasts in the event plans are not completed; in fact, the rule requires forecasting.¹⁵

RESPONSE STATEMENT

EC 1.2 RESPONSE STATEMENT: The FEIS fails to adequately consider the direct, indirect, and cumulative impacts of the proposed Units 3 and 4 on aquatic resources.

- I. Direct and Indirect Impacts Were Not Adequately Assessed in the FEIS, and SNC Failed to Supplement the Record to Allow for an Adequate Assessment.
 - A. *There is Insufficient Data in the FEIS and Record to Develop an Adequate Baseline.*

As explained above, NEPA requires that an agency take a “hard look” at the environmental consequences of a proposed action.¹⁶ NRC cannot sufficiently complete this requisite “hard look” analysis without an adequate baseline.¹⁷ As the court states in *Oregon Natural Desert Ass’n*, “[t]he environmental baseline is an integral part of an EIS...therefore, it is critical that the baseline be *accurate and complete*.”¹⁸ Thus, an accurate and complete baseline, which provides a clear picture of the habitat conditions, species diversity, and species abundance in the vicinity of the VEGP site, must be established before a sufficient evaluation of the impacts on aquatic species resulting from the construction and operation of Units 3 and 4 can be conducted.

¹⁵ See 15 Fed. Reg. 15618, 15621 (April 25, 1986) (stating that “the agency need not foresee the unforeseeable, but by the same token, neither can it avoid drafting an impact statement simply because describing the environmental effects of alternatives to a particular agency action involves some degree of forecasting.”)

¹⁶ *Kleppe v. Sierra Club*, 427 U.S. 390, 410 (1976).

¹⁷ See *Or. Natural Desert Ass’n v. Shuford et al.*, Civ No. 06-242-AA, slip op. at 13 (D. Or. 2007) (stating that agencies are required to “maintain a current inventory of resource” to create an adequate baseline and, thus, permitting the agency to meet NEPA’s “hard look” mandate).

¹⁸ *Id.*

As Dr. Young will testify (and has previously testified in his prefiled direct testimony), an adequate baseline is absent from the FEIS.¹⁹ SNC wrongly states that the FEIS adequately describes “the species composition and habitat in the vicinity of the intake and cooling structures,” thus providing sufficient baseline information for the Staff to conduct its analysis.²⁰ Dr. Young will explain that, in actuality, the species composition and habitat information in the FEIS is incomplete.²¹ Furthermore, the Staff incorrectly asserts that the sources used to establish this incomplete baseline were “both adequate and appropriately comprehensive to enable the Staff’s evaluation of environmental impacts.”²² In fact, these sources are wholly insufficient.²³

Moreover, SNC has failed to adequately supplement the record. As explained above, in NRC licensing proceedings, the applicant may introduce evidence into the record that enhances the detail and completeness of the FEIS.²⁴ As Dr. Young will testify, SNC failed to supplement the record with the information required to develop an “accurate and complete” baseline.²⁵ Therefore, even with the supplemented record, NRC is unable to take a “hard look” at the environmental impacts of granting the ESP to SNC.

B. The FEIS Does Not Adequately Consider the Impacts that Construction and Operation of Units 3 and 4 Will Have on Savannah River Aquatic Populations in the Likely Event of Extended Periods of Low River Flows.

¹⁹ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answers 1-3, 7, & 11-12; *see also* Young Pre-filed Direct Testimony for EC 1.2 at Answer 18; Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answers 1-8 & 11.

²⁰ SNC 1.2 Position Statement at 14.

²¹ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answers 11-12.

²² Staff Position Statement at 15.

²³ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answers 1, 3 & 11-12.

²⁴ *See* La. Energy Servs., L.P. (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 89 (1998).

²⁵ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answer 1-3, 7 & 11-12.

The NEPA “hard look” mandate requires agencies to evaluate the environmental impacts of a proposed action using accurate assumptions.²⁶ The FEIS instead relies on inaccurate conjectures regarding the duration and likelihood of low flow rates, and thus fails to adequately assess the environmental impacts Units 3 and 4 will have on the Savannah River’s aquatic populations during low flows.

Although the Savannah River has experienced low flow rates since November 2007, the Staff surprisingly asserts that these drought conditions should not be used to establish a new baseline and do not prompt reconsideration of “long-term normal flows.”²⁷ As Mr. Sulkin will testify, such an assertion is not based in reality.²⁸ Low flow rates have become commonplace, and thus the potential impacts of Units 3 and 4 during drought conditions must be fully assessed.²⁹

SNC seemingly acknowledges that low flow rates should be considered, and notes in the SNC 1.2 Position Statement that long term low flow rates may result in shoreline changes causing shoreline habitat impacts, and impingement, entrainment, and thermal impacts.³⁰ Nevertheless, SNC concludes that the Staff’s determination that overall impacts on aquatic species will be “minor” should not be affected by

²⁶ See 40 C.F.R. § 1500.1(b).

²⁷ Staff Position Statement at 18.

²⁸ Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answers 10 & 12-13.

²⁹ Remarkably, both the Staff in its Position Statement (page 23), and SNC in its 1.2 Position Statement (page 23), assert that very low flow rates (i.e. those rates below Drought Level 3 (<3800 cfs)) would be “extremely rare.” As Mr. Sulkin testified in Answer 12 of his Pre-filed Rebuttal Testimony for EC 1.2, such assertions are simply untrue. The Savannah River has experienced such low flow rates for over a year.

³⁰ SNC 1.2 Position Statement at 23; *see also* SNC 1.2 Position Statement at 20.

consideration of these shoreline changes.³¹ Mr. Sulkin will testify that such a conclusion is illogical, and thus falls short of the NEPA “hard look” mandate.³² Moreover, in light of such shoreline changes, the impacts of Units 3 and 4 on aquatic populations may potentially exceed the SMALL threshold.³³

C. The Staff’s Incorrect Assumption of Uniform Drift Distribution in the FEIS Results in the Unsubstantiated and Misleading Conclusion that Impacts on Aquatic Species will be SMALL.

As stated above, NEPA’s “hard look” mandate requires an environmental impact statement to rely on proper assumptions when assessing impacts.³⁴ In conflict with this seemingly obvious mandate, the FEIS assumes that the drift community in the vicinity of the VEGP site is uniform, when – in fact – most widely recognized studies indicate non-uniformity.³⁵

The Staff asserts that the uniform drift distribution assumption is justified because, although the assumption is “not necessarily realistic for some species,” the assumption is “conservative”.³⁶ SNC agrees with the Staff, stating that this assumption represents a “common, conservative approach...”³⁷ However, as Dr. Young will testify,

³¹ SNC 1.2 Position Statement at 23, citing NRC000001 at 5-39.

³² Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answer 12; Trout Unlimited v. Morton, 509 F.2d 1276, 1283 (9th Cir. 1974) (“hard look” review is tempered by the “rule of reason” that requires environmental impact statements to contain a “[r]easonably thorough discussion of the significant aspects of the *probable* environmental consequences”) (emphasis added).

³³ Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answer 12.

³⁴ See 40 C.F.R. § 1500.1(b).

³⁵ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answer 18, *see also id.* at Answer 16.

³⁶ Staff Position Statement at 17.

³⁷ SNC 1.2 Position Statement at 26.

this assumption is neither conservative nor correct.³⁸ NEPA requires a “hard look” based on the actual distribution pattern. Despite the Staff’s and SNC’s claims, NEPA does not permit inconvenient facts to simply be ignored.

D. SNC’s 2008 Impingement and Entrainment Study Fails to Confirm That the Construction and Operation of Units 3 and 4 will Potentially Cause SMALL Impacts on Aquatic Species.

As noted above, in NRC licensing proceedings, the applicant may introduce evidence into the record that enhances the detail and completeness of the FEIS.³⁹ Although SNC attempted to supplement the record with a new impingement and entrainment study,⁴⁰ the study fails to support the Staff’s conclusion that impacts on aquatic species will be SMALL.⁴¹ As Dr. Young will testify, the study suffers from certain fatal weaknesses, including: (i) concluding that there would be a low impingement rate solely because screen-maintenance personnel did not see a significant number of impinged fish; (ii) switching the point of entrainment measurement midway through the study; and (iii) failing to discuss ichthyoplankton drift distribution in the thermal plume.⁴² Thus, the Staff’s conclusion in the FEIS that impacts on aquatic species will be SMALL remains insufficiently supported, and accordingly the NEPA “hard look” standard remains unsatisfied.

II. Cumulative Impacts Were Not Adequately Assessed in the FEIS nor Adequately Supplemented in the Record by SNC.

³⁸ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answer 18.

³⁹ See La. Energy Servs., L.P., 47 NRC at 89.

⁴⁰ SNC000004; SNC000005; SNC 1.2 Position Statement at 29-30.

⁴¹ Young Pre-filed Rebuttal Testimony at Answers 4-6 and 17.

⁴² *Id.*

NEPA requires the NRC to take a “hard look” at the cumulative impacts of the proposed Units 3 and 4.⁴³ However, the FEIS, as supplemented by the record, fails to satisfy this NEPA mandate, and instead inadequately assesses the impacts of Units 3 and 4 on aquatic resources, when considered in concert with the impacts of all other past, present, and reasonably foreseeable future actions.

A. NEPA Requires Adequate Consideration of All Factors Contributing to the Degradation of the Savannah River Baseline.

NEPA’s “hard look” mandate, as tempered by the “rule of reason”, requires that an environmental impact statement “furnish only such information as appears to be reasonably necessary under the circumstances for evaluation of the project....”⁴⁴ As Dr. Young will testify, the Savannah River hosts several vulnerable species, including the federally-endangered shortnose sturgeon.⁴⁵ Because of the existence of such vulnerable aquatic populations and thus the degraded state of the Savannah River’s baseline, the “rule of reason” requires a more detailed analysis of the cumulative impacts of Units 3 and 4 than would be required if the Savannah River’s baseline was not degraded.⁴⁶ However, this detailed analysis is lacking from the FEIS.

Moreover, SNC fails to supplement the record with sufficient information to permit an adequate cumulative impact analysis. Instead, Dr. Moorer, on behalf of SNC, inexplicably claims that the Staff’s cumulative impact analysis as set forth in the FEIS is

⁴³ 40 C.F.R. § 1508.25(c). As explained above, a “cumulative impact” is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions.” (40 C.F.R. § 1508.7).

⁴⁴ *New York et al. v. Kleppe*, 429 U.S. 1307, 1311 (1976) (citing *Nat. Res. Def. Council v. Calloway*, 524 F.2d 79, 88 (2d Cir. 1975)).

⁴⁵ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answer 15.

⁴⁶ See generally *New York et al.*, 429 U.S. at 1311.

sufficient, because it considers and references Savannah River Site (“SRS”) studies, which conclude that no quantifiable impact to the aquatic community would result at intake flows much larger than the proposed VEGP intake flows.⁴⁷ However, as Dr. Young will testify, the SRS is consistently reported as a cause of decline of Savannah River aquatic species.⁴⁸ Reliance on inaccurate studies falls short of the “hard look” requirement.

B. The FEIS Fails to Adequately Assess All Cumulative Impacts.

The FEIS and the record contain inadequate analysis of the cumulative impacts of Units 3 and 4. In *Hanly v. Kleindienst*, the court notes that agencies must review “cumulative harm that results from [an applicant’s] contribution to existing adverse conditions or uses in the affected areas.”⁴⁹ Specifically, the *Hanly* court states that a NEPA review must include “[(1)] the extent to which the action will cause adverse environmental effects in excess of those created by existing uses in the area affected by it, and [(2)] the absolute *quantitative adverse environmental effects* of the action itself.”⁵⁰ The Staff and SNC’s cumulative impacts analysis clearly fails to meet this standard.

There are numerous references to cumulative impacts in the FEIS and the record that do not do contain the requisite detailed, quantitative analysis.⁵¹ For example, Mr.

⁴⁷ Moorer Pre-filed Direct Testimony for EC 1.2 at Answer 7.

⁴⁸ Young Pre-filed Rebuttal Testimony for EC 1.2 at Answers 2 and 14-16.

⁴⁹ *Hanly v. Kleindienst*, 471 F.2d 823, 831 (1972).

⁵⁰ *Id.* at 830.

⁵¹ *See e.g.*, Moorer Pre-filed Direct Testimony for EC 1.2 at Answer 8; Coutant Pre-filed Direct Testimony for EC 1.2 at Answer 45 (stating that the results of a study “fully support the EIS conclusion that impacts of entrainment at the proposed intake for Units 3 & 4, designed similarly to that for Units 1 & 2, will be SMALL,” but failing to consider and quantitatively analyze the cumulative impacts of Units 3 & 4 when added to all past, present, and reasonably foreseeable future water withdrawals on the Savannah River); and Masnik Direct Testimony for EC 1.2 at Answer 22 (using total withdrawal as a percent of flow as the

Moorer asserts that there is a “clear, well documented assessment of the baseline aquatic community *in the vicinity of plant Vogtle*” (emphasis added), but neglects to set forth what upstream and downstream actors “in the vicinity of Plant Vogtle” were considered in establishing this baseline, or quantitatively analyze how the baseline aquatic community has been effected by the past and present actions of these actors.⁵² As Dr. Young will testify, how “the vicinity of plant Vogtle” is defined may determine whether the cumulative impacts of Units 3 and 4 are actually SMALL.⁵³ Without this definition, and additional quantitative analysis, the NRC cannot take a “hard look” at cumulative impacts.

C. The Staff and SNC Err in Assuming That Because the Cumulative Impacts of Units 1 and 2 are SMALL, the Cumulative Impacts of Units 3 and 4 Will Also be SMALL.

By definition, “[c]umulative impacts can result from individually minor but *collectively significant actions* taking place over a period of time (emphasis added).”⁵⁴ Thus, because each piece of infrastructure built that pollutes water “may represent the straw that breaks the back of the environmental camel,” an FEIS must evaluate “the absolute, as well as comparative, effects of a major federal action.”⁵⁵ Contrary to this principle, the Staff⁵⁶ and SNC⁵⁷ wrongly assert that because the cumulative impacts of

entrainment rate to conclude that Units 3 & 4 will kill between 0.9 and 2.2 percent of the Savannah River’s entrainable organisms, but failing to use a similar calculation method to determine the total cumulative entrainment of Units 3 & 4 in combination with other past, present, and reasonably foreseeable future withdrawals on the Savannah River).

⁵² Moorer Pre-filed Direct Testimony for EC 1.2 at Answer 8.

⁵³ Young Pre-filed Rebuttal Testimony at Answers 9 & 10.

⁵⁴ 40 C.F.R. § 1508.7.

⁵⁵ Hanley, 471 F.2d at 831.

⁵⁶ Staff Pre-filed Direct Testimony for E.C. 1.2 at Answers 21 & 22.

Units 1 and 2 are SMALL, the cumulative impacts of Units 3 and 4 must necessarily also be SMALL. As Mr. Sulkin will testify, the SMALL impacts of Units 1 and 2 and the SMALL impacts of Units 3 and 4, when viewed together, may result in larger than SMALL cumulative impacts.⁵⁸ Accordingly, a more complete analysis of cumulative impacts – rather than reliance on the inaccurate assumption that “small” plus “small” necessarily equals “small” – is required.

EC 1.3 RESPONSE STATEMENT: The FEIS fails to adequately consider the appropriateness of a dry-cooling alternative.

I. NEPA Requires a More Detailed Analysis of the Dry Cooling Alternative

A. *Direct and Indirect Impacts of the Wet Cooling System Are Potentially Greater Than “SMALL.”*

In their Position Statements, both the Staff and SNC cite to the FEIS conclusion that the overall impact on aquatic resources of the proposed wet cooling system is SMALL as justification for the adequacy of the FEIS’s analysis of the dry-cooling alternative.⁵⁹ In fact, Dr. Masnik and Mr. Vail concede in their direct testimony that the adequacy of the Staff’s alternatives analysis hinges on a finding of SMALL impacts to aquatic resources, stating “[i]f the Staff had instead reached a conclusion that water-related impacts were greater than SMALL, the Staff would have identified and analyzed alternatives in greater depth.”⁶⁰ As Dr. Young and Mr. Sulkin previously testified

⁵⁷ Coutant Pre-filed Direct Testimony for EC 1.2 at Answers 45 and 47; Moorer Pre-filed Direct Testimony for EC 1.2 at Answer 7.

⁵⁸ Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answer 9.

⁵⁹ Staff Position Statement at 29; SNC 1.3 Position Statement at 19.

⁶⁰ NRC Staff Testimony Concerning Environmental Contention 1.3 at Answer 16.

concerning EC 1.2, and as they will further illustrate in their rebuttal testimony,⁶¹ impacts on aquatic species are potentially greater than SMALL.

Accordingly, and pursuant to the Staff's own testimony, NEPA requires a more complete analysis of the dry cooling alternative. SNC's reliance on the "rule of reason"⁶² in no way negates this conclusion. While the rule of reason tempers NEPA's "hard look" requirement, NRC is still obligated to give adequate consideration to all reasonable alternatives.⁶³ Given the existence of certain important aquatic species, and the potential impacts on these species, the reasonableness standard set forth by the rule of reason requires more than the cursory analysis set forth in the FEIS. Moreover, and as further explained below, while the Board may consider the full record before determining whether NEPA's hard look obligation has been satisfied,⁶⁴ SNC has failed to introduce sufficient evidence to permit a "hard look" at the dry cooling alternative.

- i. As Previously Explained in Discussions Regarding EC 1.2, Impacts on Aquatic Species are Potentially Greater than SMALL.

In addition to the reasons set forth in those sections of the Intervenors Position Statement (as supported by the pre-filed direct testimony and exhibits filed in connection therewith) and this Response Statement (as supported by the pre-filed rebuttal testimony and exhibits filed in connection herewith) explaining why impacts of the wet-cooling system are potentially greater than SMALL, an additional flaw exists in the Staff's

⁶¹ Sulkin Pre-filed Rebuttal Testimony for EC 1.2 at Answers 1-14; Young Pre-filed Rebuttal Testimony for EC 1.2 at Answers 1-8; *see also*, Young Pre-filed Rebuttal Testimony for EC 1.3 at Answers 1-11.

⁶² SNC 1.3 Position Statement at 7-10.

⁶³ 40 C.F.R. §§ 1502.14(a)-(c), 1508.25(b)(2); *Westlands Water Dist. v. U.S. Dept. of Interior*, 376 F.3d 853, 868 (9th Cir. 2004) (stating that "[u]nder the rule of reason, the EIS "need not consider an infinite range of alternatives, only reasonable or feasible ones").

⁶⁴ *La. Energy Servs., L.P. (Clairborne Enrichment Center)*, CLI-98-3, 47 NRC 77, 89 (1998).

impact analysis. Specifically, Dr. Masnik explains that in arriving at a prediction of only SMALL impacts, the Staff considered whether distribution, abundance, relevant life history, or past data collected in the Savannah River indicated a causal link to a particular impact category (impingement, entrainment, or thermal effects) resulting from operation of Vogtle Units 3 and 4.⁶⁵ Dr. Masnik concluded that no individual casual links existed, and thus a SMALL impact is predicted.⁶⁶ As Dr. Young will testify, this SMALL impacts conclusion is inaccurate because it considers causal links between the operation of Units 3 and 4 and particular impact categories in isolation, instead of cumulatively.⁶⁷ Dr. Masnik overlooks the possibility that a causal link may exist between operation and consideration of distribution, abundance, relevant life history and past data collected as a whole, thus potentially exceeding the SMALL aquatic resources impacts threshold.⁶⁸

ii. Specifically, Impacts on the Shortnose Sturgeon and Robust Redhorse are Potentially Greater Than SMALL.

As explained above, the Staff's conclusion that impacts on aquatic species, including the shortnose sturgeon and the robust redhorse, will be SMALL is unsupported. While SNC is permitted to supplement the record in order to support this conclusion,⁶⁹ as will be explained below, adequate support has not been introduced.

First, SNC's expert Dr. Coutant argues that Vogtle Units 3 and 4 will not "compromise any extremely sensitive biological resources needed by the shortnose

⁶⁵ Masnik Pre-filed Direct Testimony for EC 1.3 at Answer 22.

⁶⁶ *Id.*

⁶⁷ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 3.

⁶⁸ *Id.*

⁶⁹ La. Energy Servs., L.P. (Clairborne Enrichment Center), CLI-98-3, 47 NRC 77, 89 (1998).

sturgeon” simply because Vogtle Units 1 and 2 are not located in “critical zones of passage” for the species.⁷⁰ Dr. Young, however, will testify that this conclusion rests on an incomplete analysis.⁷¹ Dr. Coutant fails to take into account the potential cumulative impacts associated when Vogtle Units 3 and 4 operate together with Vogtle Units 1 and 2.⁷² By definition, “cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.”⁷³ Accordingly, the mere fact that Units 1 and 2, and Units 3 and 4, may have minor impacts alone means nothing. These impacts must be considered in concert with each other.

SNC also argues that the U.S. National Marine Fisheries Service Letter (Exhibit SNC000022) supports the Staff’s finding that operation of Vogtle Units 3 and 4 is not likely to adversely affect the shortnose sturgeon.⁷⁴ However, as Dr. Young will testify, this letter is potentially unreliable, insofar as it does not analyze year-round impacts and contains a number of overly-broad generalizations.⁷⁵

iii. The Staff Mistakenly Equates SMALL Impacts with No Impacts.

Even if the anticipated impacts of Units 3 and 4 are SMALL, the Staff and SNC mistakenly give too much weight to this conclusion. For example, in the Staff’s pre-filed direct testimony for EC 1.3 at question 15, Mr. Vail argues that because the FEIS concludes that the wet cooling related aquatic species impacts would be SMALL, § 9.4.1

⁷⁰ Coutant Pre-filed Direct Testimony for EC 1.3 at Answer 9.

⁷¹ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 4.

⁷² *Id.*

⁷³ 40 C.F.R. § 1508.7.

⁷⁴ SNC 1.3 Position Statement at 20.

⁷⁵ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 5.

of the Environmental Standard Review Plan (“ESRP”) necessitates the corresponding conclusion that there are no preferable heat dissipation systems.⁷⁶ However, as Dr. Young will explain, Mr. Vail mis-equates “no adverse impacts” as the phrase is used in § 9.4.1, with the FEIS term SMALL.⁷⁷ While Mr. Vail is correct in asserting that the ESRP requires a reviewer to conclude that “there are no environmentally preferable heat dissipation-system alternatives” in the event “no adverse impacts have been predicted for the proposed system”, the ESRP does not mandate a similar conclusion if adverse impacts are predicted.⁷⁸

The FEIS defines the SMALL significance level as existing where “environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attributes of the resource.”⁷⁹ Thus, as Dr. Young will explain, SMALL incorporates numerous actions having some impact and could potentially encompass a certain degree of adverse impacts as that phrase is used in § 9.4.1.⁸⁰ Accordingly, the ESRP, together with NEPA, requires a more in depth analysis of the dry-cooling alternative.

Like the Staff, SNC applies an inconsistent and inappropriate standard in assessing potential aquatic impacts. As Dr. Young will testify, the SNC 1.3 Position Statement cites Dr. Coutant for the proposition that “the proposed cooling system would

⁷⁶ Vail Pre-filed Direct Testimony for EC 1.3 at Answer 15.

⁷⁷ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 1.

⁷⁸ ESRP at § 9.4.1. In fact, the ESRP provides that “if adverse impacts are predicted, the reviewers should coordinate in identifying and analyzing means to mitigate these impacts.” *Id.*

⁷⁹ NRC000001 at 1-4.

⁸⁰ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 1.

have to pose significant risks to these species [robust redhorse and shortnose sturgeon],” before the dry cooling alternative must be considered.⁸¹ However, the elevated impacts threshold of “significant risks to these species” in no way relates to the “no adverse impacts” threshold found in the ESRP, or to the FEIS term SMALL.⁸²

In summary, both the Staff and SNC propose significance levels for determining permissible levels of impacts to aquatic species that are inconsistent and potentially higher than the significance level contemplated by the FEIS term SMALL. This, along with the arguments outlined previously in this Response Statement, highlights the flaws in the Staff’s wet cooling impacts analysis and SNC’s supplemented record. Accordingly, because the wet cooling analysis is incomplete, NRC cannot take a “hard look” at the dry cooling alternative as required by NEPA.

B. “Extremely Sensitive Biological Resources” are Present.

SNC states in the SNC 1.3 Position Statement that the Staff’s NEPA evaluation of dry cooling is adequate at least in part because of the alleged evidence that “there are no extremely sensitive biological resources as that term is used in EC 1.3, present in the area of the Savannah River that will be impacted by the proposed Vogtle intake or discharge facilities.”⁸³ Phrased in a slightly distinctive manner, SNC subsequently asserts in the SNC 1.3 Position Statement that “the area of the Savannah River in the vicinity of the

⁸¹ SNC 1.3 Position Statement at 17 (citing Coutant Pre-Filed Direct Testimony for EC 1.3 at Answer 6).

⁸² Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 2.

⁸³ SNC 1.3 Position Statement at 19. Along these lines, the Staff concludes that “the proposed design will have only a small effect on extremely sensitive biological resources.” Staff Position Statement at 28.

Vogtle site does not have extremely sensitive biological resources that are necessary for the maintenance of the shortnose sturgeon or robust redhorse.”⁸⁴

Dr. Young argues in rebuttal that SNC mischaracterizes both the significance and implication of the inclusion of the phrase “extremely sensitive biological resources” in the preamble of the final rule for § 316(b) of the Clean Water Act and ultimately, in EC 1.3.⁸⁵ Although the Environmental Protection Agency (“EPA”) rulemaking provisions reject dry cooling as a national minimum standard, the EPA expressly notes that “dry cooling may be the appropriate cooling technology . . . in areas with . . . extremely sensitive biological resources (e.g., endangered species, specially protected areas).”⁸⁶ EC 1.3 incorporates this phrase in stating that “the dry cooling analysis is inadequate to address the appropriateness of a dry cooling system given the presence of extremely sensitive biological resources.” First, Dr. Young will explain that the framework advanced by SNC, namely that either the shortnose sturgeon or robust redhorse must be adversely affected in order to qualify as an “extremely sensitive biological resource” as used by the EPA, is misguided.⁸⁷ Federally and state protected species are inherently extremely sensitive, and because the presence of these two species at the VEGP site is not

⁸⁴ SNC 1.3 Position Statement at 13. Similarly, SNC expert Coutant states that “studies and analyses support the belief that the Savannah River at the Vogtle location is not an extremely sensitive habitat for shortnose sturgeon. . . . [instead] [t]he river at Vogtle serves mainly as a migration corridor for adults and juveniles.” Coutant Pre-filed Direct Testimony for EC 1.3 at Answer 9.

⁸⁵ Young Pre-filed Rebuttal Testimony at Answer 6.

⁸⁶ 66 Fed. Reg. 65,255, 65,282.

⁸⁷ Young Pre-filed Rebuttal Testimony for EC 1.3 at Answer 6.

at issue, the EPA rulemaking provision recognizes that dry cooling may be the appropriate technology.⁸⁸

Dr. Young will then explain that SNC unnecessarily restricts the definition of “extremely sensitive biological resources” to the shortnose sturgeon and robust redhorse.⁸⁹ However, a broader interpretation is warranted because the EPA rulemaking provision, which cites “endangered species” and “specially protected areas” as examples of extremely sensitive biological resources, simply represents a non-exhaustive list.⁹⁰ For instance, the Atlantic sturgeon is a federally protected candidate species, and as such should be considered an extremely sensitive biological resource present in the Savannah River in the vicinity of the Vogtle site.⁹¹ The Staff inadequately addresses impacts to the Atlantic sturgeon, as discussed by Dr. Young at questions 7 and 8 of his pre-filed rebuttal testimony,⁹² and – because of SNC’s narrow definition – SNC completely omits discussion of the impacts to this species. Thus, the NEPA mandate that NRC take a “hard look” at the impacts on the Atlantic sturgeon, together with other extremely sensitive biological resources, remains unsatisfied.

II. Dry Cooling Is a Feasible Alternative.

A. *The “Rule of Reason” Mandates Full Consideration of the Dry Cooling Alternative.*

⁸⁸ *Id.*

⁸⁹ *Id.* at 7.

⁹⁰ *Id.* at 7.

⁹¹ *Id.* at 7-8.

⁹² *Id.*

SNC extensively discusses the application of the “rule of reason” to NEPA’s requirement that the discussion of alternatives be “sufficiently complete.”⁹³ As noted above, SNC is correct in that NEPA’s “hard look” mandate requires discussion of only reasonable and feasible alternatives, and that the “rule of reason” guides both the choice of alternatives and the extent to which the FEIS must discuss each alternative.⁹⁴ Nonetheless, as illustrated by Mr. Power’s testimony, dry-cooling is in fact a reasonable and feasible alternative.⁹⁵ Accordingly, the NEPA “rule of reason” mandates its full consideration in the FEIS.

SNC essentially argues that because dry cooling is economically infeasible, the rule of reason does not mandate any further analysis of the dry cooling alternative.⁹⁶ However, this is a misstatement of the law. While SNC correctly notes that the U.S. Supreme Court has held that “an agency is not constrained by NEPA from deciding that other values (such as economic considerations) outweigh environmental issues,”⁹⁷ SNC fails to note that this is only the case when “the adverse environmental effects of the proposed actions are adequately identified and evaluated.”⁹⁸ As explained in EC 1.2, and previously in this Response Statement, the FEIS fails to adequately assess the adverse

⁹³ SNC 1.3 Position Statement at 8-10.

⁹⁴ *Citizens Against Burlington v. Busey IV*, 938 F.2d 190, 195 (D.C. Cir. 1991); *Private Fuel Storage, L.L.C.*, 58 N.R.C. 454, 479 (2003).

⁹⁵ Powers Pre-Filed Rebuttal Testimony for EC 1.3 at Answers 1-8.

⁹⁶ SNC 1.3 Position Statement at 30-33. SNC also asserts that dry cooling is technologically infeasible, a point which Mr. Powers rebuts at Answers 2-8 of his Pre-Filed Rebuttal Testimony for EC 1.3.

⁹⁷ SNC 1.3 Position Statement at 10.

⁹⁸ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

environmental effects of the wet-cooling system. Accordingly, SNC's reliance on economic considerations is premature and misplaced.

Moreover, even if the Staff and SNC adequately identified and evaluated the environmental effects of the wet cooling system, SNC grossly overestimates the extent of the efficiency loss, financial expenditures, and environmental harm associated with a wet cooling system. This overestimation is explained in sections (B) and (C) below and further explained by Mr. Powers at questions 1-8 of his pre-filed rebuttal testimony.

B. SNC Overestimates the Magnitude of the Incompatibility of the Standard Design of the AP1000 Turbine with the Dry Cooling System.

SNC claims that a dry cooling system based on an air cooled condenser ("ACC") is currently incompatible with the standard AP1000 turbine.⁹⁹ Specifically, Mr. Cuchens asserts that based on the environmental conditions at the VEGP site, the ACC would operate at a prohibitively high backpressure, thus resulting in a marked decrease in plant efficiency and capacity.¹⁰⁰

Mr. Powers will show, however, that SNC significantly overestimates the extent to which operation of an ACC with the standard design will result in higher backpressure and the associated loss in electrical generating efficiency.¹⁰¹ Relying on these faulty estimations, Mr. Cuchens' then incorrectly overestimated the efficiency differential between a wet and dry cooling system.¹⁰²

⁹⁹ SNC 1.3 Position Statement at 25.

¹⁰⁰ Cuchens Pre-filed Direct Testimony for EC 1.3 at Answers 9-10.

¹⁰¹ Powers Pre-filed Rebuttal Testimony for EC 1.3 at Answers 2-4.

¹⁰² *Id.* at 2-4.

In addition, Mr. Powers will discount many of the costly changes in plant design cited by Mr. Cuchens as simply unnecessary, while pointing to other similarly successful dry cooling power plant examples.¹⁰³

C. SNC Overestimates the Environmental Harm and Expenditures That Will Result from Implementation of Dry-Cooling.

SNC argues that even if it is possible to design and construct the dry cooling system, the dry cooling system would result in significant environmental harm.¹⁰⁴ Additionally, Mr. Cuchens asserts that dry cooling would cost approximately six times the cost of the wet cooling system.¹⁰⁵ Finally, based on these environmental and financial considerations, SNC concludes that dry cooling is simply not a feasible alternative.¹⁰⁶

Mr. Powers will testify that Mr. Cuchen's initial overestimation of the efficiency differential between a wet and dry cooling system lead SNC to a corresponding gross overestimation of the accompanying increased environmental harm and additional financial expenditures related to Units 3 and 4.¹⁰⁷ Accordingly, SNC's conclusion that dry cooling is an infeasible alternative is invalid.

EC 6.0 RESPONSE STATEMENT: The FEIS fails to adequately assess the impacts related to barging components of Units 3 and 4 to the VEGP site.

I. The Staff Failed to Adequately Assess Impacts of Dredging the Federal Navigation Channel.

¹⁰³ *Id.* at 5-7.

¹⁰⁴ SNC 1.3 Position Statement at 29-30.

¹⁰⁵ Cuchens Pre-filed Direct Testimony for EC 1.3 at Answer 22.

¹⁰⁶ SNC 1.3 Position Statement at 31.

¹⁰⁷ Powers Pre-filed Rebuttal Testimony for EC 1.3 at Answers 2-8.

The Staff's failure to adequately assess the impacts of dredging the Federal navigation channel in the FEIS violates the NEPA "hard look" requirement, and the CEQ and NRC regulations. As explained above, and as the CEQ regulations make clear, the Staff must address the environmental impacts of any connected action in its FEIS.¹⁰⁸ Actions are connected if, among other reasons, they "[a]utomatically trigger other actions which may require environmental impact statements"¹⁰⁹ or if they "[a]re interdependent parts of a larger action and depend on the larger action for their justification."¹¹⁰ Dredging the Federal navigation channel is a connected action because it is automatically triggered by the issuance of the ESP,¹¹¹ and, as Dr. Hayes will testify, such dredging is, in fact, inextricably linked to the construction of Units 3 and 4.¹¹²

A. Dredging is "Automatically Triggered" by Issuance of the ESP.

SNC's ESP application provides that SNC plans to barge the nuclear reactor components of Units 3 and 4 to the VEGP site.¹¹³ Although SNC argues that dredging is not automatically triggered by the ESP because there are alternative means by which to transport the reactor components,¹¹⁴ SNC's ESP application also includes a design for a

¹⁰⁸ 10 C.F.R. § 1508.25(a)(1)(i)-(iii).

¹⁰⁹ *Id.* § 1508.25(a)(1)(i).

¹¹⁰ *Id.* § 1508.25(a)(1)(iii).

¹¹¹ *Id.* § 1508.25(a)(1)(i).

¹¹² *Id.* § 1508.25(a)(1)(iii); Hayes Rebuttal Testimony for EC 6.0 at Answer 3.

¹¹³ SNC Early Site Permit Application, Part 3, Environmental Report (Revision 0) ("ER") at 2.5-10 ("SNC plans to utilize the Savannah River navigation channel to support delivery of large components and modules for construction of Units 3 and 4."); *see also, id.* at 3.9-5 ("Large module component shipments will arrive by barge, be offloaded at the barge facility, and transported over the heavy haul road to the fabrication assembly area.").

¹¹⁴ SNC 6.0 Position Statement at 21. *See* Neubert Pre-filed Direct Testimony for EC 6.0 at Answer 9 (stating that barging is the preferred method of transportation and implying that there are other methods); *see also* Staff Position Statement at 31 ("[B]ecause rail and highway transportation are available options,

barge slip and a proposal to dig a haul road from the barge slip to the VEGP site.¹¹⁵ Additionally, SNC relies on experts who advised SNC that barging is the most cost effective means of transporting the reactor components to the VEGP site.¹¹⁶ SNC even hired Captain David Scott to survey the Federal navigation channel and two more experts, Mr. Smith and Mr. Neubert, to address the extent of dredging necessary to barge the reactor components to the VEGP site.¹¹⁷ Given SNC's plans, preparation, and significant investment in barging as the means of transporting the reactor components to the VEGP site, SNC's argument that there are alternative means of transportation, namely rail and truck, is purely theoretical.¹¹⁸

On its face, the ESP requires barging. Barging, in turn, requires there to be some dredging of the Federal navigation channel. Thus, dredging is "automatically triggered" by the issuance of the ESP, and pursuant to 10 CFR § 1508.25(a)(1)(i), its impacts must be considered in the Staff's FEIS as a connected action.

B. Dredging the Federal Navigation Channel Has No Independent Utility.

The utility of dredging is completely dependent on the Staff's issuance of the ESP. Under NEPA, actions are connected if they "[a]re interdependent parts of a larger action and depend on the larger action for their justification."¹¹⁹ The proper test for

Staff did not assume that barging was the only possible option for bringing components to the Vogtle Site.").

¹¹⁵ ER at 3.9-3 and 3.9-5.

¹¹⁶ Neubert Pre-filed Direct Testimony for EC 6.0 at Answer 6.

¹¹⁷ SNC 6.0 Position Statement at 19.

¹¹⁸ SNC 6.0 Position Statement at 21; *see also* Staff 6.0 Position Statement at 31 (stating that, "the Staff assumed that heavy components would be delivered to the Vogtle site by use of barges on the Savannah River").

¹¹⁹ 10 C.F.R. § 1508.25(a)(1)(iii).

determining whether an action is an interdependent part of a larger action is “whether the project has independent utility.”¹²⁰

SNC and the Staff argue that dredging is not dependent upon the issuance of the ESP because it is too speculative, given that SNC (i) has not even submitted a formal request that the United States Army Corps of Engineers (the “Corps”) dredge the Federal navigation channel,¹²¹ and (ii) dredging is simply one of many options available to SNC to transfer reactor components to the VEGP site.¹²² These arguments, however, are without merit. SNC has had “several general meetings” with the Corps¹²³ suggesting that dredging is more than merely speculative. The fact that a formal request has not been submitted in no way negates this conclusion. In fact, in his Pre-Filed Direct Testimony, Mr. Bailey admitted that the Corps had yet to receive a formal proposal for the Corps to dredge the area around the barge slip.¹²⁴ This did not make construction of the barge slip speculative or uncertain. Accordingly, the Staff analyzed the impacts of dredging for SNC’s proposed barge slip in the FEIS.¹²⁵ As SNC has been planning and preparing to construct a barge slip at the VEGP site, it has also been planning to have the Federal navigation channel dredged to permit barging of reactor components to the VEGP site.

¹²⁰ *Town of Huntington v. Marsh*, 859 F.2d 1134, 1142 (2d Cir. 1988).

¹²¹ Maciejewski Pre-filed Direct Testimony for EC 6.0 at Answer 8.

¹²² Neubert Pre-filed Direct Testimony for EC 6.0 at Answer 9.

¹²³ *See* Maciejewski Pre-filed Direct Testimony for EC 6.0 at Answer 16.

¹²⁴ Bailey Pre-filed Direct Testimony for EC 6.0 at Answer 11.

¹²⁵ NRC000001 at section 4.1. The Staff’s analysis of the impacts of constructing the barge slip makes it more remarkable that they refuse to analyze the impacts of the necessary dredging of the Federal navigation channel to barge the reactor components to the VEGP site.

Moreover, while barging may theoretically be one of many transportation options available to SNC, such theoretical possibilities do not make barging – and thus dredging – any less likely. As explained above, all other transportation options have effectively been dismissed from consideration. Thus, dredging is far from speculative; instead, dredging is a reality. Units 3 and 4 will not be built without dredging, and accordingly, the ESP application depends on it.

Just as the ESP application depends on dredging, so too does dredging depend on the ESP application. As Mr. Maciejewski stated, the Corps currently has no plans, resources, or funding to dredge the long-dormant Federal navigation channel.¹²⁶ With no plans to dredge and no funding to do so, the Corps has no intention of dredging but for the NRC's issuance of the ESP. Furthermore, based upon the testimony of Cpt. Scott, Mr. Neubert, Mr. Bailey, and Mr. Simpson, it appears that dredging will only occur to the extent necessary to permit barges to transport reactor components to the VEGP site.¹²⁷ In other words, as Dr. Hayes will testify, dredging will not be done to restore the Federal navigation channel to its permitted width and depth, thus allowing most vessels to navigate it.¹²⁸ Instead, the extent of the dredging project is wholly dependent upon the barging needs of SNC.

Therefore, dredging of the Federal navigation channel has no independent utility. If the ESP is not issued, the Corps will have no need to dredge the Federal navigation channel. Conversely, if the Corps does not dredge the Federal navigation channel, SNC

¹²⁶ Maciejewski Pre-filed Direct Testimony for EC 6.0 at Answer 14.

¹²⁷ See generally Scott and Neubert Pre-filed Direct Testimony for EC 6.0; Bailey Pre-filed Direct Testimony for EC 6.0. See further Scott, Neubert, and Smith Pre-filed Direct Testimony for EC 6.0 at Answer 20.

¹²⁸ Hayes Rebuttal Testimony for EC 6.0 at Answer 7; see also *id.* at Answers 5-6.

cannot construct and operate Units 3 and 4. Because dredging lacks independent utility, the Staff must adequately address the environmental impacts of the dredging in the FEIS.

II. Given That Dredging is a Connected Action, the NRC Has an Independent Obligation to Assess the Foreseeable Impacts of Dredging.

Because dredging is a connected action as explained above, NRC has an independent duty to assess the environmental impacts of dredging before issuing the ESP. The fact that the Corps exercises jurisdiction over dredging projects in the Federal navigation channel in no way relieves NRC of this duty.

In their respective Position Statements, SNC and the Staff argue that the environmental impacts of dredging the Federal navigation channel do not need to be addressed further because the Corps has jurisdiction over dredging and must prepare an environmental impact statement before any dredging of the Federal navigation channel will occur.¹²⁹ This jurisdictional argument fails for two reasons: (i) an FEIS may necessarily include an assessment of environmental impacts caused by actions within another agency's jurisdiction—this is specifically contemplated by NEPA and the CEQ regulations,¹³⁰ and (ii), while the NRC, in fulfilling its NEPA obligations, may rely on another agency's environmental findings, where no such assessment exists, the NRC must establish its own impact determination.¹³¹ Given that the Staff is required to consider all environmental impacts related to issuance of the ESP in the FEIS, even if those impacts are caused by actions otherwise outside of NRC's jurisdiction, the only issue is whether the Staff must make its own environmental assessment of the impacts of

¹²⁹ SNC 6.0 Position Statement at 21-22; Staff Position Statement at 32-33.

¹³⁰ 42 U.S.C. § 4332(2)(C) (2006); 10 C.F.R. § 1503.1(a)(1).

¹³¹ *See generally* NUREG-1555, 4.2.2-4.5.

dredging, or whether there are assessments available for it to rely upon. As Mr. Bailey states, the Corps has yet to analyze the environmental impacts of dredging in the Federal navigation channel.¹³² In order for the Staff to rely on another agency's environmental study of impacts, the study must obviously be complete.¹³³ Because, as Mr. Bailey stated, the Corps has yet to complete an environmental study, the Staff cannot meet its obligations under NEPA and the NRC regulations by deferring to the Corps future obligation to address the environmental impacts of dredging the Federal navigation channel. Consequently, the Staff must assess the environmental impacts of dredging the Federal navigation channel in the FEIS.

III. The Staff Has No Basis to Conclude That Potential Impacts of Dredging Could be MODERATE.

The Staff has no adequate basis from which to conclude, as it did in the FEIS, that the environmental impacts of dredging could be MODERATE.¹³⁴ Moreover, although in NRC licensing proceedings the applicant may introduce evidence into the record that enhances the detail and completeness of the FEIS,¹³⁵ SNC has failed to introduce sufficient evidence regarding the impacts of dredging to support the FEIS's conclusion. Without adequate information, NRC cannot take the requisite "hard look" at the impacts of dredging.

¹³² See Maciejewski Pre-filed Direct Testimony for EC 6.0 at Answer 8 (the Corps has not received a formal request to complete dredging from SNC) and Bailey Pre-filed Direct Testimony for EC 6.0 at Answer 9 (stating that if the Corps did receive a formal request to dredge it would prepare an environmental assessment of the proposed action).

¹³³ See generally NUREG-1555, 4.2.2-4.5. See also, *In re Philadelphia Electric Co. (Limerick Generating Station)*, 20 N.R.C. 848 ("The Commission has an independent responsibility to fulfill the purposes of NEPA to the fullest extent possible.").

¹³⁴ NRC000001 at 7-20.

¹³⁵ See *La. Energy Servs., L.P.* (Claiborne Enrichment Center), LBP-06-8, 63 NRC 241, 286; see generally, 10 CFR §§ 51.102 and 51.103.

As Dr. Young will testify, more studies are necessary to adequately determine the extent of impacts that dredging the Federal navigation channel will have on the aquatic environment.¹³⁶ The limited studies conducted by SNC are too narrow in scope and rely on inapplicable information. For instance, SNC's witness Dr. Coutant failed to adequately address the effect even limited amounts of dredging may have on the mussel populations located in the Savannah River.¹³⁷ Dr. Coutant also failed to use the most recent mussel survey for the Savannah River, instead relying upon a more dated survey from a different river.¹³⁸ According to the most recent Savannah River study,¹³⁹ there are 14 mussel species listed as species of concern, threatened, or endangered by South Carolina and the United States Fish and Wildlife Service.¹⁴⁰ Given the proximity of some of the dredging sites to these mussel species, NEPA requires a more detailed assessment of the potential impacts even limited dredging could have.

Failure to adequately examine the impacts dredging may have on mussel species in the Federal navigation channel is just one example of the inadequacies of SNC's supplemented record. As Dr. Young will testify, Dr. Coutant's examination of the impacts of snag removal failed to take into account that snags create velocity breaks, which provide refuge from velocity shear stress for benthic organisms, mussels, suckers,

¹³⁶ Young Rebuttal Testimony for EC 6.0 at Answers 1, 8-10; *see also id.* at Answers 4-6, 8; Hayes Rebuttal Testimony for EC 6.0 at Answers 2, 8, 11 and 16 (testifying that SNC could not properly determine based on information known to it that the environmental impacts of dredging and sediment disposal will be MODERATE and that more studies are needed).

¹³⁷ *Id.* at Answer 5; *see also id.* at Answers 2-3.

¹³⁸ *Id.* at Answers 5-6.

¹³⁹ NRC000005.

¹⁴⁰ Young Rebuttal Testimony for EC 6.0 at Answer 7.

catfish, and other fishes.¹⁴¹ Since SNC has failed to supplement the record to allow these impacts to be fully considered by the Board, the NEPA “hard look” mandate remains unsatisfied.

IV. Impacts of Upstream Releases are Reasonably Foreseeable.

NEPA and the CEQ regulations require agencies to assess the environmental impacts of reasonably foreseeable actions.¹⁴² SNC and the Staff contend that upstream releases are not reasonably foreseeable because there is neither a plan nor a need to release water from the Savannah River’s reservoirs in order to barge the reactor components to the VEGP site.¹⁴³ As Mr. Neubert and Mr. Smith testified, this conclusion is based on an assumed river flow rate of 3,700 cfs. The Savannah River, however, has not had flows near 3,800 cfs since November 2007.¹⁴⁴ And, as Mr. Simpson stated, the region continues to face drought conditions.¹⁴⁵ Thus, SNC’s and the Staff’s assessment is premised on an unrealistic assumption. Moreover, Mr. Simpson testified that a barge shipment on the Federal navigation channel, *before the drought*, required a release of 10,000 cfs.¹⁴⁶

Given the drought conditions, the fact that SNC’s plan of barging the components is based on river flows that have not occurred since 2007, and the fact that past barging shipments required flows 6,200 cfs greater than those assumed by SNC to

¹⁴¹ *Id.* at Answers 3-4.

¹⁴² 42 U.S.C. § 4332(C)(i) (2006); 10 C.F.R. §§ 1508.7 (defining cumulative impacts to include environmental impacts of “reasonably foreseeable future actions”), 1508.25 (defining the scope of an agency’s environmental assessment to include cumulative actions).

¹⁴³ SNC 6.0 Position Statement at 13; Staff Position Statement at 37.

¹⁴⁴ Sulkin Pre-filed Direct Testimony for EC 1.2 at Answer 14.

¹⁴⁵ Simpson Pre-filed Direct Testimony for EC 6.0 at 9.

¹⁴⁶ Simpson Pre-filed Direct Testimony for EC 6.0 at Answer 15.

support barging, upstream releases from the reservoirs are reasonably foreseeable.

Accordingly, the impacts of these releases must be addressed by the Staff in its FEIS.

RESPONSE TO RELIEF SOUGHT

For the reasons set forth in the Intervenor's Position Statement as supported by the pre-filed direct testimony and evidence filed in connection therewith, together with the reasons set forth in this Response Statement as supported by the pre-filed rebuttal testimony and evidence filed in connection herewith, EC 1.2, EC 1.3, and EC 6.0 should be sustained. Joint Intervenor's respectfully request that the Board rule that the FEIS is inadequate for the reasons set forth in the contentions. Moreover, Joint Intervenor's respectfully request that the Board rule that the evidentiary record has not been adequately supplemented by SNC and the Staff to permit the NRC to satisfy its NEPA obligation to take a "hard look" at the environmental issues raised in the contentions. Accordingly, SNC's request for an ESP should be denied.

Respectfully submitted this 6th day of February, 2009,

/signed (electronically) by/

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of)	
)	
SOUTHERN NUCLEAR OPERATING COMPANY)	Docket No. 52-011-ESP
)	
(Early Site Permit for the Vogtle ESP Site))	February 6, 2009

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **JOINT INTERVENORS' RESPONSE STATEMENT, PRE-FILED REBUTTAL TESTIMONY, AND EXHIBITS** were served upon the following persons by Electronic Information Exchange and/or electronic mail.

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Dated: February 6, 2009

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