

**Official Transcript of Proceedings**

**NUCLEAR REGULATORY COMMISSION**

Title: Southern Nuclear Operating Company

Docket Number: 52-011-ESP;  
ASLBP No. 07-850-01-ESP-01-BD01

Location: Augusta, Georgia

Date: Thursday, March 19, 2009

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

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ATOMIC SAFETY AND LICENSING BOARD PANEL

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HEARING

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In the Matter of:                   :  
SOUTHERN NUCLEAR                   :     Docket No. 52-011-ESP  
OPERATING COMPANY                 :     ASLBP No.  
(Early Site Permit for :     07-850-01-ESP-BD01  
Vogtle ESP Site                     :

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Thursday, March 19, 2009

Doubletree Hotel Augusta &  
Convention Center  
2651 Perimeter Parkway  
Augusta, Georgia

BEFORE:  
G. PAUL BOLLWERK, Chair, Administrative Judge  
NICHOLAS G. TRIKOUROS, Administrative Judge  
DR. JAMES F. JACKSON, Administrative Judge

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13 Environmental Defense League, Center for a  
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C-O-N-T-E-N-T-S

1			
2	INSERTS	DIRECT	REBUTTAL
3	NRC Staff	1477	1479
4	Dr. Shawn Young	1569	1570
5	Dr. Donald <sup>Hayes</sup> Young	1572	1573
6	EXHIBIT NO	DESCRIPTION	MARK RECD
7	NRC		
8	NRC000048-00-BD01	Excerpts from: . . . . .	.1480 1481
9		US Army Corps of Engineers, ER-1105-2-100	
10	NRC000049-00-BD01	US Army Corps . . . . .	.1480 1481
11		of Engineers, ER-200-2-2, Procedures For	
12		Implementing NEPA (1988)	
13	JOINT INTERVENORS		
14	JTIR00005-00-BD01	Declaration of Young . . . . .	.1574 1580
15	JTI000026	Short Nosed Sturgeon. . . . .	.1575 1588
16		Recovery Plan	
17	JTI000027	Savannah River flow . . . . .	.1575 1580
18		Alternatives	
19	JTIR000029-00-BD01	Monitoring of organic	
20		compounds and trace metals during a	
21		dredging episode. . . . .	.1575 1580
22	JTI000040-00-BD01	Chlor-Alkali	
23		Plant Contributes to Mercury	
24		Contamination . . . . .	.1575 1580
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EXHIBIT NO	DESCRIPTION	MARK	RECD
	JOINT INTERVENORS (CONT:)		
JTIR20041-00-BD01			
	Declaration of Hayes . . . . .	.1576	1580
JTIR00045-00-BD01	Curriculum Vitae		
	of Donald Hayes . . . . .	.1576	1580
	APPLICANT		
SNC000098	Cogan Creek Project Drycooling		
	Technology Report . . . . .	.1639	

## P R O C E E D I N G S

1  
2 (8:30 a.m.)

3 JUDGE BOLLWERK: All right, let's go on the  
4 record please.

5 Good morning, everyone. We are here for  
6 what is the fourth and what will probably be the final  
7 day of our contested hearing relating to contentions  
8 EC 1.2, EC 1.3 and EC 6.0. And today we are going to  
9 be dealing with EC 6.0, as we were yesterday  
10 afternoon.

11 We have yet to hear, or receive, the  
12 direct and rebuttal prefiled testimony of the NRC  
13 staff, as well as the Joint Intervenors, and then to  
14 have Board questions for those witnesses. And that's  
15 what we'll be dealing with today.

16 Before we get started, let me see if there  
17 are any administrative matters the parties want to  
18 raise with the Board.

19 MR. BLANTON: Your Honor, just wanted to  
20 note for the record that we sent Mr. Cuchens home  
21 last night, and he found his trip report from South  
22 Africa from 1999, and I've delivered copies of that to  
23 both parties.

24 JUDGE BOLLWERK: All right, thank you  
25 very much. Appreciate it. And you will be reviewing

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1 those in the near term hopefully?

2 MR. SANDERS: Absolutely.

3 JUDGE BOLLWERK: All right, thank you.  
4 We may revisit that briefly at the end of the hearing  
5 just to see if you've had a chance to look at that.

6 All right, then, I believe if there is  
7 nothing else that any of the Board members have, we  
8 are ready for the staff panel regarding contention  
9 6.0, EC 6.0.

10 Who's going to do the honors?

11 MS. PRICE: I'll take care of that.

12 Beginning on your left, I'd like to  
13 introduce the staff witnesses. We have Dr.  
14 Christopher B. Cook; Mr. Lance W. Vail; Ms. Rebekah  
15 Krieg; Ms. Nancy Kuntzleman; and Mr. Mark Notich.

16 JUDGE BOLLWERK: All right. And if my  
17 recollection serves correctly, I have to track the  
18 list here, I believe all these witnesses have  
19 previously been sworn.

20 All right, then you all remain under oath  
21 for the duration of what we do today.

22 MS. PRICE: At this time I'd to ask Mark,  
23 Becky, Chris and Lance, can you bring up the  
24 testimony, I'm sorry, the direct testimony.

25 JUDGE BOLLWERK: You may need to pull

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1 that microphone a little bit closer to you.

2 MS. PRICE: I always have a problem.

3 JUDGE BOLLWERK: No problem. These are  
4 not as directional as the ones we have in Rockville.

5 MS. PRICE: Okay, at this time I'd like  
6 to ask Mark Notich, Becky Krieg, Chris Cook and Lance  
7 Vail, are you familiar with the testimony entitled NRC  
8 Staff testimony of Mark D. Notich, Anne. R.  
9 Kuntzleman, Rebecca H. Krieg, Dr. Christopher B. Cook  
10 and Lance W. Vail concerning environmental contention  
11 EC 6.0, dated February 26th, 2009, which has been  
12 provided to the court reporter in electronic format  
13 under file name Vogtle ESP NRC Staff EC 6.0 direct  
14 testimony?

15 (All panel members affirm)

16 MS. PRICE: Do you affirm that the  
17 portions of this testimony bearing your initials as  
18 well as your attached statement of professional  
19 qualifications were prepared by you, and that they are  
20 true and correct to the best of your knowledge and  
21 belief?

22 (All panel members affirm)

23 MS. PRICE: At this time I move to have  
24 these admitted into the record as if read.

25 JUDGE BOLLWERK: Any objections?

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(No response)

JUDGE BOLLWERK: Then the staff's direct testimony relative to contention EC 6.0, Notich, Kuntzleman, Krieg, Cook and Vail, will be admitted, and entered in to the record as if read, as DDMS item ID 59323.

(Insert Staff Direct Testimony (EC 6.0 (DOMS-59323))

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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 TESTIMONY OF MARK D. NOTICH, ANNE R. KUNTZLEMAN,  
REBEKAH H. KRIEG, DR. CHRISTOPHER B. COOK, AND LANCE W. VAIL  
CONCERNING ENVIRONMENTAL CONTENTION EC 6.0

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Q1. Please state your names, occupations, and by whom are you employed.

A1(a). (MDN) My name is Mark D. Notich. (MDN) I am employed as a Senior Project Manager in the Division of Site and Environmental Reviews, Office of New Reactors, U.S. Nuclear Regulatory Commission ("NRC"). I am the NRC Project Manager for the environmental review associated with the application submitted on August 14, 2006, by Southern Nuclear Operating Company, Inc. ("Southern" or "Applicant") for an early site permit ("ESP") for a site within the existing Vogtle Electric Generating Plant ("VEGP") site near Waynesboro, GA. A statement of my professional qualifications is attached hereto.

A1(b). (ARK) My name is Anne "Nancy" R. Kuntzleman (ARK). I am employed as an Aquatic Biologist in the Division of Site and Environmental Reviews, Office of New Reactors, NRC. I am a technical reviewer for the NRC on aquatic and terrestrial resources issues associated with the application submitted on August 14, 2006, by Southern for an ESP for a site within the existing VEGP site near Waynesboro, GA. A statement of my professional qualifications is attached hereto.

A1(c). (RHK) My name is Rebekah H. Krieg (RHK). I am employed as a Senior Research Scientist in the Ecology Group, Environmental Sustainability Division, Energy and

Environment Directorate of the Pacific Northwest National Laboratory ("PNNL"). I am a technical reviewer for PNNL's contract with the NRC on aquatic resource issues associated with the application submitted on August 14, 2006, by Southern for an ESP for a site within the existing VEGP site near Waynesboro, GA. A statement of my professional qualifications is attached hereto.

A1(d). (CBC) My name is Dr. Christopher B. Cook (CBC). I am employed as a Senior Hydrologist in the Division of Site and Environmental Reviews, Office of New Reactors (NRO), NRC. I was employed as a Senior Research Engineer at PNNL and was assigned as the lead technical reviewer on hydrology issues for PNNL's contract with the NRC when the application was submitted on August 14, 2006, by Southern for an ESP for a site within the existing VEGP site near Waynesboro, GA. While at PNNL, I assisted with the development of portions of NUREG-1872, "Draft Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site," September 2007 ("DEIS"), relating to hydrological alterations, water use, and water quality issues. As part of my current employment, I was a technical reviewer for the NRC on hydrological alterations, water use, and water quality issues associated with the Vogtle ESP. A statement of my professional qualifications is attached hereto.

A1(e). (LWV) My name is Lance Vail (LWV). I am employed as a Sr. Research Engineer in the Hydrology Group, Environmental Sustainability Division, Energy and Environment Directorate of PNNL. I am a technical reviewer for PNNL's contract with the NRC on hydrological alterations, water use, and water quality issues associated with the application submitted on August 14, 2006, by Southern for an ESP for a site within the existing VEGP site near Waynesboro, GA. A statement of my professional qualifications is attached hereto.

Q2. Please describe your current responsibilities in relation to this review.

A2(a). (MDN) As the NRC Project Manager for the environmental review, I was responsible for overseeing the preparation of NUREG-1872, the "Final Environmental Impact

Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site," August 2008 ("FEIS") (Exhibit NRC000001).

A2(b). (ARK) In my capacity as the aquatic biologist assigned to the VEGP ESP review, I provided technical oversight to the PNNL reviewers during the preparation of Sections 2.7.2 (Aquatic Ecology), 4.4.2 (Aquatic Impacts from Construction), 5.4 (Ecological Impacts from Operation), and 7.5 (Aquatic Ecosystem - Cumulative Impacts) of the FEIS.

A2(c). (RHK) In my current responsibility as the aquatic ecology technical reviewer assigned to the VEGP ESP review, I wrote the descriptive information contained in Section 2.7.2 and performed the review of the impact to aquatic organisms due to interactions with the proposed station intake and discharge structures as presented in Sections 5.4 and 7.5 of the FEIS. I worked under the technical oversight of Dr. Michael T. Masnik and Ms. Nancy Kuntzleman of the NRC.

A2(d). (CBC) As part of my official responsibilities at PNNL as a hydrology technical reviewer to the VEGP ESP review, I evaluated the surface water hydrology and plant water systems documented in Chapters 2, 3, 4, 5, 7 and 9 of the DEIS. As part of my official responsibilities at the NRC as the hydrology technical reviewer assigned to the VEGP ESP review, I was responsible for reviewing the analysis prepared by Mr. Vail (LWV) related to surface water hydrology and plant systems until March 2008. Although I was not a technical reviewer on the application during completion of the FEIS, I am familiar with the Staff's analysis and conclusions documented in Chapters 2, 3, 4, 5, 7, and 9 of the FEIS concerning surface water hydrology and plant water systems.

A2(e). (LWV) In my current responsibility as the hydrology technical reviewer assigned to the VEGP ESP review, I am responsible for the analysis related to surface water and plant water systems documented in Chapters 2, 3, 4, 5, 7, and 9 of the FEIS. I assumed responsibility as the PNNL hydrology technical reviewer following publication of the NRC Staff's Draft Environmental Impact Statement ("DEIS") in September 2007.

Q3. What is the purpose of this testimony?

A3. (ALL) The purpose of this testimony is to present the NRC Staff's views with respect to Contention EC 6.0, which challenges the adequacy of the analysis in the FEIS of potential cumulative impacts associated with the possible dredging of the Savannah River Federal navigation channel, as well as of potential upstream reservoir operations, to support river navigation.

Q4. Are you familiar with Contention 6.0?

A4. (ALL) Yes. Contention EC 6.0, submitted in this proceeding by 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 (collectively, "Joint Intervenors"), as restated by the Atomic Safety and Licensing Board in its Memorandum and Order of October 24, 2008, ruling on the Applicant's Motion for Summary Disposition, alleges that:

Because Army Corps of Engineers (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.

We are familiar with the contention and the bases submitted in its support presented in the Joint Intervenors' filing dated September 22, 2008, as well as with the declarations of Shawn Paul Young, Ph.D. dated September 22, 2008, and the declaration of Donald F. Hayes, dated September 21, 2008. It is our understanding that the contention concerns the possible environmental impacts of dredging of the Federal navigation channel on aquatic biota as well as postulated impacts to the Savannah River basin, if releases were made from upstream reservoirs to provide flows necessary to facilitate barge traffic to the VEGP site.

Q5. Please describe how you prepared for this testimony.

A5. (ALL) Our assessment of the impacts to aquatic biota in the Savannah River, including impacts due to potential dredging activities on the Savannah River, is presented in the FEIS. Our testimony therefore focuses on the Staff analysis documented in the FEIS. However, in preparing this testimony we have also considered the "U.S. Army Corps of Engineers Testimony of William G. Bailey, Carol L. Bernstein, Lyle J. Maciejewski, and Stanley L. Simpson Concerning Environmental Contention 6.0" provided on January 9, 2009, by the Corps of Engineers, Savannah District (hereinafter "USACE Testimony"), as well as the following specific documents:

NUREG-1555, Standard Review Plans for Environmental Reviews for Nuclear Power Plants ("ESRP") Rev. 1 (2007) (Exhibit NRC000010).

US Army Corps of Engineers, ER-1105-2-100, PLANNING GUIDANCE NOTEBOOK (2000) (Exhibit NRC000048).

US Army Corps of Engineers, ER-200-2-2 PROCEDURES FOR IMPLEMENTING NEPA (1988) (Exhibit NRC000049).

I. **Basis for NRC Staff Assumptions in FEIS Analysis**

A. **Barging and Navigation**

Q6. In the FEIS, did the NRC staff assume that heavy components would be delivered to the VEGP site by the use of barges on the Savannah River? If so, what was the basis for this assumption?

A6. (LWW, CBC) Yes. In the DEIS at pages 4-8, 4-16, and 4-25, the Staff mentioned Southern's plans for dredging the barge slip adjacent to the VEGP site. Given that Southern planned to refurbish and dredge the barge slip, it was reasonable to assume that it expected to use the barge slip to bring items to the site that might not be easily transported by conventional transport (e.g. roads or rail). Consistent with the DEIS, the FEIS identified and evaluated that dredging of the barge slip area as one of the construction impacts. Exhibit NRC000001 at pages 4-8, 4-9, 4-17, 4-26 through 4-27, and 4-37. Additionally, based on comments on the DEIS from the public and from Federal and state resource agencies, the Staff identified and

evaluated the possible impacts of dredging the Federal navigation channel in the FEIS. Exhibit NRC000001 at pages 4-9 and 7-20.

Q7. Did the Staff in the FEIS discuss upstream reservoir operations in relation to support for navigation on the Savannah River?

A7. (LWV, CBC) No. The Staff assumed reservoir operations would not be altered solely for the purpose of navigation. The Staff assumed, based on informal discussions with members of the U.S. Army Corps of Engineers ("USACE" or "Corps"), that navigation would be feasible, at least during high flows on the Savannah River, without dredging of the Federal navigation channel. The Staff assumed that these high flows would occur in response to the Corps' flood control rule curve, which is the policy that specifies the releases from the reservoir to ensure that the safety of the dam structure is not compromised by overtopping. The Staff assumed that the high flows resulting from implementation of the flood control rule curve would not, therefore, alter the conservation pools. Consistent with the above assumptions, the Staff would not expect that barging would occur until the current drought had ended and the reservoirs had sufficiently refilled to result in high flows without compromising the conservation pools. Accordingly the Staff did not consider it reasonably foreseeable that there would be impacts to the upstream reservoirs associated with releases for navigation, in connection with either the NRC's action or the potential dredging of the Federal navigation channel.

Q8. How does the testimony of the Corps witnesses in this proceeding relate to that assumption?

A8. (LWV, CBC) The Staff considers the Corps testimony in this proceeding to be consistent with the Staff's assumptions. The Corps witnesses state that "The USACE has made no study of minimum river flow needed to eliminate the need for dredging of the Savannah River Federal navigation channel or whether releases from upstream reservoirs could enable barge traffic to reach as far upstream as the Vogtle Electric Generating Plant. The region is presently experiencing a drought and excess water is not available in the lakes for such purposes."

USACE Testimony at A15. Thus the Staff believes that upstream releases for navigation would not occur under drought conditions.

B. Potential Dredging of the Federal Navigation Channel

Q9. In the DEIS, did the Staff discuss a potential need for dredging the Savannah River Federal navigation channel as far upstream as the VEGP site?

A9. (LWW, CBC) Dredging of the Federal navigation channel was not mentioned in the DEIS, because it was not expected to occur based on informal Staff discussions with members of the Corps. This continued to be the opinion of the Staff at the time of the writing of the FEIS. However, based on comments to the DEIS, the Staff added an analysis in the FEIS regarding the potential dredging of the Federal navigation channel.

Q10. In preparing the DEIS, what assumptions (if any) did the Staff make regarding the need for dredging of the Federal navigation channel?

A10. (LWW, CBC) As mentioned in the response to Question 9, at the time of the preparation of the DEIS, the Staff did not believe that dredging for the Federal navigation channel was expected to occur. Moreover, the Staff did not assume that barging would be entirely infeasible without dredging nor that barging was the only possible transportation option for bringing components to the VEGP site. While road and rail transportation are other available options, the Staff evaluated the barging because this was the transportation option that was being contemplated by Southern in the ER.

Q11. Did those assumptions change between the issuance of the DEIS and the preparation of the FEIS?

A11. (LWW, CBC) No.

Q12. Did the Staff determine in the FEIS whether dredging of the Savannah River Federal navigation channel would be necessary for barge transportation of heavy components to the VEGP site?

A12. (LWW, CBC) In preparing the FEIS, the Staff expected that dredging was not essential to get large components to the VEGP site, even if barging were determined to be the only transportation option. Based on informal conversations with members of the Corps, the Staff believes that large components could be barged during periods of naturally occurring high flow. The Staff recognizes that this approach (i.e., having barging dependent on periods of high flow) could expose Southern to financial risk because of the inability to reliably predict naturally occurring periods of high flow, and thus could impact its desired construction schedule. However, the Staff does not consider such factors to be material to an ESP environmental review.

Q13. Were the Staff's assumptions regarding the need for dredging based on any specific communications with the applicant or with the USACE?

A13. (LWW, CBC, ARK, MDN) Yes. (MDN) In informal discussions with the Staff before and after the DEIS was issued, the applicant stated that the Corps had a mandate to maintain the Federal navigation channel. Also in informal discussions with the Staff occurring before and after the DEIS was issued, members of the Corps stated that while the Corps had authorization for maintaining the Federal navigation channel, the channel had not been maintained for several decades and Congress would need to provide funding before maintenance dredging could resume. Members of the Corps also stated to the Staff that the Corps had received no formal request from Southern regarding such dredging either by Southern or by the Corps.

(LWW, CBC) Based on informal discussions with members of the Corps following the publication of the DEIS, the Staff determined that it was unlikely that dredging of the Federal navigation channel would occur and certainly not within any short-term time frame. [ARK] This Staff view was also supported by the Staff's understanding of the Corps authorization and review process that would need to occur before dredging would begin. [LWW, CBC] Furthermore, members of the Corps did state in informal discussions with the Staff their view

that without dredging Southern could barge during high flow (flood) periods. Based on these considerations, the Staff determined that it was not implausible that Southern could move large components via barge during high flows.

Q14. Did the Staff assume that intentional releases of water from the upstream dams would be authorized to enable navigation and that those releases would be capable of providing adequate flows for barging regardless of whether or not dredging occurs?

A14. (LWV, CBC) No. As stated above in response to Question 12, the Staff assumed, based on informal discussions with the Corps before and after publication of the DEIS, that navigation would be feasible during high flows. The Staff assumed that these high flows would occur as a result of the Corps' implementation of the flood control rule curve, rather than being scheduled for the specific purpose of allowing barging.

Moreover, the testimony of Stanley L. Simpson of the USACE in this proceeding states that "[t]ransportation of large industrial components upstream by barge is not currently possible due to the shallow river depths. However, transportation of large components upstream by barge has occurred several times in the last 10 years. Shipment was made by Chem Nuclear of contaminated power plant reactor vessels to Barnwell, South Carolina (SC) for disposal. However, it required about a 10,000 cubic feet per second (cfs) discharge." USACE Testimony at A7. Mr. Simpson's testimony further notes that "from previous experience with nuclear waste shipments, it has required about 10,000 cfs discharge for more than one week to get a barge to Jackson, SC and back from Savannah Harbor." USACE Testimony at A15. The Staff considers that testimony to be consistent with the Staff's assumptions regarding the possibility of barging during high flow periods.

Q15. Did the Staff identify or assume a specific minimum flow at which dredging would not be necessary to enable barge traffic to the site?

A15. (LWV, CBC) No. The Staff believes this view is consistent with the Corps testimony in this proceeding. Moreover, the testimony of Stanley L. Simpson of the USACE in

this proceeding states that "The USACE has made no study of minimum river flow needed to eliminate the need for dredging of the Savannah River Federal navigation channel." USACE Testimony at A15.

Q16. At the time of the preparation of the FEIS, had the Staff reviewed or become aware of any formal USACE plan for dredging or channel maintenance of the Federal navigation channel (or any formal request to the USACE for such a project)?

A16. (LWW, CBC) No. The Staff believes this view is confirmed by the Corps testimony in this proceeding. Moreover, the testimony of Lyle J. Maciejewski of the USACE in this proceeding responds "No" to the question of whether the Corps has developed a plan or received a formal request or authorization for dredging of the Savannah River Federal navigation channel in the near future to facilitate barge traffic as far north as the Vogtle Electric Generating Plant. USACE Testimony at A8.

Q17. At the time of the preparation of the FEIS, had the Staff reviewed or become aware of any formal USACE plan for intentionally releasing water from the upstream dams to provide adequate flows for barging?

A17. (LWW, CBC) No.

Q18. As of the date of this testimony, is the Staff aware of (or has the Staff reviewed) any such formal proposal pending before the Corps - whether proposed by the Corps or submitted to the Corps as an application by a private entity - for dredging of the Federal navigation channel or for intentionally releasing water from the upstream dams to provide adequate flows for barging?

A18. (LWW, CBC) No. The Staff believes this view is confirmed by the Corps testimony in this proceeding. The testimony of Lyle J. Maciejewski of the USACE in this proceeding responds "No" to the question of whether the Corps has developed a plan or received a formal request or authorization for dredging of the Savannah River Federal navigation channel in the near future to facilitate barge traffic as far north as the Vogtle Electric

Generating Plant. USACE Testimony at A8. The testimony of Carol L. Bernstein of the USACE also indicates that Southern has not indicated an intention to submit a permit application for dredging of the Federal navigation channel. USACE Testimony at A10.

**C. Cumulative Impacts**

Q19. Ultimately, did the Staff decide to include a discussion in the FEIS of the potential impacts of dredging the Federal navigation channel?

A19. (LWW/RHK) Yes. The Staff decided to include in the FEIS a discussion of the potential impacts of dredging the Federal navigation channel after receiving comments on the DEIS from the public and from Federal and state resource agencies. Some of these comments stated that the dredging of the Savannah River navigation channel would have major impacts or was not fully analyzed or considered. These comments are provided in Appendix E of the FEIS. Exhibit NRC000001 at E-55 to E-58, E-69, E-70, E-72 and E-73-74. The organizations that commented included the South Carolina Department of Natural Resources, the Georgia Department of Natural Resources, the U.S. Department of Interior, the U.S. Fish and Wildlife Service, the USACE, the Southern Alliance for Clean Energy, and the Nature Conservancy.

Q20. Where in the FEIS did the Staff analyze the potential impacts of dredging the Federal navigation channel?

A20. (RHK) The Staff analyzed the potential impacts in Chapter 7 – Cumulative Impacts. Exhibit NRC000001 at 7-20 and 7-21. The Staff determined this was the appropriate section for the discussion of dredging because the action of dredging the Federal navigation channel in the Savannah River is not under the NRC's jurisdiction and would require a separate review under the National Environmental Policy Act ("NEPA").

Q21. How does the NRC staff determine what actions to include in its discussion of cumulative impacts in Chapter 7 of the FEIS? And what steps are used in the review of cumulative impacts?

A21. (RHK, ARK) ESRP 4.7, "Cumulative Impacts Related to Construction Activities" (NRC 2007) "directs the staff's summarization of potential cumulative environmental impacts associated with construction activities for the proposed project." Exhibit NRC000010 at 4.7-1. The ESRP defines cumulative impacts as "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." This definition appears in the regulations of the Council on Environmental Quality (CEQ) implementing NEPA (40 CFR 1508.7). NRC regulations state that 40 CFR 1508.7 will be used by NRC in implementing NEPA. 10 CFR 51.14(b); Exhibit NRC000010 at 4.7-1.

According to the ESRP guidance, the evaluation of cumulative impacts is a three-step review. Exhibit NRC000010 at 4.7-3. The first step guides the Staff to identify past, present and reasonably foreseeable Federal, non-Federal, and private actions that could have meaningful cumulative impacts with the proposed action. The second step involves identifying the geographic area to be considered in evaluating cumulative impacts (in this case the Savannah River at and below the VEGP site). The final step involves the identification and tabulation of the cumulative impacts.

As described in ESRP Section 4.7, CEQ guidance directs agencies to focus on cumulative impact information that is relevant to reasonably foreseeable significant adverse impacts, is essential to a reasoned choice among alternatives, and can be obtained without exorbitant cost. Exhibit NRC000010 at 4.7-3.

Q22. Why did the Staff analyze the potential dredging of the Federal navigation channel as a cumulative impact?

A22. (ARK, RHK) The dredging of the Federal navigation channel was, in the Staff's opinion, not required for the NRC's licensing action, since there are other ways to move the

large components to the VEGP site besides dredging the river (see the Staff response above to Question A10). In addition, the Staff did not assume that dredging would be necessary to allow barging, and it was the Staff's understanding that no formal request or permit application for dredging was before the Corps (see the Staff responses above to Questions A12 and A16). However, as a result of comments received on the DEIS, the Staff decided it was appropriate to consider dredging the Federal navigation channel as a potential future Federal action, even though the Staff did not believe it was certain to occur. Accordingly it was only discussed as a cumulative impact.

Q23. Why did the Staff not analyze in the FEIS any cumulative impacts to upstream reservoirs from intentionally releasing water from upstream dams?

A23. (LWW) As discussed in the response above to Question 7, the Staff did not believe there would be any alterations to the upstream reservoirs.

## II. Staff Analysis of Potential Dredging Impacts

### A. Assessment of Potential Impacts

Q24. Did the Staff identify in the FEIS the types of impacts to aquatic biota that might result from dredging of the Federal navigation channel?

A24. (ARK) Yes. In the FEIS at 7-20 the Staff concluded that dredging the Federal navigation channel in the Savannah River downstream of the VEGP site would likely have an effect on aquatic organisms for most trophic levels. These potential impacts could include: temporary loss of benthic habitat, disruption of spawning migrations, and resuspension of sediments that might be contaminated. In addition, the Staff mentioned that dredging would also require the disposal of dredged materials. Exhibit NRC000001 at 7-20.

Q25. Do you have professional experience in assessing the environmental impacts of such dredging projects?

A25. (ARK) Yes. From October 1987 until June 2006 I was a biologist with the Department of the Navy, Engineering Field Activity Northeast (EFANE), a former component of

the Naval Facilities Engineering Command, Atlantic Division, Lester, PA. EFANE performed engineering services for Naval Bases throughout the northeastern United States (U.S.). For almost 18 years, I served as the sole professional/technical authority at EFANE for the preparation and coordination of all Department of the Army permit applications, state wetland permit applications, and water quality certificate applications for activities in waters of the U.S. and navigable waters of the U.S. within the regulatory authority of Sections 401 and 404 of the Clean Water Act, Sections 9 and 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. In addition, I also assisted in the preparation of federal consistency determinations pursuant to Section 307 of the Coastal Zone Management Act and 15 CFR Part 930, Federal Consistency. As the Authorized Agent for Corps of Engineers Permits at EFANE, I had signatory authority for permit applications and attendant issues. I worked on very complex, controversial, and environmentally sensitive dredging projects during my EFANE tenure, which included the following locations: Naval Station Newport, RI; Naval Submarine Base New London, CT; the former Naval Station New York, Staten Island, NY; US Merchant Marine Academy, Kings Point, NY; Naval Weapons Station Earle, Leonardo, NJ; and the Naval Inactive Ship Maintenance Facility, Philadelphia, PA.

Q26. What was the Staff's basis for identifying the types of impacts discussed in the FEIS with respect to the potential dredging of the Savannah River Federal navigation channel?

A26. (ARK) Maintenance dredging involves the periodic removal of accumulated sediment (e.g., sand, silt, and clay) from a previously dredged area (e.g., navigation channel, harbor, marina) for the purpose of maintaining an authorized water depth and width for safe navigation. The general types of potential adverse environmental effects I have evaluated with previous dredging projects include: destruction of benthic habitat; disruption of spawning migrations, impairment of water quality, and the direct (e.g., toxicological) and indirect (e.g., habitat alteration) effects on fish and their prey species. It is reasonable to assume that the

regulatory and natural resource agencies responsible for reviewing a possible maintenance dredging project in the Savannah River Federal navigation channel would consider similar factors.

Maintenance dredging may result in adverse effects to benthic habitat either by direct removal of the benthic substrate by the dredging operation itself, or via disposal of the dredged material onto the benthic habitat at the disposal site. Various fish species can also lose a source of forage from removal of benthic macroinvertebrates within the dredged area. Sediment disturbance can also impact fish spawning, egg and larval development, and juvenile survivorship.

Water quality impacts from dredging and dredged material disposal include physical, chemical, and biological impacts. Physical impairment of the water column occurs from changes in dissolved oxygen, pH, oxidation-reduction state, and turbidity with a resultant decrease in light penetration. Chemical impairment is caused by release of various chemical contaminants that may occur within the sediment. Biological impairment can occur when introduction of dredged material into the water column kills submerged aquatic vegetation and macroalgae (either through direct smothering or via impaired light penetration) leading to higher rates of bacterial decomposition and a resultant increase in bacterial oxygen demand.

Due to my experience with very complex environmentally sensitive dredging projects in the northeastern U.S., I concluded that these considerations would also be potentially relevant to the analysis of maintenance dredging of the Savannah River Federal navigation channel.

Q27. What level of detail did the Staff use in its analysis of impacts to aquatic biota as a result of dredging the Federal navigation channel?

A27. (ARK, RHK) The Staff performed a qualitative impact analysis because it was the Staff's understanding that there was no formal request or permit application for maintenance dredging of the Federal navigation channel before the Corps (see Staff response above to Question 22). The qualitative analysis was based on the Staff's familiarity with previous

dredging projects and the fact that the Savannah River Federal navigation channel had previously been dredged.

Q28. Was this level of detail appropriate for the ESP FEIS? Why?

A28. (RHK, ARK) The qualitative nature of the review was appropriate for the ESP FEIS. As explained in the FEIS, the potential dredging project is incompletely defined, the amount of material that would be removed is unknown, and the locations of the dredged material disposal areas have not been identified. Exhibit NRC000001 at 7-20.

In addition, the Staff analysis in the FEIS emphasized that any dredging of the Federal navigation channel would require a separate NEPA process with a separate environmental review performed by the agency with the appropriate authority or jurisdiction, in this case the USACE. This review would be conducted at the time an actual project is formally requested or a permit application is submitted. The Corps in its environmental review presumably would be able to consider the specific details rather than trying to speculate about those details. For these reasons, the Staff determined that a qualitative review for the purposes of this FEIS was appropriate.

B. Basis for Staff Determinations

Q29. Did the Staff make a determination in the FEIS as to what the cumulative impacts to aquatic biota might be as a result of potential dredging of the Federal navigation channel?

A29. (ARK, RHK) Yes. In the FEIS, the Staff concluded that "the cumulative impacts to aquatic organisms in the region from the construction including dredging of a navigation channel could be MODERATE, depending on the type of mitigation." Exhibit NRC000001 at 7-20. However, in reaching that conclusion, the Staff explained that "these impacts would be evaluated in more detail in the NEPA analysis that would need to be conducted by the USACE." Exhibit NRC000001 at 7-21.

Q30. What was the basis for the determination that cumulative impacts to aquatic organisms in the region could be MODERATE depending on the type of mitigation?

A30. (ARK, RHK) The Staff determined that if the Corps were to pursue maintenance dredging of the Savannah River Federal navigation channel, the Corps would conduct its own NEPA review of that action. This review would likely include the preparation of either an Environmental Assessment (EA) or Environmental Impact Statement (EIS) in order to maintain the authorized navigation channel depth and width and manage the dredged material in a cost-effective, environmentally acceptable, and, wherever possible, beneficial manner. In the Staff's view, as a result of this anticipated Corps' review process, appropriate and practicable steps would be taken to minimize potential adverse impacts of the dredging and dredged material disposal on the aquatic ecosystem. The testimony of William G. Bailey of the USACE confirms that the Corps "...would prepare an environmental assessment of the proposed action... The process would conclude with either an Environmental Assessment (with a Finding of No Significant Impact) or an Environmental Impact Statement (with a Record of Decision)." USACE Testimony at A9.

It is the Staff's understanding that, as part of that environmental review, the Corps would conduct consultations with the Federal resource agencies, including the U.S. Fish and Wildlife Service ("USFWS") and National Marine Fisheries Service ("NMFS"), and would coordinate with the State regulatory and resource agencies where the dredging and dredged material disposal would occur. The agencies would work together to identify the biota at risk and determine the time of the year the areas proposed for maintenance dredging would be used by important species (e.g., birds, fish, macroinvertebrates) for breeding, foraging, rearing, or migration. Because of these Federal and state consultations, the Staff anticipates that the Corps would likely be required to avoid dredging activities during peak reproductive and migratory activities, and seasonal restrictions (or environmental windows) would be established by the Federal and state resource agencies for the project.

The testimony of the Corps witnesses is consistent with the Staff's understanding of this process. The testimony of William G. Bailey and Carol L. Bernstein describes the Corps'

process for an environmental review including consultation with other Federal and state agencies. USACE Testimony at A10 and A12. Their testimony also confirms the possibility of "special requirements/conditions for the dredging activities" including time-of-year restrictions. USACE Testimony at A11. The testimony of William G. Bailey also acknowledges that a coastal zone consistency certification may be required. USACE Testimony at A19.

The Staff understands that Section 401 of the Clean Water Act would require that maintenance dredging of the Savannah River Federal navigation channel comply with applicable State water quality standards authorized pursuant to Section 404 of the Clean Water Act. The states of both Georgia and South Carolina would likely require implementation of a water quality monitoring plan, and violation of state water quality standards would not be permitted to occur beyond a designated mixing zone. The testimony of William G. Bailey and Carol L. Bernstein confirms the need to obtain clearances under the Clean Water Act. USACE Testimony at A9 and A10.

The Staff acknowledged in the FEIS that "at the present time the dredging project is incompletely defined, the amount of material to be removed is unknown, and the locations of the dredged material disposal areas have not been identified." Exhibit NRC000001 at 7-20. The testimony of Lyle J. Maciejewski states that "[t]he USACE does not currently know how much sediment would need to be removed, the nature of those materials, or where they could be deposited." USACE Testimony at A17. The testimony of William G. Bailey states that "[t]he USACE has not sampled sediments in the Savannah River Federal navigation channel and can not accurately predict what contaminants may be present in those sediments." USACE Testimony at A21.

Nevertheless, the Staff performed a qualitative review and concluded that cumulative impacts to aquatic organisms in the region from the construction, including dredging of a navigation channel, could be MODERATE, defined as "environmental effects [being] sufficient to alter noticeably, but not to destabilize, important attributes of the resource." Exhibit NRC000001

at 1-4 and 7-20. The Staff anticipated that the Federal and state regulatory and resource agencies responsible for reviewing the dredging project would require project-specific mitigation measures to ensure that the cumulative impacts to aquatic organisms in the region would not be LARGE, defined as clearly noticeable environmental effects that would be sufficient to destabilize important attributes of the resource.

Q31. Does the Staff still consider the bases for the Staff's analysis and determination to be reasonable?

A31. (ARK) Yes. The Staff believes that the Staff's assumptions and approach are supported by the Corps testimony in this proceeding. First, the testimony of William G. Bailey acknowledges that if a project is eventually proposed, the Corps would conduct an environmental review in accordance with the US Army *Planning Guidance Notebook* (ER 1105-2-100) and the US Army *Procedures for Implementing NEPA* (ER 200-2-2). Exhibit NRC000048; Exhibit NRC000049; USACE Testimony at A12. As stated in his testimony, the Corps' environmental review document would identify the dredging that would be performed, the locations where the sediment would be deposited, and the environmental impacts of those actions. USACE Testimony at A9. The Corps would coordinate the document with the public and natural resource agencies and conclude with a Finding of No Significant Impact (FONSI) or a Record of Decision (ROD). *Id.* at A9. Through this coordination process, the Corps "would hope to obtain clearances under NEPA, the National Historic Preservation Act, the Coastal Zone Management Act, the Magnuson Fishery Conservation and Management Act, the Endangered Species Act, the Clean Water Act, and the Clean Air Act." *Id.* at A9.

As mentioned earlier in my testimony, the testimony of William G. Bailey and Carol L. Bernstein also acknowledges that "[s]pecial requirements/conditions for the dredging activities would likely result if a review of the project scope warrants such action." *Id.* at A11. In addition, their testimony states that "coordination with other federal and state agencies may result in a determination that time-of-year restrictions would be required in order to prevent impacts to

threatened and endangered species or aquatic resources.” *Id.* at A11. This description of the Corps’ environmental review process is consistent with the Staff’s conclusion in the FEIS that environmental impacts would be evaluated in more detail in the Corps’ NEPA analysis. Exhibit NRC000001 at 7-21.

The testimony of Lyle J. Maciejewski also verifies that the Corps has neither developed a plan nor received a formal request or authorization for dredging of the Savannah River Federal navigation channel in the near future to facilitate barge traffic as far north as the VEGP site. USACE Testimony at A8. His testimony explains that there are no funds currently available in the budget for either dredging the Savannah River Federal navigation channel or for conducting the environmental scoping, review, and documentation that would be necessary prior to the start of any dredging project. *Id.* at A14. In my view, this description of the Corps’ understanding of the current absence of any formal action to dredge the Federal navigation channel is consistent with the Staff’s assumptions in the FEIS.

Q32. Did the Staff assume that mitigating actions would be taken as part of any future dredging action, and what kinds of mitigating actions did the Staff consider to be possible or likely?

A32. (ARK) Yes, in the FEIS, the Staff discussed potential mitigation measures. In my experience, these mitigative measures, including the use of best management practices, time-of-year restrictions, relocation of benthic organisms, and restrictions on equipment types, are fairly standard and routine measures for dredging projects. Exhibit NRC000001 at 7-20. They were provided in the FEIS as examples only and not as specific recommendations for mitigative measures because there was (and is) no formal request or permit application to dredge the Federal navigation channel before the Corps for its review. See USACE Testimony at A8. The Staff indicated in the FEIS that “Specifics of the project including any time-of-year restrictions or mitigation to protect aquatic resources would be provided in the Corps’ assessment to fulfill the NEPA requirement.” Exhibit NRC000001 at 4-27.

The Staff also considers it likely that the Corps would conduct an evaluation of the physical, chemical, and biological characteristics of the sediment proposed for dredging in order to determine the dredging methodology (e.g., mechanical versus hydraulic) and dredged material disposal options and locations. But as stated in the FEIS, “[a]t the present time the dredging project is incompletely defined, the amount of material to be removed is unknown, and the locations of the dredged material disposal areas have not been identified.” Exhibit NRC000001 at 7-20. The testimony of Lyle J. Maciejewski confirms that the Corps does not currently know how much sediment would need to be removed, the nature of those materials, or where they could be deposited. USACE Testimony at A17. Without this information the Staff was not able to address the impacts of sediment disposal more specifically without entering into undue speculation.

The Staff anticipated that if dredging were conducted, by employing best management practices, impacts to water quality would be minimized and the water quality of the Savannah River would return to pre-project conditions. In my experience, some examples of best management practices to control sediment resuspension and downriver transport of resuspended sediments include selection of the proper dredge type and/or size, use of a sealed or environmental bucket for mechanical dredging, deployment of silt curtain containments, use of sheet pile enclosures, management of barge overflow, and control of sediment loss from bucket to barge as well as from the barge to the upland offloading location.

The Staff also considered that time-of-year restrictions on dredging operations would reduce water quality impacts (including physical, chemical, and biological impairment) due to dredging operations during migration, breeding, and early life history stages of sensitive aquatic species. The testimony of William G. Bailey and Carol L. Bernstein has noted that “[s]pecial requirements/conditions for the dredging activities would likely result if a review of the project scope warrants such action.” USACE Testimony at A11.

Finally, the Staff considered the concerns expressed in comments on the DEIS from members of the public and from Federal and state resource agencies regarding the potential impacts that dredging of the Savannah River Federal navigation channel would have on aquatic resources (e.g., freshwater mussels). These comments are provided in Appendix E of the FEIS. Exhibit NRC000001 at E-56, E-57, E-69, E-71 to E-73 and E-76. The Staff anticipated that if such a dredging action were to occur, the Corps' environmental review process (including consultation with other Federal and state agencies) would consider impact avoidance, but would then consider minimization with, ultimately, mitigative actions to preserve the threatened, endangered, and sensitive mussel species that occur in the Savannah River. In the Staff's view, if avoidance of the freshwater mussels during future dredging of the Federal navigation channel were deemed to be infeasible by the Corps based on its review, then, as stated in the FEIS, in combination with other mitigative measures described above, relocation of benthic organisms could ameliorate many of the impacts. Exhibit NRC000001 at 7-20.

The types of project-specific mitigation required by the regulatory and resource agencies might involve sediment testing and analyses, dredge plume modeling, pre-and post-dredge biological surveys, mussel relocation and survival monitoring. Dredging operations could be limited to a few months each year or restricted to certain times of the day, limitations could be imposed on size and type of dredge and disposal equipment used, and special requirements/monitoring could be required at the dredged material disposal locations. Based upon my personal experiences, these special mitigation efforts have been successfully implemented elsewhere to minimize impacts to biological resources.

Q33. Why did the Staff ultimately conclude that the cumulative impacts to aquatic organisms in the region could be MODERATE rather than another impact level?

A33. (ARK) After considering the potential types of impacts, likely mitigation measures and the Corps' review process as discussed above, the Staff ultimately concluded that the cumulative impacts to aquatic organisms in the region could be MODERATE. This

impact level is defined as "environmental effects [being] sufficient to alter noticeably, but not to destabilize, important attributes of the resource." The considerations discussed above support the finding of MODERATE.

Pursuant to Title 33 CFR 335, Operation and Maintenance of Army Corps of Engineers Civil Works Project Involving the Discharge of Dredged or Fill Material into Water of the U.S. or Ocean Waters, Section 335.2 Authority, "the Corps does not issue itself a CWA [Clean Water Act] permit to authorize Corps discharges of dredged material or fill material into U.S. waters, but does apply the 404(b)(1) guidelines and other substantive requirements of the CWA and other environmental laws." These Guidelines, prepared by the US Environmental Protection Agency in consultation with the Corps, are the Federal environmental regulations for evaluating the filling of waters and wetlands.

As defined at 40 CFR 230.1(a), "The purpose of these Guidelines is to restore and maintain the chemical, physical, and biological integrity of waters of the United States through the control of discharges of dredged or fill material." Compliance with the Guidelines at Subpart B, 40 CFR 230.10 (a) through (d), prohibits discharges under various circumstances, including: (a) "...if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences..." [also known as Least Environmentally Damaging Practicable Alternative (LEDPA)]; (b) if the action causes or contributes to violations of any applicable State water quality standard, violates any applicable toxic effluent standard or prohibition under section 307 of the Act, the Endangered Species Act, or Marine Protection, Research, and Sanctuaries Act; (c) if the action "...will cause or contribute to significant degradation of waters of the US..."; and (d) "... unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem..." It should be noted that the goal of the Section 404(b)(1) Guidelines is to provide a framework for arriving at the LEDPA.

Appendix C of the US Army *Planning Guidance Notebook* (ER 1105-2-100) addresses the integration of environmental evaluation and compliance requirements into the planning of Civil Works projects. In particular, Exhibit C-1 provides a recommended outline for completing a Section 404(b)(1) evaluation. Exhibit NRC000048 at C-48 to C-55. The testimony of William G. Bailey acknowledges that if a Federal project is eventually proposed, the Corps would conduct an environmental review in accordance with ER 1105-2-100. USACE Testimony at A12.

It is the Staff's understanding that in order for the Corps to complete its NEPA analysis, the project must be in compliance with the CWA Section 404(b)(1) Guidelines. The testimony of Carol L. Bernstein notes that if the Corps were to receive a permit application from Southern, the Corps would also evaluate the dredging project with respect to Section 404(b)(1) analysis, 31 public interest factors, and cumulative impacts. USACE Testimony at A10. It is the Staff's understanding that these criteria would constrain the potential impacts of maintenance dredging of the Savannah River Federal navigation channel, were such a project to be undertaken. In the Staff's opinion, if a potential dredging project for the Federal navigation channel were to comply with these standards, it would not result in a cumulative impact of LARGE, which is defined as "environmental effects [being] clearly noticeable and [being] sufficient to destabilize important attributes of the resource." For that reason, I consider it unlikely that a dredging project that would destabilize the Savannah River would obtain the necessary approvals from the Federal and state regulatory agencies. Accordingly, the Staff determined that cumulative impacts from construction of Vogtle Units 3 and 4 including dredging of the Federal navigation channel could be MODERATE, depending on the type of mitigation. Exhibit NRC000001 at 1-4 and 7-20.

Q34. Does this conclude your testimony?

A34. (ALL) Yes.

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) )

AFFIDAVIT OF ANNE R. KUNTZLEMAN CONCERNING  
PREFILED TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2 AND 6.0

I, Anne R. Kuntzleman, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*, and in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 6.0*, as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Anne R. Kuntzleman

Executed at Rockville, Maryland  
This 9th day of January, 2009

Anne "Nancy" R. Kuntzleman  
STATEMENT OF PROFESSIONAL QUALIFICATIONS  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
Washington, D.C.

I am currently employed as an aquatic biologist in the Office of New Reactors, Division of Site and Environmental Reviews, Environmental Technical Support Branch, U.S. Nuclear Regulatory Commission. As an NRC staff member, I am responsible for conducting the aquatic and terrestrial technical reviews associated with the preparation of an environmental impact statement (EIS) for siting, construction, and operation new nuclear power plants.

I hold a Bachelor of Science in Biology from the Pennsylvania State University (1975), a Master of Science in Education from Temple University (1981), and a Master of Science in Biology from the University of Michigan (1982). I have also pursued graduate studies in biology at the University of Maryland (1980) and the University of Pennsylvania (1985).

From July 1975 through August 1986, I was an aquatic ecologist for two environmental consulting firms (Ichthyological Associates and Radiation Management Corporation, respectively) under contract to Philadelphia Electric Company. I assisted in all phases (field work, data processing, data analyses, report writing) of both aquatic and terrestrial preoperational studies at the Limerick Generating Station (LGS), Limerick Township, PA. My duties during this time included assisting in the age and growth survey of redbreast sunfish (*Lepomis auritus*), green sunfish (*Lepomis cyanellus*), and white sucker (*Catostomus commersonii*) from the East Branch Perkiomen Creek and the Schuylkill River in the vicinity of LGS by participating in field sampling with a small stream shocker and performing fish scale removal, pressing, and reading. I also participated in field work to conduct fish population estimates along the Schuylkill River via electrofishing, fish community characterizations via seine in the Perkiomen Creek, and angler surveys along the East Branch Perkiomen Creek and Schuylkill River in conjunction with the pre-operational monitoring program at LGS. Assisted in writing the procedures for collecting plant, mammal, sediment, and fish samples in conjunction with the Radiological Environmental Monitoring Program (REMP) at LGS and was responsible for coordinating the collection of the REMP sediment, vegetation, and fish samples.

In addition, from August 1975 through December 1976, I supervised two fishery biologists and two fishery technicians during the field work performed for two Clean Water Act (CWA) Section 316(a) thermal plume investigations on the Schuylkill River: Schuylkill Generating Station (SGS), Philadelphia, PA, and Cromby Generating Station (CGS), Phoenixville, PA, respectively. Field work included electrofishing, larval fish tows, Ponar grabs for benthic macroinvertebrates, plankton sampling, thermal plume mapping, and collection of physical chemistry data. I sorted, identified, measured, and processed both adult and larval fish collections. I assisted in report writing, data coding, and editing. I conducted a thorough non-parametric statistical analysis of both the catch per effort and larval fish data for SGS. Our electrofishing efforts at the base of Fairmount Dam in Philadelphia documented the presence of American shad (*Alosa sapidissima*). This finding assisted the Pennsylvania Fish Commission in justifying construction of the Fairmount Dam Fish ladder in 1979.

During the late 1970's I was also a field biologist for CWA Section 316(b) cooling water intake studies (impingement of fish and macroinvertebrates and entrainment of plankton, macroinvertebrates, and larval fish) at four freshwater and seven estuarine steam electric power stations on the Schuylkill and Delaware Rivers, respectively. I sorted, identified, measured, and processed the impingement and larval fish collections. I assisted in the preparation of the 316(b) evaluations for CGS and SGS located on the Schuylkill River and the Eddystone Generating Station and Edge Moor Power Station on the Delaware River.

Later as an environmental educator, I developed and presented aquatic ecology and fish identification in-service training programs for elementary and secondary schoolteachers within the Philadelphia Electric service area. I also presented lectures to community groups, environmental organizations, and students explaining the environmental preoperational studies and monitoring requirements for LGS.

From September 1986 until September 1987 I taught life science and physical science at Northeast Junior High School, Reading, PA.

From October 1987 until June 2006, I was a senior biologist with the Department of the Navy, Engineering Field Activity Northeast (EFANE), a component of the Naval Facilities Engineering Command, Atlantic Division. For almost 18 years, I served as the sole professional/technical authority for EFANE in the preparation and coordination of all Department of the Army permit applications, Coast Guard permits, state wetland permits, and water quality certificates for activities in waters of the United States (U.S.) and navigable waters of the U.S. within the regulatory authority of Sections 401 and 404 of the Clean Water Act (CWA), Sections 9 and 10 of the Rivers and Harbors Act of 1899, and Section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972. In addition, I also prepared federal consistency determinations pursuant to Section 307 of the Coastal Zone Management Act and Volume 15 of the Code of Federal Regulations, Part 930, Federal Consistency.

During my tenure at EFANE, I had signatory authority for permit applications and attendant issues involving some of the Navy's most complex, controversial, and environmentally sensitive projects in the northeastern U.S.: dredging and dredged material disposal, waterfront construction, and new construction in or adjacent to wetlands.

Concomitant with regulatory requirements, I prepared or evaluated environmental documentation or analyses (prepared by Navy contractors) conducted under the National Environmental Policy Act (NEPA), Section 7 of the Endangered Species Act (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat Assessment), Marine Mammal Protection Act, Fish and Wildlife Coordination Act, Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), and Executive Order 13112 (Invasive Species).

As the Navy technical representative, I developed scopes of work, prepared independent cost estimates, analyzed contractor proposals, participated in negotiations, and developed contract execution schedules for Navy contractors. I provided technical oversight of contractor's work, monitored work in progress, and evaluated contractor's performance. I reviewed technical

submissions for accuracy and interpreted biological, chemical, and other environmental test results during contractor preparation of a variety of environmental documents including: NEPA environmental assessments and EISs, essential fish habitat assessments, coastal zone consistency determinations, 401 water quality certification applications, sediment sampling and testing plans for dredging projects, wetland delineations, wetland restoration plans, CERCLA remedial action plans, and integrated natural resources management plans.

In June 2006, I joined the Nuclear Regulatory Commission as an aquatic biologist. I serve as a technical specialist whose primary responsibility is that of independently assessing the environmental impacts of siting, construction, and operation of new nuclear power plants and related facilities on the aquatic environment. This involves reviewing and evaluating specific aspects of Environmental Reports submitted to the NRC by applicants and licensees and then assisting in the preparation an EIS. My duties also include updating the NRC environmental standard review plans for aquatic ecology contained in NUREG-1555, preparing biological assessments for Federal threatened and endangered species, and coordinating with federal and/or state agencies pursuant to NEPA, ESA, Sections 401 and 404 of the CWA, Section 10 of the Rivers and Harbors Act of 1899, Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat Assessment), Marine Mammal Protection Act, and Fish and Wildlife Coordination Act.

Thus far I have participated in pre-application activities for the Bell Bend, North Anna, Shearon Harris, William States Lee, Vogtle, River Bend, South Texas Project, Comanche Peak, and Callaway combined license (COL) applications. I have conducted the aquatic and terrestrial acceptance reviews for the Shearon Harris, William States Lee, and Callaway COL applications. In addition, I have participated in site audits and alternative site visits for the Vogtle Early Site Permit (ESP) as well as the William States Lee and Shearon Harris COL applications. I have provided technical oversight for the aquatic and terrestrial sections of the Vogtle ESP draft and final EISs.

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) )

AFFIDAVIT OF LANCE W. VAIL CONCERNING  
PREFILED TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2, 1.3 AND 6.0

I, Lance W. Vail, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*, in *NRC Staff Testimony of Dr. Michael T. Masnik, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.3*, and in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 6.0*, as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Lance W. Vail

Executed at Richland, Washington  
This 9th day of January, 2009

# STATEMENT OF PROFESSIONAL QUALIFICATIONS OF LANCE W. VAIL

## CURRENT POSITION

Senior Research Engineer II  
Environmental Technology Division  
Battelle, Pacific Northwest Division  
Pacific Northwest National Laboratory

Since joining Battelle in 1981, Mr. Vail has been involved in projects covering a diverse set of water related issues. His professional experience includes basic and applied research, and regulatory compliance assessments. His areas of expertise cover a broad spectrum of areas related to water resources.

## RESEARCH INTERESTS

Water resource management  
Multiple objective tradeoff analysis in water resources  
Uncertainty analysis in water resources  
Advanced hydrologic process modeling  
Impacts of climate on water resources  
Neural networks, fuzzy logic, and genetic algorithms applied to water resource issues  
Linking simulation models with optimization methods to water resource problems  
Linkage of physical and biological models in fisheries management

## EDUCATION

B.S.	Humboldt State University, environmental resources engineering	1979
M.S.	Montana State University, civil engineering	1982

## PROFESSIONAL AFFILIATIONS

American Geophysical Union  
American Society of Civil Engineers  
American Water Resources Association

## CURRENT PROJECTS

***Hydrologic Site Safety Reviews for Early Site Permits.*** Principal Investigator and Project Manager. Three applications for an Early Site Permit (ESP) have been submitted to the Nuclear Regulatory Commission. This project provides an independent assessment of hydrologic suitability of the proposed sites. Assessments include a broad range of considerations such as flooding, low water conditions, ice impacts, seiches, storm surge, and tsunamis.

***Water-related Environmental Reviews for Early Site Permits.*** Task Manager. Three applications for an Early Site Permit (ESP) have been submitted to the Nuclear Regulatory Commission. This task provides an independent assessment of the proposed sites' environmental suitability. Assessments include a broad range of considerations such as water-use conflicts and changes in water quality.

***Snohomish Basin Characterization.*** Technical Lead. Advanced distributed watershed models were applied to provide the Tulalip Tribes of Western Washington state a thorough understanding of the impacts of logging, development, and climate on the Snohomish River Basin.

***Acid Rain TMDL.*** Principal Investigator and Technical Project Manager. The objective of this work assignment for Region II of the U.S. Environmental Protection Agency is to develop a preliminary assessment approach for TMDLs

for pH impaired waters listed on the New York State Section 303(d) list. The intent is to enhance and further develop TMDL program capabilities by providing expertise in both acid deposition and TMDL development. The development of such an assessment approach requires that available models and data resources be reviewed. Systems engineering methods will be used in developing a conceptual model to ensure the relationships between models and data are fully understood. The assessment approach will be tested on one or more representative watersheds to be determined in close coordination with EPA, NYSDEC and Battelle. <http://acidraintmdl.pnl.gov>

## PAST PROJECTS

*Environmental Impact of License Renewal of Commercial Nuclear Power Plants.* Contributor. Mr. Vail assesses the water use, water quality, and hydrologic impacts of license renewal for the Nuclear Regulatory Commission's NEPA process. He has performed this function for the following commercial nuclear plants: Calvert Cliffs, Oconee, Arkansas Nuclear One, Hatch, McGuire, Catawba, North Anna, Robinson, Ginna, and St. Lucie.

*Chehalis Basin Characterization.* Principal Investigator and Project Manager. Advanced numerical modeling and GIS methods were applied to assist the Corps of Engineers in characterizing the Chehalis Basin in Western Washington State. The Chehalis Basin is subject to frequent flooding. The native populations of anadromous fish have been stressed to adverse changes in habitat resulting from development and logging.

*Generic Environmental Impact Statement (GEIS) for Decommissioning Commercial Nuclear Power Plants.* Contributor. Mr. Vail is providing expertise in the development of a GEIS for decommissioning of nuclear plants. He provides expertise on water use, water quality, and hydrologic impacts for the Nuclear Regulatory Commission.

*Impact of Climate on the Lower Yakima Basin.* Principal Investigator and Project Manager. The objective of this three-year EPA STAR Grant Project was to develop and demonstrate an integrated assessment of the impact of climate variability and climate change on a diverse set of interests in the Lower Yakima Valley in Central Washington State. Interests considered include: surface and groundwater supply, surface and groundwater quality, air quality, public health, farm and regional economics, and fisheries. The project considered the effectiveness of changes in land management (crop selection) and water management (reservoir operation) in adapting to an uncertain future climate. A diverse set of models was linked with an optimization procedure to ensure that the tradeoffs between various resource management objectives are clearly articulated. <http://projects.battelle.org/yakima/>

*Use of NOAA's Seasonal Climate Forecast for Water Resource Management.* Task Manager of Reservoir Optimization Task. The objective of this NOAA funded project was to show the potential value of improved climate forecasts in managing surface water reservoirs for multiple objectives. Using a pareto genetic algorithm, the reservoir operating rules were optimized to define the tradeoff curves for hydropower, flood control, and instream flow requirements in the Tennessee River basin. Changes in forecast reliability result in changes to these tradeoffs and thereby express the value of such improved forecasts.

*Accelerated Climate Prediction Initiative.* Task Manager of Water Resources and Habitat Task. This project will provided a limited, systematic assessment of the potential effects of anthropogenic climate change over the next half-century on water resources in the western United States. This objective was accomplished by "downscaling" the results of the global-scale simulations described above to the spatial and temporal resolution needed to drive impact assessment models. Downscaling is particularly important for the West, where topography is a dominant climate driver. An important aspect of the hydrology of almost all western rivers is water management. Other than a few headwater streams, the hydrology of most rivers in the west is strongly affected by water use and artificial storage. Water management models were

used to study the effect of reservoir operations and understand the implications of climate variability and change on the water resources of the west. <http://acpiwater.pnl.gov>

***Linking Physical and Biological Models.*** Principal Investigator and Project Manager. The objective of this three-year Laboratory Directed Research and Development project is to develop and demonstrate an integrated natural resource analysis framework. This framework: dramatically improves the ability to integrate physical and biological models, thereby encouraging the utilization of advanced process models; allows utilization of large, sparse, and distributed data sets (including model output); communicates high-level tradeoffs and their respective uncertainties; and assesses, communicates, and minimizes scales issues. During the first year, the fundamental structural differences between such models was identified as a significant obstacle to successful linking of physical and biological models. The pervasive vagueness of rules and the multivaluedness associated with temporal/spatial upscaling suggested an approach using "fuzzy methods". The second year of this project utilized a variety of fuzzy methods including: fuzzy arithmetic, fuzzy logic, fuzzy clustering, and adaptive neural fuzzy inference systems (ANFIS). A series of rules and a database from the Multispecies Framework Process were employed to test the various fuzzy methods. These rules and data are used to define aquatic habitat diversity in the Pacific Northwest. A tool called FuzzyHab was developed to estimate habitat diversity from a set of categorical statements about the environment. Each of these categorical statements is vaguely defined. Estimates for each categorical statement are derived from physical process models.

***Integrated Natural Resource Data System.*** Contributor. This project is to demonstrate INRDS. INRDS is an advanced, web-based environmental information system that will promote public understanding of natural resource management issues and assist planners and decision makers in accessing the most relevant information and analytical tools and evaluating the tradeoffs of alternate actions. <http://inrds.pnl.gov>

***Early Warning of El Niño Southern Oscillation (ENSO) Events for Regional Agriculture.*** Task Manager of Reservoir Optimization Task. This project is investigating the current predictability of interannual variability in climate conditions in the Pacific Northwest to determine whether and how early warning and seasonal climate forecasts by the Climate Prediction Center (CPC) of the National Oceanic and Atmospheric Administration (NOAA) forecasts can be used to reduce the vulnerability of irrigated agriculture to low water-availability conditions. The study is funded by a grant from the economics and Human Dimensions Program of the NOAA Office of Global Programs. The Economics and Human Dimensions program aims to improve our understanding of how social and economic systems are currently influenced by fluctuations in short-term climate (seasons to years), and how human behavior can be (or why it may not be) affected based on information about variability in the climate system. <http://elrino-northwest.labworks.org>

***Impact of Reservoir Operating Strategies on Resident Fish*** - Mr. Vail has employed several models to assess the impact on resident fish species of a variety of reservoir operating strategies. This study was undertaken as part of the Columbia Basin System Operation Review process. Mr. Vail helped define the values and value measures of the Resident Fish Work Group.

***Multiobjective Optimization*** - Mr. Vail is the project manager of an effort to assess the multiobjective optimization needs of Bonneville Power Administration. Objectives include: hydropower, resident fish, anadromous fish, irrigation, flood control, wildlife, and navigation. Mr. Vail is developing definitions of the canonical mathematical form of each of these objectives. The resulting multiobjective statement will be used to define the required optimization tools.

***Integrated Environmental Monitoring Initiative*** - Mr. Vail is a co-principal investigator for the Integrated Environmental Monitoring Initiative. The objective of this initiative is to develop and demonstrate a comprehensive interdisciplinary methodology targeted to improve the effectiveness of environmental monitoring and restoration activities. This objective required comprehensive integration of monitoring regimes, analytical practices, design methodologies, and compliance needs.

***Coupled Simulation/Optimization of Ground Water Remediation*** - Mr. Vail developed a computer code that coupled a ground water flow model with an optimization procedure. The code was able to provide estimates of the pumping/injection rates that would mitigate or remove a plume at minimal cost.

***Simulation of Watershed Hydrologic Responses to Alternative Climates*** - Mr. Vail is the principal investigator of a project studying the impacts of global climate change on the hydrologic response of a watershed. The results of hydrologic simulations using distributed snowmelt and soil moisture accounting algorithms were graphically compared via video displays of daily simulated snow water equivalent, soil moisture, and runoff for the American River, Washington, which drains 204 square kilometers of the east slopes of the Cascade Mountains, Washington. Snow water equivalents and snowmelt were simulated using a simplified distributed temperature-index model augmented with seasonally estimated net solar radiation. A classification scheme was used to partition the empirical cumulative probability distributions of precipitation (rain plus melt) and a topographic index over the basin into groups of near-equal membership. Topographically-based soil moisture capacities were assumed for each class and were estimated via automated calibration methods using historical data. The simulated soil moisture and snow water accumulations for each class were geographically mapped for visualization. Tests of the effect of alternative, warmer climates on snow accumulation, the seasonal distribution of soil moisture, and runoff were conducted by adjusting historical (daily) temperature and precipitation and repeating the analysis.

***Pacific Northwest Climate Change Case Study - Water Resource Impacts*** - Mr. Vail is investigating the effects of global climate change on water resources of the Pacific Northwest. Spatially distributed snowmelt, soil moisture, and runoff models have been combined with a graphics visualization package to understand the changes in snowpack, soil moisture, and evapotranspiration over time. A weather classification scheme has been developed which estimates point precipitation as a function of large-scale atmospheric variables. This allows the synthesis of point precipitation given large-scale meteorological information as might be produced by GCM simulations. Orographic effects also have a significant role in defining climate at the watershed scale. Efforts are under way to develop a scientific basis to extend the sparse meteorological measurements basis to extend the sparse meteorological measurements available for any watershed to estimate the spatial distribution of precipitation, temperature, and wind speed within the watershed. A reservoir network model for the Columbia River Basin has been aggregated to fourteen nodes. This network model of the Columbia River Basin has been aggregated to fourteen nodes. This network model will be driven by a collection of index watersheds. A daily hydroclimatological data set has been developed to aid in the selection of index watersheds.

***Acid Rain Watershed Modeling Project*** - Mr. Vail directed the hydrologic part of a study to evaluate and apply several coupled hydrology/geochemical codes that were developed to model the impact of acid rain on surface water chemistry. The project involved extensive behavior and sensitivity analyses of three coupled geochemical/hydrological simulation codes.

***Incineration at Sea*** - The objective of this project was to assess the impact of incinerating toxic waste at sea on the aquatic environment. Mr. Vail developed a model on an IBM-PC to estimate the concentration of contaminant in the ocean.

***Aquifer Thermal Energy Storage*** - The objective of this project was to develop and apply computer codes that would simulate the trade-offs between different management policies of an Aquifer Thermal Energy Storage system. Mr. Vail independently developed, validated, and applied several computer codes for this purpose.

***Flow and Fractured Media*** - The objective of this study is to develop a state-of-the-art predictive capability for flow and transport in saturated fractured media. Mr. Vail was responsible for implementing, modifying, and testing a computer code that models steady flow in permeable media with discrete fractures. Mr. Vail has also developed a computer code that models steady flow through fractures in an impermeable rock mass. The fractures can either be specified or generated via Monte Carlo Methods. This code was applied in an investigation of the potential impact of a nuclear meltdown on groundwater.

***Modeling Flow With Certainty in Hydraulic Parameters*** - The objective of this study is to develop a methodology to analyze the uncertainty in predicting piezometric surfaces caused by uncertainty in groundwater flow parameters. Mr. Vail developed a computer code that couples perturbation and finite-element techniques to estimate the mean and variance of the piezometric surface.

***Stripa Mine Hydrogeologic Characterization*** - The objective of this study was to perform three-dimensional simulations with the CFEST code for ground water flow at the Stripa Mine in Sweden. Mr. Vail was the Battelle project manager of this effort.

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Prasad R, LW Vail, CB Cook, and G Bagchi. 2005. "Establishment of Safety-Related Site Characteristics Based on Consideration of External Sources of Flooding at Nuclear Power Plant Sites in the United States of America". In Proceedings of International Workshop on External Flooding Hazards at Nuclear Power Plant Sites (tentative; title yet to be finalized by IAEA). PNNL-SA-46268, Pacific Northwest National Laboratory, Richland, WA.

Coleman A, LW Vail, and A Savery. 2005. "Landscape Classification for Assessment of Impacts of Landuse and Climate on Water Resources." PNWD-SA-7118, Battelle—Pacific Northwest Division, Richland, WA.

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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) )

AFFIDAVIT OF MARK D. NOTICH CONCERNING PREFILED TESTIMONY  
ON ENVIRONMENTAL CONTENTION EC 6.0 AND SPONSORING NUREG-1872

I, Mark D. Notich, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 6.0* and in *Prefiled Direct Testimony of Mark D. Notich Sponsoring NUREG-1872 Into Hearing Record*, as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Mark D. Notich

Executed at Rockville, Maryland  
This 9th day of January, 2009

Mark D. Notich  
STATEMENT OF PROFESSIONAL QUALIFICATIONS  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
Washington, D.C.

I am currently employed as a Senior Project Manager in the Office of New Reactors, U.S. Nuclear Regulatory Commission (NRC). I have been employed by the NRC since October 2005. I am currently assigned as the Environmental Project Manager for the development of the Environmental Impact Statement for the Early Site Permit (ESP) application for the Vogtle Electric Generating Plant (VEGP), submitted by Southern Nuclear Operating Company (SNC).

I hold a Bachelor of Science in Agricultural Chemistry from the University of Maryland (1978).

As the Environmental Project Manager for the Vogtle ESP, I have been deeply involved in all planning and management activities for pre-application activities, the acceptance review for the Plant Vogtle Environmental Report (ER), public meetings, meetings with State and federal agency stakeholders, site visits, review of SNC's ER, development of Requests for Additional Information (RAIs), and development and publication of the Draft and Final Environmental Impact Statements for the ESP. I also oversee the activities of the team specialists from Pacific Northwest National Laboratory (PNNL) and serve as the Technical Monitor for tracking the financial and technical progress of the contractor's task.

I have also supported the following NRC activities:

- Review of the Grand Gulf ESP and Clinton ESP Draft EISs by reviewing and commenting on assigned sections
- Review and comment on the Appendices for the North Anna ESP EIS
- Development of the format for the North Anna ESP Supplemental EIS
- Review and comment on the Historic and Cultural Resources section of the Vermont Yankee (VY) License Renewal Supplemental EIS (SEIS)
- Review of pre-application activities at the North Anna Plant and at the V.C. Summer Nuclear Power Station

Prior to joining the NRC, I served as a Senior Environmental Scientist for Advanced Technologies and Laboratories (ATL) International, Inc. from July 2000 to September 2005. I was the Deputy Project Manager/QA Manager for the Savannah River Dose Reconstruction Task for the Centers for Disease Control and Prevention (CDC) contract with responsibility for overseeing and managing the completion of project tasks, adherence to project schedules, and coordinating the preparation of the project's final report. I also served as Task Manager for the preparation of an Environmental Impact Statement for the Louisiana Energy Services Uranium Enrichment Facility in Hartsville, TN, supported the revision and updating of several NRC Regulatory Guides, and served as Task Manager for the development of an Environmental Assessment for the Re-

licensing of the General Electric- Morris Operation (GE-MO) Independent Spent Fuel Storage Installation (ISFSI) and a Generic Environmental Assessment for the Relicensing of Wet and Dry Storage ISFSIs. I also supported the development of numerous Environmental Impact Statements for the U. S. Department of Energy (DOE) including the Programmatic EIS for the Disposition of Radioactively Contaminated Scrap Metal and the Hanford Site Solid Waste Environmental Impact Statement.

From May 1987 to June 2000, I was a Senior Environmental Scientist for Tetra Tech NUS. I supported the development of several Environmental Impact Statements including an EIS for ship breaking and recycling in the United States and a Preliminary Environmental Impact Statement (PEIS) for the U.S. Department of Defense's Strategic Defense Initiative's Ballistic Missile Defense Program and of the Spent Nuclear Fuel Environmental Impact Statement for DOE's Idaho National Environmental Engineering Laboratory. I also provided senior technical review for DOE's New Production Reactor Environmental Impact Statement.

From September 1978 to May 1987, I was a Senior Analytical Chemist and Project manager supporting numerous environmental analyses and assessment projects for Hittman Ebasco Associates, Inc.

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) )

AFFIDAVIT OF MICHAEL T. MASNIK CONCERNING  
PREFILED TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2 AND 1.3

I, Michael T. Masnik, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*, and in *NRC Staff Testimony of Dr. Michael T. Masnik, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.3*, as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Michael T. Masnik

Executed at Rockville, Maryland  
This 9th day of January, 2009

Michael T. Masnik  
STATEMENT OF PROFESSIONAL QUALIFICATIONS  
UNITED STATES NUCLEAR REGULATORY COMMISSION  
Washington, D.C.

I am currently employed as a Senior Aquatic Ecologist in the Office of New Reactor Operations, U. S. Nuclear Regulatory Commission (NRC). As a senior member of the staff I am responsible for understanding and assessing the non-radiological impacts of nuclear power generation on a variety of aquatic environments.

I hold a Bachelor of Science in Conservation from Cornell University (1969), a Master of Science in Zoology from Virginia Polytechnic Institute and State University (1971), and a Doctor of Philosophy in Zoology also from Virginia Polytechnic Institute and State University (1975).

While at Virginia Polytechnic Institute and State University (VPI&SU), I undertook research in a variety of areas, specializing in zoogeography and distribution of freshwater fishes in large river systems. Other areas of research which resulted in published papers include thermal studies on fishes, recovery of damaged aquatic ecosystems, and development of sampling methodology for fish and macroinvertebrates. I have authored or co-authored some 16 publications on the above areas or research. My formal education has encompassed and emphasized studies in Zoology, Aquatic Ecology, Ichthyology, and Evolutionary Biology. Prior to joining the Federal government I participated as scientific staff for a Duke University Caribbean cruise conducting oceanographic investigations, and served as a consultant, through VPI&SU, for American Electric Power Company, Koppers Company, Inc., U.S. Army Corps of Engineers, and the Tennessee Valley Authority. I was also employed by Ichthyological Associates as a field biologist investigating the fisheries resources of the Delaware Bay as part of a baseline study for several new nuclear stations.

I joined the Atomic Energy Commission, the predecessor to the NRC, in 1974 as a Fisheries Biologist performing and overseeing NEPA reviews for nuclear power reactor license applications. My principal expertise was in evaluating the impacts of various cooling system designs and intake structures on fish and shellfish in source and receiving waterbodies. In the late 1970s and early 1980s I participated in the initial licensing reviews for more than 10 sites, three alternative site reviews and investigated numerous environmental events involving aquatic resources occurring at operating nuclear power stations. In 1976, as the NRC representative, I participated in the development of U.S. Environmental Protection Agency's draft Guidance for Evaluating the Adverse Impact of Cooling Water Intake Structures on the Aquatic Environment as well as the 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements. I also provided expert testimony at a number of NRC administrative hearings on a variety of environmental topics including shipworms, alternative site reviews, impingement and entrainment, and shortnose sturgeon. I developed the NRC staff's practices related to Commission compliance to the Endangered Species Act.

In 1982 I became the Technical Assistant to the Director of the Three Mile Island (TMI-2) Program Office. For the next 13 years I provided technical oversight on all aspects of the TMI-2 cleanup. I made over 15 containment entries at TMI-2, conducted numerous inspections and surveys developed custom technical specifications for the damaged facility, and oversaw the preparation of three supplements to the programmatic environmental impact statement on the cleanup. I provided expert testimony at an administrative hearing on the impacts of disposal of

the TMI-2 accident generated water. From 1982 to 1995 I served as the Designated Federal Official (DFO) to the NRC sponsored TMI-2 Advisory Panel. During my tenure as the DFO the panel held over 65 public meetings in the Harrisburg, PA area. In 1993, as the TMI-2 cleanup effort neared its conclusion I assumed project management responsibilities for the decommissioning of the Trojan Nuclear Power Plant. Trojan was the first large PWR to permanently cease operation and immediately begin active decontamination and dismantlement.

In 1997 I became first Acting, then Section Chief, of the Decommissioning Section in the NRC's Office of Nuclear Reactor Regulation (NRR). I was responsible for the project management of 19 permanently shutdown reactors. I also oversaw the implementation of NRC's 1996 final rule on decommissioning and the development of the 2002 Generic Environmental Impact Statement on the decommissioning of nuclear power reactors. During my tenure as Section Chief I made numerous presentations on the subject before industry, trade, and professional society meetings. In 1997, along with two coworkers, I developed and taught a one week course on reactor decommissioning at the University of Kiev, Ukraine. During my assignment to the TMI-2 cleanup effort and then as Chief of the Decommissioning Section I continued to periodically assist the NRC in the specialized areas of aquatic impact assessment and compliance with the Endangered Species Act. In the early 1990s, I assisted in the development of the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, and the Final Environmental Impact Statement, Operating License Stage, for the Watts Bar Nuclear Station Unit 1.

In 2001, with the transfer of the responsibility for decommissioning within the NRC to the office of Nuclear Materials Safety and Safeguards I joined the license renewal effort in NRR, again as an expert in environmental impacts assessment. Since 2001 I have served as the license renewal environmental project manager for the St. Lucie, Browns Ferry, and the Oyster Creek nuclear stations, worked on numerous other license renewals as well as several early site permits serving as the Commission's expert in aquatic and terrestrial ecology, and water intake design. I also was responsible for or assisted in conducting formal and informal endangered species consultations for a number of nuclear power stations including Crystal River, Hatch, Saint Lucie, and Turkey Point. I provided oversight in the preparation of the aquatic and in some cases the hydrological sections of the supplemental environmental impact statements for license renewal for the following both closed-cycle and once through nuclear stations: Arkansas, Turkey Point, Saint Lucie, Fort Calhoun, North Anna, Surry, Catawba, Ginna, Summer, Cook, Quad Cities, Millstone, Vermont Yankee, Nine Mile Point, Monticello, FitzPatrick and Wolf Creek.

In early 2007 I transferred to the NRC's Office of New Reactors to devote myself full time to the environmental assessment of the construction and operation of new reactors, both at existing as well as Greenfield sites, on aquatic ecosystems. I am the NRC's principal contact for endangered species concerns with the National Marine Fisheries Service (NMFS) Southeast Regional Office (SERO). I assisted in the development of the Biological Assessment for the Vogtle Early Site Permit (ESP) application that was submitted to SERO for their review. I have also provided oversight to the aquatic ecology and hydrology sections for the preparation of the environmental impact statements for the North Anna, Clinton, and Grand Gulf ESP sites. I am currently providing technical oversight to the Grand Gulf, North Anna, Bellefonte, Vogtle, and Levy Combined License Applications as well as the Vogtle ESP. I am a member of the American Fisheries Society.

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) )

AFFIDAVIT OF REBEKAH HARTY KRIEG CONCERNING  
PREFILED TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2, 1.3 AND 6.0

I, Rebekah Harty Krieg, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*, in *NRC Staff Testimony of Dr. Michael T. Masnik, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.3*, and in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 6.0*, as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Rebekah Harty Krieg

Executed at Richland, Washington  
This 9th day of January, 2009

## Resume

### **Rebekah Harty Krieg**

Ecology Group  
U.S. DOE's Pacific Northwest National Laboratory, operated by Battelle  
P.O. Box 999 K6-85  
Richland, WA. 99352  
(509) 371-7155 (509) 371-7160 (fax)

### **Education:**

M.S. in Fisheries and Oceanographic Sciences, University of Washington, 1983

B.S. in Biology, Washington State University, 1979.

### **Experience:**

*Senior Research Scientist* (1979-2002 and 2005 – present) Battelle, Pacific Northwest National Laboratory, Richland, WA.

Technical Reviewer for the aquatic ecology sections of the Combined License (COL) application in support of the U.S. Nuclear Regulatory Commission's (NRC's) environmental evaluation of Tennessee Valley Authority's application for a COL for Bellefonte Units 3 and 4.

Technical Reviewer for the aquatic ecology sections of the Early Site Permit (ESP) application in support of the U.S. Nuclear Regulatory Commission's (NRC's) environmental evaluation of Southern Nuclear Corporation's application for an ESP for Vogtle Units 3 and 4.

Preapplication Team lead for COLs for Summer (SCEG), Bellefonte (TVA), Levy (Progress Energy), and Victoria (Exelon). Aquatic Ecology reviewer for Comanche Peak preapplication.

Technical contributor on project to assist the Army Corps of Engineers (Walla Walla District) develop configuration and operation plans for their hydroelectric projects to meet the requirements of the Biological Opinion on anadromous salmonid species listed under the Endangered Species Act.

Task leader for the Knowledge Management portion of the Infrastructure for New Reactor Environmental Reviews project. This project includes developing tools (GIS, comment databases, collaboration sites) for the Nuclear Regulatory Commission and their contractors to use during the environmental reviews that will occur when applications are received for new power reactor licenses.

Technical leader for NRC's review of license renewal applications. Managed interdisciplinary teams that provided technical support to the NRC on their review of the

environmental impacts related to the renewal of operating licenses for commercial nuclear power stations. Specifically Ms. Krieg managed the team that developed the Supplemental Environmental Impact Statement for the Oconee Nuclear Station and co-managed the teams for McGuire and Catawba.

Technical leader for development of an interdisciplinary team that provided assistance to the NRC on the development of a Supplemental Environmental Impact Statement for the Watts Bar Nuclear Plant.

Deputy Team lead for updating and revising the Environmental Standard Review Plan (ESRP), NUREG-1555.

Project Manager for assisting the NRC with development of a Generic Environmental Impact Statement (GEIS) to decommissioning of commercial nuclear power reactors. Includes the development of a revision to the Generic Environmental Impact Statement (GEIS) on Decommissioning that was originally published in 1988, development of Regulatory Guides and review plans related to the initial phases of the decommissioning process, technical review of the types of accidents that are of concern during the decommissioning process and the development of a handbook related to decommissioning for resident inspectors.

Project Manager to provide technical assistance to the NRC on the cleanup of Three Mile Island, Unit 2. Included occupational dose calculations, safety evaluations, development of supplements to a programmatic environmental impact statement, and measurement of fuel quantities remaining in the facility.

Provided technical support to the U.S. Department of Energy (DOE) in relation to the use of collective dose as a performance measurement, the development of guidance for fetal/reproductive health hazards from ionizing radiation and chemicals and extremity dosimetry.

#### **Publications:**

Krieg, RH, E.E. Hickey, J.R. Weber, and M.T. Masnik. 2004. *Nuclear Power Plants, Decommissioning of* contained in *Encyclopedia of Energy*. Cutler J. Cleveland, Editor-in-Chief. Volume 4. Elsevier Inc. Oxford, England.

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Harty, R., and G. A. Stoetzel. 1986. *Occupational Dose Estimates for a Monitored Retrievable Storage Facility.* PNL-5744, Pacific Northwest Laboratory, Richland, Washington.

Harty, R., W. D. Reece and J. A. MacLellen. 1986. *Extremity Dosimetry at U.S. Department of Energy Facilities.* PNL-5831, Pacific Northwest Laboratory, Richland, Washington. Reece, W. D., R. Harty, L. W. Brackenbush and P. L. Roberson. 1985. *Extremity Monitoring: Considerations for Use, Dosimeter Placement, and Evaluation.* NUREG/CR-4297, U.S. Nuclear Regulatory Commission, Washington, D.C.

Munson, L. F., and R. Harty. 1985. *Possible Options for Reducing Occupational Dose from the TMI-2 Basement.* NUREG/CR-4399, U.S. Nuclear Regulatory Commission, Washington, D.C.

Parkhurst, M. A., D. E. Hadlock, R. Harty and J. L. Pappin. 1985. *Radiological Assessment of BWR Recirculatory Pipe Replacement.* NUREG/CR-4494, U.S. Nuclear Regulatory Commission, Washington, D.C.

Reece, W. D., R. T. Hadley, R. Harty, J. Glass, J. E. Tanner and L. F. Munson. 1984. *Personnel Exposure from Right Cylindrical Sources (PERCS).* NUREG/CR-3573, U.S. Nuclear Regulatory Commission, Washington, D.C.

Fisher, D. R., and R. Harty. 1982. "The Microdosimetry of Lymphocytes Irradiated by Alpha Particles." *Int. J. Radiat. Biol.* 41(3):315-324.

W. E. Kennedy, Jr., E. C. Watson, D. W. Murphy, B. J. Harrer, R. Harty and J. M. Aldrich. 1981. *A Review of Removable Surface Contamination on Radioactive Materials Transportation Containers.* NUREG-CR/1858, PNL-3666, Pacific Northwest Laboratory, Richland, Washington.

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) )

AFFIDAVIT OF DR. CHRISTOPHER B. COOK CONCERNING  
PREFILED TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2, 1.3  
AND 6.0 AND REBUTTAL TESTIMONY ON ENVIRONMENTAL CONTENTION 1.2

I, Dr. Christopher B. Cook, do declare under penalty of perjury that my statements in *NRC Staff Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Dr. Christopher B. Cook, and Lance W. Vail Concerning Environmental Contention EC 1.2 (as corrected and refiled on February 2, 2009 and February 26, 2009)*, in *NRC Staff Testimony of Dr. Michael T. Masnik, Rebekah H. Krieg, Dr. Christopher B. Cook, and Lance W. Vail Concerning Environmental Contention EC 1.3 (as corrected and refilled on February 2, 2009 and February 26, 2009)*, in *NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Dr. Christopher B. Cook, and Lance W. Vail Concerning Environmental Contention EC 6.0 (as corrected and refilled on February 2, 2009 and February 26, 2009)*, and in *NRC Staff Rebuttal testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Dr. Christopher B. Cook, and Lance W. Vail Concerning Environmental Contention EC 1.2 (as corrected and refiled on February 26, 2009)* (including to the extent it modifies my testimony in the Staff's prefiled direct testimony on EC 1.2), as well as in my attached statement of professional qualifications are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

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Christopher B. Cook

Executed at Rockville, Maryland  
This 26th day of February, 2009

**Christopher Bruce Cook**  
STATEMENT OF PROFESSIONAL QUALIFICATIONS

**Current Position**

Senior Hydrologist  
Hydrologic Engineering Branch  
Division of Site and Environmental Reviews  
Office of New Reactors  
U.S. Nuclear Regulatory Commission

**Education**

Ph.D., Civil and Environmental Engineering, University of California at Davis, 2000  
M.S., Civil and Environmental Engineering, University of California at Davis, 1993  
B.S., Civil Engineering, Colorado State University, 1991

**Professional Experience**

Dr. Cook joined the U.S. Nuclear Regulatory Commission in 2007. Prior to joining the NRC, he was employed as a Senior Research Engineer at the Pacific Northwest National Laboratory (PNNL) for over seven years. Dr. Cook's professional experience covers a diverse set of hydrology-related areas including basic and applied research and regulatory compliance assessments. Past research areas have focused on the use of multi-dimensional hydrodynamic and water-quality modeling of surface water systems, including simulation of complex density-driven flows in stratified environments, and field instrumentation relevant to environmental fluid mechanics.

**NRC Experience**

**Hydrologic Reviews for New Plant Applications.** Dr. Cook's duties include support of NRC reviews associated with early site permits and combined license applications. Dr. Cook is currently the lead hydrologist for the Bell Bend, Bellefonte, Grand Gulf, and North Anna combined license applications. Responsibilities associated with these reviews include preparation of hydrology-related sections of the Safety Evaluation Report (SER) and Environmental Impact Statement (EIS). Safety-related assessments include a broad range of surface water and groundwater site hazard assessments. Responsibilities on the EIS reviews include assessment of water-use and water-quality impacts to the environment from construction and operation of the proposed nuclear reactor, as well as evaluation of alternatives to the proposed action.

**IAEA Safety Standard Development.** Dr. Cook is currently assisting with the development of hydrology-related sections of the new International Atomic Energy Agency (IAEA) Safety Guide DS417, "Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations." This new guide will both update and combine Safety Guide NS-G-3.5 "Flood Hazard for Nuclear Power Plants on Coastal and River Sites" and Safety Guide NS-G-3.4 "Meteorological Events in Site Evaluation for Nuclear Power Plants."

### Private Sector Experience

**Hydrologic Site Safety Reviews for Early Site Permits.** PNNL Task Manager. Dr. Cook prepared surface water hydrology (Section 2.4) sections of the Safety Evaluation Reports (SERs) associated with the North Anna (NUREG-1835), Clinton (NUREG-1844), and Grand Gulf (NUREG-1840) early site permit applications. Assessments included a broad range of site hazards, including flooding from extreme storm events and cascade-failure of upstream dams.

**Hydrology-Related Environmental Reviews for Early Site Permits.** PNNL Task Manager. Dr. Cook provided assessments for the hydrology-related sections of the Environmental Impact Statements associated with the North Anna (NUREG-1811), Clinton (NUREG-1815), Grand Gulf (NUREG-1817), and Vogtle (NUREG-1872; draft) early site permit applications. Assessments include a broad range of water-use and water-quality impacts to the environment from both construction and operation of the proposed nuclear reactors.

**Field Assessment and Simulation of Temperature Fluctuations in the Lower Snake River.** PNNL Principal Investigator and Project Manager. Dr. Cook lead a multi-year project to monitor and model temperature fluctuations in the lower Snake River (contract totaling over \$1 million per year). He applied three-dimensional numerical models to simulate transient density currents at the confluence of the Clearwater and Snake rivers, and a two-dimensional laterally-averaged model to simulate temperature variations throughout the 140 river mile reach downstream to the confluence of the Snake and Columbia rivers. *In situ* measurements in the confluence region focused on density gradients and their impacts on juvenile Chinook salmon migration, and included the use of a wide range of field instrumentation.

**Analysis and Simulation of 3-D Free-Surface Hydrodynamics near Hydroelectric Dams.** PNNL Principal Investigator and Project Manager. Dr. Cook participated in and managed several free-surface computational fluid dynamics (CFD) modeling projects to compute water velocities, turbulence intensities, and pressure variations (including hydraulic loads) to assist with designing various hydraulic structures at several hydroelectric dams. Typical examples are an analysis of the spillway and tailrace conditions at The Dalles Dam (Columbia River) and simulation of entrance conditions at the Bonneville Second Powerhouse Ice and Trash Sluiceway (Columbia River).

**Three-Dimensional Hydrodynamic and Water Quality Simulation of a Terminal Basin Lake.** UC Davis Post-Graduate Research Engineer. While at the University of California at Davis, Dr. Cook modified and applied the multi-dimensional finite element model RMA10 to the Salton Sea, California. To calibrate and verify the model, a team lead by Dr. Cook implemented a year-long field data monitoring program to obtain *in situ* water current (ADCP) and quality (e.g. temperature, salinity, pH, and dissolved oxygen) information. Applications of the computational model focused on management alternatives to restore the Salton Sea's degrading saline environment.

### Selected Publications and Technical Reports

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Cook, C. B., G. T. Orlob, and D. W. Huston. (2002). "Simulation of Wind-Driven Circulation in the Salton Sea: Implications for Indigenous Ecosystems." *Hydrobiologia*, 473: 59-75.

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Abt, S. R., C. B. Cook, K. Staker, and D. Johns. (1991). "Small Parshall Flume Rating Corrections." *Journal of Hydraulic Engineering*, American Society of Civil Engineering, 118(5): 798-802.

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Cook, C. B., D. W. Huston, M. R. Jensen, G. T. Orlob, and S. G. Schladow. (1998). "Internal Dynamics of a Large Saline Lake: Field Investigation and Monitoring of the Salton Sea, California." *1998 Ocean Sciences Meeting*, AGU and ASLO, San Diego, February.

### **Professional Affiliations**

American Society of Civil Engineers  
American Geophysical Union

1 MS. PRICE: At this time could you pull  
2 up the rebuttal testimony for EC 6.0.

3 Ms. Kuntzleman, are you familiar with the  
4 testimony entitled NRC Staff Testimony of - oh, I'm  
5 sorry, are you familiar with the testimony entitled  
6 NRC Staff Rebuttal Testimony of Anne R. Kuntzleman  
7 concerning environmental contingent EC 6 dated  
8 February 26th, 2009, and February 6th, 2009,  
9 respectively, which have been provided to the court  
10 reporter in electronic format under file names ESP NRC  
11 Staff EC 6.0 direct testimony, and Vogtle ESP NRC  
12 Staff EC 6.0 rebuttal testimony?

13 MS. KUNTZLEMAN: I am.

14 MS. PRICE: And I apologize, that should  
15 just be dated February 6th, 2009.

16 Do you affirm that the portions of the  
17 rebuttal testimony bearing your initials, as well as  
18 your attached statement of professional  
19 qualifications, were prepared by you, and that  
20 together they are true and correct to the best of your  
21 knowledge and belief?

22 MS. KUNTZLEMAN: I do so affirm.

23 MS. PRICE: At this time I move to have  
24 the rebuttal testimony of Ms. Kuntzleman entered into  
25 the record as if read.

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1 JUDGE BOLLWERK: All right, any  
2 objections?

3 (No response)

4 JUDGE BOLLWERK: Hearing none, then the  
5 rebuttal testimony of Anne Kuntzleman on contention EC  
6 6.0 will be admitted and entered into the record at  
7 this point as if read as DDMS item ID 59143.

8 (Insert Staff Rebuttal Testimony (EC 6.0)  
9 (DDMS-59143))

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February 6, 2009

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

NRC STAFF REBUTTAL TESTIMONY OF ANNE R. KUNTZLEMAN  
CONCERNING ENVIRONMENTAL CONTENTION EC 6.0

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Q1. Please state your name.

A1. (ARK) My name is Anne "Nancy" R. Kuntzleman (ARK).

Q2. Have you previously submitted testimony concerning Contention EC 6.0 in this proceeding?

A2. (ARK) Yes. My prefiled direct testimony is provided in "NRC Staff Testimony of Mark D. Notich, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 6.0." (Jan. 9, 2009; as corrected and refiled February 2, 2009) (hereinafter "Staff EC 6.0 Direct Testimony").

Q3. Are you familiar with the direct testimony submitted by the Joint Intervenors concerning EC 6.0?

A3. (ARK) Yes.

Q4. Mr. Hayes asserts that "[d]espite the lack of specific data, the FEIS could provide a range of estimates for sediment volume and dredging duration based upon some reasonable assumptions and ranges of conditions." Hayes EC 6.0 Testimony at A14. Mr. Hayes also states that "the FEIS does not estimate the duration of the dredging project or the volume of

sediment that will need to be dredged and placed outside of the river.” Hayes EC 6.0 Testimony at A13. Please explain whether the Staff considered it appropriate to assume details about the scope and duration of any potential dredging of the Federal navigation channel.

A4. (ARK) Each dredging project is unique and must be evaluated by the physical, chemical, and biological conditions present at the dredging and disposal sites. A multitude of parameters define each Federal navigation channel dredging project including: existing depths, required maintenance depth, quantity [cubic yards (cy)] of maintenance dredging, quantity (cy) of allowable overdepth dredging, types and drafts of vessels using the waterway, sediment type and quality, dredging and dredged material disposal methods, habitats within and adjacent to the dredging and disposal areas, fish migration patterns, identification of spawning and nursery habitat, and determination of benthic macroinvertebrates present. In preparing the FEIS, these details were not before the Staff, only the potential of a maintenance dredging project with potential dredging limits covering up to 116 river miles. The Staff was also unaware of any designated dredged material disposal sites for the potential dredging project. In addition, it was the Staff’s understanding that no formal request or permit application for dredging was before the Corps; this understanding is confirmed by the Corps EC 6.0 Direct Testimony at A8. It was not reasonable for the Staff, lacking any dredging and dredged material disposal parameters, to assume specific project details and develop a bounding analysis. Doing so would not result in realistic or reasonable details for either sediment volume or dredging duration. Dredging duration is determined by the extent of dredging to be performed, the type(s)/size(s) of dredging equipment used, the location of the dredged material disposal/beneficial reuse area(s) relative to the dredge site(s), as well as the permit conditions and environmental window(s) designated by the Federal and state regulatory and resource agencies. None of these details were available to the Staff during preparation of the FEIS. In their EC 6.0 Direct Testimony, the Corps witnesses also acknowledge that sediment quantity, quality, and disposal location(s) are

unknown (A17), sediment chemistry is unknown (A21), dredging locations are unknown (A18), project duration is uncertain (A13), and special requirements/conditions and time-of-year restrictions are unknown (A11).

Without project-specific information for such a potentially large-scale dredging project (one that indeed may change in scope after review by the resource and regulatory agencies or not occur at all), the Staff could not conduct a meaningful quantitative assessment.

Nevertheless, based on the Staff's familiarity with previous dredging projects, the Staff determined that a qualitative analysis to identify the types of potential environmental impacts likely to occur with such a project was appropriate.

Q5. Mr. Hayes states that "[c]onducting a comprehensive environmental analysis of dredging would require substantial environmental, ecological, physical, and hydrologic data not presented in the FEIS." Hayes EC 6.0 Testimony at A19. Do you agree with that assertion?

A5. (ARK) Based upon my prior professional experiences, a large-scale dredging project does involve a comprehensive environmental analysis that would call for substantial ecological, geotechnical, chemical, and physical information. In their EC 6.0 Direct Testimony, the Corps witnesses outlined the Corps National Environmental Policy Act (NEPA) coordination process (A9), explained the environmental review/permitting process for a non-Federal applicant (A10), and identified the Corps project planning and environmental review requirements documents (A12). Based upon my prior Clean Water Act (CWA) permitting experiences for complex projects, the time from pre-application meeting to permit issuance can often span several years, even with the applicant working in a cooperative relationship with the Federal and state resource and regulatory agencies. The Staff was unable to conduct a comprehensive environmental analysis because the project parameters identified in A4 above were not available and because, as stated in the Corps EC 6.0 Direct Testimony at A8, the Corps has neither developed a plan nor received a formal request or authorization for dredging

of the Savannah River Federal navigation channel in the near future to facilitate barge traffic as far upstream as the VEGP site.

Q6. Mr. Hayes states that “[t]he FEIS rates the potential cumulative impacts for the federal navigation channel dredging as MODERATE, but does not provide any evidence that the ranking is based upon a quantitative evaluation.” Hayes EC 6.0 Testimony at A18. Was it appropriate for the Staff to provide a quantitative evaluation of the Federal navigation channel dredging?

A6. (ARK) For the reasons outlined in A4 above and in Staff EC 6.0 Direct Testimony at A28, it was not appropriate for the Staff to provide a quantitative evaluation of the Federal navigation channel dredging. Without a pending plan or dredging application before the Corps, the Staff was severely constrained during preparation of the FEIS. The Staff emphasized in the FEIS that it would be the responsibility of the Corps to assess dredging impacts on river biota as part of its NEPA review process, once the Corps had actually received authorization to develop a dredging plan or had received a formal request. Staff EC 6.0 Direct Testimony at A28; Exhibit NRC000001 at 7-20. Any quantitative evaluation by the Staff would have been a highly speculative effort, since the range of postulated dredging quantities alone would encompass several orders of magnitude. The Staff, however, still sought to disclose the potential environmental impacts associated with a potential dredging project and decided a quantitative analysis was the most appropriate method, based on the Staff’s familiarity with previous dredging projects.

Q7. Dr. Young identifies several potential effects of dredging activities, including impacts on “food web dynamics” and spawning of fish species. Young EC 6.0 Testimony at A12. He also mentions that dredging may resuspend contaminants and destroy benthic habitat, including that needed by mussels. *Id.* Are such potential effects of dredging of the Federal navigation channel disclosed in the Staff’s analysis?

A7. (ARK) Yes, the Staff identified a range of potential environmental effects associated with dredging activities within the Federal navigation channel. These potential effects are disclosed in my direct testimony and in the FEIS. Staff EC 6.0 Direct Testimony at A26; Exhibit NRC000001 at 7-20. In my direct testimony I also discussed some potential mitigation measures. Staff EC 6.0 Direct Testimony at A32.

Q8. Dr. Young states that “[t]he FEIS mentions the potential for benthic organism (i.e. the freshwater mussel) relocation, yet surprisingly provides no detail concerning this proposal.” Young EC 6.0 Testimony at A12. Was it appropriate for the Staff to provide details in the FEIS concerning mussel relocation?

A8. (ARK) It was not appropriate for the Staff to provide details in the FEIS concerning mussel relocation because Federal and state resource agencies are responsible for identifying recommendations or requirements for mussel relocation. It is the Staff’s understanding that the United States Fish and Wildlife Service would provide recommendations and/or requirements to the Corps as part of the regulatory review process under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403) and Section 404 of the Clean Water Act (33 U.S.C. 1344) whereas the state resource agencies (Georgia and South Carolina) would provide recommendations and/or requirements to their respective state regulatory agencies as part of the CWA Section 401 (33 U.S.C. 1341) water quality certification review. As stated in the FEIS (Exhibit NRC000001 at 7-20) and in the Corps EC 6.0 Direct Testimony at A8, the scope of the dredging project is not defined and there is no formal request or permit application for maintenance dredging of the Federal navigation channel before the Corps. Therefore, it is premature for the Staff to speculate on the details of what Federal and state resource agencies would recommend or require for any mussel relocation efforts.

Q9. Dr. Young states that “[w]ith the large-scale dredging, a thorough freshwater mussel survey for the entire affected area should be completed.” Young EC 6.0 Testimony at A13.

Does the Staff agree with this assertion?

A9. (ARK) The Staff agrees that thorough freshwater mussel surveys should be completed prior to conducting any large-scale dredging project only if Federal and state resource agencies determine that they are warranted. As discussed in A8 above, surveys would only be conducted after the areas proposed for dredging have been identified, there is a formal request or permit application before the Corps, and the Federal and state resource agencies have completed their reviews. As stated in the Corps EC 6.0 Direct Testimony at A8, the Corps has neither developed a plan nor received a formal request or authorization for dredging of the Savannah River Federal navigation channel to facilitate barge traffic as far upstream as the VEGP site.

If the Corps were to receive an application for maintenance dredging, it is the Staff's understanding that the CWA Section 404 permit application process would require that the applicant identify the least environmentally damaging practicable alternative (LEDPA) with impact avoidance as the initial goal. As mentioned in A8 above, the Federal and state resource agencies would provide recommendations and/or requirements for conducting mussel surveys to minimize and mitigate any unavoidable impacts.

Q10. Does this conclude your testimony?

A10. (ARK) Yes.

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) )

AFFIDAVIT OF ANNE R. KUNTZLEMAN CONCERNING PREFILED  
REBUTTAL TESTIMONY ON ENVIRONMENTAL CONTENTIONS 1.2 AND 6.0

I, Anne R. Kuntzleman, do declare under penalty of perjury that my statements in *NRC Staff Rebuttal Testimony of Dr. Michael T. Masnik, Anne R. Kuntzleman, Rebekah H. Krieg, Jill S. Caverly, and Lance W. Vail Concerning Environmental Contention EC 1.2*, and in *NRC Staff Rebuttal Testimony of Anne R. Kuntzleman Concerning Environmental Contention EC 6.0*, are true and correct to the best of my knowledge, information, and belief.

**Executed in Accord with  
10 C.F.R. § 2.304(d)**

\_\_\_\_\_  
Anne R. Kuntzleman

Executed at Rockville, Maryland  
This 6th day of February, 2009

1 MS. PRICE: At this time I believe we  
2 have two exhibits.

3 JUDGE BOLLWERK: I think that is what I  
4 counted last night. Yes.

5 MS. PRICE: NRC000048, excerpts from  
6 United States Army Corps of Engineers, ER-1105-2-100,  
7 planning guidance notebook, dated 2000.

8 JUDGE BOLLWERK: Let the record reflect  
9 that Exhibit NRC000048 is marked for identification.

10 (Whereupon the aforementioned document  
11 was marked for identification as Exhibit  
12 NRC000048-00-BD01)

13 MS. PRICE: We also have NRC000049,  
14 United States Army Corps of Engineers, ER-200-2-2,  
15 procedures for implementing NEPA, dated 1988.

16 JUDGE BOLLWERK: And the record should  
17 reflect NRC Exhibit 000049 is marked for  
18 identification.

19 (Whereupon the aforementioned document  
20 was marked for identification as Exhibit  
21 NRC000049-00-BD01)

22 MS. PRICE: At this time I'd move to have  
23 these entered into evidence.

24 JUDGE BOLLWERK: Any objections to the  
25 entry of these exhibits?

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1 (No response)

2 JUDGE BOLLWERK: Hearing none, then  
3 Exhibits NRC000048 and 49 are admitted into evidence.

4 (Whereupon the documents previously  
5 marked for identification as NRC000048-  
6 00-BD01

7 and NRC000049-00-BD01 were admitted into  
8 evidence)

9 JUDGE BOLLWERK: All right, at this point  
10 then, the testimony having been admitted, and the  
11 evidentiary materials having come in, I believe this  
12 panel is ready for questions from the board.

13 All right. One of the things I'd like to  
14 talk with you all this morning about is to sort of get  
15 a better understanding among other things of the sort  
16 of timeline under which the staff's review of the  
17 question of dredging sort of was played out.

18 And Mr. Wilkey, if you could pull up SNC  
19 Exhibit 00001N, and on page 4.2-4, down toward the  
20 bottom I believe, up in the paragraph right under the  
21 bullet, first sentence: SNC will have a passage  
22 dredged from the main channel of the Savannah River to  
23 the new barge slip to facilitate movement of heavy  
24 equipment and components to the site by barge.

25 This is in the environmental report, and

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1 while it doesn't say anything about what would happen  
2 to the main channel, it does suggest that they do plan  
3 to barge. And as we heard yesterday they would  
4 apparently do that in one of two ways: either they  
5 would wait for the level of the river to be at such a  
6 level at whatever it needed to be in order for them to  
7 be able to barge the material; or they would need to  
8 dredge.

9 With that in mind, and as well I guess  
10 there was a history with Vogtle 1 and 2 in terms of  
11 extensive, as we heard yesterday, extensive barging up  
12 the river for components for that facility, what was  
13 the first - approximately when was the first contact  
14 that you all had with SNC relative to the question of  
15 barging in the channel?

16 MS. KRIEG: Well, the first contact we  
17 had was when we received the environmental report, and  
18 we read through that, and read that paragraph that you  
19 referred to.

20 JUDGE BOLLWERK: And - go ahead.

21 MS. KRIEG: But I'm talking about barging  
22 just that channel from the main channel to the barge  
23 slip; not barging the entire channel, navigation  
24 channel. I'm not referring to that.

25 JUDGE BOLLWERK: But obviously there was

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1 some expectation that the barge is going to get to the  
2 barge slip somehow. So what question did you raise  
3 with them at that point about the main channel?

4 MS. KRIEG: Well, at the site audit we  
5 asked them about bringing the barges up the river, and  
6 we were told that they would do it on a high water  
7 flow.

8 JUDGE BOLLWERK: All right, so the high  
9 water flow was the way that it would be handled. That  
10 was approximately when, if you remember?

11 MS. KUNTZLEMAN: Your Honor, it was the  
12 middle of October, 2006.

13 JUDGE BOLLWERK: Middle of October, 2006.  
14 Okay. That was a site visit, I take it, right?

15 MS. KUNTZLEMAN: It was the site audit.

16 JUDGE BOLLWERK: Okay.

17 MS. KUNTZLEMAN: And I'd also like to add  
18 to Ms. Krieg's testimony that we had asked Southern  
19 about dredging, requirement for dredging, the federal  
20 navigation channel, and it was no. And that's why  
21 there is that level of detail in that paragraph.

22 JUDGE BOLLWERK: Let me back up. It was  
23 no, meaning what?

24 MS. KUNTZLEMAN: That there wouldn't be  
25 any requirement for dredging.

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1 JUDGE BOLLWERK: Okay.

2 MS. KUNTZLEMAN: And then we were into a  
3 level of detail such that we also inquired about  
4 whether there would be a requirement for dredging from  
5 the Federal navigation channel to the barge slip. And  
6 the river there is only about 312 feet wide, and the  
7 channel, the Federal navigation channel, is 90 feet.  
8 And the channel there runs pretty much in the middle  
9 of the river.

10 So we went to the level of detail that we  
11 were concerned about that, what, few hundred feet just  
12 from the edge of the channel over to the barge slip.  
13 That was the level of detail, and that's why that  
14 sentence is written the way it is.

15 So dredging was never a consideration for  
16 the Federal navigation channel.

17 JUDGE BOLLWERK: Because your  
18 understanding, at least at that point was, that the  
19 Southern was basically going to - well, it was going  
20 to use the level of the river as the way to get the  
21 barges up without having to do any dredging?

22 MS. KUNTZLEMAN: Correct.

23 JUDGE BOLLWERK: All right. So that was  
24 October of 2006, you told me.

25 MS. KUNTZLEMAN: Correct.

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1 JUDGE BOLLWERK: All right. What is the  
2 next contact you had with - what was - let me put it  
3 this way. That was your understanding. When did that  
4 understanding change?

5 MS. KUNTZLEMAN: It was always our  
6 understanding that Southern never had a requirement  
7 for dredging the Federal navigation channel. It  
8 wasn't until the draft environmental impact statement  
9 was published, and then we received comments from  
10 several environmental organizations, U.S. Fish &  
11 Wildlife Service, Army Corps of Engineers, the states  
12 of Georgia and South Carolina. And those  
13 organizations and regulatory agencies mentioned that  
14 gee, maybe there would be a requirement for dredging.

15 So it was never from the Southern nuclear  
16 side; it was from the agencies and environmental  
17 organizations, and that wasn't until the draft was  
18 published.

19 JUDGE BOLLWERK: All right, so the draft  
20 goes out, and you receive comments back from various  
21 private entities, intervenor groups, individuals as  
22 well as some governmental entities, states, local  
23 governments, saying, well, really you need to look a  
24 little bit more carefully at the possibility of  
25 dredging.

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1 So what actions did you take then?

2 MS. KRIEG: Well, the first thing we did  
3 was, we responded to the comments in the appendix of  
4 the final environmental impact statement. And then we  
5 took -

6 JUDGE BOLLWERK: Just for the record,  
7 your response was what?

8 MS. KRIEG: Our response was basically  
9 the same information that we included in the  
10 cumulative section of the FEIS, which was to do  
11 qualitative analysis, and look at just to kind of give  
12 a general idea about the kinds of impacts. So we  
13 reflected back the concerns that the authors of those  
14 comment letters had, and said yes, there would be  
15 impacts if the Federal navigation channel were to be  
16 dredged. And then we gave an impact level of small -  
17 or of up to moderate.

18 JUDGE BOLLWERK: All right, and that was  
19 based on an expectation that - and again, you said it  
20 was qualitative not quantitative, but did you have an  
21 expectation, even in a ball park figure, of how much  
22 dredging would have to be done?

23 MS. KRIEG: We knew that that Federal  
24 navigation channel had not been dredged since 1979.  
25 We didn't have any information or data as to how much

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1 dredging would be required. We made the assumption  
2 that the Federal navigation channel would be dredged  
3 to the 9-foot depth and 90-foot width, and that was  
4 all the information we had.

5 JUDGE BOLLWERK: But you didn't actually  
6 know what the status of the channel was between the  
7 Vogtle area all the way down to, as far south as it  
8 runs. You just assumed that it would be required to  
9 be restored to what the - I guess what the Corps is  
10 authorized to dredge, which is a channel that is nine  
11 feet deep and 90 feet wide.

12 MR. VAIL: We had no detailed data. We  
13 did have information that the Corps mentioned  
14 yesterday of those sort of casual surveys that they do  
15 on the river, and we had that information that had  
16 shown that in some areas they - it appeared that they  
17 had as much as four additional, four or five feet  
18 additional sediment in the channel. But this was very  
19 cursory survey that the Corps does that they mentioned  
20 yesterday.

21 JUDGE BOLLWERK: And when did you receive  
22 that information?

23 MR. VAIL: I believe that was around the  
24 time of - and Dr. Cook might know the best, he was the  
25 one that was actually at the meeting with the Corps

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1 early on.

2 DR. COOK: We had a meeting with the  
3 Corps of Engineers on January the 12th, 2007.  
4 However, I don't recall if those tables that Mr. Vail  
5 is referring to were brought up at that time.

6 JUDGE BOLLWERK: But what information did  
7 you receive from the Corps at that meeting relative to  
8 the potential of having to dredge the river?

9 DR. COOK: At the meeting with the Corps  
10 of Engineers on January 12th, 2007, we discussed four  
11 items that were there. We talked about sort of the  
12 general overall process and timeline associated with  
13 dredging permits that Southern needed looking at their  
14 barge slip.

15 We discussed low water conditions that  
16 were there, that was part of our main impetus for the  
17 trip was looking at the drought management plan that  
18 was being developed, in draft, their plans for  
19 releasing water in low water conditions.

20 We also talked about the status,  
21 refurbishment, of the new Savannah Lock & Dam that was  
22 there. And because this audit was also related with  
23 the safety review, we also talked about some  
24 components related to our safety study that was going  
25 on as well, for the SER, and looking at the cascade.

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1 failure of dams.

2 JUDGE BOLLWERK: And this was, I'm sorry,  
3 in January, 2007?

4 DR. COOK: January 12th, 2007.

5 JUDGE BOLLWERK: And again, just so the  
6 timeline, when did you actually issue the draft  
7 environmental impact statement?

8 DR. COOK: The summer of 2007. Mr.  
9 Notich may be able -

10 MR. NOTICH: Judge, the Draft EIS was  
11 issued September 15th of 2007.

12 JUDGE BOLLWERK: So before you put the  
13 Draft EIS out you had actually had some contact with  
14 the Corps?

15 DR. COOK: Yes, Your Honor. We met with  
16 the Corps. We met with individuals from Ms.  
17 Bernstein's branch, from Mr. Bailey's branch as well  
18 as Mr. Simpson.

19 JUDGE BOLLWERK: You mentioned before  
20 that the comments were sort of what triggered the  
21 concern about dredging. When did the comments come  
22 in?

23 MR. NOTICH: Judge, we received those  
24 comments after the Draft EIS was issued. So between  
25 sometime in October of 2007, and the comment period

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1 ended December 28th of 2007.

2 JUDGE BOLLWERK: Okay. But even in  
3 January of 2007 you were having discussions with the  
4 Corps about dredging; am I misunderstanding, about the  
5 main channel? That's what I'm trying to understand.  
6 I just want to make sure we're clear.

7 DR. COOK: That's correct, Your Honor.  
8 We were talking about the process that was there,  
9 because of the dredging at the barge slip that we knew  
10 was going to be occurring. And we saw barging to the  
11 site as reasonably foreseeable; we knew that was going  
12 to occur.

13 However our discussions with both Southern  
14 as well as with the Corps confirmed that barging to  
15 the site was possible, probably, under high water  
16 conditions, because it had happened before. So we  
17 were told that information.

18 So we got collaborating evidence from both  
19 Southern as well as the Corps that in order to reach  
20 the barge slip, dredging might not be necessary.

21 JUDGE BOLLWERK: All right. So that was  
22 the premise under which you were proceeding through  
23 the comments that you received on the DEIS sometime  
24 between October and December of 2007?

25 DR. COOK: That's correct.

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1 JUDGE BOLLWERK: All right.

2 You received those comments and began to  
3 assess them. And what did you then relative to  
4 dredging the channel, and with respect to any  
5 questions about dredging the channel.

6 MR. VAIL: I don't think the staff's  
7 opinion about the reasonable foreseeableness of  
8 dredging changed during that period. I think we still  
9 think it's unlikely that dredging the navigation  
10 channel would happen.

11 JUDGE BOLLWERK: You thought so then, you  
12 think so now, notwithstanding the fact that Southern  
13 yesterday said that is their first choice.

14 MR. VAIL: I think there is a question  
15 about Southern's opinion of the authorization and  
16 appropriation. Maybe we put more weight in  
17 appropriation over authorization in an action  
18 occurring.

19 JUDGE BOLLWERK: You mean -

20 MR. VAIL: The fact that they sort of  
21 have an authorization to do it, as long as they don't  
22 have money to do it it's not going to happen.

23 JUDGE BOLLWERK: And so I take it what  
24 you are saying you are skeptical that that money will  
25 be forthcoming?

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1 MR. VAIL: Yes..

2 DR. COOK: if I may add, Your Honor..

3 JUDGE BOLLWERK: Surely.

4 DR. COOK: Southern stated to us as they  
5 did yesterday that they had no intentions to dredge  
6 the navigation channel. When we met with the Corps,  
7 the Corps told us, as they did yesterday, that they  
8 had no intention to dredge the channel themselves, nor  
9 had they received an application from Southern to  
10 dredge the navigation channel.

11 MR. NOTICH: And Judge, I was at that  
12 meeting on January 12th, and I concur with Dr. Cook's  
13 statements.

14 JUDGE TRIKOUROS: I may have heard  
15 something different yesterday. I thought the Corps  
16 said that they had - they hadn't received the request  
17 from Southern, but if Southern did request the  
18 dredging that they would then proceed to try to get an  
19 appropriation of the funds. That they would act on  
20 that request.

21 Did you hear something different?

22 DR. COOK: No, I heard that as well.

23 However, none of those steps had taken place.

24 JUDGE BOLLWERK: Right.

25 MR. VAIL: It's also an issue of, it may

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1 go into their prioritization process whether it would  
2 ever make it out of the queue of even the local  
3 prioritization processes. So it's questionable.

4 JUDGE TRIKOUROS: I don't know, I don't  
5 think we can pre-judge that. Because there is an  
6 energy crisis in this country. There is a desire on  
7 the part of government to have energy; they might make  
8 an exception for a nuclear power plant, we don't know.

9 MR. VAIL: But I think as we established,  
10 or that Southern mentioned yesterday in their  
11 testimony, bringing components to the site via barge  
12 was not the only option available. And so there are  
13 still other options that exist or are available for  
14 bringing those components to the site.

15 And it was primarily an economic advantage  
16 to them to be able to bring them by barge to the site.  
17 So I don't think we've necessarily gone against the  
18 national energy policy if they were to bring it by  
19 some other mechanism.

20 JUDGE BOLLWERK: How often does - you  
21 are drawing, as I understand what you are saying, you  
22 are drawing a conclusion about the need to analyze  
23 environmental impacts, sort of based on your  
24 perception of the practical or the - as a practical  
25 matter whether this is going to happen.

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1 Is that a general approach you take in  
2 looking at environmental impacts?

3 MR. VAIL: Well, in this case there has  
4 not been - Southern still has not submitted an  
5 application to the Corps. And certainly if that  
6 application had been submitted the staff would have  
7 reviewed that information. But since no application  
8 had been submitted we didn't consider that; still  
9 don't consider that reasonably foreseeable.

10 JUDGE BOLLWERK: And you never issued any  
11 RAIs or anything to Southern relative to the question  
12 of dredging?

13 MS. KRIEG: We did relevant to the  
14 question of dredging from the center of the channel,  
15 from the Federal navigation channel to the barge  
16 slope.

17 JUDGE BOLLWERK: But not in terms of the  
18 main channel itself?

19 MS. KRIEG: No, we did not.

20 JUDGE BOLLWERK: All right.

21 Do you have any questions?

22 JUDGE TRIKOUROS: Just a comment. What  
23 struck me was the number of shipments, which I believe  
24 the testimony was 30 to 60 barge shipments.

25 And when I combine that with the testimony

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1 of the Corps of Engineers saying that one barge  
2 shipment requires basically two weeks of increasing  
3 flow in order to get the barge up and back. Just 30  
4 shipments alone would be over a year of high flow; 60  
5 shipments would be well over two years of high flow.  
6 It doesn't seem practical to me.

7 MR. VAIL: Well, at the time we had done  
8 the FEIS, I'm not sure we had any insight into the  
9 number of barge shipments that were being proposed at  
10 that time. So to my knowledge we had no information  
11 about the number of barge shipments that would be  
12 involved.

13 MS. KRIEG: And I concur with Mr.  
14 Vail on that.

15 JUDGE BOLLWERK: And when did you find  
16 out how many barge shipments were involved?

17 MS. KRIEG: Yesterday.

18 JUDGE BOLLWERK: So you never asked  
19 Southern how many barge shipments they intended to  
20 send up the river, up I guess - until yesterday you  
21 had no knowledge that it was that many?

22 MS. KRIEG: Our understanding was  
23 that they were going to barge the large components,  
24 and that is - my understand was, there are only two  
25 types of large components, which would be the steam

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1 generator and the reactor vessel. So we didn't - did  
2 not ask about additional transport of other items.

3 DR. COOK: However we did in our Draft  
4 EIS equally weight dredging with transportation by  
5 road as well as transportation to the site by rail,  
6 and all three of those modes are still viable for the  
7 applicant to transport components to the site.

8 JUDGE JACKSON: It's not uncommon for you  
9 to receive a lot of comments when you publish a Draft  
10 EIS, I presume.

11 MS. KRIEG: That is correct.

12 JUDGE JACKSON: And you received a lot on  
13 this topic you just testified. I believe that you  
14 also - and perhaps it was Mr. Vail - said that these  
15 comments didn't cause you to change your evaluation  
16 that dredging would be unlikely. I mean you still -

17 MS. KRIEG: That is correct.

18 JUDGE JACKSON: Okay, but yet you made  
19 the decision to change the discussion in the - in this  
20 area between the draft and the final EIS; is that  
21 correct?

22 DR. COOK: That's correct.

23 JUDGE JACKSON: Is that fairly unusual to  
24 respond to comments and modify the discussion in the  
25 EIS on that basis?

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1 MS. KRIEG: No, we look at the comments,  
2 and if they - if they relate to the information in the  
3 EIS, and especially if they bring forward concerns  
4 that have not been addressed that we think are worthy  
5 of mention, we will add that information in.

6 JUDGE JACKSON: Was it the volume of  
7 comments or was it the fact that comments came from  
8 other agencies that weighed in this decision?

9 MS. KRIEG: It was both.

10 JUDGE JACKSON: Both of those?

11 Are there other instances in this  
12 particular DEIS where - did you modify it in any other  
13 instances because of comments that you received?

14 MS. KRIEG: Yes, there was the other  
15 instance of the information that the Fish & Wildlife  
16 Service sent in a comment saying that they had done an  
17 additional survey of mussels in the Savannah River,  
18 and we asked them for that report, which is The Catena  
19 Group report which is in evidence.

20 And we reviewed that report, and then  
21 added that information in. So that is another  
22 example.

23 And that is just from the aquatic ecology  
24 arena. I can't speak to the other subject matter  
25 areas.

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1 MR. VAIL: There actually were also  
2 significant revisions between the draft and the final  
3 based on the continuation of the drought, and we  
4 included some additional context in there about flows  
5 lower than what had been mentioned in the draft, and  
6 that is when the 3000 and 2000 CFS numbers were added  
7 to the final. And so that had a pretty significant -  
8 and that was all tied to questions that we had from  
9 the public relative to the drought.

10 JUDGE JACKSON: All right, thanks.

11 JUDGE BOLLWERK: Do you have any  
12 additional questions on this point?

13 JUDGE TRIKOUROS: I do have. If Southern  
14 had formally requested the Corps to dredge at the DEIS  
15 stage, what would - would then you have included an  
16 environmental impact of that in the DEIS? Is that the  
17 way it would work?

18 MS. KUNTZLEMAN: Yes, Your Honor, we  
19 would have had the details available to describe  
20 potential impacts and mitigation measures.

21 JUDGE TRIKOUROS: And that's if they had  
22 formally requested the Corps - if they had declared to  
23 you that they were planning to request to the Corps  
24 for a dredging, would that have been essentially the  
25 same thing?

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1 MS. KUNTZLEMAN: It depends on the level  
2 of detail that Southern would have provided to the  
3 Army Corps of Engineers.

4 JUDGE BOLLWERK: Let me take a step back  
5 here and ask a couple of questions. We heard  
6 testimony yesterday about the memorandum of  
7 understanding that currently exists. And my  
8 understanding is that prior to that memorandum of  
9 understanding, which was signed in September of 2008,  
10 wasn't there another memorandum with the Corps of  
11 Engineers in place?

12 MS. KUNTZLEMAN: Yes, Your Honor.

13 JUDGE BOLLWERK: And under that  
14 memorandum what was the responsibilities of the  
15 parties if you will, the Corps and the staff, in terms  
16 of interaction on things about dredging issues like  
17 this?

18 MS. KUNTZLEMAN: The Corps would have  
19 provided technical services in terms of analysis to  
20 the NRC.

21 JUDGE BOLLWERK: So the NRC was the lead  
22 under that memorandum of understanding as well?

23 MS. KUNTZLEMAN: Yes, Your Honor.

24 JUDGE BOLLWERK: And so the description  
25 that we heard yesterday about what the Corps would do

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1 relative to - in relationship to the NRC is what -  
2 whether it's the old memorandum of understanding or  
3 the current memorandum of understanding is the same  
4 then.

5 And again my understanding with what we  
6 were told was that the NRC is the lead party and would  
7 prepare the environmental impact statement; the Corps  
8 would provide NRC with whatever information they  
9 thought relevant based on the NRC's - of I'm sorry,  
10 they would provide NRC with questions or information  
11 requests that they felt needed to be addressed in the  
12 NRC's environmental impact statement.

13 MS. KUNTZLEMAN: Your Honor, that is for  
14 the current memorandum of understanding.

15 JUDGE BOLLWERK: How was the memorandum  
16 of understanding that was in place prior to that, how  
17 did that work?

18 MR. NOTICH: Judge, that memorandum was  
19 signed in the mid-'70s, and it just basically outlined  
20 a procedure for the Corps to interact, and be funded  
21 by the NRC. There was no specific information on  
22 assessing impacts or any action at that level.

23 JUDGE BOLLWERK: And when you say, funded  
24 in what way? Who was funding what for whom?

25 MR. NOTICH: That provided a mechanism

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1 for the NRC to provide funds to the Corps to support  
2 NRC actions.

3 MS. KUNTZLEMAN: Your Honor, I would like  
4 to add something for clarification.

5 JUDGE BOLLWERK: All right.

6 MS. KUNTZLEMAN: The memorandum on I  
7 believe it was 1977 it didn't include anything  
8 addressing NEPA, it was for geotechnical or  
9 engineering work, a structure would be built in the  
10 waterway where there would be actual dredging, and the  
11 NRC wouldn't have that technical ability to do that  
12 type of review.

13 So the current MOU is for NEPA and on the  
14 combined license applications, that are in process  
15 now. As an aquatic biologist, I'm working very  
16 closely with the Army Corps of Engineers, but it's the  
17 regulatory division, it's not the technical  
18 engineering group. So it's a different organization  
19 within the Army Corps that we are dealing with for the  
20 MOU.

21 JUDGE BOLLWERK: So let me then clarify  
22 or try to clarify until you tell me how I'm misstating  
23 it. Under the prior MOU you are receiving technical  
24 assistance from the Corps, it was only on the safety  
25 side, or could it be on the environmental side as

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1 well?

2 MS. KUNTZLEMAN: I've only been working  
3 for the NRC for the last 2-3/4 years, so I have no  
4 personal experience. But based on what I have read,  
5 it would be on engineering technical matters, and it  
6 could involve the construction.

7 JUDGE BOLLWERK: Could it involve  
8 environmental help as well, help on the environmental  
9 side as well?

10 MR. NOTICH: Yes.

11 JUDGE BOLLWERK: Okay, so basically if  
12 you needed information on whatever the Corps knew  
13 about safety or environmental, the NRC can go to the  
14 Corps and say, please help us out, under the existing  
15 MOU, the pre-September, 2008 MOU?

16 MR. NOTICH: Correct.

17 DR. COOK: Your Honor, if I may?

18 JUDGE BOLLWERK: Sure.

19 DR. COOK: In fact we did that. I had  
20 numerous conversations with the Corps of Engineers  
21 during 2006 that led up to our meeting with numerous  
22 members from the divisions that were there in 2007.

23 JUDGE BOLLWERK: All right. So the Corps  
24 was available then to give you all technical  
25 assistance as needed. Then there is Judge Trikouros'

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1 question which is what was the staff's responsibility  
2 - I'll let you state the question again, or did you  
3 think you got the answer that you needed?

4 JUDGE TRIKOUROS: Well, the question was,  
5 if SNC had declared to you that they were going to  
6 request the Corps to do the dredging, how that would  
7 have - how you would have responded to that in terms  
8 of the EIS.

9 DR. COOK: If I can somewhat respond -  
10 you can tell me if I respond incorrectly - what we did  
11 is, we confirmed with the Corps that that had indeed  
12 not taken place. We confirmed that they had had some  
13 generic discussions about that they were going to be  
14 building a plant. But when we met with the Corps in  
15 2007, and had discussions before, the whole idea of  
16 dredging was speculative; was not reasonably  
17 foreseeable.

18 All of our discussions with them was that  
19 they had no intentions, they had never heard Southern  
20 say that they were going to apply for an application;  
21 everything confirmed that this was not going to occur,  
22 and did though reaffirm what we were trying to check  
23 out which was that barging was possible without  
24 dredging; that you could barge, albeit you'd have to  
25 perhaps wait for Mother Nature to provide the storage

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1 volume behind the reservoirs, or to rains so that you  
2 had higher flows, and then you could barge up using  
3 higher flow conditions.

4 JUDGE BOLLWERK: And under the current  
5 memorandum of understanding, I take it, when you have  
6 a non-speculative request as you stated that the NRC  
7 is the lead agency for assessing environmental impacts  
8 relative to that non-speculative request, under the  
9 existing memorandum of understanding, the one after  
10 2008.

11 MR. NOTICH: Correct.

12 JUDGE BOLLWERK: Correct? All right.  
13 With respect to the pre-September, 2008, what is the  
14 situation? When you have a non-speculative dredging  
15 request that can involve environmental impact  
16 potentially? Is the NRC the lead agency?

17 MR. NOTICH: I don't know about that  
18 situation, Judge.

19 MS. KUNTZLEMAN: Your Honor, may we  
20 receive some clarification? It would be a non-  
21 speculative dredging.

22 JUDGE BOLLWERK: Yes. In other words, we  
23 just heard that you felt no reason to move forward in  
24 terms of environmental impact because it was  
25 speculative. The only thing I'm changing is, it's now

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1 not speculative.

2 MS. KUNTZLEMAN: So if I understand  
3 correctly, it would be that Southern would have gone  
4 to the Army Corps of Engineers, say under a pre-  
5 application meeting, and discussed the possibility of  
6 dredging.

7 JUDGE BOLLWERK: Yes.

8 MS. KUNTZLEMAN: That level of detail.

9 MR. MOULDING: Your Honor, if I could  
10 just interject here, we're still talking about a, is  
11 this still a hypothetical situation?

12 JUDGE BOLLWERK: Yes. I've changed a  
13 fact. They said it was speculative at this point.  
14 I'm saying now it was non-speculative.

15 MS. KUNTZLEMAN: Well, once again it  
16 depends on the level of detail and how serious  
17 Southern Nuclear would be concerning the possibility  
18 of dredging. Because if it were an initial pre-  
19 application meeting, that would be a very high level,  
20 and the Army Corps would inform Southern, being the  
21 applicant, of the level of detail it would need to  
22 proceed with further processing.

23 And quite a bit of information is actually  
24 gathered prior to the applicant actually submitting an  
25 application to the Corps, so once again it's all

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1 speculative. But if Southern had been serious about  
2 dredging they would have gathered enough information,  
3 and then we would coordinate with the Army Corps of  
4 Engineers, and also discuss this with the state and  
5 federal resource agencies to determine the level of  
6 potential impact. It would be an entirely different  
7 situation.

8 And this new memorandum of understanding  
9 is going to make this a much better process.

10 JUDGE BOLLWERK: Let me go back, you  
11 didn't answer the one part of the question which I  
12 asked you, which is, who is the lead agency?

13 MS. KUNTZLEMAN: The lead agency for the  
14 environmental impact statement?

15 JUDGE BOLLWERK: Yes, in the non-  
16 speculative situation that you just outlined for me.

17 MS. KUNTZLEMAN: Okay, the lead agency,  
18 pre the new MOU for the EIS, is the NRC. If Southern  
19 were to apply for a permit from the Army Corps of  
20 Engineers, then the Army Corps of Engineers would  
21 conduct their own NEPA, because to issue a Section 10  
22 and 404 permit under their regulatory authority is a  
23 major federal action, and the Army Corps is  
24 responsible to do their own NEPA analysis.

25 JUDGE BOLLWERK: And so what would be the

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1 relationship be between the NRC as the lead agency and  
2 the Army Corps of Engineers under their  
3 responsibility?

4 MR. MOULDING: Your Honor, can I just  
5 make sure I understand your question. Are you talking  
6 about once an interagency agreement has been  
7 established under the MOU, or simply under the terms  
8 of the MOU itself.

9 JUDGE BOLLWERK: I'm basically saying,  
10 prior to the MOU that is currently in place what would  
11 the situation have been?

12 MR. MOULDING: I just wanted to make sure  
13 that the witness understood where in the process you  
14 were referencing.

15 JUDGE BOLLWERK: We will talk about after  
16 the MOU is established in a second. I'm not talking  
17 under the current MOU, but I'm talking about prior to  
18 that current MOU.

19 MS. KUNTZLEMAN: Okay, Your Honor, under  
20 the basically old system, the NRC would produce its  
21 own EIS, and then the Army Corps would produce its own  
22 NEPA document. It could be an environmental  
23 assessment or an environmental impact statement that  
24 would be a determination made by the Army Corps of  
25 Engineers.

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1                   And because it would depend on the level  
2 of detail in our environmental impact statement if the  
3 Army Corps could use any of that information. But  
4 under the old system it was two separate processes.

5                   JUDGE BOLLWERK: Okay, and how would your  
6 EIS be - you mentioned that if your EIS had enough  
7 information, the Corps of Engineers might be able to  
8 use it. How about in terms of what they were doing  
9 and what you would use? Or would you use it at all?

10                  MS. KUNTZLEMAN: Sorry, Your Honor, I'm  
11 getting a little confused here.

12                  JUDGE BOLLWERK: Well, you said there are  
13 two separate NEPA processes. Now in part this depends  
14 on who issues what first. You seem to be saying that  
15 if - the supposition seems to be that if you issued  
16 something first, the Corps might well use that to  
17 inform their process. And I guess the question I'm  
18 asking is, if the Corps issued something first, how  
19 would you use that to inform your processes assuming  
20 you hadn't completed it.

21                  MS. KUNTZLEMAN: If we had - it depends  
22 on the level of detail in the documents. Because for  
23 the NRC to do our review, we don't need the level of  
24 detail that the Army Corps would need. So it depends  
25 on the level of detail.

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1 MS. KRIEG: I'd like to add that there  
2 are occasions in our reviews where we look at other  
3 environmental impact statements that have either been  
4 performed by the Nuclear Regulatory Commission or by  
5 other federal agencies.

6 And as Ms. Kuntzleman is saying, if there  
7 is information in those EISes that is pertinent to our  
8 review, we do include it in our review. And in our  
9 EIS.

10 JUDGE BOLLWERK: Okay. So what I heard  
11 then is that prior to the current memorandum of  
12 understanding, there were probably going to be two  
13 processes, an NRC process and an Army Corps of  
14 Engineers process.

15 MS. KUNTZLEMAN: Yes, Your Honor.

16 JUDGE BOLLWERK: And it may well be that  
17 those two processes might inform each other, but they  
18 would be separate for all practical purposes, but with  
19 the NRC being the lead agency.

20 Did I misunderstand that?

21 MS. KUNTZLEMAN: Lead agency on the NRC  
22 EIS.

23 JUDGE BOLLWERK: Okay, on the NRC EIS.

24 Okay, now let's talk about the memorandum  
25 of understanding that was signed in September, 2008,

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1 is now in effect. How is the process different?

2 MS. KUNTZLEMAN: Correct. The new  
3 process has only been in effect since September, the  
4 end of September. I foresee it as being a much more  
5 efficient and informative process. Because already on  
6 some of the other combined license applications we are  
7 involved and coordinating with the Army Corps of  
8 Engineers at the site audit. And also for alternative  
9 site visits.

10 And now the Army Corps when they  
11 participate in our meetings with the applicant, the  
12 Army Corps can request a higher level of detail that  
13 we as biologists at the NRC could ask. So all these  
14 details are going to be coming out sooner rather than  
15 later, and the Army Corps also provides requests for  
16 additional information as part of the information  
17 gathering process. They are reviewing the  
18 environmental reports. They are preparing information  
19 needs, or participating in the audits, alternative  
20 site visits. They are also preparing requests for  
21 additional information.

22 And I see it as a much more efficient and  
23 informative process, and I'm really excited and happy  
24 about it.

25 JUDGE BOLLWERK: When you say they are

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1 going to be preparing what we refer to as RAIs, do  
2 those come from them directly to the party that is  
3 involved? Or is it something that they give to you  
4 all, and you issue them and ask them for the  
5 information?

6 MS. KUNTZLEMAN: The Army Corps of  
7 Engineers submits the RAIs to the environmental  
8 project manager.

9 JUDGE BOLLWERK: I'm sorry, the NRC  
10 project manager?

11 MS. KUNTZLEMAN: Correct. So we actually  
12 will have two sets of RAIs. We'll have a set of RAIs  
13 from the NRC staff, and we'll have a set of RAIs from  
14 the Army Corps of Engineers.

15 JUDGE BOLLWERK: And they'll be labeled  
16 as such? In other words you'll be able to see what  
17 they are?

18 MS. KUNTZLEMAN: Yes, Your Honor. You  
19 could check on that, because that is currently going  
20 on with the Harris Application.

21 JUDGE BOLLWERK: All right. And they are  
22 issued under NRC rubric, or they have titles from both  
23 agencies? Or how does that work?

24 MS. KUNTZLEMAN: They are identified as  
25 Army Corps' requests for additional information.

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1 JUDGE BOLLWERK: And they are signed out  
2 by the Army as opposed to being signed out by NRC?

3 MS. KUNTZLEMAN: Correct.

4 JUDGE BOLLWERK: Okay, so basically there  
5 are two documents that are put together, and sent to  
6 the applicant, or whoever is involved with the  
7 environmental process, and saying, respond to these  
8 questions?

9 MS. KUNTZLEMAN: Yes, Your Honor.

10 JUDGE BOLLWERK: And then the responses  
11 come back, and both agencies get them I take it, even  
12 though the NRC sees the answers to the Army's  
13 questions and vice versa.

14 MS. KUNTZLEMAN: Yes, Your Honor. And  
15 then based on those responses, it does - it has  
16 created some extra work for the applicant. Because in  
17 the case of Harris, there were RAIs presented by the  
18 Army Corps of Engineers, and then the utility had to  
19 prepare another report to answer the RAIs from the  
20 Army Corps of Engineers.

21 JUDGE BOLLWERK: All right. And as we  
22 move down the line, say the agencies have gotten the  
23 information they need now, both agencies are satisfied  
24 they have what they need, what in terms of a final  
25 product are the two agencies going to issue, either

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1 separately or together?

2 MS. KUNTZLEMAN: Well, the NRC will issue  
3 its final EIS. And then the Army Corps will take the  
4 NRC EIS and then go issue a ROD -

5 JUDGE BOLLWERK: A ROD meaning?

6 MS. KUNTZLEMAN: A Record of Decision.

7 JUDGE BOLLWERK: Okay. So the - it's  
8 contemplated that the NRC would act first, issue its  
9 final Environmental Impact Statement, I take it?

10 MS. KUNTZLEMAN: Correct, Your Honor.

11 JUDGE BOLLWERK: There is always a draft  
12 and a final, but I take it their final Environmental  
13 Impact Statement. And the Army Corps of Engineers  
14 would be waiting to receive that document. They would  
15 use that to inform their process in terms of their  
16 record of decision.

17 MS. KUNTZLEMAN: Right. There could be  
18 a possibility down the road that they may need to  
19 issue some supplemental information. But the process  
20 right now, we are both running together.

21 JUDGE BOLLWERK: All right. And in terms  
22 of if the Army were to issue supplemental requests, it  
23 would be requests back to the applicant? Or what? I  
24 mean I guess my question is, how, if the Army Corps of  
25 Engineers felt the need to do something additional,

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1 would that work itself back into the NRC process? Or  
2 is basically your FEIS the final document you all are  
3 concerned about?

4 MS. KUNTZLEMAN: The FEIS would be our  
5 final document.

6 JUDGE BOLLWERK: So once you have that in  
7 place, then the Army is sort of moving in its own  
8 direction then? The Army Corps of Engineers?

9 MS. KUNTZLEMAN: Yes.

10 JUDGE BOLLWERK: All right.

11 With that explanation, do you have any  
12 questions?

13 JUDGE TRIKOUROS: Yes, I think maybe  
14 you've just answered it. But let me ask it anyway.  
15 If I fast forward, respectively fast forward, and  
16 Southern Nuclear requests next week that the Corps  
17 proceed to dredge, then how does that work?

18 MS. KUNTZLEMAN: If the - Your Honor, let  
19 me repeat this to make sure I understood your question  
20 correctly.

21 This would be if next week Southern  
22 Nuclear met with Savannah District Army Corps of  
23 Engineers and requested Savannah District conduct  
24 dredging for Southern?

25 JUDGE TRIKOUROS: No, that the Corps

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1 conduct the dredging.

2 MS. KUNTZLEMAN: The Corps conducts the  
3 dredging, and it would happen next week, that really -

4  
5 JUDGE TRIKOUROS: It could happen.

6 MS. KUNTZLEMAN: It could happen, but we  
7 have a dilemma that we can't change our impact  
8 determination because we don't have a level of detail  
9 necessary, so to make any change in our conclusion.

10 Dredging is a very complicated process,  
11 permit-wise.

12 JUDGE BOLLWERK: I got that impression  
13 yesterday, yes. And I take it Judge Trikouros'  
14 hypothetical was that if Southern were to ask the Army  
15 to basically dredge under their current authorization.  
16 If Southern were to come in and file for a permit on  
17 its own, I take it you would have the same problem, or  
18 same issue?

19 In other words Southern comes in and  
20 applies for a permit to do the dredging itself.

21 MS. KUNTZLEMAN: Next week?

22 JUDGE BOLLWERK: Next week.

23 MS. KUNTZLEMAN: The way the permit  
24 application, the process works, it would take Southern  
25 quite a bit of time to gather the information

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1 necessary to submit a permit application.

2           Based on personal experience, depending on  
3 the type of project, it could take years to gather  
4 enough information to submit an application.

5           JUDGE BOLLWERK: For all I know they may  
6 have that information in their back pocket right now;  
7 I don't know the answer to that. But let's just  
8 assume they submit for the permit; I mean there is an  
9 application they have to file.

10           You are right, it may take a long time to  
11 process it and get everything, but they could  
12 certainly file for a permit next week.

13           MR. MOULDING: And Your Honor, again,  
14 these are hypothetical situations rather than the  
15 current situation; is that your question?

16           JUDGE BOLLWERK: Yes, I Mean they haven't  
17 filed for a permit, so it's definitely a hypothetical.

18           MS. KUNTZLEMAN: Your Honor, they really  
19 couldn't file for a permit application next week.

20           JUDGE TRIKOUROS: Negate the time part of  
21 that. Just at some time in the future. The way that  
22 the Corps works, apparently, their rules do not allow  
23 amendments to permits because of this concern about -  
24 that they had expressed yesterday.

25           And Southern has not filed a permit

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1 application yet for the dredging that we know they are  
2 going to do, namely, at the barge slip. So they have  
3 to make an absolute final decision at the time they  
4 submit that permit that they are not going to submit  
5 a permit for dredging the Federal navigation channel?

6 MS. KUNTZLEMAN: Yes, Your Honor.

7 JUDGE TRIKOUROS: So that point has not  
8 occurred yet. And we don't know what's going to  
9 happen until we pass that point.

10 And I understand they said that they are  
11 not going to do that. However, there is a reasonable  
12 likelihood that they will request that the Federal  
13 navigation channel be dredged by the Corps under their  
14 existing authorization.

15 Would then the Corps be liable for the  
16 development of an environmental impact statement for  
17 that activity, and you, the NRC, would be basically  
18 not part of that?

19 MS. KUNTZLEMAN: Yes, Your Honor. There  
20 was final environmental statement prepared for the  
21 previous dredging in 1979. And then the Army Corps  
22 would have to evaluate what changes have occurred  
23 since that time, and then the Army Corps would make a  
24 decision as to whether or not to prepare an  
25 environmental impact statement or an environmental

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1 assessment, and the Army Corps would have its own  
2 process and public meetings.

3 And you also want to remember that the  
4 states of Georgia and South Carolina would also be  
5 involved in the process, because your Army Corps of  
6 Engineers permit isn't valid unless you have a 401  
7 water quality certification from the states of Georgia  
8 and South Carolina.

9 And two of the proposed dredge locations  
10 are in Effingham County, Georgia, and that is within  
11 the coastal zone of Georgia, so you may need a coastal  
12 zone consistency as well.

13 There are many details involved in this.

14 JUDGE TRIKOUROS: But the bottom line is  
15 that your moderate determination just stands on its  
16 own. The Corps will have to reach their own  
17 determination?

18 MS. KUNTZLEMAN: Yes, Your Honor.

19 JUDGE TRIKOUROS: There will be no  
20 amendments or supplements to the - your FEIS?

21 MS. KUNTZLEMAN: No, Your Honor.

22 MR. MOULDING: May I just interject  
23 briefly, were you specifying what change in conclusion  
24 the staff would or wouldn't make under that  
25 circumstance?

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1 JUDGE TRIKOUROS: I'm sorry, could you  
2 repeat?

3 MR. MOULDING: I just wanted to make sure  
4 the witness understood what you were - that you were  
5 asking for a specific conclusion, whether the NRC's  
6 staff would change its conclusion under that  
7 circumstance?

8 JUDGE TRIKOUROS: Right, I'm asking - I'm  
9 just trying to understand what the process would look  
10 like if that happened. Would that moderate  
11 determination that was made by the staff just sit  
12 there kind of the way it is, and the Corps would  
13 proceed to do an environmental impact statement and  
14 reach an environmental determination of small,  
15 moderate or large, I guess, and that would be the  
16 determination that would be in effect.

17 MS. KUNTZLEMAN: Yes, Your Honor. The  
18 Army Corps of Engineers would make its own impact  
19 assessment. And the goal is really to have a small  
20 impact, and when an applicant submits an application  
21 to the Army Corps of Engineers there is coordination  
22 with the agencies, and you would attempt to mitigate  
23 the impacts.

24 So you may submit an application wanting  
25 to do X, but until there is all the coordination you

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1 may end up with Y, in order to mitigate impacts.

2 JUDGE BOLLWERK: There seem to be, if I  
3 understood the response to one of the questions I had  
4 yesterday, some expectation on the part of the Corps  
5 that the NRC will be issuing some kind of additional  
6 environmental impact statement relative to the  
7 combined license for the Vogtle facilities; is that  
8 correct or incorrect?

9 MS. KUNTZLEMAN: Yes, Your Honor, that is  
10 correct.

11 JUDGE BOLLWERK: That is correct? So  
12 there is an EIS relative to the - notwithstanding the  
13 fact that there is potentially an ESP involved here  
14 that there will also be a separate EIS for the  
15 combined license?

16 MR. NOTICH: All correct.

17 JUDGE BOLLWERK: And would potentially  
18 that combined license EIS have anything to do with  
19 dredging?

20 MS. KUNTZLEMAN: Your Honor, if it would  
21 be new and significant information it would be  
22 included.

23 JUDGE BOLLWERK: You look like you have  
24 a question?

25 JUDGE TRIKOUROS: What's that?

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1 JUDGE BOLLWERK: I said you look like you  
2 have a question?

3 JUDGE TRIKOUROS: No, just -

4 JUDGE BOLLWERK: So the standard there  
5 would be if there is new and significant information  
6 as such, then the environmental impact before the  
7 combined license would need to reflect that?

8 MS. KUNTZLEMAN: Yes, Your Honor.

9 MR. NOTICH: Correct.

10 JUDGE BOLLWERK: A couple of other  
11 questions. We heard some information yesterday about  
12 transportation alternatives, and it appears that there  
13 are, as I think you have already indicated, there is  
14 Plan A, and Plan B slash C. Plan A, at least from  
15 Southern's perspective I think that they made pretty  
16 clear, was to be able to use barging. Plan B slash C  
17 would be to use some alternative transportation,  
18 either rail or highway transportation.

19 Could you give me a sense of what, again  
20 for the record, the alternative analysis you did  
21 relative to transportation besides barging? In terms  
22 of the components we are talking about, either rail  
23 or highways? If you need a second to look through,  
24 you certainly can do that.

25 MS. KRIEG: Thank you.

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1 We did - and I'm not sure I actually have  
2 the sections in here anyway - we did mention the  
3 possibility of rail and truck transport of  
4 construction equipment, and I know there were analyses  
5 related to transportation and transportation impacts  
6 on the roads. They did not specifically look at large  
7 components, however.

8 JUDGE BOLLWERK: So this was basically  
9 just general construction equipment being brought onto  
10 the site or leaving the site?

11 MS. KRIEG: That is correct.

12 JUDGE BOLLWERK: Was there anything with  
13 respect to rail?

14 MS. KRIEG: Yes, rail is mentioned also,  
15 and it was mentioned that there was a rail spur.

16 JUDGE BOLLWERK: But was there any  
17 discussion in particular of these types of large  
18 components and their transportation?

19 MS. KRIEG: Not that I recall.

20 JUDGE BOLLWERK: There's also been a  
21 question I guess about the limited work authorization  
22 relative to any impacts that may arise with the work  
23 that is contemplated under the proposed limited work  
24 authorization, relative to dredging of the channel.  
25 Are you aware of any relationship between the need to

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1 dredge the channel and what would be happening under  
2 the limited work authorization potentially?

3 MR. NOTICH: Judge, this is Mark Notich,  
4 also of the staff. Southern has not indicated that  
5 they plan on using barging to support any of their LWA  
6 activities.

7 JUDGE BOLLWERK: So as far as you are  
8 aware right now, there would be no impact?

9 MR. NOTICH: That is correct.

10 JUDGE BOLLWERK: There is no relationship  
11 between the LWA and any kind of dredging request or  
12 dredging possibility?

13 MR. NOTICH: That is correct.

14 JUDGE BOLLWERK: All right.

15 In terms of the moderate designation that  
16 the staff made, it was based obviously on the  
17 information you had, and I think you described that.  
18 You had incomplete information about what Southern's  
19 intentions might have been, at least from your  
20 perspective. And you knew what the Federal navigation  
21 channel was supposed to be able to do. You had some  
22 information from the Corps of Engineers in terms of  
23 what had transpired since the last dredging had  
24 occurred, and you gave a moderate designation in terms  
25 of the potential impacts.

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1 We've obviously gotten a lot more  
2 information since then. It's in the record of this  
3 proceeding. Is there anything there that gives you  
4 any cause to think that that designation might have  
5 been too high or too low? Or was it correct?

6 MS. KUNTZLEMAN: After listening to Dr.  
7 Coutant's testimony yesterday, I'm an aquatic  
8 biologist, and he makes certain assumptions, and he  
9 could very well be correct in his assumptions. But at  
10 the present time I am unable to change my conclusion  
11 of moderate, and I can't proceed with any further  
12 analysis until such time a plan or an application  
13 would be before the Corps, because with a dredging  
14 project you need site-specific information, and you  
15 also need to coordinate with the subject matter  
16 experts at respective state and federal agencies.

17 There is quite a bit of coordination that  
18 goes on with these dredging permit applications.

19 Another issue that is often overlooked is  
20 that it's many times easy to dredge the material but  
21 it's the issue of where you place it and you run into  
22 issues with access to a placement site, and also the  
23 habitat of where you want to place the material.

24 And all these issues are addressed as part  
25 of a pre-application process. And without those

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1 details, I can't change my determination of moderate.

2 JUDGE JACKSON: In your testimony, in the  
3 prefiled testimony of the staff, it said that - you  
4 used the term, could be moderate. And as I read the  
5 FEIS, I was struck with the use of "could be" I  
6 believe in most cases the staff tends to use, "would  
7 be" instead of "could be." And I just wanted to  
8 explore the thinking on that.

9 "Could" usually opens up a range to me, it  
10 could be one thing, it could be something else. Could  
11 you help me understand the choice of the word, could,  
12 and was there something - was there some implication  
13 there that wasn't explicitly stated?

14 MS. KRIEG: Well, could be moderate in  
15 this case meant that we did not have adequate  
16 information to do a quantitative analysis. And so you  
17 are correct, it does open up more of a range.

18 JUDGE JACKSON: Is that range in your  
19 view and in your deliberations, was that a, could be  
20 small, could be moderate, could be large?

21 MS. KRIEG: It did not include large for  
22 reasons that Ms. Kuntzleman will explain.

23 MS. KUNTZLEMAN: Your Honor, it could end  
24 up being small. The goal would be to make the impact  
25 small. But without details, I selected moderate.

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1 It's unlikely the project would have a large impact,  
2 and that has to do with the permitting process. The  
3 Army Corps of Engineers, their process is actually  
4 overseen by the Environmental Protection Agency. And  
5 the Environmental Protection Agency has promulgated  
6 the 404(b)(1) guidelines, and once again there are two  
7 ways of conducting this 404(b)(1) analysis which I've  
8 described in my testimony.

9 But the end result of this process is that  
10 if Southern were the applicant, or if the Army Corps  
11 were conducting dredging, the least environmentally  
12 damaging practicable alternative must be selected.

13 So given that process, I see it very  
14 unlikely that you would have a permit issue with a  
15 large impact.

16 JUDGE JACKSON: So do you consider, could  
17 be moderate, or moderate as a conservative call?

18 MS. KUNTZLEMAN: Yes, Your Honor, I do.

19 JUDGE JACKSON: Okay, thanks.

20 JUDGE BOLLWERK: Just a point of  
21 clarification, you mentioned Dr. Coutant's testimony  
22 yesterday as possibly having the potential if it were  
23 true to have some effect on the designation here, the  
24 height of the designation. That was his testimony as  
25 to both the mussels and the contamination? Because he

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1 talked about both.

2 MS. KUNTZLEMAN: Yes, Your Honor, the  
3 fact that Dr. Coutant mentioned sand, normally sand is  
4 an inert material. So if it is sand, that's a good  
5 thing. And -

6 JUDGE BOLLWERK: If it's contaminated  
7 sand, though, that is not a good thing.

8 MS. KUNTZLEMAN: That is not a good  
9 thing. But what will happen is, what would really  
10 need to be done is that you would revisit the areas  
11 that you have identified for potential dredging, and  
12 you would conduct a grain size analysis on it, and  
13 some other physical parameters that I really don't  
14 need to discuss here.

15 And then the Army Corps in coordination  
16 with the states of South Carolina and Georgia they  
17 would know what possibly contaminants of concern might  
18 be in those stretches of river. And then there would  
19 be perhaps a requisite sediment characterization.

20 It's an iterative process, and you go step  
21 by step through this process.

22 MS. KRIEG: But may I add too that the  
23 bottom line is that we still do not have enough  
24 information to change what we have written as our  
25 determination in the FEIS.

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1 JUDGE BOLLWERK: What about the mussels,  
2 the testimony you heard on mussels?

3 MS. KRIEG: We have not looked at the  
4 mussels at those locations that they said need to be  
5 dredged. So without more information and very site  
6 specific information -

7 MS. KUNTZLEMAN: Your Honor, what would  
8 happen here is if the dredging were actually serious,  
9 and contemplated, there would be a pre-application  
10 meeting, and South Carolina and North Carolina,  
11 department of natural resources, in coordination with  
12 U.S. Fish & Wildlife Service, Army Corps of Engineers,  
13 EPA, they would identify the areas for dredging. And  
14 then the subject matter experts would look at those  
15 locations, and they may or may not have data for those  
16 locations. And it could be a requirement that some  
17 type of survey be done.

18 JUDGE BOLLWERK: Let me just stop you  
19 there. In terms of Captain Scott's survey, would that  
20 be sufficient for your purposes?

21 MS. KUNTZLEMAN: For -

22 JUDGE BOLLWERK: For NRC's purposes in  
23 terms of looking at impacts?

24 MS. KRIEG: You mean as far as the  
25 bathymetry of the river?

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1 JUDGE TRIKOUROS: When you said survey,  
2 you meant survey of the aquatic organisms?

3 MS. KRIEG: Correct.

4 JUDGE BOLLWERK: I'm sorry, I'm switching  
5 over, I apologize. But let's stay with one thing,  
6 let's stay with the aquatic survey, I'm sorry, the  
7 survey of aquatic resources, sorry.

8 MR. NOTICH: Judge Bollwerk, let me make  
9 one comment here. And my colleague just mentioned the  
10 state of North Carolina.

11 MS. KUNTZLEMAN: Oh, sorry, South  
12 Carolina.

13 MR. NOTICH: Thank you very much. Go  
14 ahead.

15 MS. KUNTZLEMAN: Thank you. Sorry.

16 MR. SANDERS: Your Honor, this is Larry  
17 Sanders.

18 JUDGE BOLLWERK: Yes.

19 MR. SANDERS: May I ask for a  
20 clarification? On that testimony that just occurred,  
21 was the assumption that that would be under a  
22 permitting situation or under the Corps doing its own  
23 act? If I could clarify the staff just testified  
24 about a pre-application meeting with the EPA and all  
25 these other folks, and 404 permitting stuff, and all

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1 of that. Yesterday the Corps testified that they  
2 don't need a 404 permit if they do their own dredging  
3 project. So I'm just curious to know whether they are  
4 talking about a 404 permitting situation or a Corps  
5 operation?

6 JUDGE BOLLWERK: So you'd like me to ask  
7 a question in that regard?

8 MR. SANDERS: I'm just asking for  
9 clarification because I'm unclear.

10 JUDGE BOLLWERK: All right. Let's find  
11 out then. We heard about arguably three different  
12 processes yesterday. One is a process dealing with  
13 permitting. The second one is a process dealing with  
14 a federal agency that comes in and asks the Corps to  
15 undertake some kind of a project for them.

16 And then the third one was someone that  
17 has a request relative to an already authorized  
18 project which lacks an appropriation, but nonetheless  
19 there is the authorization there for the Corps to take  
20 certain actions if they have the money. And I think  
21 what we are dealing with here is probably that  
22 situation or the permitting situation.

23 In other words operation and maintenance  
24 is already authorized, but the Corps simply has no  
25 money. And I guess the question would be, in the

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1 permitting situation or in the operation and  
2 maintenance situation, what would the process be? Is  
3 that clear?

4 MS. KUNTZLEMAN: Yes, Your Honor, I'd be  
5 happy to provide the clarification.

6 The Army Corps does not issue itself a  
7 permit under their civil works program. However they  
8 must comply with all the substantive requirements. So  
9 other than submitting an application to the regulatory  
10 division, if the Army Corps were going to do the  
11 dredging themselves, the - all the coordination with  
12 the agencies, requiring 401 water quality  
13 certification, all those processes run in parallel.  
14 It's just that they don't submit an application to the  
15 regulatory division.

16 But they will also coordinate with the  
17 federal and state resource agencies. So the Army  
18 Corps wouldn't get a free pass on this coordination.

19 JUDGE BOLLWERK: All right. And we were  
20 talking about a survey of the biota; that would be  
21 part of that process as well.

22 MS. KUNTZLEMAN: Correct. And that is  
23 conducted on a case by case site-specific basis. And  
24 that is in coordination with the subject matter  
25 experts.

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1 JUDGE BOLLWERK: And in terms of the  
2 survey, the physical survey of the channel that  
3 Captain Scott had produced, that gives you arguably  
4 some information. But I think I heard from the Corps  
5 yesterday it may well require something different?

6 MS. KUNTZLEMAN: Yes, Your Honor. The  
7 survey mentioned yesterday, that should be considered  
8 a planning level survey. It's at a high level.

9 JUDGE BOLLWERK: Well you've indicated  
10 that there may be distinctions, as I understood it,  
11 between what the NRC would need to assess in terms of  
12 environmental impact, and what the Corps might need to  
13 assess in terms of their process. Is that sort of  
14 survey that we have currently on the record sufficient  
15 for NRC purposes?

16 MS. KUNTZLEMAN: Your Honor, that is just  
17 one piece of the puzzle. The dredging process has  
18 many many parameters that need to be defined in order  
19 to better define an impact assessment.

20 So once again the survey is not going to  
21 change my determination of moderate.

22 JUDGE BOLLWERK: I guess the real  
23 question I'm asking you is, would you send them out  
24 and say do a better survey? Do a different survey?  
25 Do a more detailed survey, which I think Captain Cook

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1 indicated may well happen with the Corps - Scott, I'm  
2 sorry, wrong name. I apologize. Captain Scott.

3 MS. KUNTZLEMAN: Your Honor, I wouldn't  
4 be able to do that. Only the Army Corps would request  
5 that. And once again this new MOU will enhance the  
6 process where we won't have these dilemmas in the  
7 future.

8 JUDGE BOLLWERK: Okay, any questions at  
9 this point?

10 (No response)

11 You'd mentioned the fact that with a  
12 moderate you are always trying to reach a small impact  
13 if possible by mitigations or whatever means you can.  
14 In this context you have given a designation of  
15 moderate. I didn't necessarily see any mitigation  
16 measures. Can you address that? Why weren't those  
17 mitigation measures mentioned here in anyway?

18 MS. KUNTZLEMAN: I mentioned possible  
19 mitigation measures in my testimony.

20 JUDGE BOLLWERK: Okay.

21 MS. KUNTZLEMAN: But I can provide a few.

22 JUDGE BOLLWERK: What would be the sort  
23 of mitigation you'd want that - you are saying this is  
24 going to be moderate; you'd try to mitigate it. Is it  
25 possible that would push it to small? Or is it going

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1 to be moderate whether you mitigate or not?

2 MS. KUNTZLEMAN: Your Honor, you could  
3 incorporate mitigation measures -

4 MR. MOULDING: One quick question: is  
5 this again a hypothetical situation?

6 JUDGE BOLLWERK: Yes.

7 MS. KUNTZLEMAN: Your Honor, in  
8 coordination with the state and federal resource  
9 agencies, EPA and Army Corps of Engineers, basically  
10 all the agencies work together, and you'd develop  
11 mitigation measures.

12 And it could be a common one for dredging  
13 is a time of year restriction on dredging activities,  
14 such that that would enable short-nose sturgeon,  
15 robust redhorse, American shad, to move through the  
16 area unencumbered by any type of turbidity or noise  
17 impacts, as one way to mitigate.

18 There could be turbidity controls. Once  
19 again this depends on the character of the material  
20 and the sediment chemistry. Once again everything is  
21 on a case by case basis. And at this point we don't  
22 know the dredging map. There are two basic methods in  
23 dredging, bucket dredging and hydraulic dredging. The  
24 dredging conducted the last time the river was dredged  
25 was hydraulic, and you don't know how far they would

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1 have to pump that material, to put it. Nowadays it  
2 would most likely be an upland location as opposed to  
3 the in-water placement in the 1979.

4 JUDGE BOLLWERK: You mean back on the  
5 bank? Or just move it basically out of the channel?

6 MS. KUNTZLEMAN: They move it out of the  
7 channel to the sides. They had installed dike piles,  
8 and they placed it behind the dikes, or they also  
9 placed it outside the channel. And they had elevation  
10 requirements back then where they had limitations on  
11 where they could put it. It was all controlled.

12 JUDGE BOLLWERK: I take it you are saying  
13 now it will probably be in a designated area that  
14 we've heard about, perhaps a permitted area where they  
15 would have to put it?

16 MS. KUNTZLEMAN: Yes, Your Honor.

17 JUDGE BOLLWERK: And when you mentioned  
18 the difference between hydraulic and bucket, I take it  
19 hydraulic is basically putting for want of a better  
20 term a vacuum cleaner into the river and pumping it  
21 out as opposed to taking large buckets or - and  
22 basically scooping it out and putting it on the bank?

23 MS. KUNTZLEMAN: Yes, Your Honor. It  
24 also could involve - an area is identified that would  
25 have mussels, and where say an endangered species,

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1 they would make every effort to minimize the amount of  
2 dredging in that area, and possibly relocate mussels.  
3 That really is a last resort choice.

4 But once again all of this is on a case by  
5 case basis, and even looking at upland disposal, you'd  
6 have to make sure there were no wetlands or endangered  
7 species there.

8 You get down to a level of detail where  
9 you have to evaluate the access road into the disposal  
10 site to make sure you weren't impacting endangered  
11 species or wetlands.

12 All these issues get mitigated as part of  
13 the permitting process.

14 JUDGE BOLLWERK: Relative to moving the  
15 mussels, what are the impacts of that? How successful  
16 is that as a general rule?

17 MS. KUNTZLEMAN: It really depends on who  
18 is doing the relocation, the amount of experience they  
19 have, the time of year, the weather conditions. And  
20 that has to be carefully managed, or it won't be a  
21 success. The success rate varies, and that's why it's  
22 an option of last resort.

23 JUDGE BOLLWERK: All right.

24 Let me change to a slightly different  
25 subject, although related.

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1           And Judge Trikouros made reference to this  
2 as well. We heard yesterday from the Corps about the  
3 possibility of flow changes. And for a second let's  
4 just put aside the question of how many, and the  
5 durations.

6           But they described these flow changes as  
7 they felt within their authority under their existing  
8 regulatory regime. Is that anything that the NRC  
9 would be looking at as well in terms of impacts? And  
10 again, your understanding was that Southern intended  
11 to accomplish this barge movement via flow, and it  
12 could have happened one of two ways, either as a  
13 natural flow, simply the river because the rain rose,  
14 or because the Army Corps of Engineers did something.

15           In terms of the Army Corps of Engineers  
16 doing anything, would that be something the NRC would  
17 be looking at in anyway?

18           MR. VAIL: We didn't assume that any  
19 Corps - any flow changes were being made specifically  
20 to enable barging. This would be incidental  
21 to cooperation. It would be releases that would be  
22 occurring when the reservoir was above its rule curve,  
23 and therefore would be spilling these higher flows.

24           And that would not in anyway jeopardize  
25 the conservation pool.

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1 JUDGE BOLLWERK: Well, I think you heard  
2 the testimony yesterday - go ahead.

3 JUDGE TRIKOUROS: Yeah, I just wanted to  
4 remind you that with yesterday's testimony it didn't  
5 come across that way. It was really indicating that  
6 assuming they had sufficient water storage, either I  
7 guess in the reservoir or they mentioned a flood pool  
8 yesterday, they would then -

9 JUDGE BOLLWERK: As they have done in the  
10 past.

11 JUDGE TRIKOUROS: - release that water  
12 for the purposes of barging, and they would maintain  
13 it for I believe they said two weeks.

14 DR. COOK: Our discussions with the Corps  
15 in 2007 focused mainly on their drought management  
16 plan. And it was very clear as part of their water  
17 management plan that was there that there would be no  
18 releases specifically to facilitate barging to occur.

19 JUDGE TRIKOUROS: That is correct, based  
20 on the testimony yesterday, assuming they are in a  
21 drought management mode. But when they are not - and  
22 the testimony yesterday also indicated that they can  
23 go from a drought mode to a flood mode in an extremely  
24 short time, I think he said in three months they could  
25 basically be flooded versus you know releasing to

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1 prevent a flood problem -

2 JUDGE JACKSON: Judge Trikouros, I think  
3 he said in a few days.

4 JUDGE TRIKOUROS: That's really quite  
5 extraordinary.

6 MS. KRIEG: Well our assessment in the  
7 environmental impact statement did not account for any  
8 purposeful releases for the purpose of barging up the  
9 river.

10 JUDGE BOLLWERK: So your assessment was  
11 basically just somehow that the natural flow of the  
12 river would permit them to do the barging?

13 MS. KRIEG: That is correct.

14 MR. VAIL: Well, I'd caveat that. There  
15 is no natural flow of the river anymore. It's all  
16 regulated by the reservoir system. And once they are  
17 above their guide curve, which is basically the target  
18 elevation that they are trying to operate in, it's  
19 basically any water that is above there is what they  
20 consider their flood pool. And they basically try to  
21 keep that drafted down to the flood pool, so they can  
22 catch a flood, they try to keep it up to that level so  
23 they can maintain an adequate supply in the reservoir.

24 So that's basically what the guide curve  
25 is, once you drop below the guide curve then you have

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1 some flexibility for hydropower operations and other  
2 operations, and then you further can continue to drop  
3 down, and you will start hitting the drought levels.

4 Certainly when you hit the drought levels  
5 they would do nothing, and I think that was consistent  
6 with Stan Simpson's testimony yesterday, they would do  
7 nothing that would jeopardize them to put themselves  
8 into that drought curve.

9 But they do have opportunities to manage  
10 that flood pool, and make those releases.

11 JUDGE TRIKOUROS: That's correct. But it  
12 was also indicated that if there is a plan to barge,  
13 that that plan should be shared with the Corps as far  
14 in advance as possible, and then they would try and  
15 store additional water for the purposes of releasing  
16 it for the barge to facilitate barge movement.

17 MR. VAIL: Yes, they would basically use  
18 some of their flood capacity free board to make sure  
19 that they could maintain those stable flows during  
20 that period, to help facilitate that barging.

21 But to a great extent that is incidental  
22 to their normal operations, flood releases. They  
23 would just want to make sure that that was  
24 coordinated.

25 JUDGE TRIKOUROS: Now I got the

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1 impression that they in fact would lower the flow in  
2 the river in the month or so prior to the barge  
3 shipments.

4 MR. VAIL: No, I think what he was saying  
5 was that it had been slightly lowered. And in one of  
6 the things that you have, when you change flows, you  
7 have to be conscious about ramping up the flows. You  
8 don't want to all of a sudden take a river from 5,000  
9 CFS to 10,000 CFS overnight necessarily, because it  
10 can have an impact on the ecology.

11 So what they do is, they sort of gradually  
12 pull those flows up, and at the time he was doing  
13 that, they were actually operating below the 10,000,  
14 and he basically ramped it up to 10,000.

15 JUDGE TRIKOUROS: Right, but I think the  
16 point here is that this is not a natural activity.  
17 This whole thing appears to be a very planned activity  
18 with respect to barges, regardless of what the  
19 conditions are, unless they are in drought condition.  
20 In which case there will be nothing.

21 MR. VAIL: Then there would be no  
22 releases.

23 DR. COOK: Your Honor, two things. One  
24 is that looking at the Augusta gauge that is there,  
25 from 1925 until present every year except for 2002 I

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1 believe there have been flows for a period during each  
2 year where the discharge is in excess, or at 10,000  
3 CFS, which is high enough for barges.

4 The second thing would be the - in the  
5 testimony that we heard yesterday, I think Mr. Simpson  
6 expressed a little bit of concern at that question,  
7 looking at the number of barge trips that this was  
8 even something that was feasible.

9 JUDGE TRIKOUROS: And I'm sorry, could  
10 you repeat that?

11 DR. COOK: Well, if I remember correctly,  
12 Your Honor, with the number of trips that they were  
13 discussing yesterday, trying to control reservoir  
14 releases for something on the order of 60 trips, it  
15 was just not -

16 JUDGE TRIKOUROS: I don't remember any  
17 actual testimony to that effect. But I do - yeah, it  
18 makes sense that it would be very difficult to do  
19 that.

20 JUDGE BOLLWERK: Let me then just go back  
21 to my original question, which is, given that we've  
22 talked about this now, in terms of this process that  
23 the Corps would undertake at the behest of Southern or  
24 anybody else that wanted to be barged, wanted to use  
25 barging on the river, is that something relative to

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1 the NRC NEPA process that you all would need to  
2 account for in some way?

3 MR. VAIL: Yes, if we had a specific plan  
4 for barging where the Corps expected to have to ramp  
5 up and manage those flows, then we would have to  
6 include that in the new NEPA.

7 JUDGE BOLLWERK: And does that have  
8 anything to do with the fact whether there is one or  
9 two or 60?

10 MR. VAIL: Well, it would be the period  
11 of time over which they would try to get those barges,  
12 and the staff assumes that there would be no efforts  
13 made on the part of the Corps for instance to release  
14 out - to jeopardize the conservation pool to make  
15 those flows.

16 JUDGE BOLLWERK: All right.  
17 Anything further you have, Judge Jackson?  
18 We've been going here for almost a little  
19 less than two hours. Let's go ahead and take a 15-  
20 minute break. This would be a good time to generate  
21 some questions.

22 MR. SANDERS: Your Honor, could we have  
23 20? We've got a lot of questions.

24 JUDGE BOLLWERK: I apologize, if that's  
25 what you think you need, I prefer to take the

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1 appropriate amount of break. I agree, so let's go  
2 ahead and take a 20-minute break. Come back at say  
3 10:30. We will continue then.

4 Thank you, we are on recess.

5 (Whereupon at 10:08 a.m. the proceeding  
6 in the above-entitled manner went off the  
7 record to return on the record at 10:44  
8 a.m.)

9 JUDGE BOLLWERK: All right, let's go back  
10 on the record, please.

11 All right, we have returned after our  
12 break. And we have a couple of sets of questions. We  
13 are going to go through some of those, as well as I  
14 think Judge Jackson had one question for  
15 clarification, as well as did I. So if you would go  
16 ahead and ask your question first.

17 JUDGE JACKSON: We discussed the  
18 designation of moderate earlier in your testimony.  
19 The more recent study survey of the river that was  
20 conducted, and discussed yesterday, had come to light.  
21 You've seen that report, is that correct?

22 MS. KRIEG: That is correct.

23 JUDGE JACKSON: Did that new information  
24 have an impact on your view of the conservatism that  
25 you might have put in to your designation of moderate?

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1 In other words did that make you feel more comfortable  
2 that you were conservative in making the call that the  
3 impacts could be moderate or not?

4 MS. KRIEG: We -

5 JUDGE JACKSON: Is that question not  
6 clear? Would you like me to try again?

7 MS. KRIEG: No, the question is clear.  
8 It's just that comfort level part that caused me to  
9 pause, because there is not enough information in that  
10 report for us to change our impact determination.

11 JUDGE JACKSON: Okay, I wasn't asking you  
12 would you change it. The testimony earlier I think  
13 indicated that the language you use in saying the  
14 impact could be moderate, I asked, is that a  
15 conservative position you've taken, and the answer was  
16 yes, that's conservative.

17 Now I'm just saying, you made that call at  
18 a given time with a given set of information. You've  
19 looked at the survey that has been done, and the  
20 estimate on the magnitude, the potential magnitude of  
21 the dredging that would be required to get down to the  
22 six-foot level. You did see that, right?

23 So my question was, not would that cause  
24 you to change your conclusion that it would be or  
25 could be moderate. Did that have an impact on the

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1 level of conservatism that we talked about earlier  
2 today? Does that give you comfort that you were  
3 conservative or not, or it has no impact? I'm not  
4 trying to answer it for you; I'm just asking.

5 MS. KRIEG: Well, the one area where it  
6 probably provided the most information was that when  
7 we did the analysis on the FEIS we were looking at  
8 dredging - we were assuming the dredging would be to  
9 restore the original Federal navigation channel which  
10 is down to nine feet. And as part of the testimony  
11 along with that report, it became clear the extent of  
12 dredging that was being discussed yesterday was not to  
13 nine feet. It was a shallower amount. So the amount  
14 of dredging of course then appears to be smaller to us  
15 now.

16 MS. KUNTZLEMAN: Your Honor, I would like  
17 to supplement Ms. Krieg's testimony.

18 When I was doing my analysis of the  
19 potential impacts of dredging, I couldn't quantify -  
20 there were orders of magnitude of possible volumes of  
21 dredging. And when it was last maintenance dredged in  
22 1979, it was actually nine foot plus one foot of over-  
23 depth dredging. So it was actually down to minus 10.  
24 And when I received the information about the quantity  
25 I felt confident about my conservative approach.

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1 However in the back of my mind I still don't know as  
2 an aquatic biologist what specific habitat is in the  
3 dredged area, or adjacent to that area.

4 Therefore it still is - could be moderate.  
5 Because we haven't actually investigated that area.  
6 It could be some type of unique habitat. It could be  
7 a migratory pathway. And basically it's another piece  
8 of the puzzle; but we don't have all the pieces.

9 JUDGE JACKSON: Thank you.

10 JUDGE BOLLWERK: A process question. You  
11 had mentioned before that there might be a - and you  
12 can clarify to me whether it would be a new EIS or a  
13 supplement - I guess it would have to be a new EIS,  
14 relative to the combined licensing process. If there  
15 were significant changes that came to your attention,  
16 there might well be another environmental impact  
17 statement, or there might be an environmental impact  
18 statement issued relative to the COL that would  
19 discuss those significant changes.

20 MS. KUNTZLEMAN: Your Honor, it would  
21 depend upon the timing. Since the early site permit  
22 hasn't been issued, if there were new and significant  
23 information obtained before the permit was issued,  
24 then we would issue a supplemental to our final EIS  
25 for the ESP.

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1 JUDGE BOLLWERK: And in terms of either  
2 the supplement to the ESP or to a combined license,  
3 what would be the process by which you would do that?  
4 Would you put something in the Federal Register?  
5 Would you put something on the NRC website? What  
6 would you do? And what would the process be in terms  
7 of public comment and that sort of thing as well?

8 MR. NOTICH: Your Honor, this is Mark  
9 Notich with staff. We would follow the process of  
10 issuing an environmental impact statement. It would  
11 be noticed in the Federal Register, and there would be  
12 a public comment opportunity, correct.

13 JUDGE BOLLWERK: All right. And would  
14 there be some kind of a draft, and then a final, as is  
15 usually the case?

16 MR. NOTICH: Yes. Yes.

17 JUDGE BOLLWERK: In terms of the notice,  
18 would you issue - would you basically put the draft  
19 out with a notice, or would you notice it saying, we  
20 are revisiting this, we are going to issue a draft, at  
21 such and such a point that would be subject to public  
22 comment? Or is the draft when you issue that, is that  
23 when you issue the notice in terms of comment?

24 MR. NOTICH: I have to be perfectly  
25 honest with you, Judge, I don't know how that process

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1 would work in terms of the Federal Register notice.

2 JUDGE BOLLWERK: But at a minimum when  
3 you issue the draft you would certainly issue a  
4 Federal Register notice?

5 MR. NOTICH: Oh, yes, sir.

6 JUDGE BOLLWERK: Asking for comments?

7 MR. NOTICH: Yes, sir.

8 JUDGE BOLLWERK: All right.

9 Let me try to maybe fill in a couple of  
10 additional places in the timeline that I was trying to  
11 put together. You indicated that what - that there  
12 was - when you received the comments during the public  
13 comment period, after the DEIS, that's when you began  
14 to consider the need to say something about dredging  
15 in the environmental impact statement; is that  
16 correct?

17 MS. KRIEG: That is correct.

18 JUDGE BOLLWERK: Okay. And at that point  
19 did you contact the Corps of Engineers about dredging?  
20 You already talked to them I guess about the dredging  
21 relative to the ramp. When did you first talk to the  
22 Corps about dredging relative to the channel?

23 MS. KRIEG: I did not talk to the Corps  
24 about dredging relative to the channel. One of the  
25 reasons was, one of the comment letters came from the

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1 Corps, so we felt like we had the appropriate amount  
2 of information from that comment.

3 JUDGE BOLLWERK: Again, what did that  
4 comment say about channel dredging? I could look it  
5 up; I'm sure it's in there somewhere. I'm just trying  
6 to see if you remember?

7 MS. KRIEG: I don't remember right off  
8 the top of my head.

9 JUDGE BOLLWERK: Did it mention channel  
10 dredging to the best of your recollection?

11 MS. KRIEG: Yes, we take the comments,  
12 and we group them into groups, and it was in that  
13 group of navigation channel dredging.

14 JUDGE BOLLWERK: Okay. And did you  
15 subsequently - I take it you've had meetings with the  
16 Corps relative to channel dredging, subsequently?

17 DR. COOK: Your Honor, if I may?

18 JUDGE BOLLWERK: Sure.

19 DR. COOK: On our January 12th meeting,  
20 and Mr. Notich can collaborate -

21 JUDGE BOLLWERK: This is back in 2007,  
22 right?

23 DR. COOK: This is back in 2007, we  
24 discussed the process and steps associated with the  
25 various dredging of the barge slip, but we also at

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1 that meeting discussed dredging and the status of -  
2 well, we discussed the status of the navigation  
3 channel, and if there were any applications before  
4 them, requests to look at the channel, or if they had  
5 any intentions. And at the time we were told that no,  
6 there were no requests before them, and they had no  
7 intention of dredging the channel, and that  
8 maintenance of the channel had stopped in the past.

9 JUDGE BOLLWERK: All right. And then did  
10 you subsequently have any additional meetings with the  
11 Corps to discuss the channel and dredging?

12 DR. COOK: I did not, no.

13 MR. VAIL: No meetings I'm aware of.

14 MR. NOTICH: No, Your Honor.

15 MS. KRIEG: Same here. I do want to add,  
16 though, that we did in our conversations, continued  
17 conversations, with the applicant, ask them if they  
18 were indeed putting in an application, what the status  
19 was, were they now planning to have the Federal  
20 navigation channel dredged, and then every  
21 conversation that the subject of dredging was not one  
22 that they were planning to do, they were not  
23 planning to put in an application.

24 They had had - that had continued talks  
25 with the Army Corps of Engineers and they did inform

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1 us of those talks.

2 JUDGE BOLLWERK: All right.

3 MS. KUNTZLEMAN: Your Honor, I would like  
4 to also concur with Ms. Krieg's testimony. Having been  
5 involved for over 18 years with Army Corps permitting  
6 with another employer, I was quite concerned about the  
7 whole process. But in every conversation I had with  
8 a representative from Southern, that representative  
9 said there was no intention of dredging the Federal  
10 navigation channel.

11 So without a plan or an application before  
12 the Corps, the Corps had no information because once  
13 again there were no details. So it would be purely  
14 speculative as to what would be required.

15 JUDGE BOLLWERK: So you didn't contact  
16 them thereafter or discuss this with them?

17 MS. KUNTZLEMAN: No, I did not, Your  
18 Honor.

19 JUDGE BOLLWERK: I guess up until the  
20 present, is that true?

21 MR. VAIL: Your Honor, I have had several  
22 conversations on the phone subsequent to the release  
23 of the draft with Mr. Simpson, primarily concerned  
24 with the drought, where we did mention - I did ask if  
25 there was anything going on with dredging, and

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1 basically his response was they were worried about the  
2 drought, and dredging was not something that was on  
3 anyone's radar at that point.

4 JUDGE BOLLWERK: Any other conversations,  
5 meetings, contacts I should be aware of?

6 MS. KUNTZLEMAN: No, Your Honor.

7 The one point of clarification I would  
8 like to make is that the way the Army Corps is  
9 organized, they have a navigation branch, planning, I  
10 believe it's a division. They have a regulatory  
11 branch.

12 So in the case of all the details that  
13 would be required for a permit action, you would be  
14 dealing with the regulatory branch of the Corps.

15 JUDGE BOLLWERK: Okay. In terms of the  
16 staff's action relative to dredging impacts, as I have  
17 understood your testimony up to this point, and you  
18 need to obviously clarify if I am not correct,  
19 basically you - the basis on which you made the  
20 determination of moderate was your understanding that  
21 Southern intended basically not to dredge, at least  
22 implied that they did not intend at that point to  
23 dredge; that they were going to use the flow of the  
24 river to get the barges up to the facility; and that  
25 that was the basic information you were operating off

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1 of.

2 MS. KUNTZLEMAN: Yes, Your Honor.

3 JUDGE BOLLWERK: And the second part  
4 being that the channel of the Savannah River had not  
5 been dredged in a number of years. And that was the  
6 basis on which you made your determination that you  
7 thought the impacts were moderate?

8 MS. KUNTZLEMAN: Yes, Your Honor.

9 JUDGE BOLLWERK: You didn't perform any  
10 other investigation. You didn't do any other  
11 analysis. That was the basic information you were  
12 working off of?

13 MS. KUNTZLEMAN: Yes, Your Honor. I did  
14 an analysis based on the process that would be  
15 followed as part of a permit application. And that  
16 goes back to all the coordination that would be  
17 required.

18 MS. KRIEG: And I'd just like to clarify,  
19 to make sure it's understood, that the impacts are up  
20 to moderate.

21 JUDGE BOLLWERK: Up to moderate? Okay.  
22 So you haven't ever done any independent analysis or  
23 investigation about how much dredging might be  
24 required there, other than you looked at the expanse  
25 of the river and just assumed that that - it had a lot

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1 of stuff in it, and that would require as you said a  
2 fairly significant amount of dredging if in fact that  
3 was the case.

4 MS. KUNTZLEMAN: Yes, Your Honor. The  
5 variable could be from example 36,000 cubic yards to  
6 millions of cubic yards, orders of magnitude.

7 JUDGE BOLLWERK: And any discussions with  
8 other federal agencies about dredging, put aside the  
9 Corps of Engineers?

10 MS. KRIEG: Well, we did receive comment  
11 letters from - also one from the Fish & Wildlife  
12 Service,

13 MS. KUNTZLEMAN: And the state of Georgia.

14 MS. KRIEG: There was a Department of  
15 Interior one, and I think the state of Georgia and the  
16 state of South Carolina.

17 JUDGE BOLLWERK: And basically those  
18 letters, you had no contacts with them, you just  
19 received their letters and read them?

20 MS. KRIEG: We did have further  
21 contact with the Fish & Wildlife Service over other  
22 aspects of their letter that did not apply to  
23 dredging.

24 JUDGE BOLLWERK: Okay.

25 MS. KUNTZLEMAN: Your Honor, when an

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1 applicant, or Southern Nuclear tells you time and time  
2 again that they are not going to dredge the Federal  
3 navigation channel, you take their word for it.

4 JUDGE BOLLWERK: Okay.

5 You had a question?

6 JUDGE TRIKOUROS: I will read you what  
7 the Corps said in their comments. The Corps said,  
8 local construction will likely require many shipments,  
9 parentheses 15 to 30, close parentheses, and it would  
10 be impossible to plan and provide that many shipment  
11 windows with releases that are incidental to flood  
12 control or pulse flow releases. Therefore it appears  
13 dredging of the Federal navigation channel would be  
14 required.

15 JUDGE BOLLWERK: And that comes from?

16 JUDGE TRIKOUROS: That's one of the  
17 comments to Appendix E.

18 JUDGE BOLLWERK: That's NRC00001 some  
19 part of it. Do you have the page number?

20 JUDGE TRIKOUROS: It's comment 0045-1,  
21 and it's page E-56.

22 JUDGE BOLLWERK: All right, I don't know  
23 what subpart of that document it is.

24 MS. KRIEG: Thank you for refreshing my  
25 memory on that. I do remember that, now, and the fact

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1 that they said would be required brought us back to  
2 the statement by Southern that they were not going to  
3 apply for a permit for dredging, and that they did  
4 have other means to bring in the components.

5 And the 15 to 30, yeah, I overlooked that.  
6 But that again we had been told that they were just  
7 looking at the large components. So we had not put  
8 much analysis in that 15 to 30 shipments.

9 JUDGE TRIKOUROS: I'm not suggesting  
10 anything here. I mean you asked Southern. Southern  
11 told you they are not - they don't expect to have any  
12 dredging done.

13 JUDGE BOLLWERK: Let me just clarify,  
14 after you received that comment you inquired of  
15 Southern again?

16 MS. KRIEG: We had multiple conversations  
17 with Southern during the late spring of 2008  
18 discussing what their plans were. And I remember  
19 several phone calls that I was involved in - I  
20 remember two phone calls where I was involved where  
21 the subject of the dredging came up again, and we were  
22 told again that they hadn't applied for - either that  
23 they hadn't applied for permits, or that they were  
24 still talking to the Army Corps of Engineers but  
25 nothing had been determined yet. It was always along

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1 that same line of, no decision had been made, but they  
2 still were not planning to dredge the channel, because  
3 they were hoping that the channel would be dredged  
4 under the Corps' existing authority, and that that was  
5 always the plan. And under their existing authority  
6 that was not - that's part of the process.

7 MS. KUNTZLEMAN: Yes, Your Honor, we had  
8 a dilemma. We had the Southern Nuclear saying -

9 JUDGE BOLLWERK: I'm getting that  
10 impression.

11 JUDGE TRIKOUROS: Nothing that you have  
12 said is inconsistent with testimony that we have heard  
13 over the last three days.

14 JUDGE BOLLWERK: Let me just - what was  
15 your dilemma, I'm sorry?

16 MS. KUNTZLEMAN: My dilemma having the  
17 experience of applying for Corps permits was, had  
18 Southern Nuclear were preparing an EIS for impacts,  
19 Southern Nuclear said we weren't going to - no  
20 requirement for dredging of the Federal navigation  
21 channel. Southern wasn't going to apply for a permit.  
22 The Army Corps wasn't going to dredge it. There was  
23 going to be no dredging of a federal navigation  
24 channel, period.

25 On the other hand, we received these

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1 letters, including the Corps, Fish & Wildlife Service,  
2 Georgia, South Carolina, Southern Alliance,  
3 environmental action groups. We had Nature  
4 Conservancy, so we had the applicant saying, no  
5 dredging. We had these letters saying, maybe you  
6 should look at dredging.

7 And that is how the dredging issue was put  
8 into the cumulative impact section. Because we  
9 thought it was only fair that dredging should be  
10 mentioned because of these agencies providing these  
11 comments, and it was from a wide range of agencies.  
12 So maybe there was some credibility to their concern.

13 And then based on the fact that we had no  
14 details, you couldn't say small, but moderate,  
15 moderate was a conservative approach.

16 MS. KRIEG: And if I might add, from my  
17 perspective it wasn't so much the credibility of the  
18 concerns, but it was that we did not see this as a  
19 reasonably foreseeable action, but some of these  
20 other agencies had mentioned it, and it came across  
21 their radar, and we thought that we needed to address  
22 it, although otherwise we probably would not have.

23 JUDGE BOLLWERK: But I take it it didn't  
24 rise to the level that you felt you needed to send an  
25 RAI for instance to Southern to try to put something

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1 on the record necessarily?

2 MS. KUNTZLEMAN: Now I wish I would have.

3 JUDGE BOLLWERK: Go ahead.

4 JUDGE TRIKOUROS: Just putting this  
5 altogether, there really aren't any major  
6 inconsistencies in the sense that Southern really was  
7 in a process. You were in a process. So the whole  
8 thing was basically in process, even with the  
9 testimony we have had to date, it isn't clear that  
10 barging cannot occur. The Corps is referring to many  
11 barge shipments. A few would certainly be viable.  
12 Southern is looking into other modes of  
13 transportation, from what I understand this is an  
14 ongoing process even today, given the testimony we've  
15 heard.

16 So yes, there was a dilemma. It was a  
17 dilemma of insufficient information at the time. And  
18 I think we are still fundamentally in that same  
19 situation.

20 JUDGE BOLLWERK: Let me just clarify one  
21 other matter. In terms of, we talked a little bit  
22 about the fact that the assessment here was moderate,  
23 and that there generally would be - that would  
24 certainly speak to mitigation, that mitigation is  
25 available.

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1           You mentioned I guess mitigation in your  
2 testimony, is that correct, in terms of mitigating  
3 measures that might be involved?

4           MS. KUNTZLEMAN:    Yes, Your Honor.

5           JUDGE BOLLWERK:   Was there a reason why  
6 you didn't put those same measures in the  
7 environmental impact statement?

8           MS. KUNTZLEMAN:   We mention potential  
9 mitigation measures in the Final Environmental Impact  
10 Statement. We provided examples.

11          JUDGE BOLLWERK:   Did you? All right, I'd  
12 have to go back and look.

13          MS. KUNTZLEMAN:   It's page 7-20.

14          JUDGE BOLLWERK:   7-20? That's probably -

15          MS. KRIEG:        The sentence actually is,  
16 this would presumably include mitigative actions to  
17 preserve the threatened, endangered and sensitive  
18 mussel species that occur in the Savannah River.

19                 And then later on we talk about the use of  
20 best management practices, time of year restrictions,  
21 relocation of benthic organisms, and restrictions on  
22 equipment that could ameliorate many of the impacts.

23          JUDGE BOLLWERK:   All right.

24                 Just a couple of more questions here. Ms.  
25 Kuntzleman, when you spoke about mitigation measures

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1 that might be imposed if a permit application to  
2 dredge the Federal navigation channel is submitted to  
3 the Corps. Were you referring to mitigation measures  
4 that would be imposed by the Corps in its permit  
5 rather than by the NRC?

6 MS. KUNTZLEMAN: Yes, Your Honor.

7 JUDGE BOLLWERK: So the mitigation  
8 measures, while you might have listed them there, they  
9 are ones you anticipate that the Corps would -

10 MS. KUNTZLEMAN: Yes, Your Honor, based  
11 on my personal experience with 404 permits for  
12 dredging, they would be typical mitigation measures,  
13 and they would be part of the permit conditions.

14 JUDGE BOLLWERK: Would that be the reason  
15 they wouldn't be for instance - if there were an ESP  
16 or COL permit - or if that became necessary? That's  
17 something we always see in the Corps as opposed to an  
18 NRC license? I'm asking you, would an NRC license ever  
19 include those types of mitigation requirements as part  
20 of the licensing actions?

21 MS. KUNTZLEMAN: Your Honor, we wouldn't  
22 be able to attach those conditions. If we were to  
23 impose them we couldn't attach them to our  
24 environmental protection plan because of the Yellow  
25 Creek case.

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1 JUDGE BOLLWERK: All right.

2 MS. KRIEG: However I do want to clarify  
3 that when we come to a determination in an  
4 environmental impact statement, no matter what that  
5 determination is, we do discuss potential mitigation  
6 measures. We don't include those measures always as  
7 being part of the impact level, however.

8 JUDGE BOLLWERK: All right.

9 MS. KUNTZLEMAN: Your Honor, I'd like to  
10 clarify something.

11 JUDGE BOLLWERK: Sure.

12 MS. KUNTZLEMAN: If when an applicant  
13 receives a permit from the Army Corps of Engineers,  
14 the applicant is responsible for complying with those  
15 conditions. So the responsibility for compliance  
16 would be on the applicant, it's not even a  
17 responsibility of a contractor.

18 JUDGE BOLLWERK: All right.

19 Another question: Ms. Kuntzleman, when you  
20 spoke about the information that would be submitted  
21 with a permit application to the Corps to dredge the  
22 Federal navigation channel, whether it would be  
23 considered by the Corps in determining whether to  
24 undertake maintenance dredging, you mentioned that in  
25 assessing potential impacts the mussels from that

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1 dredging, there would need to be site-specific  
2 information.

3           Would that necessarily be new studies if  
4 information about the relevant locations is available?

5           MS. KUNTZLEMAN:   If information is  
6 available about the relative locations, once again the  
7 state and federal regulatory agencies would evaluate  
8 that information and then make a determination.

9           Many times when you could conduct  
10 biological sampling, it's very habitat-specific, so  
11 you could have data for an area, but it could be in an  
12 area that wouldn't be dredged.  Therefore the agency  
13 would say, you are going to conduct a site-specific  
14 study.

15           In more sophisticated arenas you will meet  
16 with the agencies, and you actually set up data  
17 quality objectives.  You never collect data unless you  
18 actually know how you are going to use the data.  And  
19 in some cases you would make an actual decision tree,  
20 this is what we are going to do, this is how we are  
21 going to do it, this is what we want to determine if  
22 we find X, then we proceed with Y.  You just don't run  
23 out and collect samples.

24           So once again it's an iterative thoughtful  
25 process with the subject matter experts.

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1 JUDGE BOLLWERK: There probably would be  
2 new studies then, it sounds like what you are saying?

3 MS. KUNTZLEMAN: I don't like to  
4 speculate because I'm not a subject matter expert in  
5 freshwater mussels, but probably is an appropriate  
6 answer.

7 JUDGE BOLLWERK: Ms. Kuntzleman and Ms.  
8 Krieg, you describe a goal of ensuring that impacts to  
9 mussels from any potential dredging in the Federal  
10 navigation channel would be small. Were you referring  
11 to that as a goal of the Corps or of the NRC?

12 MS. KUNTZLEMAN: Your Honor, that would  
13 be the goal of the Corps. And once again, that  
14 relates back to the 404(b)(1) guidelines, where you  
15 have to select the least environmentally damaging  
16 practicable alternative. Because many times when an  
17 applicant will submit an application they also have to  
18 provide a 404(b)(1) analysis with that.

19 JUDGE BOLLWERK: And is that the goal of  
20 the Corps because the Corps is the one that can impose  
21 the conditions, the mitigation conditions?

22 MS. KUNTZLEMAN: The 404(b)(1) guidelines  
23 were promulgated by the EPA, because the EPA  
24 ultimately has veto authority over an Army Corps  
25 permit.

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1           So the Army Corps will work with the  
2 applicant to minimize the impacts. Because the  
3 applicant could propose to do something, and it  
4 doesn't meet the 404(b)(1) guidelines, and  
5 modifications will have to be made in it.

6           JUDGE BOLLWERK: All right.

7           Any other questions from either of the  
8 judges at this point?

9           All right, anything from the parties  
10 generated based on what we asked?

11           (No response)

12           JUDGE BOLLWERK: All right, then, at  
13 this point I believe we are finished with this panel.

14           Ladies and gentlemen, we very much  
15 appreciate your testimony, the time you spent with us  
16 this morning. We found it very useful and helpful,  
17 and thank you for your service to the board.

18           (Panel excused)

19           JUDGE BOLLWERK: Let me check, did we  
20 find the number on that document they were referring  
21 to by chance? Was it NRC 1, A, B, C? All right, I  
22 believe it's in there somewhere.

23           MR. MARTIN: I believe it's NRC1B.

24           JUDGE BOLLWERK: B? 1B? Thank you.

25           All right. We have one final panel, Joint

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1 Intervenors, on Contention 6.0.

2 Dr. Young and Dr. Hayes.

3 MR. SANDERS: Your Honor, we had  
4 submitted corrected testimony yesterday to the court  
5 reporter and to Andy, and gave it to the other  
6 parties. It was just related to the recent change  
7 from five feet to six feet. Dr. Hayes needed to  
8 revise his testimony related to that issue.

9 JUDGE BOLLWERK: All right. It basically  
10 changed the number?

11 MR. SANDERS: His answers changed a  
12 little bit because there was an apparent inconsistency  
13 when you said you needed a depth of 5.5 feet and you  
14 were only dredging to five.

15 JUDGE BOLLWERK: Right. That was a  
16 problem, yes.

17 MS. GOLDSTEIN: It's Hayes rebuttal  
18 questions five and seven that ended up changing.

19 JUDGE BOLLWERK: Okay. All right.  
20 Whenever you are ready.

21 MS. GOLDSTEIN: All right, I'll first  
22 introduce the witnesses to you. On the far right is  
23 Dr. Donald Hayes, and to his left is Dr. Shawn Young.

24 JUDGE BOLLWERK: Good morning.

25 Dr. Young, welcome back. Mr. Hayes, I

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1 believe I need to swear you in.

2 If you would raise your right hand,  
3 please, and respond affirmatively, orally, to the  
4 question.

5 Do you swear or affirm that the testimony  
6 you will give in this proceeding is the truth, the  
7 whole truth and nothing but the truth?

8 DR. HAYES: I do.

9 JUDGE BOLLWERK: Thank you, sir.

10 MS. GOLDSTEIN: Would you please pull up  
11 the direct testimony of Shawn Young concerning  
12 Environmental Contention 6.0.

13 Dr. Young, do you recognize this as your  
14 prefiled direct testimony for Environmental Contention  
15 6.0?

16 DR. YOUNG: Yes.

17 MS. GOLDSTEIN: Is this testimony  
18 entitled revised prefiled direct testimony of Shawn P.  
19 Young in support of EC 6.0, and dated January 9th,  
20 2009, which has been provided to the court reporter in  
21 electronic format under file name Young 6.0 Direct  
22 Testimony prepared under your supervision and  
23 direction? And is it true and correct to the best of  
24 your knowledge?

25 DR. YOUNG: Yes.

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1 MS. GOLDSTEIN: We move to admit this  
2 into evidence.

3 JUDGE BOLLWERK: All right.

4 Any objections?

5 (No response)

6 JUDGE BOLLWERK: Hearing none, then the  
7 direct testimony of - I'm sorry, can you put that back  
8 up one second? I need to check one thing.

9 All right. Then the direct testimony of  
10 Dr. Young relating to contention EC 6.0 is admitted,  
11 and should be entered into the record at this point as  
12 if read as DDMS Item ID 59077.

13 (Insert Young Direct Testimony (EC 6.0)

14 (DDMS-59077) here)

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the 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

Originally Filed: January 9, 2009

Refiled: February 2, 2009

**REVISED PRE-FILED DIRECT TESTIMONY OF SHAWN P. YOUNG  
IN SUPPORT OF EC 6.0**

**Q1: Please state your name and current business address.**

**A1:** My name is Shawn Paul Young, and my current business address is 103A Natural Resources Building, University of Idaho, Moscow, ID 83844.

**Q2: What is your educational background?**

**A2:** I received a B.S. degree in Environmental Studies from Northland College (Ashland, WI) in 1996. I received a M.S. degree in Aquaculture, Fisheries, and Wildlife Biology (Fisheries emphasis) from Clemson University (Clemson, SC) in 2001. I received a Ph.D. in Fisheries and Wildlife Biology (Fisheries emphasis) from Clemson University (Clemson, SC) in 2005.

**Q3: For whom do you work and in what capacity?**

**A3:** I am currently Research Faculty of Fisheries Biology at the University of Idaho (Moscow, ID). I also currently hold Adjunct Faculty status at Clemson University (Clemson, SC).

**Q4: What is your professional background?**

**A4:** A copy of my curriculum vitae has been provided to the Board and other parties previously and is attached to this testimony as JTI000042. Briefly, I have eleven years of experience researching the effects of human activities on fisheries and aquatic ecosystems, including six years of experience studying fisheries in the Savannah River Basin. In addition to the faculty positions I currently hold, I was previously a visiting Assistant Professor of Fisheries Biology at Purdue University.

**Q5: Have you published or presented in the fields of fisheries and aquatic ecology?**

**A5:** Yes; I have in publication, in press, and in review twenty-seven peer-reviewed articles relevant to fisheries and aquatic ecology. I have presented scientific presentations at numerous professional meetings, academic seminars, and citizen fishing association functions.

**Q6: Have you testified as an expert previously in any jurisdiction or proceeding?**

**A6:** Yes; I have been recognized as an expert in fisheries and aquatic ecology. I provided scientific review and affidavit opinion on the potential environmental impacts of nuclear expansion on the North Anna/Pamunkey River (VA) and Tennessee River (AL). I am currently involved in fisheries issues pertaining to the Federal Energy Regulatory Commission ("FERC") re-licensing of Tillery Dam on the Yadkin-Pee Dee River (NC). Also, I provided review on a draft petition to designate critical habitat for the endangered Goldline Darter and Blue Shiner.

**Q7: Do you have a written summary of your education, employment, experience and background, and papers and presentations you have made over your career?**

**A7:** The copy of my curriculum vitae attached as JTI000042. to this testimony supplies such a summary.

**Q8: What materials have you reviewed and actions have you taken in preparation for your testimony?**

**A8:** I am familiar with the application of Southern Nuclear Operating Company (“SNC”) for an Early Site Permit (“ESP”) at the Vogtle Electric Generating Plant (“VEGP”) site. I have reviewed excerpts of the Final Environmental Impact Statement (“FEIS”) prepared by the staff of the Nuclear Regulatory Commission (“NRC”), including those sections describing water intake, water consumption, and thermal discharge into the Savannah River associated with the proposed additional nuclear power generating units (“Units 3 and 4”), the cumulative impacts of Units 3 and 4 operation, and the subsequent potential impacts of Units 3 and 4 on the fish assemblage of the Savannah River, together with related documents submitted in this matter.

**Q9: Have you given affidavits or declarations in support of or in connection with any of Joint Intervenors’ contentions in this ESP proceeding?**

**A9:** Yes, I submitted a declaration in support of the petition to intervene in December 11, 2006. (JTI0000023). I submitted an affidavit in opposition to SNC’s motion for summary disposition of EC 1.2 on November 13, 2007. (JTI0000003). Also I submitted a declaration in support of admission of contention EC6.0 on September 22, 2008. (JTI0000005)

**Q10: What are the topics of your testimony?**

**A10:** I will testify on one topic to a reasonable degree of scientific certainty. I will testify on the deficiencies, in data, quantitative analysis, field studies, and logic, of the FEIS conclusions regarding the impacts of the proposed dredging required for construction of Units 3 and 4 on the aquatic species located in the Middle, Lower, and estuarine Savannah River. My testimony will support Environmental Contention 6.0, which provides that the FEIS fails to adequately analyze

the cumulative impacts of dredging the Savannah River federal navigation channel and water flow regulation from upstream reservoirs.

Dredging

**Q.11: Is it likely that the proposed dredging of the federal navigation channel required for construction of the New Units may impact the aquatic species located in the Middle, Lower, and estuarine Savannah River?**

**A.11:** Yes. It is likely that the proposed dredging may impact the aquatic species located in the Middle, Lower, and estuarine Savannah River.

**Q.12: What are the potential impacts of the proposed dredging of the federal navigation channel required for construction of the New Units on the aquatic species located in the Middle, Lower, and estuarine Savannah River?**

**A.12:** Such dredging may (i) disrupt food web dynamics, affecting the aquatic species located in the Middle, Lower, and estuarine Savannah River, including the endangered shortnose sturgeon (JTI000026 (Shortnose Sturgeon Recovery Team 1998)) and rare robust redhorse (which are benthic feeders), and (ii) affect spawning success of some of the aquatic species located in the Middle, Lower, and estuarine Savannah River, including the striped bass. In fact, previous dredging activities have been cited as a cause for the decline of numerous Savannah River fish (JTI000027 (Duncan et al. 2003)) such as Atlantic sturgeon (NRC000025 (Atlantic Sturgeon Review Team 2007)). Dredging may also degrade chemical aspects of water quality and re-suspend contaminants, which contaminants may then in turn be bioaccumulated by mussels and other organisms (JTI000029 (Bellas et al. 2007)). Further, previous dredging has been identified as a major cause for freshwater mussel decline (JTI000017 (Ricciardi and Rasmussen 1999)). Dredging destroys benthic habitat needed by mussels, and mussels may be killed directly by

being suffocated or buried in dredging spoils. In addition, if dredging causes fish hosts of the mussels' glochidial life stage to vacate co-inhabited areas, mussel reproduction will be negatively impacted by the disruption in the commensalistic relationship. The FEIS mentions the potential for benthic organism (i.e. the freshwater mussel) relocation, yet surprisingly provides no detail concerning this proposal. Relocations of freshwater mussels have had variable success – with some relocation attempts resulting in 100% mortality.

**Q.13: Does the FEIS contain sufficient information to adequately assess and analyze the impacts of the construction of the New Units and operation of the VEGP (including the New Units) on the freshwater mussels?**

**A.13:** No. The FEIS does not contain sufficient information to adequately assess and analyze the impacts of the construction of the New Units and operation of the VEGP (including the New Units) on these freshwater mussels. With the large-scale dredging, a thorough freshwater mussel survey for the entire affected area should be completed. The last survey conducted by the U.S. Fish and Wildlife Service in 2006 (NRC000001 (FEIS, 2-76)) was incomplete, as it failed to survey a forty-four mile segment around VEGP. Further, because each mussel species has specific fish hosts and habitat requirements, a thorough discussion of each mussel species' life history is also required.

**Q.14: Does the FEIS provide sufficient data and analysis regarding the federal navigation channel dredging impacts on the aquatic species located in the Middle, Lower, and estuarine Savannah River?**

**A.14:** No. Although the proposed dredging required for construction of the New Units will likely have very large and severely negative impacts on the aquatic species located in the Middle, Lower, and estuarine Savannah River, these impacts are insufficiently assessed and analyzed.

For example, the FEIS lacks sufficient data and analysis of the impacts on the freshwater mussels, shortnose sturgeon, Atlantic sturgeon, striped bass, robust redhorse and other catostomids, catfish species, and numerous benthic organisms, which may be affected by the dredging.

In accordance with 28 U.S.C. § 1746, I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on January 9, 2009.

Executed in Accord with 10 C.F.R. 2.304(d)  
Dr. Shawn Young  
University of Idaho, Fish and Wildlife Resources  
103A Natural Resources Building  
Moscow, ID 83844  
Phone: (208) 885-6001  
Email: [syoung@uidaho.edu](mailto:syoung@uidaho.edu)

1 MS. GOLDSTEIN: Would you please pull up  
2 the rebuttal testimony of Shawn Young for EC 6.0.

3 Dr. Young, do you recognize this as your  
4 rebuttal testimony on Environmental Contention 6.0?

5 DR. YOUNG: Yes.

6 MS. GOLDSTEIN: This testimony entitled  
7 Rebuttal Testimony of Dr. Shawn P. Young concerning  
8 contention EC 6.0, and dated February 6th, 2009, which  
9 has been provided to the court reporter in electronic  
10 format under file name Young 6.0 Rebuttal Testimony,  
11 was prepared under your supervision and direction, and  
12 is true and correct to the best of your knowledge?

13 DR. YOUNG: Yes.

14 MS. GOLDSTEIN: Move to admit this into  
15 evidence as if read.

16 JUDGE BOLLWERK: All right. Any  
17 objections?

18 (No response)

19 JUDGE BOLLWERK: There being none then  
20 the rebuttal testimony of Dr. Young on Contention EC  
21 6.0 will be admitted and entered into the record as if  
22 read as DDMS Item ID 59103.

23 (Insert Young Rebuttal Testimony (EC  
24 6.0) (DDMS-59103) here)

25

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NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the 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

**REBUTTAL TESTIMONY OF DR. SHAWN P. YOUNG CONCERNING  
CONTENTION EC 6.0**

**Q1. The NRC Staff in the FEIS and in prefiled direct testimony maintains that the impacts of dredging the Savannah River could be moderate. In your opinion, are the effects more likely to be significant or more likely to be moderate?**

A1. In my opinion, effects are more likely to be significant.

**Q2. Do you agree with Dr. Coutant, in answer 15 of his prefiled direct testimony, that the “impacts of dredging on aquatic life will be localized, temporary and not biologically significant on a broad scale of geography or animal population of the 110 miles of the Savannah River”**

A2. No. Even if only one mile of river is dredged, the dredged areas may be hotspots of high abundance for benthic organisms. Plus, the dredging of short reaches of river may change flow velocity or location of the thalweg which in turn may then cause changes in habitat for an

extended reach below the immediate vicinity of dredging. Further, the removal of several hundred trees from the main channel will destabilize benthic substrates, eliminate flow refugia for benthic organisms, and eliminate likely feeding stations for main channel organisms.

**Q3. Are there any foreseeable impacts associated with dredging that were not sufficiently addressed in Exhibit SNC000051, Dr. Coutant's report analyzing the impacts of dredging the Federal navigation channel?**

A3. Yes, I believe the extensive removal of main channel trees and woody structure was not sufficiently addressed. Dr. Coutant only discussed the positive aspect of keeping the trees within the river. However, Dr. Coutant failed to identify the negative effects of removing the trees from the main channel to begin with, which are potentially significant.

**Q4. According to Dr. Coutant's report, "A total of 180 trees and 277 snags were located for removal and identified by tenth of river mile." Does the report adequately address the impacts associated with removal or relocation of snags and woody debris?**

A4. No. The removal of 350+ trees from the main channel is a very important but overlooked aspect of the Southeast Marine report. Dr. Coutant attempts to reduce this significance by stating trees will simply be repositioned in shallow habitats along the river banks. I acknowledge this would allow for continued nutrient input important to aquatic ecosystems and may increase habitat for shallow water species; however, Dr. Coutant fails to address the importance of large woody structure to the main channel aquatic habitat. The large trees provide benthic substrate stability, provide flow refugia for benthic organisms, and as stated by Dr. Coutant host a large percent of aquatic invertebrate biomass, concentrating food items for fish species. The loss or disruption of benthic substrates and flow refugia would be detrimental to

freshwater mussels and benthic fishes, and loss of concentrated prey items would be detrimental to main channel fishes.

**Q5. Did Dr. Coutant adequately address potential impacts of mussel populations given the 2007 report by Savidge regarding the mussel populations in the Savannah River?**

A5. No. Dr. Coutant does not address or even acknowledge the Savidge study of the *Savannah River*. NRC000005. Remarkably, Dr. Coutant relies on a study of the Pee Dee River by the same group of researchers (Savidge 2006).

**Q6. In your opinion, was Dr. Coutant correct to rely on the Pee Dee River study instead of the Savannah River Study?**

A6. In my opinion, Dr. Coutant is incorrect to extrapolate from a study of the Pee Dee River, especially in light of the fact that the same group of researchers also studied the Savannah River. The Pee Dee River study may be useful to augment data collected from the Savannah River, but Dr. Coutant is mistaken to rely heavily on the study of the Pee Dee River without mention of the Savannah River study.

**Q7. In your opinion, what is the significance of Savidge's Savannah River study?**

A7. The Savannah River study by Savidge is the most recent information available about the mussel species of the Savannah River. Savidge sampled at 39 sites between Augusta and Savannah, which includes the Vogtle site and the stretch of river to be dredged for construction of Units 3 and 4. Based on the Savidge study, there are 14 mussel species listed as species of concern, threatened, or endangered by South Carolina, the United States Fish and Wildlife Service, or scientists. . Even limited dredging and the large scale wood removal may affect those vulnerable species. Further, no discussion of translocation of mussels from proposed dredging

areas was offered. It is remarkable that Dr. Coutant would not mention a 2007 study from the same area of the Savannah River as the contemplated dredging.

**Q8. If Southern's witnesses are correct that only 8 sites comprising less than one mile of dredging, would you still be concerned with impacts to mussels.**

A8. Yes, I would still be concerned because Savidge found rare, threatened, or endangered mussels at sample sites that were relatively close to where dredging will occur. In particular, proposed dredging sites at River Mile 51.3 and 121.6. Also, I would be concerned because most of the dredging sites identified are not close by one of Savidge's survey sites and have not been surveyed recently.

**Q9. According to Dr. Coutant's report, the robust redhorse "has not been identified from the reach of the Savannah River where the dredging is proposed." Is this accurate?**

A9. No. In a telemetry study conducted to determine habitat use and distribution of robust redhorse, of which I participated in personally, robust redhorse were located as far downriver as RM 73 during summer, fall, and winter (NRC000017).

**Q10. Are the studies that have been cited thus far sufficient? In your opinion, are more studies necessary to determine the likely effects in the aquatic environment?**

A10. No, the studies cited are not sufficient. More studies are necessary. Mussel and fish surveys should be undertaken at the proposed dredging and tree removal sites. Studies using experimental design should compare species composition and abundance near trees/woody structure versus habitat with no trees to determine importance of trees/wood.

In accordance with 28 U.S.C. § 1746, I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on February 6, 2009.

Executed in Accord with 10 C.F.R. 2.304(d)

Dr. Shawn Young

University of Idaho, Fish and Wildlife Resources

103A Natural Resources Building

Moscow, ID 83844

Phone: (208) 885-6001

Email: [syoung@uidaho.edu](mailto:syoung@uidaho.edu)

1 MS. GOLDSTEIN: Would you please pull up  
2 the prefiled direct testimony of Dr. Hayes for  
3 Environmental Contention 6.0.

4 Dr. Hayes, do you recognize this document  
5 as your prefiled direct testimony on Environmental  
6 Contention 6.0?

7 DR. HAYES: Yes.

8 MS. GOLDSTEIN: Would you please affirm  
9 the following. The testimony entitled Revised  
10 Prefiled Direct Testimony of Donald F. Hayes in  
11 Support of EC 6.0, and dated January 9th, 2009, which  
12 has been provided to the court reporter in electronic  
13 format under the file name Hayes 6.0 direct testimony  
14 was prepared under your supervision and direction, and  
15 is true and correct to the best of your knowledge?

16 DR. HAYES: Yes.

17 MS. GOLDSTEIN: I move to admit this into  
18 evidence as if read.

19 MR. SANDERS: Your Honor, I'm not sure  
20 that that is the revised - the most recent revision.  
21 Can we go down to - I see the date is February 2nd.  
22 I know we submitted one yesterday.

23 MS. GOLDSTEIN: That was for the  
24 rebuttal.

25 MR. SANDERS: Oh, that was the rebuttal.

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1 I'm sorry.

2 JUDGE BOLLWERK: Okay, I'm glad you  
3 checked. It's better that we check and deal with it  
4 now. I appreciate it. Not a problem. It's not like  
5 I haven't had the problem myself.

6 All right, where were we? Trying to admit  
7 it?

8 MS. GOLDSTEIN: Yes, we move to admit it  
9 as if read.

10 JUDGE BOLLWERK: All right. And any  
11 objections?

12 (No response)

13 JUDGE BOLLWERK: All right, there being  
14 none, then the revised direct testimony of Dr. Hayes  
15 in support of EC 6.0 is admitted, and will be entered  
16 into the record as if read as DDMS Item ID 59072.

17 (Insert Hayes Direct Testimony (EC  
18 6.0) (DDMS-59072) here)

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UNITED STATES OF AMERICA  
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ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the 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

Originally Filed: January 9, 2009

Revised: February 2, 2009

**REVISED PRE-FILED DIRECT TESTIMONY OF DONALD F. HAYES**  
**IN SUPPORT OF EC 6.0**

**Q1: Please state your name and current business address.**

**A1:** My name is Donald F. Hayes, and my current business address is University of Louisiana at Lafayette, Department of Civil Engineering, P.O. Box 42291, Lafayette, LA 70504-2291.

**Q2: What is your educational background?**

**A2:** I received a B.S. degree with honors in Civil Engineering from Mississippi State University in 1981. I received a M.S. degree in Civil Engineering from Mississippi State University in 1986. I received a Ph.D. in Civil Engineering with emphases in Environmental Engineering and Water Resources Planning and Management from Colorado State University in 1990.

**Q3: For whom do you work and in what capacity?**

**A3:** I am the Director of the Institute for Coastal Ecology and Engineering and an Endowed Professor of Civil Engineering at the University of Louisiana at Lafayette.

**Q4: What is your professional background?**

**A4:** A copy of my curriculum vitae has been provided to the Board and other parties previously and is attached to this testimony as JTI000045. Briefly, I have twenty-seven years of experience as an engineer, much of it related to dredging and associated environmental impacts. I am a registered Professional Engineer in the State of Mississippi and a Board Certified Environmental Engineer by the American Academy of Environmental Engineers. I am also on the Board of Directors of the Western Dredging Association. In addition to the faculty position I currently hold, I was previously an Assistant and Associate Professor of Environmental and Water Resources Engineering at the University of Utah and an Assistant Professor of Civil Engineering at the University of Nebraska—Lincoln.

**Q5: Have you published or presented in the field of dredging and the associated environmental impacts?**

**A5:** Yes, I have published or contributed to more than 50 articles, book chapters, special publications, and technical reports relevant to dredging and the associated environmental impacts. I have presented scientific presentations at numerous conferences and academic seminars. The copy of my curriculum vitae, attached as JTI000045, supplies a detailed summary of my publications and presentations.

**Q6: Have you testified as an expert previously in any jurisdiction or proceeding?**

**A6:** Yes, I have been recognized as an expert in dredging and the associated environmental impacts in a variety of venues. I have provided depositions pertaining to dredging in four cases and testimony in two cases. My curriculum vitae, attached as JTI000045, supplies a detailed summary of my expert consulting activities, depositions, and testimony.

**Q7: Do you have a written summary of your education, employment, experience and background, and papers and presentations you have made over your career?**

**A.7:** The copy of my curriculum vitae, attached as JTI000045, supplies such a summary.

**Q8: What materials have you reviewed and actions have you taken in preparation for your testimony?**

**A8:** I am familiar with sections of the application of Southern Nuclear Operating Company (“SNC”) for an Early Site Permit (“ESP”) at the Vogtle Electric Generating Plant (“VPEG”) site. I have reviewed excerpts of the Final Environmental Impact Statement (“FEIS”) prepared by the staff of the Nuclear Regulatory Commission (“NRC”), and related documents submitted in this matter. I have also reviewed correspondence (including, e-mail attachments) by and among SNC, The Shaw Group Inc. and/or Westinghouse Electric Company, LLC, and their contractors, employees and agents.

**Q9: Have you given affidavits or declarations in support of or in connection with any of Joint Intervenors' contentions in this ESP proceeding?**

**A9:** Yes, on September 21, 2008, I gave a declaration in support of Joint Intervenors' Motion to Admit New Contention (filed as JTI000041).

**Q10: What are the topics of your testimony?**

**A10:** I will testify on two topics to a reasonable degree of scientific certainty. I will testify on the deficiencies in data, quantitative analysis, field studies, and logic of the FEIS conclusions regarding the potential impacts of (1) dredging and (2) sediment placement. My testimony will support contention EC 6.0, which provides that the FEIS fails to adequately analyze the cumulative impacts of dredging the Savannah River federal navigation channel and water flow regulation from upstream reservoirs.

Dredging Impacts

**Q11: Please summarize your conclusions related to the dredging activities required in connection with the construction and operation of a new nuclear power generating facility at the VEGP site.**

**A11:** According to the FEIS on page 4-27, dredging of the Federal Navigation Channel (the "FNC") in the Savannah River to its authorized dimensions of nine (9) feet deep by ninety (90) feet wide is required to allow barge traffic during normal river flow. Because SNC intends to ship its reactor components by barge, such dredging is required in connection with the construction and operation of Units 3 and 4. Although the potential impacts the dredging

activities are both foreseeable and environmentally significant, the FEIS fails to address and adequately analyze them.

**Q12: Is it possible that the required dredging activities will have a significant impact on the Savannah River ecosystem?**

**A12:** Yes, the dredging impacts to the Savannah River ecosystem could be significant. Dredging typically raises concerns about benthic habitat destruction and water quality impairment. Sediment resuspended into the water column by the dredging operation impairs water quality. The increase in suspended sediment concentrations within the river could potentially influence fish behavior, impact spawning habitat, and cover fish larvae and benthic habitat in undisturbed areas of the river. Environmental impacts are exacerbated when anthropogenic contaminants are associated with the sediments. Notably, the NRC staff seem to agree, identifying on page 7-20 of the FEIS "...temporary loss of benthic habitat, disruption of spawning migrations, resuspension of sediments that may be contaminated, ..." as issues of concern for the federal navigation channel dredging. Unfortunately, the FEIS does not provide sufficient data and information to estimate the extent of these impacts on the Savannah River ecosystem.

**Q13: Does the FEIS state the size and duration of the federal navigation channel dredging project?**

**A13:** No, the FEIS does not estimate the duration of the dredging project or the volume of sediment that will need to be dredged and placed outside of the river. The FEIS provides on page 7-20, that "[a]t the present time the dredging project is incompletely defined, the amount of

material to be removed is unknown, and the locations of the dredged material disposal areas have not been identified.”

**Q14: Is it possible to estimate the size and duration of the dredging project, based upon information provided in the FEIS?**

**A14:** Yes, it is evident from the FEIS that this will be a sizable dredging project with a significant duration. According to the FEIS, most of the federal navigation channel above RM 35 will require dredging. Plant Vogtle is located at RM 150.9; thus, about 116 miles of river channel (which has not been dredged since 1979 or before) will need to be dredged. For a 90 foot wide channel, the requisite dredging activities could disturb 140 acres or more of benthic habitat and result in about two million cubic yards of sediment to be dredged per foot of deepening required. Specific data on barge drafts and river bathymetry should be included in the FEIS so that the size and duration of the dredging project can be accurately determined. Sediment volume and dredging duration are necessary to support any evaluation of potential environmental impacts. Despite the lack of specific data, the FEIS could provide a range of estimates for sediment volume and dredging duration based upon some reasonable assumptions and ranges of conditions.

**Q15: Based on various correspondence, it appears as though SNC may only dredge the channel to a width of 70 feet and a depth of 7 feet. How does that affect your impact analysis? Could impacts still be substantial? What if only a few portions of the river were dredged instead of the entire length of the river?**

**A15:** I have not conducted or attempted an impact analysis, and instead have just opined that dredging could potentially have substantial environmental impacts. Reducing the length, width, and depth of the dredging would reduce the sediment volume to be dredged. Dredging impacts would like be reduced accordingly, although inadequate information exists to determine the extent of the reduction.

I should also point out that river conditions, both stage and velocity, can substantially influence the dredging requirements. The recent extended drought in this region has almost certainly led to lower than normal river flows and decreased water depths. Increased dredging may be required in these conditions.

**Q16: Does the number of barge trips required to transport the reactor components affect your analysis (i.e. would your analysis change if only one barge trip was required)? Does the weight of the barge loads affect your analysis (i.e. the heavier the barge, the deeper the dredging required)?**

**A16:** The impact of barge traffic is a different issue, and I have not attempted to opine on this issue.

**Q17: Does the time of year the barge trips are made affect your analysis (i.e. if river volume is usually lower during certain seasons, would more dredging be required)?**

**A17:** I anticipate that environmental impacts will vary throughout the year depending on how the ecology of the river changes. For example, impacts during spawning season may be of a particular concern. However, the ecological component of these analyses is outside of my area of expertise.

**Q18: Does the FEIS provide sufficient data and analysis to support the suggested cumulative impacts rankings?**

**A18:** No, the FEIS lacks sufficient data and analysis to support the suggested cumulative impacts rankings. The FEIS rates the potential cumulative impacts for the federal navigation channel dredging as MODERATE, but does not provide any evidence that the ranking is based upon a quantitative evaluation. Instead, the FEIS only mentions that Section 404 permits (from the US Army Corps of Engineers and the EPA) and 401 Water Quality Certifications (from the State of Georgia) will be required.

**Q19: Is it possible to independently analyze the suggested cumulative impacts rankings, based on the information provided?**

**A19:** No, since the FEIS does not provide a quantitative analysis or adequate data to independently conduct those analyses, I cannot evaluate the MODERATE ranking suggested by the FEIS for the federal navigation channel dredging. Conducting a comprehensive environmental analysis of dredging would require substantial environmental, ecological, physical, and hydrologic data not presented in the FEIS. A well-done comprehensive environmental

analysis would require input and synthesis from a multi-disciplinary group of professionals. The purpose of the FEIS is to present these data and analyses and justify the resulting conclusions.

### Sediment Placement Impacts

**Q20: Does the FEIS provide sufficient data to analyze sediment placement impacts?**

**A20:** No. I did not find any information or discussion in the FEIS on the issue of sediment placement.

**Q21: Will the dredging activities required in connection with the construction and operation of a new nuclear power generating facility at the VEGP site necessitate managing the generated sediments and carrier water?**

**A21:** Yes. Whether the dredging is conducted hydraulically or mechanically, some sediment management will be necessary. Depending upon the sediment characteristics and volumes, these sediments will likely require the construction of multiple confined disposal facilities (“CDFs”) along the Savannah River unless those facilities already exist and have adequate capacity.

**Q22: Would the construction of multiple CDFs produce significant environmental impacts?**

**A22:** Yes, it is likely that the construction of multiple CDFs would have a significant environmental impact. The CDFs will permanently alter the landscape, and associated return water discharges could potentially have significant impacts on the Savannah River environment. The resulting impacts will vary with the number of CDFs required and the environment in which they are constructed.

**Q23: Does the FEIS indicate whether the sediments contain hazardous materials?**

**A23:** No, the FEIS does not indicate whether the sediments contain hazardous materials. In the event the sediments contain hazardous materials, additional sediment management and disposal issues will arise. I understand, from Lauren Smith et al.'s paper entitled Chlor-alkali Plant Contributes to Mercury Contamination in the Savannah River (JTI000040 (2007)). This may suggest that hazardous materials are a concern. If so, data collection for the FEIS analyses will need to include sediment sampling and contaminant analysis in order to conduct a thorough evaluation of potential environmental impacts.

In accordance with 28 U.S.C. § 1746, I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on January 9, 2009.

Executed in Accord with 10 C.F.R. 2.304(d)  
Donald F. Hayes  
782 Sunset Strip  
Sunset, LA 70584  
Phone: (337) 482-5929  
Email: don.hayes@environmentaldredging.com

1 MS. GOLDSTEIN: Dr. Hayes, do you  
2 recognize this as your prefiled rebuttal testimony on  
3 Environmental Contention 6.0?

4 DR. HAYES: Yes.

5 MS. GOLDSTEIN: Can you please affirm the  
6 following: that the testimony entitled prefiled  
7 rebuttal testimony of Donald F. Hayes concerning  
8 Contention EC 6.0, and dated February 6th, 2009, which  
9 has been provided to the court reporter in electronic  
10 format under file name Hayes 6.0 rebuttal testimony  
11 was prepared under your supervision and direction, and  
12 is true and correct to the best of your knowledge?

13 DR. HAYES: Yes.

14 MS. GOLDSTEIN: I move to admit this into  
15 evidence as if read.

16 JUDGE BOLLWERK: All right. Any  
17 objections?

18 (No response)

19 JUDGE BOLLWERK: Hearing none then the  
20 rebuttal testimony of Dr. Hayes with respect to  
21 Contention EC 6.0 is admitted, and will be entered  
22 into the record as if read as DDMS item ID 60103.

23 (Insert Hayes Rebuttal Testimony (EC  
24 6.0) (DDMS-60103) here)

25

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

ATOMIC SAFETY AND LICENSING BOARD PANEL

Before the Licensing Board:

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

In the Matter of	Docket No. 52-011-ESP
SOUTHERN NUCLEAR OPERATING CO.	ASLBP No. 07-850-01-ESP-BD01
(Early Site Permit for Vogtle ESP Site)	Originally Filed: February 6, 2009 Revised: March 17, 2009

**PREFILED REBUTTAL TESTIMONY OF DR. DONALD HAYES CONCERNING  
CONTENTION EC 6.0**

**Q1. Have you reviewed or aided in preparing environmental impact statements previously?**

A1. Yes, I have more than two decades' experience reviewing and aiding in preparing environmental impacts statements and other NEPA documents related to dredging and water quality. I have consulted on NEPA-related issues on behalf of the U.S. Department of Justice, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, as well as numerous state and municipal government and private entities. My curriculum vitae, attached as JTI000045, supplies a detailed summary of my expert consulting activities, depositions, and testimony.

**Q2. Is this FEIS as detailed as you would expect with regard to dredging impacts, based**

**on your prior experience with environmental impact statements?**

A2. No, for a project that includes substantial dredging requirements, like the project described in the FEIS, I would expect a more detailed treatment of dredging impacts.

**Q3. Is dredging inextricably linked to the granting of an Early Site Permit with Limited Work Authorization for the Vogtle ESP site, such that it should be analyzed in the FEIS?**

A3. Yes, the project, as described in Southern's ER and the FEIS, includes construction of a new barge slip and heavy haul road from the barge slip to the construction laydown area, and barging modular components to the site. Based on the materials provided, dredging is a necessary and likely component of the construction project to transport essential equipment for the Vogtle Plant. The FEIS states that most areas of the navigation channel will require dredging, which leads me to conclude that dredging is within the scope of the NRC action under consideration. My understanding of the process is that the dredging will support the activities being authorized under the Limited Work Authorization, which will be issued along with the ESP. As a result, the FEIS for the ESP and LWA should include an in-depth analysis of potential dredging-related impacts.

**Q4. You indicated in answer 14 of your prefiled direct testimony that 2 million cubic yards of sediment may need to be dredged per foot of deepening. Testimony from Southern's witnesses indicates that significantly less than that will need to be dredged to support barging. How did you estimate the amount of material to be dredged?**

A4. Southern's witnesses misunderstood my statement. I did not estimate, or attempt to estimate, the sediment volume to be dredged because I did not have the bathymetric survey data to base such an estimate on. The FEIS indicated that dredging would be required along the entire length of the Federal Navigation Channel between RM 35 and Plant Vogtle at RM 150.9. Exhibit

NRC000001 at 7-20. In the absence of data on existing depths, I estimated the sediment volume that would need to be removed per foot of required dredging if the entire length of the channel were dredged, per the FEIS statements.

**Q5. Southern's witness, Captain David Scott, conducted a survey in which he noted areas in the river with depths of less than 6 feet (Neubert, Smith, and Scott Prefiled Direct Testimony at Answer 20). The barge will, however, have draft of 5.5 feet. Would this method accurately indicate what areas need to be dredged?**

A5. All areas of 6 feet or less would definitely need to be dredged. However, this provides only 0.5 feet of under-keel clearance. This is far less than recommended by EM 1110-2-1100 (USACE 2002) to compensate for vessel squat and safety clearance. Safe vessel passage under these conditions may be difficult. A dredging depth of 7 feet or greater is probably more realistic.

**Q6. Southern's witness, Captain David Scott, conducted a survey in which he noted areas in the river with depths of less than 6 feet (Neubert, Smith, and Scott Pre-Filed Direct Testimony at Answer 20). In answer 15, Mr. Smith and Mr. Scott noted that the river has been in drought conditions for the past 6 to 7 years (Smith and Scott Pre-Filed Direct Testimony at Answer 15). In answer 7, Southern's witnesses stated that they anticipated barging would occur between March 2012 and November 2014 (Neubert, Smith, and Scott Pre-Filed Direct Testimony at Answer 7). Is it possible for the river depth to fall further between the time of the survey and the time of the actual barging, requiring unanticipated dredging?**

A6. My understanding of the testimony is that the required depth was based upon a specific flowrate of 3700 cfs. They did not address the likelihood of that flow rate being delivered, but it is

approximately the same as the 2008 average flow – the lowest since 1952 based upon the chart provided in VESP\_D0000965.pdf. There will likely be additional sedimentation between now and the time of the deliveries. The extent of that deposition depends upon how near the current river condition is to an equilibrium sediment level. Sustaining a flowrate of 3700 cfs probably depends upon relief from the continuing drought conditions.

**Q7. Southern's witnesses, Neubert, Smith, and Scott, concluded that in each location where the depth of the river was 5 feet or less, no more than 2 feet of depth would need to be added to the channel for a total depth of 7 feet (Neubert, Smith, and Scott Pre-Filed Direct Testimony at Answer 20). However, the authorized dimensions of the Savannah River include a depth of 9 feet (FEIS page 4-27). Based on your experience and Southern's barging needs, is the 2 foot estimation resulting in 7 feet of depth appropriate? What impacts could result from failure to dredge deep enough? What impacts result from needing to dredge deeper?**

A7. The limited dredging described by Southern's authorized witnesses will not restore the Federal Navigation Channel to its authorized dimensions of nine (9) feet deep by ninety (90) feet wide. Southern stated that they now anticipate dredging to an assured depth of only 6 feet. This depth does not seem to be adequate for the 5.5 foot draft barges anticipated. Dredging deeper, whether to a depth of 6.0 feet or to the 9 foot authorized depth, would increase dredging impacts. The limited depth demonstrates that the project is tailored to meet Southern's needs for construction of Units 3 and 4, not the corps need for operation of the navigation channel.

**Q8. In answer 12 of your prefiled direct testimony, you state that dredging impacts could be significant. However, the NRC Staff in the FEIS and in prefiled direct testimony**

**maintains that the impacts could be moderate. In your opinion, are the effects more likely to be significant or more likely to be moderate?**

A8. There is some terminology confusion here. Impacts are often classified as Small, Moderate, or Large. Moderate impacts could well be significant, depending upon the sensitivity of the river environment. My point was that the FEIS did not provide any information upon which to base any estimate of the level of impacts. I intentionally did not state whether I believed their estimate of Moderate was correct or not. Based on the supplemental information provided in Southern's and the Staff's prefiled direct testimony, there is still insufficient data to evaluate whether impacts will likely be Small, Moderate, or Large.

**Q9. In the report prepared by Southern's witness, Mr. Coutant, he states that "only slightly more than one mile [it] is would need to be dredged in total. Thus, dredging would occur in less than one percent of the surveyed river" (SNC 000051, page 4). The dredging, however, is not estimated to be on one isolated mile. Are the impacts different if the dredging were throughout the river, as opposed to on one isolated mile?**

A9. At this time, I do not anticipate any significant differences in water quality impacts. If there were any, the scattered dredging operations might be slightly better. I cannot opine on potential biological impacts.

**Q10. Do you agree with Dr. Coutant, in answer 15 of his prefiled direct testimony, that the "impacts of dredging on aquatic life will be localized, temporary and not biologically significant on a broad scale of geography or animal population of the 110 miles of the Savannah River"?**

A10. I am not qualified to opine on biological impacts. However, Dr. Coutant's conclusion is

not surprising for a volume of 36,000 cy over a 110 mile length of the river. This volume is much smaller than intimated in the FEIS.

**Q11. In answer 12 of your prefiled direct testimony you state that “the FEIS does not provide sufficient data and information to estimate the extent of these impacts on the Savannah River ecosystem.” Given the prefiled direct testimony of Southern’s witnesses, do you now believe that extent of impacts can be better estimated? Do you have an estimation of their extent?**

A11. The impacts should be able to be better estimated now that we have locations and volumes of sediments. However, I have not attempted to estimate the water quality impacts because Southern did not provide enough data to do so.

**Q12. Are the studies relied upon by Southern and the Staff sufficient? In your opinion, are more studies necessary to determine the likely effects in the aquatic environment?**

A12. More information is necessary to quantify potential the effects on the aquatic environment. For example, no sediment quality data is available to show that the sediment is not contaminated. The FEIS (pages 7-20) mentions and describes a host of potential negative effects on mussels, benthic habitat, contaminated sediments, etc. None of these have been addressed quantitatively.

**Q13. Given the prefiled direct testimony that has been provided through Southern’s witnesses, have sediment placement impacts been sufficiently discussed and analyzed?**

A13. No. Sediment placement has not been defined. In Answer 21 of the Nuebert, Smith, and Scott testimony where they stated “(All) Based on our collective experience, we believe that the

dredged material would be disposed of in a regulated spoils area.” In Mr. Moorer’s testimony, Answer 8, he states “Whereas, the 1976 EIS indicates that ‘within bank’ disposal methods would be used, it is my opinion that the Corps will instead use existing upland disposal areas or move the material to heavily eroded areas to replenish sand lost to hurricane or heavy wave damage.” It seems that Southern’s witnesses are assuming that dredging and disposal will be the responsibility of the Corps of Engineers. However, there is no discussion or analysis of potential sediment placement impacts.

**Q14. Given the supplemental information in the prefiled direct testimony of Southern’s witnesses, particularly Thomas Moorer regarding practices employed by the Army Corps of Engineers, are the likely impacts from sediment placement consistent with the MODERATE designation?**

A14. Assuming that Southern’s witnesses are correct that only 36,000 cy of sediment will be dredged, the small volume and the use of existing disposal facilities (if available) reduce the likelihood of significant impacts. However, no information has been provided on the condition of the disposal sites. If major construction is necessary to restore these disposal sites prior to use, the impacts will increase. Also, as I noted previously, more dredging may be required than Southern estimates. If the volume of sediment is significantly more than Southern estimates, the impacts will increase.

**Q15. In your opinion, has the FEIS and subsequent testimony provided adequate information regarding potential contamination of sediment with hazardous material and the potential impacts of that contamination during dredging?**

A15. No. Sediment quality data were not provided. The Corps, in Answer 21 states “The

USACE has not sampled sediments in the Savannah River Federal navigation channel and can not accurately predict what contaminants may be present in those sediments. (CLB) If Southern elects to apply for a permit to dredge the Savannah River, Southern would need to comply with Savannah District sediment testing requirements in addition to identifying the disposal site.”

**Q16. According to Mr. Coutant’s report, if the dredged material were loaded on barges and transported to permitted disposal sites, “there would be essentially no environmental impacts of material disposal in the project reach.” Is this method feasible? Are there any foreseeable impacts associated with that method? Is it proper for the report to make the assumption that this method will be used?**

A16. Mr. Coutant is likely to be correct if the sediments are loaded into a watertight scow barge and supernatant water is not allowed to overflow as is typically done to reach an economic load. Overflow will release suspended sediment (and toxic constituents, if present) into the water column at a rate that would likely exceed any direct impacts from dredging. I am concerned, however, that these limitations are not clearly stated just how this dredging operation will be executed; thus, if the project moves forward, the approach may be changed in the interest of cost savings. The same is true for the sediment volume. Although impacts from 36,000 cy may not be significant, I am not sure what will prevent the project from expanding to a much larger volume once approved.

This approach may also expand the dredging requirements. The sediment barge will need to dock near the disposal facility to be pumped out or have the sediment removed mechanically. Either way, the docking area will need to be sufficiently deep to handle the barge draft. Further, it is also possible that the draft required by the sediment scow will exceed the 5.5 feet mentioned for the equipment delivery and may increase the dredging requirements.

In accordance with 28 U.S.C. § 1746, I state under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on March 17, 2009.

Executed in Accord with 10 C.F.R. 2.304(d)

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1 JUDGE BOLLWERK: And I think we have a  
2 couple of exhibits>

3 MS. GOLDSTEIN: Yes. Do you want me to  
4 just read them all through first?

5 JUDGE BOLLWERK: Yes, let's go ahead and  
6 get them identified. I think there are what, about  
7 half a dozen if I remember right?

8 MS. GOLDSTEIN: Seven.

9 JUDGE BOLLWERK: And again, you don't  
10 have to read necessarily the whole title, just so we  
11 have some way we can link it to the document.

12 MS. GOLDSTEIN: Sure.

13 All right, the first one is JTIR00005,  
14 entitled Declaration of Young in Support of Joint  
15 Intervenors Motion to Admit New Contention.

16 JUDGE BOLLWERK: All right. Let the  
17 record reflect that Exhibit JTIR00005 is identified  
18 for the record.

19 (Whereupon the aforementioned document  
20 was marked for identification as Exhibit  
21 JTIR00005-00-BD01)

22 MS. GOLDSTEIN: JTI000026 entitled U.S.  
23 Department of Commerce National Oceanic and  
24 Atmospheric Administration National Marine Fishery  
25 Service Final Recovery Plan for the Short Nose

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1 Sturgeon.

2 JUDGE BOLLWERK: And let the record  
3 reflect that Exhibit JTI000026 is entered - I'm sorry,  
4 is identified for the record.

5 (Whereupon the aforementioned document  
6 was marked for identification as Exhibit  
7 JTI000026-00-BD01)

8 MS. GOLDSTEIN: JTI000027 entitled  
9 Considerations for Flow Alternatives That Sustain  
10 Savannah River Fish Populations.

11 JUDGE BOLLWERK: Let the record reflect  
12 that Exhibit JTI000027 is identified for the record.

13 (Whereupon the aforementioned document  
14 was marked for identification as Exhibit  
15 JTI000027-00-BD01)

16 MS. GOLDSTEIN: JTI000029 entitled  
17 Monitoring of Organic Compounds and Trace Metals  
18 During a Dredging Episode.

19 JUDGE BOLLWERK: Let the record reflect  
20 that Exhibit JTIR00029 has been identified for the  
21 record.

22 (Whereupon the aforementioned document  
23 was marked for identification as Exhibit  
24 JTIR00029-00-BD01)

25 MS. GOLDSTEIN: JTI000040 entitled Chlor-

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1 Alkali Plant Contributes to Mercury Contamination.

2 JUDGE BOLLWERK: Let the record reflect  
3 that Exhibit JTI000040 has been identified for the  
4 record.

5 (Whereupon the aforementioned document  
6 was marked for identification as Exhibit  
7 JTI000040-00-BD01)

8 MS. GOLDSTEIN: JTIR20041 entitled  
9 Declaration of Hayes in Support of Joint Intervenors  
10 Motion to Admit New Contention.

11 JUDGE BOLLWERK: Let the record reflect  
12 that Exhibit JTIR20041 has been marked for  
13 identification.

14 (Whereupon the aforementioned document  
15 was marked for identification as Exhibit  
16 JTIR20041-00-BD01)

17 MS. GOLDSTEIN: And JTI000045 entitled CV  
18 of Donald Hayes.

19 JUDGE BOLLWERK: Let the record reflect  
20 that Exhibit JTIR00045 has been marked for  
21 identification.

22 (Whereupon the aforementioned document  
23 was marked for identification as Exhibit  
24 JTIR00045-00-BD01)

25 MS. GOLDSTEIN: We move to admit all

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1 these exhibits into evidence.

2 JUDGE BOLLWERK: All right. Any  
3 objections?

4 (No response)

5 JUDGE BOLLWERK: Hearing none, let's go  
6 through this then very quickly. Listen carefully to  
7 the numbers, make sure I give them to you correctly.

8 With respect to Exhibits JTIR00005,  
9 JTI000026, JTIR00029 -

10 MS. GOLDSTEIN: I think you skipped 27.

11 JUDGE BOLLWERK: Did I? You're right.  
12 JTI000027.

13 MR. BLANTON: I may be wrong, Judge, but  
14 I was writing down "R" on most of these exhibits.

15 MS. GOLDSTEIN: I only have R written  
16 down for five, and then 41, but that doesn't mean  
17 there aren't other ones.

18 MR. BLANTON: It may be my mistake.

19 JUDGE BOLLWERK: I think - this is going  
20 to be complicated. I think for 29 I identified 29  
21 with an R, so even if you didn't read it in, I did.

22 And I think with respect to those our list  
23 is probably correct.

24 All right, let's start over one more time  
25 here. Let me go back.

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1 Okay. Once more. With respect to  
2 Exhibits JTIR00005, JTI000026, JTI000027, JTIR00029 -

3 MR. SANDERS: Your Honor, we don't have  
4 an R with 29.

5 MR. BLANTON: I don't either, Your Honor.

6 JUDGE TRIKOUROS: There's no R?

7 MR. SANDERS: It's an article, I don't  
8 think we would have any reason to revise it.

9 JUDGE BOLLWERK: All right.

10 MS. GOLDSTEIN: I mean as long as it's  
11 the correct article, if it's R or not, I don't think  
12 it matters.

13 JUDGE BOLLWERK: My list must be  
14 incorrect then. Hold on one second.

15 MR. BLANTON: We didn't file a motion in  
16 limine to my knowledge on this one that required a  
17 revision.

18 JUDGE BOLLWERK: There were some that we  
19 asked you to correct that didn't have a number on the  
20 first page.

21 MS. GOLDSTEIN: It's possible that that  
22 was one of them, but we shouldn't have renumbered  
23 them.

24 JUDGE BOLLWERK: They were filed twice?  
25 What is the number that is in the DDMS at this point?

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1 (Off-mike remarks)

2 JUDGE BOLLWERK: So we can distinguish  
3 it. Okay. So it's our numbering system, not yours.  
4 And it's going to go into the DDMS as an R, right? Up  
5 to the official record. All right, then that is the  
6 way we need to handle it.

7 (Off-mark remark)

8 JUDGE BOLLWERK: With 45 as well? Okay,  
9 all right. We will try one more time. The difference  
10 is if we don't put that R on it we'll have the same  
11 document in there twice, and we won't be able to  
12 distinguish between it, so that's what we are trying  
13 to avoid.

14 Okay, so just this clarification for the  
15 record. The curriculum vitae of William Powers - I'm  
16 sorry, the curriculum - let me go back here - I'm  
17 sorry, the article on monitoring of organic compounds  
18 and trace metals during a dredging episode in the  
19 Göta Älv estuary is identified as JTIR00029.

20 And the curriculum vitae of Donald Hayes  
21 is identified as JTIR00045.

22 So our records are consistent. And we'll  
23 go back one more time. We are all on the same page  
24 now, right, at least in terms of the DDMS.

25 One more time then in terms of admission

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1 of evidence, and I apologize to everyone for this, but  
2 we need to keep this straight. We are going to start  
3 with 26, right?

4 MS. GOLDSTEIN: Well, five is the first  
5 one.

6 JUDGE BOLLWERK: Back to five, okay,  
7 sorry. All right.

8 With respect to the following exhibits,  
9 JTIR00005, JTI000026, JTI000027, JTIR00029,  
10 JTI000040, JTIR20041, and JTIR00045, as they have  
11 been identified for the record, are admitted.

12 (Whereupon the aforementioned documents  
13 previously marked for identification as

14 JTIR00005-00-BD01, JTI000026-00-BD01,  
15 JTI000027-00-BD01,

16 JTIR00029-00-BD01, JTI000040-00-BD01,  
17 JTIR20041-00-BD01, and

18 JTIR00045-00-BD01 were received into  
19 evidence)

20 MR. MARTIN: Did we miss 36? Sorry, JTI36?

21 JUDGE BOLLWERK: Maybe I did. That is  
22 the next thing I want to do very briefly. I have some  
23 in here that supposedly were omitted. And let's go  
24 back and just check those and make sure. Thank you  
25 for bringing that to my attention, but I did want to

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1 go back through and check those, because I've got them  
2 here.

3 There were a series of exhibits which we  
4 have marked on here as omitted, and I want to make  
5 sure that there are no problems with those.

6 The first one of those was number 30 is  
7 marked as omitted.

8 MR. MOORE: Is that JTI30?

9 JUDGE BOLLWERK: JTI30, yes. Number 36  
10 was listed as omitted. JTI36. JTI39 was listed as  
11 omitted.

12 MS. GOLDSTEIN: Correct.

13 JUDGE BOLLWERK: And I think that's it.

14 MS. GOLDSTEIN: Yes.

15 JUDGE BOLLWERK: So we're all on the same  
16 page?

17 MS. GOLDSTEIN: Yes.

18 JUDGE BOLLWERK: And I was going to  
19 mention this later, but we will be going through, and  
20 I hope you will as well, when we get the transcript,  
21 and make sure that everything matches up. If there  
22 are any problems, we're not going to close the record  
23 until everybody has had a chance to look at it.

24 But again I think we are on the same page  
25 now, but make sure you check as will we, make sure

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1 that everybody has got what they want in the record.

2 And again I apologize for the delay.

3 Gentlemen, I apologize to you for the delay. Thank  
4 you for your patience.

5 All right, I think with the admission of  
6 the testimony and the exhibits we are all ready to  
7 proceed with board questions for these two gentlemen.

8 And I think my approach is going to be a  
9 little bit different with you all. We've had a lot of  
10 stuff come in in the last day and a half, and I  
11 thought I would sort of ask you some subject matter  
12 areas, sort of what your general impression is now  
13 given what you've heard in terms of the concerns that  
14 you raised before.

15 We talked I guess about the five versus  
16 six feet that's been a change in the testimony. Do  
17 you have anything further you want to say on that  
18 particular point? Or the question of dredging levels  
19 in general.

20 DR. HAYES: There are probably several  
21 things I should add.

22 One, is, understand the draft of the  
23 barges at standing is 5-1/2 feet. There is a - there  
24 will be some squat associated with movement that will  
25 take up a bit more of that space.

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1 I looked at the Corps of Engineers coastal  
2 engineering manual; they have some approaches there  
3 for estimating that, which coincidentally happened -  
4 six inches is about three knots. Of course since the  
5 barge will be going upstream, the relative loss will  
6 be a little bit higher than that at three knots.

7 I don't know that that is a real big  
8 problem. If there are only a few barges that are  
9 drafting 5-1/2 feet, they could probably put tows up  
10 front or behind and try to scoot over some shallow  
11 places.

12 If all 60 tows were - barges were six  
13 feet, I think that is probably stretching it a little  
14 bit. And I don't know what it would take.

15 That also doesn't include in the standard  
16 Corps procedure not only do you need to account for  
17 squat, as the barges move forward, but you also need  
18 some safety clearance at the bottom.

19 And again, for a few shipments that may  
20 not be such a big issue. But for a number as I heard,  
21 I was surprised at the number at 60, that seems to be  
22 more prudent to do.

23 So it does seem to me that six is cutting  
24 it really close.

25 JUDGE BOLLWERK: What would your feeling

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1 be, based on your knowledge and experience, as to what  
2 that six ought to be?

3 DR. HAYES: I'd need to know more about  
4 the barge loads that are being planned and how many  
5 are going to be heavily loaded to the full draft.  
6 Surely seven feet begins to make you feel a little bit  
7 more comfortable. If you have say a six inch to a  
8 foot squat, you still have six inches or so of  
9 clearance. That may be okay.

10 It could be that even a little bit more  
11 than that would be appropriate. But certainly given  
12 the nature, seven feet would make me feel much more  
13 comfortable.

14 JUDGE BOLLWERK: No, that's fine, finish  
15 your answer.

16 DR. HAYES: Again, I just want to go back  
17 and say, a lot depends on how many of those barges  
18 would be fully loaded to that 5-1/2 feet. You could  
19 get by with a few, but if it's every one, that is a  
20 bigger problem.

21 JUDGE TRIKOUROS: Sir, were you here  
22 yesterday when Captain Scott was giving testimony?

23 DR. HAYES: Yes, I was.

24 JUDGE TRIKOUROS: I believe from his  
25 testimony two barges will be - will be loaded to the

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1 5-1/2 foot point, because there are only two steam  
2 generators in the plant. Those are the heaviest  
3 components in the plant. So every other load will be  
4 less than 5-1/2 feet in accordance with his testimony,  
5 and the forward motion of the barges is nil, according  
6 to his testimony. And therefore there is a negligible  
7 reduction in that, or increase in that 5-1/2 feet  
8 associated with forward motion.

9 I just wanted to point that out.

10 JUDGE BOLLWERK: If we're looking at  
11 seven feet rather than six feet, do you have a sense  
12 of what that would do to the 36,000 cubic yards of  
13 dredged material that they were referring to, in terms  
14 of increasing it?

15 DR. HAYES: No, Your Honor, I do not.

16 JUDGE BOLLWERK: With respect to the  
17 information, you indicated you were here yesterday,  
18 that we heard about the dredging, is there anything  
19 else that comes to mind that you would want the Board  
20 to know based on your testimony? A change that has  
21 caused you concern, or something you want to comment  
22 on?

23 DR. HAYES: Well, the general process,  
24 and when I first became engaged I read the FEIS, and  
25 there are some statements in there that state that the

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1 entire channel would likely need to be dredged.

2 We have come a long way from that at the  
3 36,000 cubic yards. There is a vast difference  
4 between those numbers, a 36,000 cubic yard project is  
5 a very small to modest sized dredging project. It can  
6 be managed fairly readily. Contrary to what was  
7 mentioned yesterday, I'm sure they would use a  
8 mechanical dredge and place it in a barge and haul it  
9 downstream somewhere to either another permitted  
10 facility or some other use. There may a number of  
11 them depending on the characteristics of the material.

12 My concern is if there is any constraint  
13 on that number and how precise or accurate it may be.  
14 I'm not particularly concerned whether it's 36,000 or  
15 40,000 or 30,000. My concern is, the subject changes,  
16 and there is 36,000 it's 360,000. Now things change  
17 very dramatically, because we now have material that  
18 we can't manage in what you call a high cost effort of  
19 putting everything in barges and just doing whatever  
20 we can with it. We now need placement areas of some  
21 kind, and that opens up a whole new area of  
22 environmental impacts that will need to be addressed.

23 JUDGE JACKSON: Recognizing that your  
24 frame of reference probably for your direct testimony  
25 was more dredging the entire navigation channel. You

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1 concluded, you stated in your answer 12, you said,  
2 yes, the dredging impacts of the Savannah River  
3 ecosystem would be significant.

4 Is significant some term of art, or do you  
5 just mean significant in the normal dictionary  
6 definition?

7 DR. HAYES: More a normal dictionary  
8 definition. I was not attempting to put a low or a  
9 moderate or a high state. Just that it - they are not  
10 negligible, obviously negligible, therefore they  
11 deserve some assessment.

12 JUDGE JACKSON: Okay, that was the next  
13 question. I just wondered if that in anyway related  
14 to the three levels that the NRC uses, small, moderate  
15 and large, to classify impacts, and your testimony is,  
16 it is not. You just meant it would have some impact.

17 DR. HAYES: No, Your Honor, I did not  
18 find the information in the FEIS for me to make that  
19 type of assessment.

20 JUDGE JACKSON: Okay. While we're  
21 talking you had some comments in your direct testimony  
22 regarding potential contamination. Is that correct?

23 DR. HAYES: Yes, sir, I did.

24 JUDGE JACKSON: And you had a reference  
25 that you used to indicate that there could possibly be

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1 concern. I think your words were, not terribly  
2 strong, but you said it may indicate, and I just  
3 wanted to ask you a quick question or two regarding  
4 that reference.

5 It was a paper that related to this chlor-  
6 alkali plant here near Augusta, and some measurements  
7 of mercury.

8 DR. HAYES: What is the exhibit number if  
9 I could?

10 JUDGE JACKSON: The Exhibit Number is  
11 JTI000040.

12 I took a look at that, and it looked like  
13 the levels of mercury contamination upstream and  
14 downstream, I think the paper said they are not  
15 statistically different; is that your recollection?

16 DR. HAYES: Yes, sir, that is my  
17 recollection.

18 JUDGE JACKSON: Okay. The one thing that  
19 caught my eye, and perhaps you can help me on it, it  
20 said that the concentrations of mercury I believe it  
21 was downstream in the sediments, they reported it was  
22 46.6 plus or minus 51.2 parts per billion. And I  
23 found that rather strange that the uncertainty would  
24 be larger than the magnitude. To me that sounds like  
25 data in the noise level. What would you think?

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1 DR. HAYES: I agree that we do have  
2 difficulty with - and let me first preface this to say  
3 that I am not an analytical chemist. I'm an engineer,  
4 and I use the data. But having worked a lot with  
5 contaminated sediments, I'm pretty familiar with this  
6 issue being a problem, where the analytical chemist  
7 can actually measure a concentration, but there is a  
8 lot of uncertainty about the precision and ability to  
9 do it reliably.

10 And so our real purpose for this paper was  
11 not to claim that there is contamination, that I know  
12 that there is contamination. The thing that concerned  
13 me was that there was some data that indicated there  
14 could be, and the fact there were fish consumption  
15 advisories.

16 And these particular fish consumption  
17 advisories, most of those are sediment based. And so  
18 those two things just raised the concern for me that  
19 would seem again in the FEIS these deserve some  
20 consideration in the discussion.

21 JUDGE JACKSON: Okay, thanks.

22 JUDGE BOLLWERK: You already mentioned  
23 that you were here, and you probably heard Dr.  
24 Coutant's testimony with respect to contamination.

25 Is there anything further you want to say

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1 about that beside what you told Dr. Jackson?

2 DR. HAYES: No, Your Honor, I don't  
3 believe there is.

4 JUDGE BOLLWERK: Okay. Any further  
5 information you'd like to have the Board have on the  
6 terms of the dredge fill areas, potentially, and what  
7 is in the testimony and what you may have heard over  
8 the last day or so.

9 DR. HAYES: I can't think of anything.  
10 Oh, let me if you don't mind, I'll share a couple of  
11 items.

12 JUDGE BOLLWERK: Certainly.

13 DR. HAYES: The dredging, previous  
14 dredging was done in 1979, and much as the Corps  
15 mentioned, I believe it was a Corps witness who  
16 mentioned those areas, realistically, may still exist,  
17 but are not readily available.

18 So if the volume that is dredged does  
19 reach a point where it needs to be managed locally,  
20 and that is placed somewhere, this will be a fairly  
21 substantial action to do that, getting a site  
22 identified, permitted, and constructed is a  
23 significant action.

24 JUDGE BOLLWERK: One of the questions  
25 I've come away with is that sounds to be definitely

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1 the case.

2 DR. HAYES: Yes, Your Honor. It's not  
3 impossible, certainly not even within the timeframe we  
4 have. But it is not a short term process.

5 JUDGE BOLLWERK: All right.

6 Let's see, we had testimony yesterday  
7 relative to - and we also talked to the staff about it  
8 today - about limited work authorizations, and impact  
9 on dredging relative to the limited work authorization  
10 that is part of the early site permit.

11 Do you have any concerns about limited  
12 work authorization, dredging related to limited work  
13 authorization?

14 DR. HAYES: No, Your Honor, I'm not  
15 familiar with the NRC proceedings, and so those terms  
16 don't mean anything. I don't really understand the  
17 context of how they fit; I apologize.

18 JUDGE BOLLWERK: All right. I'm not sure  
19 that I want to necessarily try to define it. But  
20 basically it has to do with limited - the  
21 authorization, limited work authorization is the  
22 ability that the applicant will be given to perform  
23 certain - what's the best way to describe it?

24 JUDGE JACKSON: Basically civil engineer,  
25 right?

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1 DR. HAYES: Yes, sir.

2 JUDGE JACKSON: They're talking about  
3 going in and excavating to the bedrock, and in essence  
4 preparing for foundation structures, and taking care  
5 of some of the preliminary activities that would go on  
6 before you would actually get into construction. And  
7 refilling, putting in engineered materials to meet  
8 their design goals.

9 DR. HAYES: I guess my response, Your  
10 Honor, would be that if there is no dredging involved,  
11 that doesn't concern me. But from the testimony I've  
12 heard the last few days, it does seem that that is an  
13 issue that is at the very forefront that needs to be  
14 addressed the short term because of the timeline of  
15 any of the alternatives discussed.

16 JUDGE BOLLWERK: In terms of dredging you  
17 mean it's something that needs to be addressed?

18 DR. HAYES: Yes, sir. My understanding  
19 was, the shipments were scheduled for 2012. We're in  
20 2009. For most of the alternatives, I could speak  
21 more directly to that if you are interested. There's  
22 a - it's a workable window, but there is not a lot of  
23 flexibility.

24 JUDGE BOLLWERK: Did you want to say  
25 something? I thought you had a question.

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1 JUDGE TRIKOUROS: Do you want to repeat  
2 the question?

3 JUDGE BOLLWERK: I think he was offering  
4 to give us a little bit more of his views on the  
5 difficulty we might be facing, the possibility of  
6 getting a permit or getting authorization in the  
7 timeframe that we have heard about.

8 Am I correct?

9 DR. HAYES: Yes, if you'd like.

10 JUDGE BOLLWERK: Sure. March ahead, I'm  
11 sorry.

12 DR. HAYES: That's okay. And I really  
13 have nothing to say that is really contradictory to  
14 what has already been said by the Corps of Engineers  
15 or the NRC panel. The process if Southern - I guess  
16 the one thing that I would say differently is, if  
17 Southern were to be the applicant, and were to do the  
18 assessment that I just as a general rule would have  
19 expected to see in the EIS, the Corps of Engineers  
20 would use that information as part of their permitting  
21 process.

22 Once that is available, the permitting  
23 process for 36,000 cubic yard project is probably  
24 measured in months to a year, six months probably on  
25 the short side, a year or shortly thereafter is more

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1 likely, so it's probably a very doable process.

2 I think internally the other issues you  
3 heard from the Corps are much more problematic, and I  
4 think it would be hard to see almost any of those be  
5 executed outside of a direct congressional  
6 authorization that said, move on expeditiously. It's  
7 possible that could occur.

8 JUDGE BOLLWERK: When you say other  
9 issues, you are talking about money issues or priority  
10 issues within the Corps' other projects? Is that it?  
11 What other issues are you talking about?

12 JUDGE TRIKOUROS: Are you talking about  
13 if Southern were to do the dredging?

14 DR. HAYES: Yes, sir, if Southern were to  
15 do the dredging.

16 JUDGE BOLLWERK: And what are the issues  
17 you are referring to that might delay this? You said  
18 there were other issues. I'm just trying to decide  
19 what those were. I may have misunderstood the answer  
20 then.

21 DR. HAYES: I can't think of any specific  
22 issues. It's more just the Corps process and  
23 sometimes it works a little faster than others  
24 depending on the fiscal year cycle and availability of  
25 funds and things of that nature.

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1 JUDGE BOLLWERK: All right.

2 We heard about the possibility of some  
3 other transportation alternatives, either rail or  
4 highways. Is there anything you have, do you want to  
5 comment on those at all?

6 DR. HAYES: No, sir, that's out of my  
7 expertise.

8 JUDGE BOLLWERK: Any comments relative to  
9 the NRC's staff testimony in terms of their  
10 designation of moderate and how they arrived at that  
11 determination?

12 DR. HAYES: Nothing beyond what I stated  
13 in my direct testimony that from the information I saw  
14 I would not be able to provide a ranking at all.

15 JUDGE BOLLWERK: And in terms of the  
16 survey that Captain Scott did, I think if I remember  
17 his testimony correctly, he sort of indicated that it  
18 may well be that the Corps would require something  
19 additional.

20 What does your experience suggest in that  
21 regard?

22 DR. HAYES: I was a little surprised at  
23 that, and he may know something that I am unaware of.  
24 Different districts do operate a little differently,  
25 but the normal surveys are done on 500-foot intervals,

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1 and that typically is what they would do planning on,  
2 which is about a tenth of a mile.

3 JUDGE BOLLWERK: So you thought what he  
4 actually produced might well be acceptable to the  
5 Corps?

6 DR. HAYES: It's been my experience that  
7 that would be acceptable in the planning and  
8 projection of an estimated yardage. Again, he came up  
9 with 36,000 cubic yards. I'm not exactly sure of the  
10 assumptions he made for that. But in the permitting  
11 process you normally would give yourself some  
12 allowance and make it clear that in the actual  
13 dredging it'd be more.

14 Now as the dredging goes on, there will be  
15 a pre-dredging and a post-dredging survey, just before  
16 and just after the operation for payment. That will  
17 be much more detail.

18 JUDGE BOLLWERK: And who would do those?

19 DR. HAYES: Usually the Corps of  
20 Engineers. If the Corps is paying for the dredging.

21 JUDGE BOLLWERK: Right, it depends on  
22 who's paying?

23 DR. HAYES: That's correct, it will  
24 depend on who is paying.

25 JUDGE BOLLWERK: Okay, so if the Corps is

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1 paying, the Corps would do it or their contractor  
2 would do it?

3 DR. HAYES: Yes, sir.

4 JUDGE BOLLWERK: And if you're under a  
5 permit, the private party that has come in then they  
6 would be responsible for that?

7 DR. HAYES: Yes, sir.

8 JUDGE BOLLWERK: Do you have any comments  
9 relative to the discussion that we heard about the  
10 possibility of flow changes, raising the river  
11 essentially or changing its level to facilitate barge  
12 traffic?

13 DR. HAYES: I'm not sure I could add much  
14 to that discussion. It does seem like given the  
15 drought conditions that we are in and the number of  
16 barge loads that that is not a practical alternative  
17 for a lot of traffic. Again if you have a few that  
18 are heavy there may be some things that can be done.  
19 It depends a little bit on the rainfall is what we  
20 heard from Mr. Simpson in the next few years. The  
21 situation could change very rapidly. I'm not sure  
22 you'd want to plan on that as a possibility.

23 But again as one of the panel mentioned,  
24 considering the number of barges you are talking  
25 about, and the duration of the flow, it doesn't seem

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1 very practical that you could raise the flow for that  
2 period of time. It'd almost be a two-year window that  
3 the flow was always high.

4 JUDGE BOLLWERK: All right. Anything  
5 further?

6 Let's turn to Dr. Young then. You heard  
7 some testimony from Dr. Coutant about contamination  
8 and mussels. And by the way if you basically, what  
9 opinion do you have of that, or what information would  
10 you like the Board to have relative to what you heard?

11 DR. YOUNG: In terms of the  
12 contamination, it is pretty much an accepted fact that  
13 if you disturb the sediments of any body of water,  
14 frequently that will resuspend any contaminants in  
15 that particular area.

16 So mussels being a filter feeding  
17 organism, would be then subject to the resuspension of  
18 any contaminants in that affected area. And so in my  
19 previous testimony I raised that fact. I did not  
20 scour the contaminant studies to find out which ones  
21 were there or weren't there. I just posed the fact  
22 that if there are highly contaminated areas with any  
23 type of toxic chemicals, the dredging or the  
24 disturbance of those sediments likely will resuspend  
25 them and thus mussels being filter feeders will be

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1 subject to those resuspended toxicants.

2 JUDGE BOLLWERK: What about the fact that  
3 we are talking at least as I understand it about sand  
4 bars, where like I said there was testimony that the  
5 mussels are not likely to be there.

6 DR. YOUNG: Well, actually for this  
7 question can we refer to a piece of evidence, please?

8 JUDGE BOLLWERK: Sure. What number?

9 DR. YOUNG: If you will give me one  
10 second. It is the NRC No. 5. It should be the  
11 freshwater mussel surveys conducted by the Catena  
12 Group.

13 JUDGE BOLLWERK: And what particular page  
14 do you have in mind?

15 DR. YOUNG: Yes, sir. Let's look at page  
16 8 please. The very first paragraph. If you will  
17 reference site 15 at river mile 68, within this  
18 paragraph it should be the third sentence. For this  
19 particular survey site it states the substrate is  
20 dominated by shifting sands in the channel, and sandy  
21 mud on the banks.

22 So it directly sampled this type of  
23 habitat that Dr. Coutant was referring to, and then if  
24 you read a few sentence below it also discusses there  
25 is a large amount of woody debris in this particular

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1 habitat, and that in this shifting sand habitat they  
2 still found nine species of mussels.

3 So there are mussels present in this  
4 shifting sand habitat in fairly high abundance, which  
5 is contradictory to Dr. Coutant's testimony.

6 And if you further evaluate those nine  
7 species by going to - let me find the page number - if  
8 you could go to page 32, and the very first portion of  
9 the page there is a list for site 15, listing those  
10 nine species. If you refer to this list and then go  
11 back into several of the previous pages leading up to  
12 that where the authors of this report discuss the  
13 status and some of the general characteristics of each  
14 of these species, you will see that within the  
15 shifting sand habitat there are five species of  
16 special concern, and there is one that is a federal  
17 species of concern, and one that is a candidate for  
18 endangered by the state of South Carolina.

19 JUDGE BOLLWERK: Could you identify those  
20 given what we have in front of us?

21 DR. YOUNG: Yes, sir. And this is based  
22 on what you will find in this report from pages -  
23 starting on page 12 and subsequent pages, the authors  
24 of this particular report lists the current status of  
25 these species.

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1                   So *Elliptio folliculata*, species of  
2 special concern, and that is listed by Williams, et  
3 al, 1993, which is a major publication within  
4 freshwater mussel research. It is basically the  
5 accepted standard for discussion of the status of  
6 freshwater mussels in North America. So they list  
7 that species as of special concern.

8                   JUDGE BOLLWERK:   And that is the third  
9 one down on site 15?

10                  DR. YOUNG:    Yes, that is the third one.  
11 And then the fourth one, *Elliptio hopetonensis*, also  
12 a species of concern *Elliptio roanokensis*, which is  
13 just down from the previous also species of concern;  
14 then the *Lampsilis cariosa*, that is the species that  
15 is a candidate for endangered in the state of South  
16 Carolina, and it is also a federal species of concern  
17 throughout its range.

18                  And then finally the *Villosa delumbis* is  
19 also a species of concern.

20                  So even within these poor shifting sand  
21 habitats you still have relatively high mussel  
22 abundance with species of concern that really will be  
23 affected by these dredgings.

24                  JUDGE BOLLWERK:   So you are saying that  
25 site 15 as it's identified here with the longitude and

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1 latitude, I guess those are the listings, that  
2 elsewhere in this document these are - this is  
3 identified as a shifting sands environment I take it?

4 DR. YOUNG: Yes, I believe the authors  
5 tried to sample an array of different substrate  
6 habitat types to try to get an overall feel of what  
7 mussels are left, because different species of  
8 mussels, they will try to segregate by microhabitats.  
9 So some might prefer a more sandy habitat; some might  
10 prefer a more clay gravel habitat. And so this must  
11 be one of the sandy habitats they chose to sample in  
12 their survey.

13 JUDGE BOLLWERK: And you think or believe  
14 that the habitat we are talking about here would be  
15 similar to what they are talking about dredging?

16 DR. YOUNG: Yes, if they are targeting  
17 more sandy habitats, then this would be more  
18 indicative. I believe if they are going to dredge  
19 certain portions of the channel, they are probably  
20 going to dredge into some other micro-habitat types.  
21 Potentially some gravels, they might dredge into some  
22 clays. And there could be other species in that area  
23 on top of what would prefer just sand.

24 JUDGE BOLLWERK: All right. Anything  
25 further with respect to Dr. Coutant's testimony that

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1 you want us to be aware of?

2 DR. YOUNG: Well, in terms of your  
3 question or in terms of his testimony in general?

4 JUDGE BOLLWERK: Either one, however you  
5 would like it?

6 DR. YOUNG: Well, if we could move on to  
7 not only the dredging but the removal of the large  
8 number of trees from the channel.

9 JUDGE BOLLWERK: All right, certainly.

10 JUDGE JACKSON: I thought you were going  
11 to go on and talk a little more about mussels.

12 DR. YOUNG: We could do that.

13 JUDGE JACKSON: I have a question before  
14 we go to snags. Let me maybe ask my question.

15 DR. YOUNG: Yes, sir.

16 JUDGE JACKSON: In your answer 12 in your  
17 direct testimony you were talking about impacts, and  
18 in that testimony you stated that previous dredging  
19 has been identified as a major cause for freshwater  
20 mussel decline, and you offer reference JTI000017 as  
21 your basis for that statement; is that correct?

22 DR. YOUNG: Yes.

23 JUDGE JACKSON: Okay. You should never  
24 reference papers unless you want me to look at them.

25 DR. YOUNG: Sir, that's fine; it's right

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1 in there.

2 JUDGE JACKSON: I looked at that paper.

3 JUDGE BOLLWERK: Do we need to bring  
4 anything up?

5 JUDGE JACKSON: It's JTI000017. And  
6 first of all is this a paper that relates to global  
7 declines, or is it something specific to Savannah  
8 River and this area?

9 DR. YOUNG: This is a paper trying to  
10 summarize, as you will see from the title, the whole  
11 phenomena of North American freshwater fauna in severe  
12 decline.

13 JUDGE JACKSON: So the answer is that it  
14 is more global?

15 DR. YOUNG: Well, it's specific to North  
16 America, so that includes the United States.

17 JUDGE BOLLWERK: But more generic I take  
18 it though.

19 JUDGE JACKSON: All right, fine. I tried  
20 to see what it had to say about dredging. And I found  
21 a reference to dredging in the last kind of summary  
22 paragraph. Is that where dredging is dealt with in  
23 this paper?

24 DR. YOUNG: Yes.

25 JUDGE JACKSON: Okay, I didn't miss

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1 anything then. And it says -

2 DR. YOUNG: What page are we on, I'm  
3 sorry?

4 JUDGE JACKSON: This is on page -  
5 actually 1222 is the page in -

6 DR. YOUNG: Okay.

7 JUDGE JACKSON: It's right at the end.  
8 There we go, you just passed it. In that paragraph  
9 under widespread modification, and if you will look at  
10 those first few sentences, that is where it talks  
11 about dredging, and it says that the alarming trends  
12 for freshwater fauna are linked to extensive habitat  
13 deterioration caused by sediment loading, inorganic  
14 pollution from land-use activities, toxic contaminants  
15 from municipal and industrial sources, stream  
16 fragmentation, and flow regulation by dams,  
17 channelization and dredging projects and interactions  
18 with increasing numbers of exotic species.

19 A pretty huge list of things that could  
20 impact mussels. Do you have a methodology for knowing  
21 what fraction of this total impact is from dredging,  
22 since it seems to list just about everything I can  
23 think of.

24 DR. YOUNG: This is an encompassing paper  
25 that has been widely accepted just to explain the

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1 phenomenon. So they list in general what the major  
2 causes of decline are. Within any river system it  
3 could be one, it could be two, it could be several.  
4 In most of the river systems of North America,  
5 including the Savannah River, it's likely going to be  
6 all of the above.

7 So again going back to previous testimony  
8 trying to tease out the exact cause from just one  
9 source of impact is very difficult when you have a  
10 large river system undergoing all of these impacts  
11 simultaneously and in synergy, and given that the  
12 Savannah River was a navigation channel for many  
13 years, and it was undergoing severe dredging, it's  
14 likely that that dredging was detrimental to the  
15 mussel populations in the Savannah River.

16 Once it ceased that may have helped  
17 stabilize the mussel population. So what is still in  
18 the river may be directly attributable to reduced  
19 dredging.

20 I can't be certain of that.

21 JUDGE JACKSON: All right. I just didn't  
22 see a lot of - I wondered if I'd missed some real data  
23 on dredging, or some systematic studies that showed if  
24 you do this much dredging here is the impact.

25 I mean it was like one comment in a whole

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1 series of things. And I didn't miss anything back in  
2 the body of the paper somewhere; that's my last  
3 question.

4 DR. YOUNG: There are other publications  
5 that -

6 JUDGE JACKSON: I just wanted to focus on  
7 this one, because this is the one you cited as the  
8 basis for making the statement that it was a major  
9 impact, and I just wanted to - I kind of thought I  
10 would see a major impact on dredging and its impact,  
11 but instead it was very global, and mentioned dredging  
12 as one factor out of a large number.

13 DR. YOUNG: Well, it is a major factor  
14 all across the world, in almost likely every major  
15 river system near any civilized development that we  
16 have dredged and modified the channel of most major  
17 river systems, which is a direct cause -

18 JUDGE JACKSON: I'm sorry, I was just  
19 trying to understand the basis - you reference this as  
20 the basis for your conclusion, and I just wanted to  
21 understand that basis. Thank you.

22 JUDGE BOLLWERK: You were talking about  
23 mussels, I believe. You were about to - did you have  
24 any other questions about mussels? We had some staff  
25 discussion about the relocation of mussels. Anything

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1 you want to add in that regard?

2 DR. YOUNG: Yes. One of the responses by  
3 the staff gave a correct depiction of relocation of  
4 mussels that it is highly variable. There are  
5 instances where they have relocated mussels for bridge  
6 construction, new hydropower construction, what have  
7 you, and they move groups of mussels and they have 100  
8 percent mortality.

9 Other studies have shown that they  
10 undertake the same activity and they have very good  
11 success. And they cited the experience of the folks  
12 performing these translocations as a major factor, and  
13 I would agree with that, that folks who just take  
14 these consulting gigs to make money to grab mussels  
15 and put them somewhere else tend to have very low  
16 success rates.

17 Folks who have more in depth knowledge of  
18 the actual life history and understanding of the  
19 importance of picking very good habitat for the new  
20 location, and how it will relate to all the aspects of  
21 their life history which is fairly complex, including  
22 which fish host might be available once you've placed  
23 the mussels in this new location being present. They  
24 have better success.

25 But yet it appears to be very stressful on

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1 a mussel to be taken from a habitat and placed in new  
2 habitat, because if there is some dis-linkage, they  
3 have very little mobility. They can't just up and  
4 swim or really move to a new habitat. If there is a  
5 dislinkage, likely they will die at any point in their  
6 life history.

7 So it has resulted in very variable  
8 success rates.

9 JUDGE BOLLWERK: All right. Anything  
10 further on mussels you'd like us to be aware of?

11 DR. YOUNG: Not at this point. If you  
12 have any more questions we can come back.

13 JUDGE BOLLWERK: And I think we have  
14 covered contamination of the potential dredge material  
15 fairly well. Anything further you want us to know  
16 about that in terms of what you've heard or other  
17 concerns you might have?

18 DR. YOUNG: Well, the concern I might  
19 have is the fact that you have Savannah River site  
20 upriver. You have the Vogtle plant. Those are  
21 nuclear facilities. Again, I'm not an expert on  
22 contamination and what may or may not have been  
23 released from those facilities. I do know I was part  
24 of a study that Clemson had a grant contract to  
25 perform an SRS where we tracked fish that were tagged

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1 at the Savannah River site on their facility. And the  
2 concern was that those fish were leaving the site with  
3 possible contamination and moving out to the river and  
4 down through the area.

5 IN that case they were concerned that  
6 fishermen were catching contaminated organisms.  
7 However if that is one potential concern that they are  
8 transporting - one mode of transportation is fish, I'd  
9 be concerned that there may have been other modes of  
10 transportation.

11 Again, I'm not an expert, and I haven't  
12 reviewed any reports to say there is or is not any  
13 type of contamination from nuclear facilities. But  
14 they are there, and they have been there for quite a  
15 long time. So I would be concerned as a biologist.

16 JUDGE BOLLWERK: All right. You started  
17 to talk about snags a second ago. Maybe we should  
18 revisit that subject for a second.

19 DR. YOUNG: For the large woody debris  
20 the fact that the channel hasn't been dredged for  
21 nearly 30 years, I believe from being out on the river  
22 on many occasions, tracking fish and what have you, I  
23 think that has allowed for a lot of the large woody  
24 debris, which is very important for stream and river  
25 function to have reestablished. So to go through and

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1 start to undo that progress in terms of a more natural  
2 river system I believe it would have larger effects  
3 than what the staff and the applicant has stated  
4 previously.

5 And for instance I'm going to refer to  
6 NRC000017, which is a publication on robust redhorse.

7 So if you will look on the first page here within the  
8 abstract, towards the bottom of the abstract, three  
9 sentences from the bottom there is a statement -

10 JUDGE BOLLWERK: Just going to blow it up  
11 here.

12 DR. YOUNG: So there is a statement,  
13 robust redhorses were consistently found in  
14 association with woody debris. And if you would like  
15 to read the rest: gravel stream bed sediments along  
16 the outer edge of river bends.

17 So robust redhorse, a lot of the other  
18 Catostomids, other fish species, and mussels, tend to  
19 congregate near these woody structures for numerous  
20 reasons. And just to exhibit the importance of this  
21 woody debris habitat to robust redhorses, if we go to  
22 page 1152 of the publication, it'll be the second  
23 column first paragraph.

24 So when we - and I refer to we, folks at  
25 Clemson, my colleagues during my tenure at Clemson, I

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1 assisted in this particular study personally, we would  
2 find that frequently as it states starting in the  
3 second sentence, radio-tagged robust redhorses often  
4 migrated more than 100 river kilometers to spawning  
5 habitats and then returned a few weeks later to the  
6 same fallen tree where they spent much of the previous  
7 winter. It appears that the robust redhorse had these  
8 smaller home ranges that key on habitats with high  
9 amount of woody debris.

10 Exactly why, we can only speculate that  
11 they are probably good feeding stations, and it  
12 provides a flow break and it provides protection from  
13 predators, what have you. But that exhibits the  
14 importance of the reestablishment of the woody debris  
15 in the Savannah River, and how a number of these  
16 species of concern or threatened and endangered  
17 species - this is a very important habitat to them.

18 And the number of trees that may have to  
19 be removed from the channel, I see - there's no way it  
20 would not affect these vulnerable species.

21 JUDGE TRIKOUROS: I just wanted a  
22 clarification. If you remove a tree, does that mean  
23 that the robust redhorse perishes immediately? Or  
24 what is the timeline of all of that?

25 JUDGE BOLLWERK: And let me just modify

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1 that to say when we say, talk about removal, my  
2 understanding is, most of the testimony we heard was  
3 basically they are not going to generally take it out,  
4 but they are going to simply move it somewhere out of  
5 the channel.

6 DR. YOUNG: Well, correct, but the robust  
7 redhorse, particularly in the adult stage, doesn't  
8 like to utilize shallow habitats. Shallow habitats  
9 create vulnerability to predation, and they probably  
10 are not very good feeding stations for the adult  
11 robust redhorse.

12 So by removing - and it would depend on  
13 how many trees are in a particular transect and how  
14 many they pluck out of that. Are they going to  
15 completely denude a section of river of all its trees,  
16 or are they only going to remove a select few? These  
17 are details that I personally wasn't able to find and  
18 I don't believe are in FEIS.

19 JUDGE BOLLWERK: I think the intent would  
20 be to move whatever trees are in the way of the  
21 channel. To get a clear channel you've got to have  
22 those trees that are blocking the channel out of the  
23 way. I think there were like 200 of them altogether  
24 that were noticed in one way or another.

25 JUDGE TRIKOUROS: Two eighty eight.

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1 JUDGE BOLLWERK: Two eighty-eight?

2 DR. YOUNG: Correct. So if there is a  
3 stretch of half a mile of river that has 50 to 100  
4 noticeably large woody debris, and I don't know does  
5 that 300 mean you are taking out 100 here, in one  
6 stretch, 100 in this stretch, 100 in this stretch, so  
7 you are only affecting three stretches? Or is it  
8 going to be - what size of stretch of that river.

9 Point being if there are robust redhorse  
10 in that area and you remove their essential habitat,  
11 I couldn't tell you personally what's going to happen  
12 to them. But altering their habitat is going to be a  
13 negative impact.

14 There's been no study to denude or take  
15 the large woody debris out of a robust redhorse  
16 habitat and see if they survive. Do they just simply  
17 move to a new habitat? Or do they vacate the area,  
18 wander, and end up as a mortality.

19 JUDGE BOLLWERK: Given the process we're  
20 talking about with the Corps of Engineers, is that the  
21 sort of thing they would likely take into account in  
22 looking at any permit requests or dredging request?  
23 And I'd open that up to either gentlemen who wants to  
24 comment on it.

25 DR. YOUNG: Yes, sir. I imagine if a

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1 particular stretch of river is identified for large  
2 scale tree removal, they will probably conduct fish  
3 surveys to determine if there is an abundance of  
4 robust redhorse or any presence of robust redhorse in  
5 that area.

6 JUDGE BOLLWERK: Anything further with  
7 respect to snags? I sort of interrupted you; please  
8 go on. Sorry.

9 DR. YOUNG: Well, I think that was my  
10 example of the importance of snags.

11 JUDGE TRIKOUROS: I'm sorry, is that  
12 comment related specifically to the robust redhorse?  
13 In other words is that the only fish that is affected  
14 by the removal of snags, or is this a generic kind of  
15 issue?

16 DR. YOUNG: It's more of a generic issue.  
17 It is proven like in the field of water shed  
18 hydrology, you know, also the restoration of streams  
19 and rivers that the restoration of - and stabilization  
20 of large woody debris is a major factor in stream and  
21 river ecosystem function. For many years several  
22 federal agencies including the Forest Service had a  
23 policy of removing most of the woody debris from  
24 streams and rivers because they were obstructing  
25 logging operations, navigation, what have you. And it

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1 was shown over those decades that was detrimental to  
2 fish populations and mussels in those streams and  
3 rivers.

4 So now as part of river restoration and  
5 stream restoration, it's proven in most cases large  
6 woody debris, reestablishment is part of that program.  
7 Because it provides structure to the substrate, so you  
8 don't have a lot of streambed I guess disruption,  
9 which is important for mussels.

10 But also the breakdown of that organic  
11 material is one of the more important nutrient inputs  
12 that drives productivity. Which is important for  
13 especially larval and juvenile fish.

14 JUDGE TRIKOUROS: When you say  
15 reestablishment, what does that mean? You remove the  
16 tree? Then what do you do?

17 DR. YOUNG: Well, reestablishment in  
18 terms of restoration means that it's likely been  
19 removed, now we are going to put it back because it is  
20 that important. You need supplementation, where they  
21 actually will take wood from some other terrestrial  
22 area and put it back in the river.

23 JUDGE TRIKOUROS: In the same location  
24 where it was causing a problem before?

25 DR. YOUNG: Well, wherever it is deemed

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1 to be effective. For example it may be placed in a  
2 high velocity area to reestablish sediments to create  
3 stabilization of the streambed. It may be placed in  
4 shallows. It may be placed in the meanders of streams  
5 or rivers simply for a nutrient input or to provide  
6 cover for a fish or a mussel. So it serves several  
7 functions.

8 JUDGE TRIKOUROS: Maybe I'm  
9 misunderstanding. Is it a potential mitigation  
10 measure then with respect to dredging that when you  
11 take a snag out, and assuming the dredging is only for  
12 a short period of time it's designed to permit passage  
13 on the channel for only a limited period of time. You  
14 would then come back and put the piece of tree or wood  
15 back where you took it from?

16 DR. YOUNG: That is a potential. But  
17 again, in the limited time, you could have streambed  
18 disruption. If you have a mussel bed that has become  
19 established in the velocity break behind some large  
20 trees, and you remove those trees, even within three  
21 or four months you could have - the streambed would  
22 redistribute itself and would disrupt those mussel  
23 beds within that period of time.

24 Placing the tree back would be better than  
25 not. However, you could still have a negative impact

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1 on the animals.

2 JUDGE BOLLWERK: All right. Anything  
3 further, Judge Trikouros?

4 JUDGE TRIKOUROS: No.

5 JUDGE BOLLWERK: All right, anything  
6 further with respect to snags or tree removal and  
7 things of that sort?

8 DR. YOUNG: No, sir.

9 JUDGE BOLLWERK: Do you have any comments  
10 on the information we heard about transportation  
11 alternatives in terms of rail or highways as opposed  
12 to the dredging? I recognize those are not aquatic,  
13 but is there anything -

14 DR. YOUNG: I did listen to portion of  
15 that testimony, but again, that type of testimony is  
16 definitely outside of my expertise.

17 JUDGE BOLLWERK: All right. We also  
18 heard some testimony about flow changes and the  
19 potential that the Corps might change the flow in the  
20 river. Any comments on that testimony, both as  
21 relative to what we heard from the staff and the Corps  
22 of Engineers?

23 DR. YOUNG: Yes, it appears that for the  
24 length of period of time it would have to be  
25 manipulated would definitely alter the management plan

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1 away from a more natural hydrograph, and so again,  
2 that would be some more human alteration to take into  
3 account how that would affect the river. I can't be  
4 sure at this time.

5 JUDGE TRIKOUROS: How do you  
6 differentiate the human from natural? For example -

7 JUDGE BOLLWERK: Especially if you have  
8 a dam.

9 JUDGE TRIKOUROS: Yeah, if there is a  
10 flood problem, they will release whatever water they  
11 have to release to prevent the flood. How is that -  
12 so it will have whatever effect it has, I don't know  
13 what the frequency of all this is, and I guess it  
14 varies from year to year. But how is that different  
15 from releasing in a manmade fashion when there isn't  
16 a flood? I don't understand the distinction?

17 DR. YOUNG: Usually the manmade  
18 alteration, the variability created is on different  
19 time scales. An organism is adapted to variation.  
20 Every stream, river goes through annual cycles of  
21 flow, temperature regime, what have you. But they  
22 tend to be on a slower drawn out timescale that, they  
23 don't have these quick changes that human alterations  
24 tend to have on the environment.

25 So if you have a flood event in a stream

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1 with very little alteration, usually the landscape  
2 helps absorb part of that moisture, at least slow down  
3 the flow, and the rise is drawn out over a longer  
4 period of time. And then the descending limb of the  
5 flow is drawn out over a longer period of time. It  
6 gives the organisms more time to adapt or acclimate to  
7 that particular situation.

8 In terms of a human alteration, we tend to  
9 create where the flows change very quickly, whether  
10 it's increase the flow very quickly or we draw the  
11 flow down very quickly. But by making everything on  
12 shorter time scales, organisms aren't adapted to those  
13 very rapid changes.

14 So like if you have a mussel in a shallow  
15 habitat, if you raise the river up over time for  
16 barging; and the mussels redistribute up to those more  
17 shallow habitats thinking, okay, we now have a more  
18 stable water level, and then after the last barge the  
19 Corps says, okay, barging is down; we are now dropping  
20 back for water storage, and the river drops several  
21 feet. Well, those mussels can't properly redistribute  
22 themselves when we decide to just shut the water off.

23 If it was in a nature hydrocycle, it would  
24 be over a period of time, and it would simply move  
25 slowly to redistribute themselves to a lower water

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1 level.

2 JUDGE TRIKOUROS: My understanding is  
3 that in river management operations there are  
4 according to the testimony that we heard, there are  
5 rates of change that are associated with the  
6 management techniques that they use that would be  
7 geared exactly to that concern.

8 Isn't that the case? In other words, they  
9 are not going to change the river flow in a very short  
10 time. They'll do it in increments over the course of  
11 enough time for the population of fish to accommodate  
12 that, or other species.

13 DR. YOUNG: No, sir, there are very few  
14 studies or even anecdotal observations discussing the  
15 effect of flow rate changes or water level changes on  
16 a time scale that affect fish and mussels.

17 I currently have a paper in press -  
18 actually in review, hopefully in press - where I'm one  
19 of the first people ever to try to determine on what  
20 time scale and to what extent would water fluctuation  
21 cause mussels to move. And this is in a laboratory  
22 setting, because it is very difficult to study out in  
23 nature.

24 But it has received very little funding  
25 and very little attention. Folks especially folks

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1 that study reservoir environments, frequently will  
2 give anecdotal accounts of when they drop the  
3 reservoir down to a low level in anticipation for  
4 spring storage, they will walk out and see that they  
5 have left the water mussels high and dry, and it's  
6 killed off a high percentage of mussels in shallow  
7 habitat.

8 That is the extent of any type of study.  
9 And as far as I know very few facilities have ever  
10 adjusted their flow rate to accommodate mussels.

11 JUDGE JACKSON: Can I ask you a question  
12 about something you said earlier that I am just  
13 puzzling over? You said that typically human  
14 activities have led to more frequent variations or  
15 more sudden variations, I guess, something like that.  
16 I would have thought that something like the dam  
17 system that they have on the Savannah River, Thurmond  
18 Dam, which tends to regulate the release, would have  
19 evened that out instead of making it more often, every  
20 time you would have storms it would be changing.

21 If you had a flow gauge, wouldn't  
22 controlling the release actually decrease the -

23 DR. YOUNG: Well, actually, you are  
24 correct. And that is another type of change. You can  
25 modify and negatively affect the organisms by not

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1 allowing any variations. Because a lot of these  
2 organisms will key in on flow to move upriver as a cue  
3 to spawn. So if you fluctuate too much or don't  
4 fluctuate at all, they both can negatively affect.  
5 Because neither follows a natural hydrograph, a  
6 natural annual cycle that most organisms follow.

7 So you are correct in that regulating a  
8 river to a base flow with no variation is also a  
9 negative impact.

10 JUDGE TRIKOUROS: Damned if you do,  
11 damned if you don't, right?

12 DR. YOUNG: Well, that is the crux of the  
13 argument with human alterations. Nature is fairly  
14 fine tuned, and when you fiddle with it and you cause  
15 disruptions, there are a lot of nuances that we still  
16 don't understand that cause decline of some of these  
17 species.

18 JUDGE BOLLWERK: All right. Anything  
19 further then on river flow that you would like the  
20 Board to be aware of? Anything you heard?

21 DR. YOUNG: Well, just one other point  
22 about the river flow. There was a discussion of  
23 holding back water or not releasing so much water  
24 because of spring spawning of fish. I was just going  
25 to clarify that I believe that discussion was in

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1 reference to the fact that the Corps will hold back  
2 water to have a stable water level in the hydro  
3 system, in order to ensure that the recreational fish  
4 species have adequate spawning above Augusta. I don't  
5 think it was in terms of how it would affect the fish  
6 below Augusta, in the middle and lower river.

7 From my experience working on Thurmond  
8 with a lot of the local fisheries managers, I believe  
9 they hold that water to ensure that the large mouth  
10 bass, sunfish, catfish, have adequate reproduction to  
11 ensure that there is a good fishery, because it brings  
12 quite a bit of money to the local economy.

13 So that is another consideration in flow  
14 releases for the river below Thurmond Dam.

15 JUDGE BOLLWERK: All right.

16 Anything you would like the Board to know  
17 relative to the testimony we've had about the size of  
18 the potential dredging, at least as the applicant has  
19 laid it out, and the number of trips that would be  
20 involved in terms of the barging?

21 DR. YOUNG: For this particular question  
22 my thoughts would be, and I think you already have  
23 determined this, that the more dredging, the more  
24 barging that must take place, the larger the impacts  
25 will become; that if they are going to dredge the

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1 whole river channel as mandated, or as they have an  
2 authorization, of course that would have large  
3 impacts, much more severe impacts than if only 36,000  
4 cubic yards in select locations are going to be  
5 dredged.

6 So the scale of the activities would  
7 determine the scale of the impacts. And the larger  
8 the scale of the activity the larger the surveys or  
9 whatever sampling activities that might be required to  
10 ensure the distribution of different organisms, would  
11 also increase in scale.

12 So it's not unreasonable to require mussel  
13 and fish surveys at only eight one-tenth of a mile  
14 dredging locations. That is not unreasonable at all.

15 But if it becomes dredging of the  
16 authorized channel of course that would entail large  
17 scale sampling and of course would cost more money.

18 JUDGE BOLLWERK: Okay, anything on that?

19 All right, let me then ask both of you,  
20 anything further given what the discussion we've had,  
21 something that has occurred to you, you want the Board  
22 to be aware of relative to the testimony you have  
23 given or anything you heard over the last day or so?

24 DR. YOUNG: I personally, I feel the  
25 evidence we just reviewed makes my point about being

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1 cautious, showing caution towards these vulnerable  
2 species in terms of dredging and snag removals and the  
3 activities in contention 6.0.

4 JUDGE BOLLWERK: All right, thank you.

5 DR. HAYES: The only last point that I  
6 would like to add, and I've made a comment a couple of  
7 times that I didn't see in the FEIS what I  
8 anticipated, as raises the question what did I  
9 anticipate.

10 And I've worked a lot with the Corps, with  
11 the permitting process, and they were very engaging.  
12 So what I anticipated to see was maybe not entirely  
13 everything that would be necessary to cover the  
14 process, whether it be a permit application, or for a  
15 permit application or an internal EIS, but certainly  
16 a reasonably well defined dredging project, and what  
17 I'd call a substantive assessment of what those  
18 impacts might be associated with that.

19 That is sort of what I was looking for.  
20 Maybe when you go forward there will be a few  
21 additional studies or things you might have to do to  
22 truly round it out, but you'd expect to have the  
23 majority of that available.

24 That's what I anticipated.

25 JUDGE BOLLWERK: All right.

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1 Any other questions from either of the  
2 other judges at this point?

3 All right. Let's then if the parties want  
4 to take say 10 minutes to think about any questions  
5 that they would like the Board to pose to these two  
6 individuals.

7 Why don't we take a 10-minute break then,  
8 and we can return at that point.

9 (Whereupon at 12:37 p.m. the proceeding  
10 in the above-entitled matter went off the  
11 record to return on the record at 12:53  
12 p.m.)

13 JUDGE BOLLWERK: All right, let's go back  
14 on the record.

15 We've taken a brief break, and have had  
16 some questions that we'll direct to -- and the  
17 staff had none, I take it, right?

18 Dr. Young, if you could, please, maybe we  
19 can bring up NRC000005 I think we had up before.

20 And we are going to be looking at page  
21 five, the second sentence under section 4.1, in the  
22 results section. It states that mussels are rare to  
23 absent in shifting sands. Is that the statement  
24 there?

25 DR. YOUNG: Yes, sir.

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1 JUDGE BOLLWERK: All right. And can you  
2 tell from the description of site 15 on page 8, let's  
3 get to site 15 on page 8 - we had that one up before  
4 as well - (pause) - all right, can you tell from the  
5 description of site 15 - I guess this is the actual  
6 description as opposed to the table we had - whether  
7 the mussels were collected from the shifting sand in  
8 the channel or the sandy mud on the banks?

9 DR. YOUNG: No, the authors do not  
10 specify. They specify that it is a shifting sand  
11 habitat in the channel, and there is sandy mud on the  
12 banks, and there is large woody debris and there is  
13 detritus, and there is also the term, abundant,  
14 following that.

15 I can't discern exactly where they  
16 captured those mussels.

17 JUDGE BOLLWERK: Well, considering the  
18 overall conclusion of the study that mussels are rare  
19 to absent in shifting sands, isn't it likely that  
20 sandy mud on the banks of site 15 contained the  
21 mussels?

22 DR. YOUNG: I can't answer that; I didn't  
23 perform the survey. I do know from personal  
24 experience that mussels tend to not like muck. They  
25 don't like mucky fine sediments. So - but I can't be

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1 sure.

2 JUDGE BOLLWERK: Okay. One additional  
3 question: isn't it true that snags are routinely  
4 relocated by natural high flow events?

5 DR. YOUNG: Yes, the ones that haven't  
6 become established into the substrate yet.

7 JUDGE TRIKOUROS: Earlier we talked about  
8 the - some testimony from the I believe it was the  
9 Corps about moving the snags over to a - closer to the  
10 bank, out away from the channel. And you had said  
11 that the robust redhorse likes deep water.

12 But don't the snags float everywhere? I  
13 mean if they are going to be at a snag, aren't they  
14 going to be on the surface?

15 DR. YOUNG: No, sir, not exactly. During  
16 a high water event, you may have new wood coming into  
17 the system, or potentially some do break free. And  
18 those would be your floating, but usually they settle  
19 somewhere, and over time they become established and  
20 anchored into the substrate, and they remain there for  
21 very long periods of time. Thus, at that point they  
22 help provide stability to the riverbed substrates, and  
23 the organisms key in on that stability as a flow  
24 break, that extra nutrient input usually creates  
25 increased aquatic invertebrates, so it's a good

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1 feeding station. It provides cover from predators.

2 So much of the woody debris in the channel  
3 right now in the Savannah River is anchored in fairly  
4 permanent - well, at least semi-permanent. That's why  
5 these fish tend to home in particular stretches of  
6 river with all this woody debris.

7 JUDGE TRIKOUROS: But the survey that was  
8 done, I don't think it - I'm asking, not telling you -  
9 how could they have found these snags if they  
10 couldn't see them?

11 DR. YOUNG: Well, likely they were using  
12 sonar or some kind of mechanical arm to determine the  
13 depth at that point, and if there is any structure at  
14 certain depths. I mean I suppose they might be able  
15 to cut some of the snags off at a certain depth to  
16 alleviate the problem instead of removing them.

17 JUDGE TRIKOUROS: So you are saying the  
18 sounding methodology would also identify snags?

19 DR. YOUNG: I believe it should, yes.

20 JUDGE TRIKOUROS: My impression, and  
21 again, just an impression that they saw these things  
22 in the river, and they identified them wherever they  
23 saw them.

24 DR. YOUNG: Yes, your basic fish finder,  
25 just for recreational fishing, can locate these types

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1 of structures. Because frequently that's what a  
2 fisherman would look for would be these woody  
3 structures that fish like to congregate near, thus you  
4 catch more fish. So yes.

5 JUDGE TRIKOUROS: Thank you.

6 JUDGE BOLLWERK: Right, anything further,  
7 Judge Jackson?

8 JUDGE JACKSON: No.

9 JUDGE BOLLWERK: All right, and Judge  
10 Trikouros?

11 All right, I have no additional questions  
12 as well.

13 Gentlemen, I think this brings your  
14 testimony to the end, and I appreciate very much both  
15 of you coming before us. Dr. Young, you have been  
16 with us all week; we appreciate very much you making  
17 yourself available. You have been very forthright  
18 with us, and we very much appreciate the service you  
19 have given to the Board, both you and Dr. Hayes.

20 Thank you very much.

21 DR. YOUNG: You're welcome.

22 DR. HAYES: Thank you..

23 (Panel excused)

24 JUDGE BOLLWERK: All right, let me raise  
25 a separate matter with counsel. We had at one point

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1 put out an order that had a hypothetical question I  
2 indicated we might want to discuss with you all. My  
3 feeling at this point is I think I've heard the  
4 testimony - given the testimony we've heard I think my  
5 hypothetical, I think I know where I'm at with it now  
6 in terms of a potential answer. But I will offer you  
7 an opportunity if you want to to discuss it with us.  
8 I'll leave it up to you all as to whether you think  
9 it's something you want to address, or something you  
10 would prefer to just move forward?

11 MR. SANDERS: The only thing I would say,  
12 Your Honor, it's an excellent hypothetical, and I  
13 intend to use it as a class assignment next year.

14 JUDGE BOLLWERK: Okay, you can do that  
15 without attribution, how about that? You can have it.

16 MR. MOORE: No, I don't think so, Your  
17 Honor, unless you have a specific question that you  
18 still want addressed. We'll just plan to address it  
19 in our brief to the extent it seems necessary.

20 JUDGE BOLLWERK: Okay.

21 MR. MOULDING: I think that would be the  
22 staff's view as well, Your Honor.

23 JUDGE BOLLWERK: Okay, then we'll just  
24 leave that where it is. Again, that was an order  
25 dated I believe it was February 23rd, okay, and there

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1 was a - five or six pages, something like that.

2 All right, we need to take a very brief  
3 break. I've got some evidentiary material here I want  
4 to talk with Mr. Wilkey about one second, because I  
5 may need to discuss it with you, and I want to make  
6 sure that the numbers he's given me are the correct  
7 ones.

8 And we are going to be then wrapping this  
9 up in very short order.

10 So let's just take a very brief break.

11 MR. MOULDING: We just have one  
12 administrative question to bring to your attention.

13 JUDGE BOLLWERK: All right.

14 MR. MOULDING: Counsel for the parties  
15 have discussed, and I think our understanding is that  
16 the hearing file obligations and mandatory disclosures  
17 under part two essentially cease with the close of  
18 this portion of the proceeding, but we wanted to see  
19 whether that was the Board's understanding as well.

20 JUDGE BOLLWERK: Okay, given that I will  
21 probably have to take a quick look at the rules, but  
22 let me do that as well.

23 So let's take about a five-minute break.

24 (Whereupon at 1:01 p.m. the proceeding in  
25 the above-entitled matter went off the

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1 record to return on the record at 1:07

2 p.m.)

3 JUDGE BOLLWERK: All right. If we could  
4 go back on the record, please.

5 I think we are at the close of the  
6 testimony in the contested portion of this case. We  
7 have received the evidentiary material. And with  
8 respect to Contentions 1.2, 1.3 and 6.0, there is a  
9 couple of things that we need to talk about including  
10 the matter you raised just before our break. So let  
11 me just go through a list of things I have, and we'll  
12 include that in it.

13 In terms of there was a question about  
14 some South African trip reports that you had mentioned  
15 this morning; I guess you had turned them over. You  
16 looked at them. Anything you want to tell the Board  
17 about them?

18 MR. SANDERS: Well, considering we did  
19 make something of an issue of it, and it's available,  
20 we would think it's appropriate for the applicant to  
21 sponsor it as an exhibit and have it admitted.

22 MR. BLANTON: We have no objection to  
23 that, Your Honor. And I think, even though it's on a  
24 10-year-old version of Word we've finally gotten the  
25 PDF version of it on this.

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1 JUDGE BOLLWERK: All right. We'll turn  
2 to Mr. Wilkey, and can you handle it? All right.

3 So we're looking then at SNC Exhibit  
4 000098. I finally got the right number of zeroes down  
5 and we are just about finished.

6 JUDGE BOLLWERK: And would you like to  
7 identify what the document is for the record, please?

8 MR. BLANTON: Yes, sir. Subject to Mr.  
9 Wilkey ensuring that what he's got on that thumb drive  
10 is the same thing I'm looking at on this piece of  
11 paper, and it's marked confidential although it's 10  
12 years old, and I'm going to represent that any  
13 confidentiality associated with this is probably  
14 expired, so we are not going to try to protect it  
15 under proprietary procedures.

16 It's entitled, Cogan Creek Project  
17 Drycooling Technology Report, final report, by J.W.  
18 Cuchens PE, Southern Company Services, Inc.

19 JUDGE BOLLWERK: All right. Let me just  
20 turn to Mr. Wilkey. Is there going to be any  
21 problems in terms of processing it if it has that  
22 label on it? All right, let's go ahead and we'll  
23 identify it for the record. And the thing I'm going  
24 to be raising about a couple of other exhibits, our  
25 document processing center is kicking some of our

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1 exhibits out because of things like what we call  
2 personal identifying information. And that is  
3 something I need to raise with you. They might do it  
4 with this, too. If that happens we may need you to  
5 refile it with maybe using EIE if you can with  
6 that stricken.

7 MR. BLANTON: We have had that experience  
8 lately in the mandatory as well, Your Honor, so we're  
9 familiar with that.

10 If we are going to do it that way, if I  
11 could beg a few days to just ensure that my client  
12 agrees with me taking confidential off this so I don't  
13 get fired in addition to producing this document,  
14 that'd be helpful.

15 JUDGE BOLLWERK: That's fine, except I  
16 think that Mr. Sanders has an expectation that we put  
17 on the record.

18 MR. SANDERS: Yes, I do.

19 MR. BLANTON: Well, I mean we can put it  
20 on the record. We may have to put it on the record  
21 under the proprietary procedures.

22 MR. SANDERS: That wouldn't be a problem.

23 JUDGE BOLLWERK: So at this point, okay,  
24 let me go back to Mr. Wilkey. We can identify - can  
25 we hold it out in terms of processing it until we

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1 determine whether it's considered proprietary or not?

2 (Off-mike voice)

3 JUDGE BOLLWERK: Okay, but you can hold  
4 it? In other words if we identify it for the record  
5 now you are going to have it, and then if we need to  
6 either treat it as confidential or we need to strike  
7 that confidentiality label, we can do either one of  
8 those by getting another copy of the document, or  
9 getting a copy of the document.

10 MR. BLANTON: Yes, sir, just to be clear  
11 I have no objection, and would propose to offer it as  
12 an exhibit regardless of whether we ask for  
13 proprietary treatment of it or whether we remove the  
14 confidential.

15 JUDGE BOLLWERK: Okay, all right. Okay,  
16 then we'll accept it. We'll put it in the holding  
17 bin, and we'll decide how we process it through, and  
18 whether it goes to the public side of the electronic  
19 hearing docket, or the private side of the electronic  
20 hearing docket, at a date to be - how long do you  
21 think you need to get back to us in terms of the  
22 proprietary nature?

23 MR. BLANTON: I will do my best to get  
24 that done tomorrow, and communicate in some form or  
25 fashion with the parties and the Board.

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1 JUDGE BOLLWERK: Probably the easiest way  
2 is just to file a document through EIE and let us know  
3 what the situation is. And do we want to go ahead, if  
4 - so would you - in this - can you find out if we are  
5 going to cause problems if it's marked confidential?  
6 All right.

7 And maybe we can communicate with you  
8 before you file your pleading. If we need that  
9 stricken, maybe you could refile it. Would that cause  
10 a problem if it's attached to the pleading, or it's  
11 part of the pleading? It's another attachment? We  
12 still got a document we have to identify here, I know.  
13 But if they were to submit it as an exhibit, with the  
14 confidential stamp stricken, if that is a problem when  
15 they send in their filing indicating whether -  
16 hopefully indicating it's not confidential, is that  
17 going to cause any problems? Or would you rather get  
18 it offline?

19 (Off-mike voice)

20 JUDGE BOLLWERK: You prefer it offline?  
21 Okay, just strike what I just said then. Why don't  
22 you just give us a document that indicates whether you  
23 prefer to treat it as confidential or nonconfidential.  
24 And if the confidential stamp on it is going to cause  
25 a problem we'll let you know. And then you can

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1 resubmit the document to us offline not through the  
2 EIE.

3 MR. BLANTON: Just to save me scratching  
4 my head later, what I would propose to do is just file  
5 a proposed motion to admit the exhibit, and in that  
6 motion either say it's proprietary or not proprietary.

7 JUDGE BOLLWERK: Okay.

8 MR. BLANTON: Is that acceptable to  
9 everybody?

10 JUDGE BOLLWERK: All right. So let's go  
11 ahead and identify for the record today, and then  
12 we'll decide on its admission once we see your motion.  
13 That way it's in there.

14 MR. BLANTON: All right. It's Southern  
15 Nuclear Exhibit however many zeroes preceded 98, and  
16 it's titled confidential Cogan Creek Project  
17 Drycooling Technology Investigation, Final Report,  
18 authored by J.W. Cuchens PE.

19 JUDGE BOLLWERK: All right. Then the  
20 record should reflect that Exhibit SNC000098 as  
21 identified by counsel has been marked for  
22 identification.

23 (Whereupon the aforementioned document  
24 was marked for identification as Exhibit  
25 SNC000098-00-BD01)

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1 JUDGE BOLLWERK: And then we will deal  
2 with its admission once we see with the pleading that  
3 you submit. And again we will communicate with you  
4 whether we need another copy with the confidential  
5 stricken, depending on what your pleading says.

6 MR. BLANTON: Thank you, Your Honor.

7 JUDGE BOLLWERK: All right, and thank you  
8 for resolving that between yourselves. Appreciate  
9 that.

10 All right, that was one matter we needed  
11 to discuss briefly.

12 Another one is with exhibits generally.  
13 As I mentioned before, we will be going through and  
14 reviewing the exhibits relative to the transcript that  
15 you should all be receiving in the next - if you  
16 haven't already, within the next several days. They  
17 were put on three-day transcripts, so they should be  
18 going into the system and going out relatively soon.

19 Again, review those. If you see any  
20 problems with them, let us know. If we see any  
21 problems we'll let you know. It looks like now we are  
22 in good shape, but one can never tell once you look at  
23 the transcripts. So we may need to deal with that.

24 With respect to exhibits also, and you  
25 made reference to this a second ago, and this is - let

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1 me put this off a second; we'll deal with all the  
2 mandatory here because it has something to do with  
3 that.

4 I would also remind everyone that you all  
5 have been providing the questions that you have been  
6 giving us typewritten which was very useful. It would  
7 be also useful for us if we could get those as either  
8 word processing or PDF - probably PDF documents is  
9 fine - through email as you sent them to me before  
10 confidentiality. And we will then, I will hold on to  
11 them, and put them on the record when we are done with  
12 the, if you still have the files.

13 Again, we have copies of them all. We  
14 can scan them. But it would be better if we had  
15 them electronically. Although some of them have been  
16 scribbled on. But we probably have at least one clean  
17 copy between all of us.

18 But again if there is a problem with that  
19 let us know in the near term. But other than that I'd  
20 just appreciate an email from folks with the different  
21 questions you sent us attached; that would be useful.

22 All right, in terms of transcript  
23 corrections, under the March 6th order we had asked  
24 for any transcript corrections by Thursday, April 2nd.  
25 We anticipate that the DDMS video for this portion of

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1 the ESP proceeding will be available on the digital  
2 management system by close of business on Monday,  
3 March 23rd. So in theory you could begin, if you have  
4 any, read the transcript, see something that doesn't  
5 match what your recollection is - if it doesn't match  
6 what your recollection is, you can look at the video  
7 and decide whether what you thought was said was or  
8 wasn't said.

9 We are interested in any corrections you  
10 may have that are substantive. Please make sure that  
11 they do jibe with what the video would show. We are  
12 not going to be correcting things that people think  
13 they should have said or would have said better. Only  
14 what the video is going to be the check here. So we'd  
15 appreciate it if you go through and do that.

16 Again, if a statement is attributed to the  
17 wrong witness or the wrong speaker, that is obviously  
18 important. We need to get those taken care of. If  
19 there are notes that are missing or have been added,  
20 those sorts of things are important. But simply  
21 cleaning up your language is not necessarily what you  
22 should be focusing on, or the witness' language. If  
23 they said it on the video, that should be the way it  
24 should stand.

25 We are hoping then again by April 2nd that

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1 we can get a joint filing if possible, which would  
2 include any objections to any of the transcript  
3 corrections. I would hope this process would keep  
4 objections to a minimum. You are going to all have  
5 the same access to the same video. It's possible that  
6 there may be a dispute. I would think it would be  
7 unlikely, but one can never tell.

8           So once we have - and I should mention  
9 also once we have received your corrections we are  
10 going to go in and make a - try to make a corrected  
11 transcript, and then marry that transcript with a time  
12 stamped version which you will be receiving from the  
13 court reporter that will then allow us in DDMS to  
14 basically put in a searchable transcript where you can  
15 go in and put search terms into the DDMS, find  
16 portions of the transcript you are interested in, if  
17 you click on those it will go to the video and you can  
18 watch it for whatever usefulness that will be. And  
19 hopefully you will have some opportunity to use that  
20 before the time for proposed findings is due, which  
21 would be Friday, April 24th, which I think we put in  
22 our November 13th, scheduling order, which was the  
23 last one I believe we issued.

24           So there are ways we can speed that  
25 process up. But if I do that I'm going to have to cut

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1 back on your time to do transcript corrections. I  
2 think you'd probably prefer that.

3 The other date, Friday May 8th, reply  
4 findings and conclusions are due. That will be  
5 another important date for you obviously. There was  
6 a question about the close of the requirement to do  
7 discovery.

8 I looked at both of the provisions you  
9 cited me to. I don't see anything that says anything  
10 one way or the other. Did I miss a sentence?

11 MR. MOULDING: No, Your Honor, I think it  
12 probably is ambiguous.

13 JUDGE BOLLWERK: All right. Have you  
14 reached some kind of agreement? Do you have a  
15 dispute? I have a suggestion, but I will see what you  
16 all have to say.

17 MR. SANDERS: I think it was mostly a  
18 matter of an abundance of caution on the part of the  
19 staff, and since this is a relatively new hearing  
20 process, nobody knew what was going on.

21 JUDGE BOLLWERK: All right. My  
22 suggestion would be, and I'm hoping to do it  
23 relatively soon after we get the transcript  
24 corrections in, to close the record. When we close  
25 the record, would that be a good time to basically end

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1 all discovery responsibilities and hearing file  
2 responsibilities?

3 MR. MOULDING: I think our immediate  
4 question at least for the staff, that our next hearing  
5 file update would be due next Tuesday, and trying to  
6 determine whether there is something we should be  
7 producing at that time.

8 JUDGE BOLLWERK: I don't want to close  
9 the record until the transcript corrections, so, it  
10 strikes me that is a reasonable date. The record is  
11 closed, and everything has come to an end at that  
12 point.

13 Is that acceptable? It'll give you one  
14 more.

15 MR. MOULDING: That's fine. We just  
16 wanted to make sure we understood when the appropriate  
17 closing date would be.

18 JUDGE BOLLWERK: All right. I appreciate  
19 your bringing that to my attention. I will check and  
20 see if any other boards have done anything in this  
21 regard, and if I've done something that is  
22 inconsistent I'll certainly look at that again and let  
23 you know.

24 But at this point why don't we basically  
25 say that when we close the record we will also close

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1 out any discovery responsibilities that the parties  
2 might have.

3 All right, let's see, I believe at this  
4 point that's all I have on the contested side.  
5 Anything the parties have, any questions? We are  
6 going to talk about mandatory in a second. But  
7 anything on the contested side that anybody has any  
8 questions about or concerns.

9 All right. In terms of the mandatory  
10 hearing, just briefly, a question for the parties, and  
11 you can let us know on this, in terms of the  
12 presentation that you put together, which are  
13 essentially PowerPoint presentations, they are  
14 currently in portable document format, PDF format, in  
15 the DDMS. Do you have a preference as to whether we  
16 control the showing of those for you through DDMS,  
17 like we have been doing here? Or would you have a  
18 preference to be able to control those slides  
19 yourself? And it's something to think about. If you  
20 wish to control them yourself, you are going to have  
21 to give us a piece of equipment which we can hook up  
22 to our system, which is basically a laptop with  
23 PowerPoint on it, assuming your slides are in  
24 PowerPoint. Then you would have - and we can display  
25 it on the same screen we are using here. It would

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1 just allow you to click through, or your presenters to  
2 click through, rather than us having to do it, we are  
3 glad to do it, but we just wanted to see what your  
4 preference was.

5 MR. BLANTON: My intuition is that the  
6 presenters will want to be able to click through their  
7 slides themselves. So it may be that we need to bring  
8 a piece of equipment.

9 JUDGE BOLLWERK: All we really need is a  
10 laptop with PowerPoint. The problem is that all the  
11 equipment we have here doesn't have PowerPoint on it.  
12 So we can take that laptop and hook it into our  
13 system. And in effect if you have - I actually brought  
14 one with me - if you have a little clicker like this  
15 one that sends you through, and you are welcome to use  
16 this one if you want, but that will allow you then to  
17 control it remotely. So it's something to think  
18 about.

19 Does the staff have any preference? Do  
20 you want to think about it?

21 MR. MOULDING: I think our presenters  
22 would probably like the opportunity to control the  
23 speed of the slides.

24 JUDGE BOLLWERK: Okay.

25 MR. MOULDING: It sounds like either way

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1 that can be done relatively easily.

2 JUDGE BOLLWERK: Again, as long as you've  
3 got a laptop with PowerPoint on it. Maybe the two of  
4 you can share a laptop so we don't have to keep  
5 hooking one or another up. It will be up to you all.  
6 But again, the laptop, obviously, we need the slides  
7 on it.

8 MR. MOULDING: I guess the alternative is  
9 to use the DDMS and just flip through them that way?

10 JUDGE BOLLWERK: Yes, we have them all in  
11 DDMS, and we would display them just like we've done  
12 here, and we can certainly do that. We're glad to do  
13 that. But we wanted to see what your preference was.

14 Just let us know - Joe, is that something  
15 we can do on Monday if we have enough -

16 VOICE: We can do it anytime.

17 JUDGE BOLLWERK: We would just need - we  
18 can take 15 or 20 minutes before we are ready to start  
19 so we can hook it up obviously. Things get busy in  
20 the morning, starting another hearing. So just give  
21 us a little bit of time.

22 Let's see. One other thing I wanted to  
23 make you aware of in terms of the timing of the  
24 presentations for the mandatory hearing, we are sort  
25 of assuming that the times that you gave us are

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1 roughly the times that it's going to take. If those  
2 get substantially longer, our ability to get this done  
3 in the three-day period we have set out may have some  
4 concerns about it.

5 So again, I'm hoping that when you said 15  
6 minutes or 40 minutes, you meant within a small  
7 fraction that that's what you anticipated.

8 I think what we are anticipating is  
9 between our questions and your presentations that  
10 probably the time would about double for each one of  
11 those, so we need to stay within that general time  
12 frame in order to get things done.

13 We can go late on Tuesday night if we need  
14 to. Monday night is a problem because of limited  
15 appearances. Wednesday night we can certainly go  
16 late, although again people probably have travel plans  
17 on Thursday. But again we'll do what we need to do.  
18 So I just wanted to make you aware of that.

19 Anything the parties have on the mandatory  
20 hearing they want to bring to the Board's attention?

21 MR. BLANTON: I assume we'll go through  
22 the same process for admitting exhibits as we did in  
23 the contested?

24 JUDGE BOLLWERK: Yes, what we will go  
25 ahead and do is, the presentations of the witnesses

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1 for each part, each presentation, we will go ahead and  
2 admit those presentations up front, admit curriculum  
3 vitae up front. I think I mentioned before, if there  
4 are particular documents that they are intending to  
5 use, I would prefer to wait until those documents are  
6 referred to at some time in the presentation to admit  
7 them into evidence. I don't think there are too many  
8 of those.

9 But basically I think if we take care of  
10 the presentations and the curriculum vitae, that is  
11 going to be the vast majority of what we have, I  
12 believe.

13 But again, this is an effort to make sure  
14 that what we are putting on the record with respect to  
15 these presentations was something that was actually  
16 referred to and utilized in the presentation in some  
17 way so we don't get a lot of extraneous material on  
18 the record, if for whatever reason somebody thought  
19 they might need and didn't, and then we had no way to  
20 tie it to anything.

21 MR. BLANTON: I guess I have one question  
22 about how that might work. If we've got a witness  
23 doing his presentation, and a fact in a presentation  
24 is based on an exhibit that we had intended to  
25 represent, it seems like it's going to break up that

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1 presentation if we stop and introduce that exhibit in  
2 the middle of his presentation.

3 JUDGE BOLLWERK: Slightly. But I think  
4 in terms of preparing your witnesses, you ought to let  
5 them know what exhibits they have, and just tell them,  
6 look, when you go to refer to this, be aware that we  
7 are going to want to stop. In fact they ought to be  
8 identifying, this is Exhibit X, and we are going to  
9 know that if we don't have it in at that point we are  
10 going to need to deal with it.

11 See how that works. If it's a problem, we  
12 may need to change it. But I'd like at least to try  
13 that, because I do have a concern about the  
14 evidentiary record having a lot of documents that we  
15 just can't tie to anything.

16 MR. MOULDING: I'll just note for staff,  
17 I think we only have a couple of exhibits including  
18 the final safety evaluation report, and the previously  
19 submitted responses to the Board's written questions.

20 And if we introduce those into evidence at  
21 the outset, I don't think the staff has any other  
22 exhibits that would break up the flow of any  
23 presentation.

24 JUDGE BOLLWERK: I don't recall if there  
25 were many exhibits of that type, but I would have to

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1 go back and look.

2 MR. BLANTON: We have a few, Your Honor.  
3 And I'm thinking back through the presentations, and  
4 we have noted where a particular slide in one of our  
5 presentations is taken from an exhibit or relying on  
6 an exhibit, we've noted that on the slides.

7 JUDGE BOLLWERK: Okay. Well all right,  
8 let me go back and look through the slides. If you  
9 have referenced the exhibit on the slide, then maybe  
10 there is a reason just to go ahead and admit them up  
11 front, and maybe you have already anticipated my  
12 concern. My assumption is you won't leave that slide  
13 out, right? You will talk about it.

14 MR. BLANTON: I won't be capable of  
15 leaving a slide out.

16 JUDGE BOLLWERK: All right, if that is  
17 the case, then, let me go back through and check, and  
18 if that is the case, then we'll just go ahead and  
19 admit them at the beginning of the presentation; if  
20 they are referenced in the slide, and we can tell  
21 that.

22 Anything else the parties have then on  
23 mandatory?

24 One other thing the Board had, we had  
25 found some exhibits - I think you made reference to

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1 this - mandatory hearing exhibits that were being  
2 kicked out by our system. Where is my list here?

3 (Off-mike voice)

4 JUDGE BOLLWERK: It's been resolved so we  
5 don't have to worry about any of it? Terrific. Okay,  
6 there were a list of about six exhibits I thought we  
7 were going to have to have you all refile, but  
8 apparently that is not the case.

9 MR. BLANTON: I don't remember six, but  
10 I remember that issue coming up and being told that it  
11 was resolved.

12 JUDGE BOLLWERK: Well, apparently it's  
13 resolved to everybody's benefit. We were still  
14 getting some push back in emails, but apparently that  
15 is not the case anymore. So never mind I guess is the  
16 best way to describe that.

17 All right. Let me just mention, I think  
18 you all are aware of the limited appearances on both  
19 Sunday afternoon and Monday evening. We will be going  
20 3:00 to 5:00 approximately Sunday afternoon, again in  
21 Waynesboro at the Augusta Technical College, the  
22 Waynesboro-Burke Campus in their auditorium. It's not  
23 hard to find. You walk into the building; you can't  
24 miss it.

25 On Monday night, 7:00 to 9:00

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1 approximately. We have at this point, Ms. Bu, what,  
2 about five or six people signed up for Monday night?  
3 At least a half a dozen?

4 (Off-mike voice)

5 JUDGE BOLLWERK: And I know at least  
6 several who are signed up for Sunday afternoon.

7 I'm not inclined, although the Sunday  
8 afternoon one doesn't appear to have a lot of people  
9 signed up at this point, I hate to cancel it because  
10 then we cause other problems with people wanting to  
11 show up.

12 Having said that we did indicate on the  
13 notice we put out that when we get done with whoever  
14 shows up we may wait a brief period, and if nobody  
15 else is there then we'll call it a day. And I won't  
16 keep you hanging around; we don't have to wait there  
17 until 5:00 o'clock.

18 But my experience with these has been, you  
19 may get three people sign up, and you may get 10  
20 people show up that kind of walk in. And that is part  
21 of the process as well.

22 So if anybody knows anybody that wants to  
23 sign up, or is interested in making a limited  
24 appearance, please let them know. We are still taking  
25 emails to get on our list of preapproved or pre-

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1 registered folks. So that is definitely an option.

2 And we'll anticipate someone from the  
3 Joint Intervenors will be there, we will have a table  
4 for you all. It's my assumption. It's really up to  
5 you.

6 MR. SANDERS: I believe the  
7 representatives of the parties will definitely be  
8 there. We actually have a COL appeal to respond to,  
9 which is due on Tuesday, so I don't know that we are  
10 going to make it.

11 JUDGE BOLLWERK: All right. Well, again,  
12 the table is there for a representative of the Joint  
13 Intervenors to be there, and that is the point.

14 MR. SANDERS: Thank you.

15 JUDGE BOLLWERK: Again, as you are all  
16 aware, if the parties don't have anything to say, they  
17 are there to listen like the Board is, and that is the  
18 process.

19 At this point, anything else the parties  
20 have for us relative to the contested case or the  
21 mandatory hearing that we need to talk about, or the  
22 limited appearances?

23 All right, I think then this brings to a  
24 close the contested portion of this case, at least  
25 this evidentiary hearing. I think on behalf of the

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1 Board I would like to thank all of you, and all of the  
2 witnesses that you presented to us. We received a lot  
3 of information. I think it was good information. I  
4 think we have a much better understanding of what's  
5 involved with respect to all three of the contentions.

6 The witnesses were well prepared, and all  
7 of them were very forthright in answering our  
8 questions. It must be a little uncomfortable for you  
9 all to sit back there and allow us to ask questions  
10 that you know you could do better or more precisely,  
11 or we didn't ask the right question. That's the  
12 Subpart L process for better or worse.

13 We hope at least that we touched on some  
14 matters that you felt were appropriate and important  
15 to get evidence into the record about. That was  
16 certainly our intent.

17 But we do appreciate your efforts in  
18 getting your witnesses ready and bringing them before  
19 us. We appreciate the efforts of counsel throughout  
20 this proceeding.

21 There has been a lot of cooperation back  
22 and forth. We have had very few disputes that we have  
23 had to settle of one kind or another. I think that  
24 shows a great deal of professionalism on behalf of all  
25 the counsel that are involved. You've worked through

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1 the process. We are always willing to resolve  
2 disputes that we need to, but it's really been only  
3 the important ones that you've brought to us that  
4 really required the Board's efforts, and we do  
5 appreciate that. You all should be - feel that you  
6 have done a very good job in that respect. And with  
7 respect to this proceeding generally, and we do  
8 appreciate it.

9 In terms of the folks that have helped us,  
10 I'd want to thank our IT specialists, Andy Welkie,  
11 Joe Deucher and Jim Cutchin who have been with us  
12 throughout this, sort of set this up. We are willing  
13 and able - we would appreciate any comments that you  
14 have on the DDMS, bad, good or indifferent. Andy is  
15 the DDMS webmaster, and I think his website, your  
16 email is available isn't it on the DDMS? And just  
17 send him an email, if you thought it was useless -  
18 hopefully not - but if you thought it was useless and  
19 didn't add anything, let us know. Or if you think  
20 there are ways it can be improved, please let us know.  
21 Because we really do want to make it a useful  
22 litigation system.

23 So it is - I won't say it's experimental -  
24 but it brings a lot of different things that haven't  
25 been brought together in a litigation context, and

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1 maybe we haven't done it quite right. If we can do it  
2 in a way that's better we will certainly try to,  
3 within the confines of the appropriation process that  
4 you heard so much about.

5 I'd also like to thank our administrative  
6 folks, Ashley Prange and Sherverne Cloyd, I'm sorry,  
7 Ashley Prange who was here to organize everything in  
8 this room and all the administrative aspects of this.  
9 Wen Bu our law clerk who has been with us throughout,  
10 and got the evidentiary material organized, until I  
11 started messing it up. That's not her fault; that's  
12 my problem.

13 But I do appreciate the efforts of all of  
14 you. And then here at the Doubletree Hotel Ms.  
15 Elizabeth Kennedy and Charlye Taylor who have helped  
16 us enormously in putting this together.

17 I think this was a good hearing venue. We  
18 had a little noise in the back from time to time, and  
19 over at the side, but I certainly - it met our needs  
20 in terms of the way we were able to set this up and  
21 conduct it. So again we appreciate the Doubletree's  
22 efforts.

23 And do the judges have anything they want  
24 to say? I've been doing all the talking here. Judge  
25 Jackson? Judge Trikouros?

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1 JUDGE TRIKOUROS: I do want to say that  
2 I've been very impressed with the level of competency  
3 that I've seen and the level of professionalism; I  
4 think it's been outstanding throughout. Thank you.

5 JUDGE BOLLWERK: All right. And again  
6 thanks to you and all your witnesses you've brought  
7 before us. It's been a useful exercise, a very useful  
8 exercise. We are looking forward to your proposed  
9 findings of fact and conclusions of law, see where you  
10 think this case needs to go next. Then we will have  
11 to assess it and make a decision. We have a schedule  
12 for doing that.

13 Those of you next week, we'll see you for  
14 the mandatory hearing. I can tell you that the two  
15 technical judges are chomping at the bit. Is excited  
16 a good word? Maybe not. I think they are looking for  
17 an opportunity to really get into some technical  
18 discussions with the folks you are going to have  
19 making the presentations. So hopefully your witnesses  
20 will have their A game when they come in, because I  
21 think the judges here are interested in talking with  
22 them. All right?

23 Again, we thank you all, and at this point  
24 I think we should also thank our court reporter. I  
25 don't know what this transcript is going to look with

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1 the evidentiary material, but it is what it is at this  
2 point. But again thanks for your efforts as well.

3 And at this point, if there is nothing  
4 else from either of the parties of the judges, we will  
5 stand adjourned.

6 (Whereupon at 1:36 p.m. the proceeding in  
7 the above-entitled matter was adjourned)

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CERTIFICATE

This is to certify that the attached proceedings  
before the United States Nuclear Regulatory Commission  
in the matter of:                      Southern Nuclear Operating Co

Name of Proceeding: Early Site Permit

Docket Number:                      52-011-ESP;

ASLB No. 07-850-01-ESP-01

Location:                              Augusta, Georgia

were held as herein appears, and that this is the  
original transcript thereof for the file of the United  
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direction of the court reporting company, and that the  
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Tobias Walter  
Official Reporter  
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