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'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW CONCERNING CONTESTED ENVIRONMENTAL MATTERS

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May 8, 2009

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I. INTRODUCTION

In accordance with the Licensing Board's Memorandum and Order (Revised General Schedule) (November 13, 2008), the U.S. Nuclear Regulatory Commission ("NRC") staff ("NRC staff") hereby files its reply findings to the proposed findings of fact and conclusions of law filed by the Applicant[1] and by the Joint Intervenors[2] regarding contested environmental matters.

II. FINDINGS OF FACT[3]

A. EC 1.2

2.83.1. In their proposed findings of fact concerning potential impacts to shortnose sturgeon, the Joint Intervenors referenced a Recovery Plan published in 1998 by the National Marine Fisheries Service ("NMFS"), and stated that cooling water intakes "are one of several

[1] "Southern Nuclear Operating Company's Proposed Findings of Fact and Conclusions of Law Regarding Environmental Contentions" (April 24, 2009).

[2] "Joint Intervenor's Proposed Findings of Fact and Conclusions of Law" (April 24, 2009). 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.

[3] The paragraph numbering used in these reply findings of fact and conclusions of law generally follows the numbering used in the Staff's Proposed Findings (*e.g.*, Staff Reply Finding 2.83.1 should be read following the Staff's initial Proposed Finding 2.83).

factors" identified in the NMFS Recovery Plan as affecting recovery of the shortnose sturgeon. "Joint Intervenor's Proposed Findings of Fact and Conclusions of Law" ["JTI Proposed Findings"] at 12-13 ¶ 6; Ex. JTI000026. The Joint Intervenors also cited this document as stating that "documented mortalities of sturgeon have occurred" on the Savannah River. JTI Proposed Findings at 12-13 ¶ 6; Ex. JTI000026. However, the Joint Intervenors did not explain how such a general reference to cooling water intakes being "one of several factors…affecting recovery" demonstrates that there would be adverse impacts to the shortnose sturgeon from the existing or proposed Vogtle units, nor did they articulate why the existence of unspecified "documented mortalities" on the Savannah River reveals adverse impacts to the shortnose sturgeon population that would be attributable to the Vogtle units. We find the Joint Intervenors' reference to this general statement in the NMFS's 1998 Recovery Plan to be even less persuasive in light of the more recent NMFS letter (dated August 11, 2008), cited by the Applicant and NRC staff. Staff Dir. EC 1.2, Post Tr. 743 at 59;[4] Ex. SNC000022. In that letter, in response to the NRC staff's Biological Assessment, the NMFS specifically stated that the "proposed action is not likely to adversely affect the shortnose sturgeon." Ex. SNC000022 at 4.

2.83.2. The Joint Intervenors further stated in their proposed findings that larval sturgeon were collected in the vicinity of the VEGP site during surveys in the 1980s. JTI Proposed Findings at 13 ¶ 7 (citing Ex. SNC000012).[5] They also asserted that authors of those surveys

[4] As in the NRC staff's proposed findings, page references herein to the hearing transcript refer to the final version of the transcript following incorporation of the transcript corrections approved by the Licensing Board in its Order dated April 9, 2009. Page references to portions of the prefiled direct and rebuttal testimony are identified by reference both to the transcript page where the testimony was bound into the record as if read, and to the page number of the prefiled testimony document (e.g., "Post Tr. 743 at 2" refers to the second page of the NRC staff prefiled direct testimony on EC 1.2, which is bound into the record at page 743 of the transcript).

[5] It appears that in this portion of their proposed findings, the Joint Intervenors' references to Ex. SNC000011 and SNC000012 were intended to be to Ex. NRC000011 and NRC000012.

had concluded that some sturgeon could have been entrained by the Savannah River Site cooling water intake, though no estimates were made; the Joint Intervenors further cited in their proposed findings the percentage of Savannah River ichthyoplankton (as well as the estimated number of organisms) entrained by the SRS reactors when they were operating. *Id.* (citing Ex. SNC000011, SNC000012, NRC000006, NRC000012). The Joint Intervenors claimed in their findings that this information "viewed collectively" reveals that a "significant number of shortnose sturgeon were entrained while the SRS reactors were operating" and that this "contributed to the endangered status of the Savannah River population." JTI Proposed Findings at 13 ¶ 7. They also asserted that impacts of the proposed action on shortnose sturgeon will be "large." *Id.* at 14-15 ¶ 9.

2.83.3. We do not agree that these findings follow from the Joint Intervenors' testimony. For example, in the studies in the 1980s referenced by the Joint Intervenors in their findings, a total of twelve shortnose sturgeon larvae were collected between 1982 and 1985 (Ex. NRC00001A at 2-91; NRC000012 at 3-112 to 114); the Joint Intervenors did not explain why such numbers supported their assertion that a "significant" number of shortnose sturgeon were entrained. In any event, the Joint Intervenors' witnesses did not explain why their view of these "baseline" conditions, even if true, demonstrates that any impacts to shortnose sturgeon from the proposed Vogtle units' intakes would be more significant than small, as stated in the FEIS for the numerous reasons described by the NRC staff and confirmed by the NMFS.

2.83.4. The Joint Intervenors also stated in their proposed findings that "the shortnose sturgeon population of the Savannah River has not recovered, despite the closure of the SRS reactors." JTI Proposed Findings at 13-14 ¶ 8. However, the Joint Intervenors offered no expert testimony for this assertion. Moreover, the same proposed finding states that "more recent population estimates of Savannah River shortnose sturgeon 'indicate that the adult

population is increasing, but juveniles are still rare.'" *Id.* (citing Ex. SNC000001).[6] Indeed, immediately following the sentence quoted by the Joint Intervenors, the FEIS states that "Smith et al (2001) attributed this recruitment bottleneck in the early life stages in part due to water-quality degradation in the nursery habitat in the lower Savannah River." Ex. NRC00001A at 2-91; Staff Reb. EC 1.2, Post Tr. 744 at 9-10. The Joint Intervenors provided no explanation for why an "increasing" population of adult shortnose sturgeon reflects an inadequacy in the NRC staff analysis of impacts from the cooling system intakes of the proposed Vogtle units. Accordingly, we find that the Joint Intervenors' assertions do not contradict the conclusion in the FEIS that impacts to the shortnose sturgeon would be small.

2.83.5. In their proposed findings, the Joint Intervenors also asserted that the existing Vogtle units "likely entrain a small, but not insignificant, number of larval robust redhorse," and that "any additional loss" of robust redhorse from the proposed units would result in "large" impacts. JTI Proposed Findings at 17 ¶ 15. In doing so, the Joint Intervenors described NRC staff testimony as stating that "robust redhorse larvae are susceptible to entrainment in the Plant Vogtle intake," and they also referenced the results of Southern's entrainment sampling at Units 1 and 2 in 2008. JTI Proposed Findings at 16-17 ¶ 13-14. The Joint Intervenors also stated in their proposed findings that although no protected fish species were encountered in that sampling, some of the taxa that were unidentified were from the Catostomid family, which includes the robust redhorse, and that Southern's methodology could not distinguish Catostomidae to the species level. JTI Proposed Findings at 17 ¶ 14.

2.83.6. We do not find the Joint Intervenors' position to be persuasive. The NRC staff acknowledged that certain individual aquatic organisms, including species' early life stages

[6] It appears that the Joint Intervenors' reference here to Ex. SNC000001 was intended to be to Ex. NRC000001A, a portion of the FEIS.

(such as the larval stages of "important species" like the robust redhorse) might be entrained by the Vogtle intakes and lost to the fishery. Staff Reb. EC 1.2, Post Tr. 744 at 13-14. However, the NRC staff emphasized that this susceptibility of individuals to entrainment is fully consistent with the analysis in the FEIS; given the variety of factors discussed in the FEIS (including intake design and species' life history data), the NRC staff determined that the number of individuals lost would be sufficiently small that no detectable changes to the fish population would result, and hence impacts would be small. *Id.* at 14. Likewise, the Applicant's witnesses testified that its taxa-identification methods were state-of-the-art, went as far as practical in terms of egg identification, and did not identify any robust redhorse. Tr. at 630-31 (Dodd).[7] The Joint Intervenors did not mention in their proposed findings that robust redhorse is one of nine species of Catostomids known to be present in the Middle Savannah River, the most common being the spotted sucker (*Minytrema melanops*). Ex. NRC000006 at 9; Ex. NRC000002 at 222, Ex. NRC000003 at 215. In contrast to the variety of factors and data considered by the NRC staff – for example, the intake design, low intake velocities, and the robust redhorse's spawning behavior and early life history – the Joint Intervenors have presented only vague speculation that robust redhorse larvae would be entrained in numbers that would be "small, but not insignificant." Accordingly, we agree that the Applicant and NRC staff have adequately supported the conclusion in the FEIS that impacts to the robust redhorse from the proposed action would be small.

2.83.7. In summary, we find the Joint Intervenors' proposed findings regarding impacts to shortnose sturgeon and robust redhorse unpersuasive, given the thorough Applicant and

[7] The Applicant's October 2008 entrainment assessment also states that "Planning elements for this study include…taxonomic identification of entrained fish species and their life stages to the lowest practical taxon[.]" Ex. SNCR00005 at 6.

NRC staff testimony demonstrating that a number of factors support the conclusion that impacts to these species from impingement and entrainment would be small. As we noted previously, the Applicant and NRC staff testimony addresses the shortnose sturgeon and robust redhorse's spawning behavior, the characteristics of their eggs, and the habitat preferences of the early larval stages of these two species; the design of the intake, preferentially selecting water from the middle of the water column rather than the bottom; the limited hydraulic zone of influence in the river from the four units resulting in the entrainment of only a small portion of the drift community passing the site; and the significantly lower densities of organisms in the intake canal as compared to the river, as demonstrated by the Applicant's 2008 sampling program. *See, e.g.*, Coutant Dir. EC 1.2, Post Tr. 604 at 15-17, 18, 23-27, 29, 44-46; Coutant Reb. EC 1.2, Post Tr. 605 at 4, 5, 10; Moorer Dir. EC 1.2, Post Tr. 610 at 8-10; Staff Dir. EC 1.2, Post Tr. 743 at 44, 46, 51-55, 57-61; Staff Reb. EC 1.2, Post Tr. 744 at 6, 12-15; Tr. 667-69 (Moorer/Coutant); Tr. 699-705 (Coutant); Tr. 767-68 (Krieg). Indeed, the Joint Intervenors' proposed findings acknowledge that the surveys conducted at Units 1 and 2 in 2008 did not find any shortnose sturgeon or robust redhorse entrained. JTI Proposed Findings at 14 ¶ 9, 17 ¶ 14. Accordingly, we agree that the Applicant and NRC staff have adequately supported the conclusion in the FEIS that impacts to the shortnose sturgeon and robust redhorse would be small.

2.83.8. In their proposed findings, the Joint Intervenors also contended that some fish that are host species for the early life stages of state-listed freshwater mussels will likely be entrained or impinged in the intake structure for Units 1 and 2. JTI Proposed Findings at 20 ¶ 20. They asserted that the record thus cannot support a finding that the impacts of operating Units 3 and 4 will be small. *Id.* However, we note that the Joint Intervenors witnesses did not make or support this claim in their testimony. Indeed, the Joint Intervenors' testimony does not

state why the host species would be adversely affected by impingement or entrainment from the Vogtle cooling system intake beyond the small impact determined by the NRC staff in the FEIS. In short, they presented no persuasive evidence in this regard to contradict the Applicant and NRC staff testimony explaining why impacts to aquatic species (including freshwater mussels) from impingement and entrainment would be small, as stated in the FEIS. *See, e.g.*, Staff Dir. EC 1.2, Post Tr. 743 at 9-10, 18, 20, 29-32, 58; Ex. NRC00001B at Sections 5.4.2, 7.5.

2.83.9. In their proposed findings, the Joint Intervenors assert more generally that threatened, endangered, or species of concern "have a low baseline, whether caused by natural occurrences or human activities." JTI Proposed Findings at 11 ¶ 3. It is unclear what precisely Joint Intervenors mean by "low baseline," a concept not clearly defined by their witnesses. The Applicant and NRC staff testimony explained, for example, why the design features of the Vogtle intakes would minimize entrainment of the eggs and larvae of species such as the shortnose sturgeon and robust redhorse, and furthermore why the anticipated small size of the hydraulic zone of influence supported the finding that the majority of the fish and drift community in the river would not be influenced by the Vogtle cooling system intakes. Dodd/Montz Dir. at 14-16; Staff Dir. EC 1.2, Post Tr. 743 at 56-58, 60-61; Staff Reb. EC 1.2, Post Tr. 744 at 12-13, 20-22. The Joint Intervenors presented no persuasive explanation as to how the presumed rarity of any threatened or endangered species – or whether such a species thus has a "low baseline" – was contrary to the NRC staff's analysis of impacts to those important species in the FEIS.

2.83.10. Accordingly, we agree that the Applicant and NRC staff have adequately supported the conclusion in the FEIS that impacts to the shortnose sturgeon, robust redhorse, and mussel species would be small.

B. EC 1.3

2.146.1 In their proposed conclusions of law, the Joint Intervenors asserted that "[b]ecause NEPA requires an analysis of cooling alternatives, and because "extremely sensitive biological resources" ("ESBRs") are present at the VEGP site, utilization of a dry cooling system must be meaningfully considered." JTI Proposed Findings at 30 ¶ 4. The Joint Intervenors, however, did not provide any justification or citation for their argument that ESBRs must merely be "present" at the VEGP site in order to trigger a more in-depth analysis. In contrast, the NRC staff testified that it was not required to analyze dry-cooling in greater depth, because it found the impacts to all "important species" – which includes all ESBRs – to be small. Staff Dir. EC 1.3, Post Tr. 1062 at 12-13, 17-19. Similarly, the Applicant testified that by using the term ESBR, the EPA "requires an analysis of the likelihood of exposure to something that could reasonably cause some harm to the population of threatened and endangered species. It doesn't mean that there should be no development where there are populations of the listed species." Tr. at 1043 (Coutant). Consequently, the Licensing Board finds that the weight of the evidence supports the position of the Applicant and the NRC staff that there must be some adverse population level effect on ESBRs in order to require a more in-depth review of the dry cooling alternative.

2.148.1. In its proposed conclusions of law, the Applicant stated that "the finding in the EIS that dry cooling is inferior to closed cycle wet cooling is reasonable." "Southern Nuclear Operating Company's Proposed Findings of Fact and Conclusions of Law Regarding Environmental Contentions" at 91 ¶ 19. The Licensing Board notes, however, that the FEIS does not characterize dry cooling as "inferior" to wet cooling at Vogtle. Rather, the FEIS found that dry cooling would not be "preferable to the proposed wet tower system[.]" Ex. NRC00001B

at 9-27. In any event, for the reasons previously described, we agree with the Applicant and NRC staff that the analysis of dry cooling in the FEIS was adequate and complies with the requirements of NEPA and the NRC's regulations.

2.150.1. We note that in their proposed findings, the Joint Intervenors assert that "General Electric committed to build (but has not actually built) an exclusively dry cooled, triple exhaust turbine with a 1,500-plus megawatt capacity (the 'ESBWR')." JTI Proposed Findings at 22 ¶ 3. To support this claim they cite, in part, Exhibit JTIR00050, an excerpt from the NRC's FEIS for the North Anna ESP. *Id.* We find that the citation to JTIR00050 is not persuasive evidence of the engineering feasibility of employing a dry cooling system at a nuclear power plant. An ESP does not require a determination that a specific design is technologically feasible; the adequacy and suitability of plant design at a particular site is a determination made as part of a combined license or certified design review. The environmental review of the North Anna ESP considered impacts of a facility represented as a "plant parameter envelope," a composite of reasonable parameter values from several potential reactor designs; the FEIS for the North Anna ESP does not state that dry cooling is technologically feasible for any of the designs (including the ESBWR) considered in that plant parameter envelope.

C. EC 6.0

2.185.1. In their proposed findings of fact, the Joint Intervenors asserted that "given recent drought conditions, a significant amount of rain would be required to sufficiently increase river flows." JTI Proposed Findings at 32 ¶ 4. Joint Intervenors further state that, because the Applicant intends to utilize many barge trips and does not find it prudent to 'wait on it to rain' (quoting Tr. at 1347 (Moorer)) "it is unreasonable to expect increased flows to last for the requisite duration." JTI Proposed Findings at 32 ¶ 4. The Joint Intervenors accordingly

conclude that dredging is necessary to support barging.

2.185.2. As an initial matter, we note that these statements are not supported by testimony provided by the Joint Intervenors' witnesses. In any event, we do not find the Joint Intervenors' claim to be persuasive; to the contrary, as stated earlier in our findings, the record demonstrates that the NRC staff reasonably determined that dredging was neither necessary nor was it reasonably foreseeable. First, as previously discussed, the testimony of the Applicant and the NRC staff confirmed that barging is not necessary because other transportation options are available. Moreover, the record demonstrates that even if barging is the preferred delivery method, barging is possible without dredging at naturally higher river flows. For example, the Applicant testified that increased river flow "could minimize (or eliminate) the need for dredging[.]" Neubert/Smith/Scott Dir. EC 6.0, Post Tr. 1290 at 10. Likewise, in Southern's recent estimate of the potential scope of dredging, the dredging quantities calculated by Capt. Scott and analyzed by Dr. Coutant were based on a river flow of 3,700 cfs. Neubert/Smith/Scott Dir. EC 6.0, Post Tr. 1290 at 7, 8; Tr. at 1306 (Moorer); Ex. SNCR20051. The Applicant testified that this is considered to be a very low flow rate for the Savannah River. Tr. at 1303 (Neubert).

2.185.3. Furthermore, the Applicant's witnesses also testified both that the number of barge trips utilized would depend on the depth of the river channel, and that fewer barge trips might be needed if the river flows increased. Tr. at 1302-1304 (Neubert). Moreover, Mr. Neubert testified that barge shipments would be limited to heavy components (Tr. at 1320) with the majority of shipments being delivered by other methods. Tr. at 1319-1320 (Trikouros/Neubert). With respect to potential future river flow conditions relevant to barging, Corps witness Mr. Simpson stated that it is possible to come out of the current drought conditions in as little as two to three months. Tr. at 1442. In light of these considerations

described by the Applicant, NRC staff, and Corps witnesses – among them that fewer barge trips may be required in order to allow delivery of the heaviest components to the Vogtle site and that other delivery methods are available – we find reasonable the NRC staff's determination that dredging of the Savannah River FNC is not necessary for the ESP or LWA action.

2.195.1. The Joint Intervenors alleged in their proposed findings that the Applicant "[s]trategically refrained from submitting a formal request [for dredging of the Savannah River FNC] to the Corps" until after certification by the Georgia Public Service Commission and that the absence of such a request is not an indication of the Applicant's intent to dredge the Savannah River FNC. Joint Intervenors Proposed Findings at 33 ¶ 6. The Joint Intervenors thereby imply that this makes dredging of the Savannah River FNC reasonably foreseeable. However, the fact that the Applicant expressed an interest in the Corps' maintenance of the Savannah River FNC does not conflict with the reasonableness of the NRC staff's assumptions regarding the foreseeability of maintenance dredging actually occurring. The Applicant's testimony clearly described its expectation that the Corps would maintain the Savannah River FNC and stated that it did not intend to submit a permit application to dredge the Savannah River FNC. Tr. at 1314, 1316 (Moorer); Tr. at 1370 (Neubert).

2.195.2. This testimony by the Applicant is fully consistent with the NRC staff's testimony. That is, the NRC staff testified that even if the Applicant wished to deliver large reactor components to the Vogtle site by barge and expected the Corps to maintain the Savannah River FNC, actual dredging of the Savannah River FNC was not reasonably foreseeable. Staff Dir. EC 6.0, Post Tr. 1477 at 7, 8; Tr. at 1490, 1492, 1550-51 (Cook); 1491, 1552-53 (Vail); Tr. at 1557-58 (Krieg). The testimony of witnesses for the Corps is also

consistent with the NRC staff position. The Corps witnesses stated that the Corps' current budget includes no funding for dredging of the Savannah River FNC, or even for the review and documentation that would be necessary prior to the start of any dredging project. USACE Dir. EC 6.0, Post Tr. 1385 at 5-6. Relatedly, Corps witness Mr. Maciejewski testified that since the FNC was last dredged in 1979, the Corps has occasionally sought funding for maintenance dredging of the Savannah River FNC, but that the project has not received the necessary funds given its low priority. Tr. 1461-63. Mr. Maciejewski also stated that the Corps typically does not conduct maintenance dredging of a FNC for a single user. Tr. at 1448-49. Accordingly, we agree that the record supports the NRC staff position that dredging of the Savannah River FNC is not reasonably foreseeable.

2.195.3. The Joint Intervenors claimed in their proposed findings that the NRC staff relied "solely on statements made by SNC that no dredging would be required." JTI Proposed Findings at 33-34 ¶ 7. We disagree. The NRC staff described multiple conversations with representatives of the Corps during the NRC review of the ESP application. Staff Dir. EC 6.0, Post Tr. 1477 at 7-9; Tr. at 1488-90, 1492, 1550-51 (Cook); 1552-53 (Vail). These interactions led the NRC staff to determine that barging of components to the Vogtle site was possible under higher river flows without dredging, that the Corps had no plan to undertake maintenance dredging of the Savannah River FNC, and that the Corps understood that Southern was not planning to apply for a permit to conduct dredging of the FNC. Staff Dir. EC 6.0, Post Tr. 1477 at 6, 8-9; Tr. at 1490, 1492, 1503-4 (Cook). All of these considerations were confirmed by the testimony of the Corps. USACE Dir. EC 6.0, Post Tr. at 5-7, 9, 10.

2.195.4. The Joint Intervenors also asserted in their proposed findings that, in concluding that dredging of the Savannah River FNC would not be required, the NRC staff gave "no weight" to comments on the DEIS received from the Corps and other environmental

agencies. JTI Proposed Findings at 34 ¶ 8. This claim is not supported by the record; indeed, it mischaracterizes the NRC staff's testimony. Specifically, the NRC staff testified that it was in fact because of the comments received from the Corps, other resource agencies, and the public that an analysis of the potential impacts of dredging was included in the cumulative impacts analysis portion of the FEIS. Staff Dir. EC 6.0, Post Tr. 1477 at 5-7, 11-13, 19-22; Tr. at 1486 (Krieg); Tr. at 1558-59 (Kuntzleman); Ex. NRC00001b at 7-20. In considering those comments, the NRC staff indicated in the FEIS that dredging would likely be required "to allow barge traffic during normal flows"; however, for the reasons explained in its testimony (including informal discussion with the Corps), the NRC staff continued to believe that barging to the Vogtle ESP site could occur at times of naturally high river flow. Staff Dir. EC 6.0, Post Tr. 1477 at 6, 8-9; Tr. at 1490, 1503-4 (Cook). The NRC staff reiterated that a detailed analysis was not possible due to the lack of a dredging plan; the absence of such a plan was confirmed by the testimony of the Corps. USACE Dir. EC 6.0, Post Tr. 1385 at 5-6. Therefore, the Licensing Board finds unpersuasive the Joint Intervenors' claim that the NRC staff gave "no weight" to the comments received from the Corps and other environmental agencies.

2.206.1. In their proposed findings, the Joint Intervenors claimed that the NRC Staff "just assumed" that river flows necessary to facilitate barge traffic to the Vogtle site would be "made available by the Corps as a result of normal operation." JTI Proposed Findings 40 ¶ 24. However, this statement mischaracterizes the NRC staff testimony. The NRC staff testified that it did not assume the Corps would authorize releases specifically to enable barge transportation to the Vogtle site. Staff Dir. EC 6.0, Post Tr. 1477 at 6, 9, 13; Tr. at 1537 (Vail); Tr. at 1539 (Krieg). In particular, the NRC staff explained that impacts to the upstream conservation pools were not reasonably foreseeable because the Corps would not authorize

releases during drought conditions. Rather, based on its discussions with the Corps, the NRC staff assumed that barging to the Vogtle site would be possible at times of naturally occurring high flows. Staff Dir. EC 6.0, Post Tr. 1477 at 6, 8-9; Tr. at 1490, 1503-4 (Cook). The NRC staff acknowledged that this approach would subject the Applicant's construction schedule to some uncertainty. Staff Dir. EC 6.0, Post Tr. 1477 at 8. However, both the NRC staff and the Corps noted that barge shipments of heavy components as far upstream as the Vogtle site had previously occurred, without dredging, at a river discharge of about 10,000 cfs, and the NRC staff also noted that river flows of 10,000 cfs have been available in the Savannah River almost every year. Staff Dir. EC 6.0, Post Tr. 1477 at 9; USACE Dir. EC 6.0, Post Tr. 1385 at 5; Tr. at 1541-1542 (Cook); Ex. NRC000028. Accordingly, we find the Joint Intervenors' position to be unpersuasive. Based on the testimony presented, the Licensing Board finds that the NRC staff reasonably determined that barging of components to the site could occur under higher flows incident to the Corps' normal implementation of its flood control plan, and that upstream water releases by the Corps specifically to enable barge transportation to Vogtle were not reasonably foreseeable.

2.206.2. The Joint Intervenors also suggested in their proposed findings that releases from upstream reservoirs to support barge traffic to the Vogtle site "could cause significant environmental impacts to … critical habitat." JTI Proposed Findings 40-41 ¶ 26. However, the hearing record does not support such a conclusion. The Joint Intervenors cited only to a general reference by a Corps witness to "habitat" which may be affected by upstream water releases. Tr. at 1447 (Simpson). This testimony did not refer to effects on "critical habitat" for any of the aquatic biota in the river. In any event, as stated above, the NRC staff and Applicant testified that no releases of water from upstream reservoirs would be either requested or needed to allow barge transportation to the Vogtle site and also that the Corps

would not authorize releases during drought conditions. Moorer Dir. EC 6.0, Post Tr. 1291 at 7-8; Tr. at 1336-37 (Moorer); Staff Dir. EC 6.0, Post Tr. 1477 at 6, 9, 13; Tr. at 1537 (Vail); Tr. 1490, 1538 (Cook); Tr. at 1539 (Krieg). The Licensing Board agrees with the Applicant and NRC staff that no "significant environmental impacts to aquatic species" from upstream water releases to enable barge transportation to the Vogtle site are reasonably foreseeable.

2.223.1. The Joint Intervenors asserted in their proposed findings that impacts to mussels at the potential dredging locations identified by Southern from Capt. Scott's survey cannot be assessed due to the Applicant's failure to conduct mussel surveys at each location. JTI Proposed Findings at 38-39 ¶ 19. In support of this proposition, the Joint Intervenors stated that mussels "can be present in fairly high abundance" in shifting sand habitats. JTI Proposed Findings at 38 ¶ 19 (quoting Tr. at 1599-1600 (Young)). However, Dr. Coutant testified that, based on information collected from a mussel study on the Pee Dee River (Ex. SNC000066), shifting sand habitats do not contain large numbers of mussels. Instead, according to the testimony of Dr. Coutant, "the shifting sand habitat that would be dredged if dredging occurs is a very poor habitat for mussels[.]" Tr. at 1350-51. He also explained that the report admitted as Ex. NRC000005 (which Dr. Young addressed in his testimony) found that " … '[i]n general, mussels are most abundant in the thalweg,' that is, the deepest part of the channel, 'at the base of the river bank and are rare or absent in the shifting sand dominated run in the center of the channel[.]'" Tr. at 1351 (Coutant) (quoting Ex. NRC000005). He also explained that the report found that much of the channel habitat "is of poor quality for fresh water mussels due to unstable shifting sediment[.]" Tr. at 1352 (Coutant) (quoting Ex. NRC000005).

2.223.2. During his testimony, Dr. Young initially stated that in the Ex. NRC000005 report, mussels were collected from locations "dominated by shifting sands in the channel, and

sandy mud on the banks," but later acknowledged that he was unable to determine from the language of the report whether the mussels were, indeed, collected from the shifting sand habitat. Compare Tr. at 1599-1600 (Young) and Tr. at 1628 (Young). Accordingly, we find that the record does not support the Joint Intervenors' position.

2.224.1. In their proposed findings, the Joint Intervenors stated that the "NRC staff concluded that the survey [conducted by Capt. Scott] is insufficient for its impact analysis." JTI Proposed Findings at 38 ¶ 16. However, the NRC staff witnesses simply testified that the survey conducted by Capt. Scott was insufficient to allow them to change their conclusion that potential impacts "could be moderate." Tr. at 1515, 1524-25, 1532 (Kuntzleman); Tr. at 1527 (Krieg).

2.225.1. The Joint Intervenors alleged in their proposed findings that the NRC staff based its environmental impact conclusion "solely" on its determinations that Southern would not dredge the Savannah River FNC and that the Savannah River FNC had not been dredged since 1979. JTI Proposed Findings at 34-35 ¶ 10. The record does not support the Joint Intervenors' position. The Joint Intervenors ignore NRC staff testimony that explains the basis for its qualitative analysis of potential impacts from dredging; NRC staff and Corps testimony regarding the Corps' environmental review process if FNC dredging were undertaken; and the NRC staff analysis of how it determined impacts would be unlikely to be greater than moderate.[8]

[8] In their proposed findings, the Joint Intervenors stated that the "NRC staff conceded that it did not have the information and project details required to conduct an adequate qualitative impacts analysis." JTI Proposed Findings at 34-35 ¶ 10. This misquotes the testimony provided by the NRC staff. In her testimony, Ms. Krieg stated that the NRC staff "did not have adequate information to do a *quantitative* analysis." Tr. at 1525 (emphasis added). However, as noted above, the NRC staff did conduct a qualitative analysis of the impacts anticipated to occur from potential dredging of the Savannah (continued. . .)

Staff Dir. EC 6.0, Post Tr. 1477 at 15-24; Kuntzleman Reb. EC 6.0 at 4; USACE Dir. EC 6.0, Post Tr. 1385 at 6-8. For example, Ms. Kuntzleman described the Corps' environmental review criteria for dredging activities, including the Corps consideration of the "least environmentally damaging practicable alternative," and the NRC staff's view that these criteria would constrain the potential impacts of maintenance dredging, were it to be undertaken. Staff Dir. EC 6.0, Post Tr. 1477 at 22-24. Considering the testimony and exhibits in the record, the Licensing Board finds that the NRC staff's analysis of environmental impacts was reasonable in light of the uncertainties associated with the likelihood and scope of the potential action and in light of the Corps regulations for environmental review of any potential Savannah River FNC dredging project.

2.227.1. In their proposed findings of fact, the Joint Intervenors also asserted that the NRC staff "failed to consider mitigation measures" which might be imposed on the Applicant to minimize the environmental impacts of any potential dredging of the Savannah River FNC. JTI Proposed Findings at 35 ¶ 11. However, the NRC staff did explain potential mitigation measures that might result from the Corps' environmental review. Staff Dir. EC 6.0, Post Tr. 1477 at 20-22; Ex. NRC00001b. Ms. Kuntzleman testified that such mitigation measures would be defined by the Corps during its environmental review and would ultimately be enforced by the Corps pursuant to its regulatory authority. Staff Dir. EC 6.0, Post Tr. 1477 at 17-24; Tr. at 1562.

2.227.2. Despite the Joint Intervenors' apparent criticism in their proposed findings that the potential mitigation measures listed by the NRC staff are based "upon the NRC staff's

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(. . .continued)
River FNC. Staff Dir. EC 6.0, Post Tr. 1477 at 15-16.

'previous experience'" (JTI Proposed Finding at 35 ¶ 11) we find the FEIS description to be appropriate. Without a dredging plan, the NRC staff had no basis for attempting to define more specific mitigation measures, and in any event, the imposition of those measures would be outside the NRC's regulatory authority. The Licensing Board also finds that it was reasonable for the NRC staff to rely, in part, on its professional experience, including Ms. Kuntzleman's extensive background with Department of the Navy, Engineering Field Activity Northeast (EFANE), in the preparation and coordination of Department of the Army permit applications for dredging and dredged material disposal, in reaching its conclusions regarding potential mitigation measures. The NRC staff's testimony is also consistent with the Corps testimony and guidance covering Corps environmental reviews of dredging projects, which were submitted as part of this hearing record. USACE Dir. EC 6.0, Post Tr. 1385 at 6-11; Tr. at 1394-1405 (Bernstein); 1412-1413 (Bailey); Ex. NRC000048. Therefore, the Licensing Board finds unpersuasive the Joint Intervenors' view that the NRC staff failed to consider such mitigation measures appropriately in its evaluation.

III. CONCLUSION

The foregoing represents the NRC Staff's reply findings to the proposed findings of fact and conclusions of law filed by the Applicant and by the Joint Intervenors regarding contested environmental matters.

Respectfully submitted,

Executed in Accord with 10 CFR § 2.304(d)
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Dated at Rockville, Maryland
This 8th day of May, 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 the "NRC STAFF'S REPLY FINDINGS OF FACT AND CONCLUSIONS OF LAW CONCERNING CONTESTED ENVIRONMENTAL MATTERS" have been served upon the following persons by Electronic Information Exchange this 8th day of May, 2009:

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