September 2, 2010

Ms. Karen Kaniatobe
Director of the Cultural/Historical
Preservation Department
Absentee-Shawnee Tribe of Oklahoma
2025 S. Gordon Cooper Drive
Shawnee, OK 74801

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Ms. Kaniatobe:

On behalf of the Nuclear Regulatory Commission (NRC) staff, I am forwarding a copy of the "Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4," for your review and comments. The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two combined licenses (COLs) to construct and operate two new nuclear units at the Vogtle Electric Generating Plant site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the draft supplemental environmental impact statement (DSEIS) to include an analysis of relevant environmental issues, including potential impacts to historic properties. The DSEIS documents the NRC determination regarding the environmental impacts at the proposed site from the construction and operation of two new nuclear units.

This DSEIS is a supplement to the Final Environmental Impact Statement (FEIS) for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified, including with respect to potential impacts to historic properties. The NRC staff conducted an environmental audit at the site and reviewed historic and archaeological records. The NRC staff also contacted Indian Tribes identified as having potential interest in the proposed action.

By letter dated December 10, 2009, the NRC staff notified you that it will comply with its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended, (NHPA) using the process set forth in 36 CFR 800.8(c) in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6. Pursuant to 36 CFR 800.8(c), the NRC staff is using the preparation of the DSEIS required by the National Environmental Policy Act of 1969, as amended, (NEPA), to comply with its obligations under Section 106 of the NHPA.

In the context of NEPA, under which the DSEIS was prepared, the NRC preliminary determination is that the impact of the two new proposed nuclear units on historical and archaeological resources remains moderate, as concluded in the ESP FEIS. In addition, SNC has entered into a Memorandum of Understanding with the Georgia State Historic Preservation Officer (SHPO). Under the provisions of the National Historic Preservation Act, the NRC preliminary determination is that, consistent with the determination in the ESP FEIS, the proposed project will affect, but not adversely affect, historic properties. Note that in Chapter 2 of the DSEIS you will find a discussion of the areas of potential effect, and impacts to historic properties from construction and operation are discussed in Chapters 4 and 5.

The NRC plans to hold a public meeting to go over the analysis and results in the DSEIS on October 7, 2010, at Augusta Technical College, Waynesboro Campus, 216 Highway 24 South, Waynesboro, Georgia 30830. The meeting will convene at 7:00 p.m. and will continue until 10 p.m., as necessary. In addition, the meeting will be preceded by an open house session from 6:00 p.m. to 7:00 p.m., during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

Pursuant to 10 CFR 51.92 and 36 CFR 800.2(c), the NRC wishes to ensure that Indian Tribes that might have an interest in any potential historic properties in the areas of potential effect are afforded the opportunity to identify their concerns, provide advice on the identification and evaluation of historic properties including those of traditional, religious, and cultural importance; and if necessary, participate in the resolution of any adverse effects to such properties.

In accordance with our December 10, 2009, letter, the NRC staff is forwarding the DSEIS for your review and comments. Pursuant to 36 CFR 800.8(c), we are requesting your comments on the DSEIS, specifically, on our preliminary conclusions regarding historic properties. Please provide any information or comments you may have on the DSEIS during the comment period, which ends on November 24, 2010. The NRC may consider additional comments after the comment period, to the extent practicable. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration Mailstop TWB-05-B01M, Washington, D.C. 20555-0001 or via e-mail to Vogtle.COLAEIS@nrc.gov. Your comments will be addressed in the final SEIS.

If you have any questions or require additional information, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at (301) 415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026

Enclosure:
As stated

cc: See next page

September 2, 2010

Ms. Debbie Thomas
Tribal Historic Preservation Officer
NAGPRA Coordinator
Alabama-Coushatta Tribe of Texas
571 State Park Road 56
Livingston, TX 77351

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

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D. Thomas - 3 -

If you have any questions or require additional information, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at (301) 415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026

Enclosure:
As stated

cc: See next page

September 2, 2010

Mrs. Joyce A. Bear, NAGPRA Contact
Muscogee (Creek) Nation of Oklahoma
P.O. Box 580
Okmulgee, OK 74447

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Mrs. Bear:

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J. Bear - 3 -

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Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026
Enclosure:
As stated

cc: See next page

September 2, 2010

Mr. Chadwick Smith, Principal Chief
Cherokee Nation of Oklahoma
P.O. Box 948
Tahlequa, OK 74465

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Chief Smith:

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Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026

Enclosure:
As stated

cc: See next page

September 2, 2010

Mr. Willard Steele, Deputy THPO
Seminole Tribe of Florida
Ah-Tah-Thi-Ki Museum
HC 61, Box 21A
Clewiston, FL 33440

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

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Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026
Enclosure:
As stated

cc: See next page

September 02, 2010

Mr. Kenneth H. Carleton
THPO/Tribal Archaeologist
Mississippi Band of Choctaw Indians
P.O. Box 6257/ 101 Industrial Road
Choctaw, MS 39350

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

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Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026

Enclosure:
As stated

cc: See next page

September 2, 2010

Ms. Stephanie Rolin
NAGRA Contact
Poarch Band of Creek Indians
5811 Jack Springs Road
Atmore, AL 36502

SUBJECT: SECTION 106 CONSULTATION AND NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Ms. Rolin:

On behalf of the Nuclear Regulatory Commission (NRC) staff, I am forwarding a copy of the "Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4," for your review and comments. The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two combined licenses (COLs) to construct and operate two new nuclear units at the Vogtle Electric Generating Plant site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the draft supplemental environmental impact statement (DSEIS) to include an analysis of relevant environmental issues, including potential impacts to historic properties. The DSEIS documents the NRC determination regarding the environmental impacts at the proposed site from the construction and operation of two new nuclear units.

This DSEIS is a supplement to the Final Environmental Impact Statement (FEIS) for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified, including with respect to potential impacts to historic properties. The NRC staff conducted an environmental audit at the site and reviewed historic and archaeological records. The NRC staff also contacted Indian Tribes identified as having potential interest in the proposed action.

By letter dated December 10, 2009, the NRC staff notified you that it will comply with its obligations under Section 106 of the National Historic Preservation Act of 1966, as amended, (NHPA) using the process set forth in 36 CFR 800.8(c) in lieu of the procedures set forth in 36 CFR 800.3 through 36 CFR 800.6. Pursuant to 36 CFR 800.8(c), the NRC staff is using the preparation of the DSEIS required by the National Environmental Policy Act of 1969, as amended, (NEPA), to comply with its obligations under Section 106 of the NHPA.

In the context of NEPA, under which the DSEIS was prepared, the NRC preliminary determination is that the impact of the two new proposed nuclear units on historical and archaeological resources remains moderate, as concluded in the ESP FEIS. In addition, SNC has entered into a Memorandum of Understanding with the Georgia State Historic Preservation Officer (SHPO). Under the provisions of the National Historic Preservation Act, the NRC preliminary determination is that, consistent with the determination in the ESP FEIS, the proposed project will affect, but not adversely affect, historic properties. Note that in Chapter 2 of the DSEIS you will find a discussion of the areas of potential effect, and impacts to historic properties from construction and operation are discussed in Chapters 4 and 5.

The NRC plans to hold a public meeting to go over the analysis and results in the DSEIS on October 7, 2010, at Augusta Technical College, Waynesboro Campus, 216 Highway 24 South, Waynesboro, Georgia 30830. The meeting will convene at 7:00 p.m. and will continue until 10 p.m., as necessary. In addition, the meeting will be preceded by an open house session from 6:00 p.m. to 7:00 p.m., during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

Pursuant to 10 CFR 51.92 and 36 CFR 800.2(c), the NRC wishes to ensure that Indian Tribes that might have an interest in any potential historic properties in the areas of potential effect are afforded the opportunity to identify their concerns, provide advice on the identification and evaluation of historic properties including those of traditional, religious, and cultural importance; and if necessary, participate in the resolution of any adverse effects to such properties.

In accordance with our December 10, 2009, letter, the NRC staff is forwarding the DSEIS for your review and comments. Pursuant to 36 CFR 800.8(c), we are requesting your comments on the DSEIS, specifically, on our preliminary conclusions regarding historic properties. Please provide any information or comments you may have on the DSEIS during the comment period, which ends on November 24, 2010. The NRC may consider additional comments after the comment period, to the extent practicable. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration Mailstop TWB-05-B01M, Washington, D.C. 20555-0001 or via e-mail to Vogtle.COLAEIS@nrc.gov. Your comments will be addressed in the final SEIS.

If you have any questions or require additional information, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at (301) 415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos. 52-025
52-026

Enclosure:
As stated

cc: See next page

September 2, 2010

Carol Bernstein
Savannah District
U.S. Army Corps of Engineers
1000 West Oglethorpe Avenue
Savannah, GA 31401-3640

SUBJECT: NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Ms. Bernstein:

The U.S. Nuclear Regulatory Commission (NRC) staff has completed NUREG -1947; "Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for the Vogtle Electric Generating Plant Units 3 and 4." The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two (COLs) to construct and operate two new nuclear units at the Vogtle Electric Generating Plant site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the draft supplemental environmental impact statement (DSEIS) to include an analysis of relevant environmental issues. The DSEIS documents the NRC determination regarding the environmental impacts at the proposed site from the construction and operation of two new nuclear units. This notice advises the public that the DSEIS is available for public inspection at the NRC Public Documents Room or from the Publicly Available Records component of the NRC Agency-wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room) and directly from the NRC website at www.nrc.gov. In addition, the Burke County Library, 130 Highway 24 South, Waynesboro, GA has agreed to make the DSEIS available for public inspection.

This DSEIS is a supplement to the Final EIS for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified.

C. Bernstein - 2 -

The NRC plans to hold a public meeting on the DSEIS at the Augusta Technical College, Waynesboro Campus Auditorium, 216 Hwy 24 South, Waynesboro, GA 30830 on Thursday, October 7, 2010. The meeting will convene at 7:00 p.m. and will continue until 10:00 p.m., as necessary. For your information, the meeting will be transcribed and will include: (1) a presentation of the contents of the DSEIS and (2) the opportunity for interested government agencies, organizations, and individuals to provide comments on the DSEIS report. Additionally, the meeting will be preceded by an open house session from 6 p.m. to 7 p.m., during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

As discussed in Section 11.7 of the DSEIS, the staff's preliminary recommendation is that the COL should be issued. This preliminary recommendation is based on (1) the Environmental Report (ER) submitted by Southern Nuclear Operating Company, as revised, and responses to staff requests for additional information; (2) the staff's review conducted for the early site permit referenced by the COL application and the staff assessment documented in the ESP environmental impact statement; (3) consultation with Federal, State, and Tribal agencies; (4) the staff's own independent review of potential new and significant information available since preparation and publication of the ESP EIS; and (5) the assessments summarized in the DSEIS, including the potential mitigation measures identified.

Please provide any information or comments you may have on the DSEIS during the comment period, which ends on November 24, 2010. The NRC may consider additional comments after the comment period, to the extent practicable. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, D.C. 20555-0001 or via e-mail to Vogtle.COLAEIS@nrc.gov. Your comments will be addressed in the final SEIS.

A separate notice of filing of the DSEIS will be placed in the *Federal Register* through the U.S. Environmental Protection Agency (EPA). If you have any questions regarding this matter, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
As stated

cc w/encl: See next page

September 3, 2010

Mr. David Bernhart
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SUBJECT: NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION

Dear Mr. Bernhart:

On behalf of the U.S. Nuclear Regulatory Commission (NRC) staff, I am forwarding a copy of NUREG -1947, "Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for the Vogtle Electric Generating Plant Units 3 and 4." The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two COLs to construct and operate two new nuclear units at the Vogtle Electric Generating Plant site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the draft supplemental environmental impact statement (DSEIS) to include an analysis of relevant environmental issues. The DSEIS documents the NRC determination regarding the environmental impacts at the proposed site from the construction and operation of two new nuclear units.

The DSEIS is available for public inspection at the NRC Public Documents Room or from the Publicly Available Records component of the NRC Agency-wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room) and directly from the NRC website at www.nrc.gov. In addition, the Burke County Library, 130 Highway 24 South, Waynesboro, GA has agreed to make the DSEIS available for public inspection.

This DSEIS is a supplement to the Final EIS for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the *Code of Federal Regulations* (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified.

During the ESP environmental review, the NRC consulted with the Southeast Regional Office and, by letter dated August 11, 2008 (Enclosure 1), received concurrence on a biological assessment evaluating the impacts of construction and operation of two new reactors at the VEGP site on the shortnose sturgeon. The draft SEIS's analysis of impacts to the shortnose sturgeon did not change from the characterization in the ESP FEIS (NUREG-1872) and remains small with no additional mitigation warranted. The Staff has concluded that the COL action involves similar impacts to the same Federally listed species in the same geographic area as analyzed in the ESP, that no new species have been listed or proposed and no new critical habitat designated or proposed for the action area, and that with respect to potential impacts to the shortnose sturgeon, no relevant information has changed regarding the project since the earlier BA was submitted. Therefore, pursuant to 50 C.F.R. § 402.12(g), the Staff hereby proposes to incorporate that biological assessment by reference. Enclosed is a copy of the draft SEIS, NUREG-1947, along with a CD containing the environmental impact statement for the ESP, NUREG-1872, to aid your review.

The NRC plans to hold a public meeting on the DSEIS at the Augusta Technical College, Waynesboro Campus Auditorium, 216 Hwy 24 South, Waynesboro, GA 30830 on Thursday, October 7, 2010. The meeting will convene at 7:00 p.m. and will continue until 10:00 p.m., as necessary. For your information, the meeting will be transcribed and will include: (1) a presentation of the contents of the DSEIS and (2) the opportunity for interested government agencies, organizations, and individuals to provide comments on the DSEIS report. Additionally, the meeting will be preceded by an open house session from 6 p.m. to 7 p.m., during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

To ensure compliance with Section 7 of the Endangered Species Act of 1973 (ESA) and fulfill consultation requirements as required by the Fish and Wildlife Coordination Act (FWCA), please provide any information and comments you consider appropriate under the provisions of the ESA or FWCA during the comment period, which ends on November 24, 2010. With respect to the incorporation by reference of the ESP biological assessment as discussed above, if no response from the Southeast Regional Office is received during the comment period, the NRC will consider the consultation closed. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington, D.C. 20555-0001 or via e-mail to Vogtle.COLAEIS@nrc.gov. Your comments will be addressed in the final SEIS.

D. Bernhart - 3 -

A separate notice of filing of the DSEIS will be placed in the *Federal Register* through the U.S. Environmental Protection Agency (EPA). If you have any questions regarding this matter, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
As stated

cc w/encl: See next page

September 3, 2010

Mr. Robert D. Perry
Special Projects Manager
Office of Environmental Programs
South Carolina Department of
Natural Resources
1000 Assembly Street, Room 310A
P.O. Box 167
Columbia, SC 29202

SUBJECT: NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSE APPLICATION REVIEW

On behalf of the Nuclear Regulatory Commission (NRC) staff, I am forwarding a copy of NUREG-1947; Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4 for your review and comments. The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two COLs to construct and operate two new nuclear units at the Vogtle Electric Generating Plant (VEGP) site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the DSEIS to include an analysis of relevant environmental issues.

The NRC staff completed the DSEIS and the associated *Federal Register* Notice of Availability. The notice advises the public that the DSEIS is available for public inspection at the NRC Public Documents Room or from the Publicly Available Records component of the NRC Agency-wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html, which provides access through the NRC Electronic Reading Room link. The accession number in ADAMS for the DSEIS is ML102370278. The DSEIS can also be found at the NRC VEGP COL-specific webpage at http://www.nrc.gov/reactors/new-reactors/col/vogtle.html. In addition, the Burke County Library located at 130 Hwy 24 South, Waynesboro, GA 30830 has agreed to maintain a copy of the DSEIS and make it available for public inspection.

This DSEIS is a supplement to the Final EIS for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the Code of Federal Regulations (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified.

The NRC plans to hold a public meeting to present the analysis and results of the DSEIS on October 7, 2010, at the Augusta Technical College, Waynesboro Campus, 216 Hwy 24 South, Waynesboro, GA 30830. The meeting will convene at 7:00 p.m., and will continue until 10:00 p.m., as necessary. For your information, the meeting will be transcribed and will include a presentation of the contents of the DSEIS and the opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the meeting will be preceded by an open house session from 6:00 p.m. to 7:00 p.m. during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

As discussed in Section 11.7 of the DSEIS, the staff's preliminary recommendation is that the COLs and requested Limited Work Authorization (LWA) should be issued. This preliminary recommendation is based on (1) the Environmental Report (ER) submitted by Southern Nuclear Operating Company, as revised; and responses to staff requests for additional information; (2) the staff's review conducted for the early site permit referenced by the COL application and the staff assessment documented in the ESP environmental impact statement (EIS); (3) consultation with Federal, State, Tribal and local agencies; (4) the staff's own independent review of potential new and significant information available since preparation and publication of the ESP EIS, and; (5) the assessments summarized in the DSEIS, including the potential mitigation measures identified. Finally, the staff concludes that the requested LWA construction activities defined at 10 CFR 50.10(a) and described in the site redress plan would not result in any significant adverse environmental impacts that cannot be redressed.

Please provide any information or comments on the DSEIS that you consider appropriate during the comment period, which ends on November 24, 2010. Please include in these comments any information you consider appropriate consistent with the provisions of the Fish and Wildlife Coordination Act. The NRC may consider additional comments after the comment period ends to the extent practicable. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington DC 20555-0001 or by e-mail to Vogtle.COLAEIS@nrc.gov.

A separate notice of filing of the DSEIS will be placed in the *Federal Register* through the U.S. Environmental Protection Agency. If you have any questions or require additional information, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at (301) 415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosures:
As stated

cc: See next page

September 3, 2010

Ms. Sandra Tucker
Field Supervisor
Georgia Ecological Services
U.S. Fish and Wildlife Service
105 West Park Drive
Athens, GA. 30607

SUBJECT: NOTIFICATION OF THE ISSUANCE AND REQUEST FOR COMMENTS ON THE DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSES APPLICATION

Dear Ms. Tucker:

On behalf of the Nuclear Regulatory Commission (NRC) staff, I am forwarding a copy of the "Draft Supplemental Environmental Impact Statement for Combined Licenses (COLs) for the Vogtle Electric Generating Plant, Units 3 and 4," for your review and comments. The NRC is reviewing the application submitted by Southern Nuclear Operating Company, Inc. (SNC) and several co-applicants for two COLs to construct and operate two new nuclear units at the VEGP site in Burke County, GA. As part of its review of the proposed action, the NRC staff has prepared the DSEIS to include an analysis of relevant environmental issues.

This notice advises the public that the draft report is available for public inspection at the NRC Public Document Room or from the Publicly Available Records component of the NRC Agency-wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html, which provides access through the NRC Electronic Reading Room link. The accession number in ADAMS for the DSEIS is ML102370278. The DSEIS can also be found at the NRC Vogtle Electric Generating Plant COL-specific webpage at http://www.nrc.gov/reactors/new-reactors/col/vogtle.html. The Burke County Library located at 130 Hwy 24 South, Waynesboro, GA 30830 has agreed to maintain a copy of the DSEIS and make it available for public inspection. A separate notice of filing of the DEIS will be placed in the *Federal Register* through the U.S. Environmental Protection Agency.

This DSEIS is a supplement to the Final EIS for the early site permit (ESP) issued on August 26, 2009, to SNC and the same co-applicants. An ESP is a Commission approval of a site suitable for construction and operation of one or more new nuclear units. Under Title 10 of the Code of Federal Regulations (10 CFR) CFR 51.50(c), a COL applicant referencing an ESP need not submit information or analyses regarding environmental issues that were resolved in the ESP EIS, except to the extent the COL applicant has identified any new and potentially significant information. Accordingly, in preparing the DSEIS, the NRC staff considered whether new and significant information has been identified.

The notice also informs the public that the NRC plans to hold a public meeting to present the analysis and results of the DSEIS on October 7, 2010, at the Augusta Technical College, Waynesboro Campus, 216 Hwy 24 South, Waynesboro, GA 30830. The meeting will convene at 7:00 p.m., and will continue until 10:00 p.m., as necessary. For your information, the meeting will be transcribed and will include a presentation of the contents of the DSEIS and the opportunity for interested government agencies, organizations, and individuals to provide comments on the draft report. Additionally, the meeting will be preceded by an open house session from 6:00 p.m. to 7:00 p.m. during which members of the public may meet and talk with NRC staff members on an informal basis. You and your staff are invited to attend.

During the ESP environmental review, the NRC consulted with your office and, by letter dated September 19, 2008 (Enclosure 1), received concurrence on a biological assessment evaluating the impacts of site preparation and preliminary construction at the VEGP site on potentially occurring Federally listed threatened or endangered species. The draft SEIS's analysis of impacts to potentially occurring Federally listed threatened or endangered species did not change from the characterization in the ESP FEIS (NUREG-1872). The Staff is preparing a biological assessment documenting potential impacts on potentially occurring Federally listed threatened or endangered species as a result of operation of the proposed new units and construction and operation of the proposed transmission line right-of-way associated with the development of the VEGP site, and will be providing that assessment for your consideration.

To ensure compliance with Section 7 of the Endangered Species Act of 1973 (ESA) and fulfill consultation requirements as required by the Fish and Wildlife Coordination Act (FWCA), please provide any information and comments you consider appropriate under the provisions of the ESA or FWCA during the comment period, which ends on November 24, 2010. The NRC may consider additional comments after the comment period ends to the extent practicable. Comments should be submitted either by mail to the Chief, Rules, Announcements, and Directives Branch, Division of Administrative Services, Office of Administration, Mailstop TWB-05-B01M, Washington DC 20555-0001 or by e-mail to Vogtle.COLAEIS@nrc.gov.

S. Tucker - 3 -

If you have any questions regarding this matter, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager at 301-415-0673 or by e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory P. Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosures:
As stated

cc: See next page

VogtleEISCEmails

From: Bryant J. Celestine [celestine.bryant@actribe.org]
Sent: Wednesday, October 06, 2010 9:01 AM
To: VogtleCOLAEIS Resource
Subject: Draft SEIS

On behalf of Mikko Oscola Clayton Sylestine and the Alabama-Coushatta Tribe, our appreciation is expressed on your efforts to consult us regarding the draft Supplemental Environmental Impact Statement for the Vogtle Electric Generating Plant, Units 3 and 4 Combined License Application in Burke County.

Our Tribe maintains ancestral associations within the state of Georgia despite the absence of written documentation to completely identify Tribal activities, villages, trails, or burial sites. However, it is our objective to ensure significances of Native American ancestry, especially of Alabama-Coushatta Tribal origin, are administered with the utmost considerations.

Upon review of your September 2, 2010 submission, we reiterate our January 7, 2010 electronic message to decline the opportunity to participate in this consultation. Burke County currently exists beyond our scope of interest for the state of Georgia. No known impacts to religious, cultural, or historical assets of the Alabama-Coushatta Tribe of Texas will occur in conjunction with this proposal. No further consultation with our Tribe regarding this project is anticipated at this time.

Should you require further assistance, please do not hesitate to contact us.

Sincerely,

Bryant J. Celestine
Historic Preservation Officer
Alabama-Coushatta Tribe of Texas
571 State Park Rd 56
Livingston, TX 77351
936 - 563 - 1181
celestine.bryant@actribe.org

REGION 4
SAM NUNN
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA GEORGIA 30303-8960

November 15, 2010

Chief, Rulemaking and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: EPA Review and Comments
Draft Supplemental Environmental Impact Statement (DSEIS) for the
Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4
Construction and Operation, Application for Combined Licenses (COLs), NUREG-1947
CEQ No. 20100351

Dear Sir:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Supplemental Environmental Impact Statement (DSEIS) for the Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4, pursuant to Section 102(2)(C) of the National Environmental Policy Act (NEPA), and Section 309 of the Clean Air Act. The purpose of this letter is to inform you of the results of our review, and our detailed comments are enclosed.

Southern Nuclear Operating Company, Inc. (Southern) and four co-applicants applied for combined construction permits and operating licenses (combined licenses or COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The proposed action is NRC issuance of COLs for two new nuclear power reactor units (Units 3 and 4) at the VEGP site near Waynesboro, Georgia.

EPA previously reviewed and submitted written comments regarding the Draft and Final Environmental Impact Statements (EISs) for the Early Site Permit (ESP) for the new units, and for the Joint Public Notice for the U.S. Army Corps of Engineers (USACE) Permit. Since these documents stated that there were no transmission line impacts, our comments at that time pertained to the plant site only. The USACE permit action on an Individual Permit application pursuant to Section 404 of the Clean Water Act, and Section 401 water quality certification for the Plant VEGP expansion were finalized in September 2010. The current DSEIS provides updated information and focuses on the proposed issuance of the COLs to authorize construction and operation of the new units and ancillary facilities.

The NRC issued an Early Site Permit (ESP) on August 26, 2009, approving the VEGP site as suitable for the construction of Units 3 and 4. NRC issuance of a Limited Work Authorization

(LWA) enabled specific pre-construction activities at the site to begin. The NRC is currently reviewing the Westinghouse AP1000 pressurized reactor design in a design certification process.

Radioactive waste storage and disposal are ongoing concerns with existing and proposed nuclear power plants. The NRC approved final revisions to the Waste Confidence findings and regulation (10 CFR Part 51.23) in September 2010. This update expresses confidence that commercial high-level radioactive waste and spent fuel generated by any reactor "*...can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor.*" This refers to storage in a spent fuel basin or at either onsite or offsite independent spent fuel storage installations.

Since appropriate storage of spent fuel assemblies and other radioactive wastes is necessary to prevent environmental impacts, the FSEIS should provide a thorough consideration of impacts resulting from such storage. Given the uncertainty regarding ultimate disposal at a repository, on-site storage may continue for many years.

Southern indicated that there would be an operations-related three percent increase in the thermal discharge flow in the DSEIS. The NRC determined that the thermal plume would remain small compared to the width of the Savannah River at this location, and that it would not impede fish passage in the river. The Final Supplemental Environmental Impact Statement (FSEIS) should include a graph of the plume showing the temperature profile, and a discussion of how the increase will (or will not) cause a violation of Georgia's water quality standard for temperature at the point of discharge.

In addition, the design and location of the proposed new cooling water intake structure has changed. The NRC determined that this new location would not alter conclusions presented in the previous ESP FEIS. Continuing measures to limit bioentrainment and other impacts to aquatic species from surface water withdrawals and discharges should be referenced in the FSEIS, and should continue to be addressed as the project progresses, in compliance with the NPDES Permit.

The FSEIS should include further information regarding plans to reduce Greenhouse Gases (GHGs) and other air emissions during construction of the facility. Specifically, energy efficiency and renewable energy should be a consideration in the construction and operation of facility buildings, equipment, and vehicles. We also recommend that the FSEIS explicitly reference the draft guidance from CEQ related to evaluating GHGs in Federal actions, describe the elements of the draft guidance, and to the relevant extent, provide the assessments suggested by the guidance. Based on your analysis using the CEQ NEPA Guidance, further data collection may be necessary in the future.

Based on EPA's review of the DSEIS, the document received a rating of EC-2, meaning that the EPA review identified environmental concerns. (A summary of EPA's rating definitions is enclosed.) In particular, EPA recommends that the FSEIS include updated information about radioactive waste storage and disposal, impacts of macro-right-of-way transmission lines, a consideration of GHGs using CEQ's draft guidance for GHGs, and a discussion of opportunities to reduce GHG and other air emissions during construction and operation of the facility. In

addition, the FSEIS should include a status update regarding the Westinghouse AP1000 certification review.

Thank you for your continuing coordination with us. We look forward to reviewing the FSEIS. If you have any questions or need additional information, please contact Ramona McConney of my staff at (404) 562-9615.

Sincerely,

Heinz J. Mueller, Chief
NEPA Program Office
Office of Policy and Management

Enclosures: EPA Review and Comments
Summary of Rating Definitions and Follow Up Action

EPA Review and Comments Regarding
Draft Supplemental Environmental Impact Statement (DSEIS) for the
Combined Licenses (COLs) for Vogtle Electric Generating Plant Units 3 and 4
Construction and Operation, Application for Combined Licenses (COLs), NUREG-1947
CEQ No. 20100351

General

This DSEIS provides updated information (subsequent to the ESP FEIS) regarding preconstruction activities and environmental data, and focuses on the proposed issuance of COLs for the two new reactor units and ancillary facilities.

In the DSEIS, the NRC concludes that there are no new and significant data or changes to conclusions since the ESP FEIS regarding the following: land-use impacts, meteorology and air quality impacts, water quality impacts, terrestrial and aquatic ecosystems, socioeconomic impacts, historic and cultural resource impacts, environmental justice, nonradiological health impacts, radiological impacts of normal operations, environmental impacts of postulated accidents.

Alternatives

Alternatives in the DSEIS include the no-action alternative, energy source alternatives and system design alternatives. The NRC's evaluation of alternative sites is documented in the EIS for the ESP, which EPA previously reviewed and submitted comments.

Radioactive wastes

Appropriate on-site storage of spent fuel assemblies and other radioactive waste is necessary to prevent environmental impacts. Given the uncertainty regarding ultimate disposal at a repository, on-site storage may continue for a longer term than currently expected.

Yucca Mountain was formerly considered a possible final repository for spent nuclear fuel, but this plan was withdrawn by the U.S. Department of Energy by the motion of March 3, 2010. The abandonment of the plan to create a Yucca Mountain permanent geologic repository has been recently countered by NRC's Atomic Safety and Licensing Board. If another repository in the contiguous United States (other than Yucca Mountain) is ever selected, the environmental impact estimates from the transportation of spent reactor fuel to the repository should be calculated as required under 42 USC 4321 Fuel Cycle, Transportation, and Decommissioning.

In the Waste Confidence Rule (10 CFR 51.23), the Commission generically determined that the spent fuel generated by any reactor can be safely stored on-site for at least 30 years beyond the licensed operating life of the reactor. The NRC approved final revisions to the Waste Confidence findings and regulation in September 2010, extending the storage period until *"...30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor"* in its spent fuel basin or at either onsite or offsite independent spent fuel storage installations.

The FSEIS should clarify the impact of this revision on the proposed project, as this new determination finds that spent nuclear fuel can be stored safely and securely without significant environmental impacts for at least 60 years after operation at any nuclear power plant. EPA recommends that the FSEIS cite any new analyses for longer-term storage regarding scientific knowledge relating to spent fuel storage and disposal. The FSEIS should also mention any developments with the Presidential Blue Ribbon Commission on alternatives for dealing with high-level radioactive waste, if there are such updates before FSEIS publication.

We understand that shipping casks have not yet been designed for the spent fuel from advanced reactor designs such as the Westinghouse AP1000. Information in the Early Site Permit Environmental Report Sections and Supporting Documentation (INEEL 2003) indicated that advanced light water reactor (LWR) fuel designs would not be significantly different from existing LWR designs; therefore, current shipping cask designs were used for the analysis of Westinghouse AP1000 reactor spent fuel shipments. EPA recommends that when shipping casks are designed for the spent fuel for the Westinghouse AP1000, the analysis should be repeated.

EPA understands that concerns have been raised by the NRC that certain structural components of the revised AP1000 shield building may not be suitable to withstand design loads. The shield building is designed to protect the reactor's primary containment from severe weather and other events, as well as serving as a radiation barrier and also supporting an emergency cooling water tank. It is EPA's understanding that the NRC is currently reviewing the remainder of the next-generation reactor's design certification amendment application, and that Westinghouse is expected to make design modifications and conduct safety testing to ensure the shield building design can meet its safety functions.

The FSEIS should address the status of the Westinghouse AP1000 certification review and related issues, particularly the analysis of the structural integrity of the AP1000. We understand that the Safety Evaluation Report will address these issues in even more detail, and that the certification review may be completed as soon as December 2010. EPA understands that Revision 15 of the AP1000 design is codified in 10 CFR Part 52, Appendix D. EPA concurs with NRC's plan to conduct an additional environmental review if changes result in the final design being significantly different from the design considered in the DEIS.

Transmission lines

We note that the NRC considers transmission lines to be "preconstruction" activities (discussed in the EIS for the ESP), and that preconstruction activities are considered in the context of cumulative impacts. EPA is concerned about the impacts of transmission lines and supporting infrastructure for the project and, in accordance with NEPA, considers these activities as part of the project, and not a separate action.

The DSEIS (pages 3-7 and 3-8) discusses the construction of a new transmission line through a "macro-right-of-way." This term should be defined in the text, with details given regarding the proposed extent and impacts of this new transmission line. The FSEIS should also clarify whether there are plans to issue a Limited Work Authorization (LWA) for these lines pursuant to the NRC's LWA process.

Wetlands and Streams

Jurisdictional determinations for all site wetlands are complete, with the exception of the required metes and bounds survey. A joint application package was submitted for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010.

EPA reviewed the impacts to wetlands and streams in response to the USACE's public notice for the Clean Water Act Section 404 permit application, and transmitted a comment letter in accordance with Section 404 coordination procedures. We note that the Dredge and Fill discharge permit was for the transmission line corridor.

NPDES Permitting

Southern indicated that there would be an operations-related three percent increase in the thermal discharge flow. The NRC determined that the thermal plume would remain small compared to the width of the Savannah River at this location, and that it would not impede fish passage in the river (Section 5.4.2). In addition, the design and location of the proposed new cooling water intake structure has changed. The NRC determined that this new location would not alter conclusions in the previous ESP FEIS. Pursuant to our review, the following areas need clarification:

- *Temperature:* The discussion of the 3% increase in the thermal discharge should include a graph of the plume showing the temperature profile, and a discussion of how the increase will (or will not) cause a violation of Georgia's water quality standard for temperature at the point of discharge.

- *Cooling Water Intake:* For clarity, the FSEIS should restate the requirements for the cooling water intake structure.

Greenhouse Gases (GHGs)

We appreciate your discussion of climate change and GHGs in the DSEIS. The DSEIS states that the majority of the potential carbon dioxide (CO_2) emissions of the proposed nuclear power plant would be the life cycle contributions associated with the uranium fuel cycle (Section 7.2). The DSEIS notes that such emissions primarily result from the operation of fossil-fueled power plants that provide the electricity needed to manufacture the nuclear fuel.

CEQ Draft Guidance on GHG Analysis within NEPA: On February 18, 2010, the Council on Environmental Quality (CEQ) proposed four steps to modernize and reinvigorate NEPA. In particular, the CEQ issued draft guidance for public comment on, among other issues, when and how Federal agencies must consider greenhouse gas emissions and climate change in their proposed actions.
(Reference: http://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa)

The draft guidance explains how Federal agencies should analyze the environmental impacts of greenhouse gas emissions and climate change when they describe the environmental impacts of a

proposed action under NEPA. It provides practical tools for agency reporting, including a presumptive threshold of 25,000 metric tons of carbon dioxide equivalent (CO_2e) emissions from the proposed action to trigger a quantitative analysis, and instructs Federal agencies regarding how to assess the effects of climate change on the proposed action and their design. The draft guidance does not apply to land and resource management actions and does not propose to regulate greenhouse gases.

While this guidance is not yet final (and thus, not required), we recommend that the FSEIS explicitly reference the draft guidance, describe the elements of the draft guidance, and to the relevant extent, provide the assessments suggested by the guidance. (Note that the discussion in Section 7.2 and referencing the Sovacool paper (see footnote 1 below) regarding the derivation of 447,000 metric tons/year of CO_2 emissions from a 1000 MW nuclear power plant is difficult to follow. For example, we could not find the "1 percent to 5 percent" citation noted as being in the Sovacool paper. It would be helpful to show a detailed derivation of the amount of direct and indirect CO_2-equivalent emissions expected specifically from this project.)

EPA also recommends a discussion of best management practices (BMPs) to reduce GHGs and other air emissions during construction and operation of the facility. Specifically, clean energy options such as energy efficiency and renewable energy should be a consideration in the use of construction and maintenance equipment and vehicles. For example, equipment and vehicles that use conventional petroleum (e.g., diesel) should incorporate clean diesel technologies and fuels to reduce emissions of GHGs and other pollutants, and should adhere to anti-idling policies to the extent possible. Alternate fuel vehicles (e.g., natural gas, electric) are also possibilities.

(1) Sovacool, BK. Valuing the Greenhouse Gas Emissions for Nuclear Power: A Critical Survey. Energy Policy 36 (2008) 2940 - 2953.

Diesel Exhaust

In addition to the EPA's concerns regarding climate change effects and GHG emissions, the National Institute for Occupational Safety and Health (NIOSH) has determined that diesel exhaust is a potential human carcinogen, based on a combination of chemical, genotoxicity, and carcinogenicity data. In addition, acute exposures to diesel exhaust have been linked to health problems such as eye and nose irritation, headaches, nausea, and asthma.

Although every construction site is unique, common actions can reduce exposure to diesel exhaust. EPA recommends that the following actions be considered for construction equipment:

- Using low-sulphur diesel fuel (less than 0.05% sulphur).
- Retrofit engines with an exhaust filtration device to capture DPM before it enters the workplace.
- Position the exhaust pipe so that diesel fumes are directed away from the operator and nearby workers, thereby reducing the fume concentration to which personnel are exposed.
- A catalytic converter reduces carbon monoxide, aldehydes, and hydrocarbons in diesel fumes. These devices must be used with low sulphur fuels.
- Ventilate wherever diesel equipment operates indoors. Roof vents, open doors and windows, roof fans, or other mechanical systems help move fresh air through work areas.

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As buildings under construction are gradually enclosed, remember that fumes from diesel equipment operating indoors can build up to dangerous levels without adequate ventilation.

- Attach a hose to the tailpipe of a diesel vehicle running indoors and exhaust the fumes outside, where they cannot reenter the workplace. Inspect hoses regularly for defects and damage.
- Use enclosed, climate-controlled cabs pressurized and equipped with high efficiency particulate air (HEPA) filters to reduce operators' exposure to diesel fumes. Pressurization ensures that air moves from inside to outside. HEPA filters ensure that any air coming in is filtered first.
- Regular maintenance of diesel engines is essential to keep exhaust emissions low. Follow the manufacturer's recommended maintenance schedule and procedures. Smoke color can signal the need for maintenance. For example, blue/black smoke indicates that an engine requires servicing or tuning.
- Work practices and training can help reduce exposure. For example, measures such as turning off engines when vehicles are stopped for more than a few minutes; training diesel-equipment operators to perform routine inspection and maintenance of filtration devices.
- When purchasing a new vehicle, ensure that it is equipped with the most advanced emission control systems available.
- With older vehicles, use electric starting aids such as block heaters to warm the engine, avoid difficulty starting, and thereby reduce diesel emissions.
- Respirators are only an interim measure to control exposure to diesel emissions. In most cases an N95 respirator is adequate. Respirators are for interim use only, until primary controls such as ventilation can be implemented. Workers must be trained and fit-tested before they wear respirators. Personnel familiar with the selection, care, and use of respirators must perform the fit testing. Respirators must bear a National Institute of Occupational Safety and Health (NIOSH) approval number. Never use paper masks or surgical masks without NIOSH approval numbers.

Endangered and Threatened Species

The DSEIS states that a biological assessment documenting potential impact on the federally listed threatened or endangered terrestrial special as a result of operation of the proposed new units and proposed transmission line is in development. The FSEIS should provided updated information on this assessment.

Historic Preservation

We appreciate the thorough discussion of cultural and historic resources in the DSEIS. Pursuant to the location of a historic cemetery on the VEGP site, Southern entered into a Memorandum of Understanding (SHPO) with the Georgia State Historic Preservation Office (SHPO). We also note SCE&G's cultural resources awareness training and inadvertent discovery procedure training for staff working at the site. The FSEIS should include an update of coordination activities with the SHPO.

SUMMARY OF RATING DEFINITIONS AND FOLLOW UP ACTION*

Environmental Impact of the Action

LO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impacts. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the Draft EIS sate, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1-Adequate

The EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alterative and those of the alternatives reasonably available to the project or action. No further analysis or data collecting is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for the EPA to fully assess the environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the Draft EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640 Policy and Procedures for the Review of the Federal Actions Impacting the Environment

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Richard B. Russell Federal Building
75 Spring Street, S.W.
Atlanta, Georgia 30303

ER10/0767

November 29, 2010

Chief, Rules, Announcements, and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Comments for the Draft Environmental Impact Statement (DEIS) for Vogtle Nuclear Plant Units 3 and 4, Application for Combined Licenses (COLs), NUREG-1947, Burke County, Georgia

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) of the Nuclear Regulatory Commission (NRC) for the proposed addition of two nuclear reactors (Units 3 and 4) at the Vogtle Electric Generating Plant (VEGP). The license applicant is Southern Nuclear Operating Company, Inc. (Southern), on behalf of itself and four co-applicants (two private and two municipal utilities). The project involves building two pressurized water nuclear reactors and associated facilities adjacent to the existing VEGP Units 1 and 2. The VEGP site is located in Burke County, Georgia, approximately 26 mi southeast of Augusta, Georgia. The reactors would draw cooling water from the Savannah River. Constructing the new reactors and associated on-site facilities would disturb about 556 acres at the VEGP site. The exact route of new transmission lines associated with the new reactors is not yet determined, but would extend from the VEGP west into Jefferson County, and then north into Warren and McDuffie Counties. Our comments follow.

Threatened and Endangered Species

By letter dated September 19, 2008, we concurred with the findings of NRC's Biological Assessment for the effects of early site preparation and preliminary construction activities at the VEGP site. The list of species protected under the Endangered Species Act (ESA) that occur in the project area has not changed since September 2008, and includes the wood stork, red-cockaded woodpecker, indigo snake, and Canby's dropwort. The DEIS indicates that the NRC is preparing a second Biological Assessment for construction and operations effects. As transmission line corridors and other pertinent construction details are more precisely defined,

please coordinate directly with the US Fish and Wild Life Service's Coastal Georgia Sub-office supervisor, Strant Colwell, at (912) 832-8739, to conclude the ESA consultation process for the project.

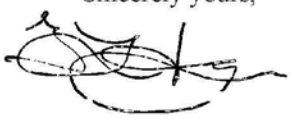
The Department had been concerned about the possible impacts of dredging the channel for barge delivery of reactors, containment vessels, and other large equipment; however, the DEIS notes (page 7-6) that Southern will instead deliver large components and materials by rail, and will not construct a barge slip or seek dredging of the Savannah River navigation channel. This change in the project plans eliminates our concerns related to ESA-protected aquatic species, such as the robust redhorse.

Avian Protection Plan

The DEIS notes that bird collisions with tall structures and transmission lines are among the impacts of building and operating the proposed project (pages 4-6 and 5-3), but does not describe mitigation measures for these impacts. The Department recommends that the NRC and Southern coordinate with us and the Georgia Department of Natural Resources Wildlife Division in the development of an Avian Protection Plan (APP). The Migratory Bird Treaty Act (MBTA) prohibits take of migratory birds except when specifically authorized by the Department of the Interior. The regulations implementing the MBTA (50 CFR Part 21) do not provide for permits authorizing take of migratory birds that may be killed or injured by activities that are otherwise lawful, such as by the construction and operation of power transmission lines. The Bald and Golden Eagle Protection Act provides for very limited issuance of permits that authorize take of eagles when such take is associated with otherwise lawful activities, is unavoidable despite implementation of advanced conservation practices, and is compatible with the goal of stable or increasing eagle breeding populations. The overall goal of the APP would be to minimize avian mortality associated with the proposed facilities.

The Department appreciates the opportunity to comment on this project. If you have questions or concerns about our comments, I can be reached on (404) 331-4524 or via email at gregory_hogue@ios.doi.gov.

Sincerely yours,



Gregory Hogue
Regional Environmental Officer

cc: Jerry Ziewitz – FWS
Brenda Johnson – USGS
David Vela - NPS
OEPC – WASH

February 24, 2011

Ms. Sandra Tucker
Field Supervisor
Georgia Ecological Services
U.S. Fish and Wildlife Service
105 West Park Drive, Suite D
Athens, GA 30606

SUBJECT: BIOLOGICAL ASSESSMENT FOR THREATENED AND ENDANGERED SPECIES AND DESIGNATED CRITICAL HABITAT FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSES APPLICATION

Dear Ms. Tucker:

The U.S Nuclear Regulatory Commission (NRC) has prepared the enclosed Biological Assessment (BA) associated with Southern Nuclear Operating Company, Inc. (Southern) and its four co-applicants request for combined licenses (COLs) for Vogtle Electric Generating Plant (VEGP) Units 3 and 4. The assessment examines the potential impacts of construction and operation of the facility on threatened or endangered species. The purpose of this letter is to request the U.S Fish and Wildlife Service's (FWS) concurrence with the NRC staff's determination in the assessment that threatened and endangered species are not likely to be adversely affected by the proposed action.

The proposed action is NRC issuance of COLs for two new nuclear power reactor units at the VEGP Site near Waynesboro, GA. The BA evaluates the effects of the proposed action on four Federally listed threatened or endangered species identified in your October 20, 2010, letter. The Federally listed species are: (1) one plant: Canby's dropwort (*Oxypolis canbyi*), (2) two birds: the wood stork (*Mycteria americana*) and red-cockaded woodpecker (*Picoides borealis*) and (3) one reptile: eastern indigo snake (*Drymarchon couperi*). In developing the BA, the NRC staff performed research, reviewed information provided by the applicant, and relied on information provided by FWS (i.e., current listings of species provided by the FWS Field Office, Brunswick, GA) in reaching its conclusion.

The FWS previously reviewed the NRC staff's BA developed in connection with Southern's VEGP, Units 3 and 4 Early Site Permit (ESP) request. The VEGP ESP Site is located adjacent to the existing VEGP, Units 1 and 2. The proposed Federal action at that time was issuance of a permit for a site suitable for constructing and operating additional nuclear power facilities and to conduct site preparation and limited construction activities under provisions of Title 10, Part 52 of the *Code of Federal Regulations*. Because issuance of COLs would authorize both construction and operation of the proposed new units, the enclosed assessment addresses the potential impact to threatened and endangered species, including impacts associated with construction and operation of offsite transmission lines.

The Federally listed species considered in the BA for the ESP included (1) three plants: smooth coneflower (*Echinacea laevigata*), Canby's dropwort (*Oxypolis canbyi*), and relict trillium (*Trillium reliquum*), (2) two birds: the wood stork (*Mycteria americana*) and red-cockaded woodpecker (*Picoides borealis*), (3) one reptile: American alligator (*Alligator mississippiensis*), and (4) one amphibian: flatwoods salamander (*Ambystoma cingulatum*). The USFWS reviewed the BA associated with the ESP and in a letter dated September 19, 2008, concluded that "…. that the species under the jurisdiction of the Service have been adequately addressed for limited site-preparation activities at the Vogtle site." The ESP and limited work authorization was subsequently approved by the NRC on August 26, 2009.

If you have any questions regarding this BA or the staff's request, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager via telephone at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
As stated

cc w/o encl: See next page

The Federally listed species considered in the BA for the ESP included (1) three plants: smooth coneflower (*Echinacea laevigata*), Canby's dropwort (*Oxypolis canbyi*), and relict trillium (*Trillium reliquum*), (2) two birds: the wood stork (*Mycteria americana*) and red-cockaded woodpecker (*Picoides borealis*), (3) one reptile: American alligator (*Alligator mississippiensis*), and (4) one amphibian: flatwoods salamander (*Ambystoma cingulatum*). The USFWS reviewed the BA associated with the ESP and in a letter dated September 19, 2008, concluded that "... that the species under the jurisdiction of the Service have been adequately addressed for limited site-preparation activities at the Vogtle Site." The ESP and limited work authorization was subsequently approved by the NRC on August 26, 2009.

If you have any questions regarding this BA or the staff's request, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager via telephone at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
As stated

cc w/o encl: See next page

Distribution:

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Name	MSutton	GHawkins	NKuntzelman	PMoulding(NLO subject to edits)	GHatchett
Date	12/7/2010	12/8/2010	12/8/2010	1/26/2011	2/24/2011

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Southern Nuclear - Vogtle Mailing List

Mr. M. Stanford Blanton
Esquire
Balch and Bingham, LLP
P.O. Box 306
Birmingham, AL 35201

Ms. Michele Boyd
Legislative Director
Energy Program
Public Citizens Critical Mass Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Marvin Fertel
Senior Vice President
and Chief Nuclear Officer
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, DC 20006-3708

Lucious Abram
County Commissioner
Office of the County Commissioner
Burke County Commission
PO Box 1626
Waynesboro, GA 30830

O. C. Harper, IV
Vice President - Resources Planning and
Nuclear Development
Georgia Power Company
241 Ralph McGill Boulevard
Atlanta, GA 30308

Mr. Steven M. Jackson
Senior Engineer - Power Supply
Municipal Electric Authority of Georgia
1470 Riveredge Parkway, NW
Atlanta, GA 30328-4684

Mr. Louis B. Long
Vice President Technical Support
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Director
Consumer's Utility
Counsel Division
Governor's Office of Consumer Affairs
2 Martin Luther King, Jr. Drive
Plaza Level East, Suite 356
Atlanta, GA 30334-4600

Mr. Arthur H. Domby, Esquire
Troutman Sanders
Nations Bank Plaza
600 Peachtree Street, NE
Suite 200
Atlanta, GA 30308-2216

Mr. Jeffrey T. Gasser
Executive Vice President
Southern Nuclear Operating Company,Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Laurence Bergen
Oglethorpe Power Corp.
2100 E Exchange Pl,
PO Box 1349
Tucker, GA 30085-1349

Mr. Charles R. Pierce
Vogtle Deployment Licensing Manager
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

Resident Inspector
Vogtle Plant
8805 River Road
Waynesboro, GA 30830

Southern Nuclear - Vogtle Mailing List

Resident Manager
Mr. Reece McAlister
Executive Secretary
Georgia Public Service Commission
Atlanta, GA 30334

Mr. Thomas O. McCallum
Site Development Project Engineer
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

Mr. Joseph (Buzz) Miller
Executive Vice President
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Mr. Thomas Moorer
Environmental Project Manager
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

David Bernhart
Assistant Regional Administrator
for Protect Resources
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Sam Booher
Concerned Citizen
4387 Roswell Drive
Augusta, GA 30907

Claude Howard
394 Nathaniel Howard Rd
Waynesboro, GA 30830

Glenn Carroll
Nuclear Watch South
PO Box 8574
Atlanta, GA 31106

Oglethorpe Power Corporation
Alvin W. Vogtle Nuclear Plant
7821 River Road
Waynesboro, GA 30830

Mr. Jerry Smith
Commissioner
District 8
Augusta-Richmond County Commission
1332 Brown Road
Hephzibah, GA 30815

Mr. Robert E. Sweeney
IBEX ESI
4641 Montgomery Avenue
Suite 350
Bethesda, MD 20814

Bentina C. Terry
Southern Nuclear Operating Company,Inc.
PO Box 1295, BIN B-022
Birmingham, AL 35201-1295

Courtney Hanson
250 Georgia Avenue
Atlanta, GA 30312

Annie Laura Stephens
146 Nathanield Howard Rd
Waynesboro, GA 30830

Lucious Abrams
Burke County Commissioner
2032 Bough Red Hill
Keysville, GA 30816

Richard H. Byne
537 Jones Avenue
Waynesboro, GA 30830

Southern Nuclear - Vogtle Mailing List

Tommy Mitchell
Burke County Schools
352 Southside Dr
Waynesboro, GA 30830

George DeLoach
Mayor of Waynesboro
201 Oak Lane
Waynesboro, GA 30830

Robin Baxley
Best Office Solutions
142 S. Liberty St
Waynesboro, GA 30830

Email

APH@NEI.org (Adrian Heymer)
awc@nei.org (Anne W. Cottingham)
robin@bestofficesolutions.net (Robin Y. Baxley)
BrinkmCB@westinghouse.com (Charles Brinkman)
deloachjane@hotmail.com (George DeLoach)
chris.maslak@ge.com (Chris Maslak)
crpierce@southernco.com (C.R. Pierce)
cwaltman@roe.com (C. Waltman)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
dlochbaum@UCSUSA.org (David Lochbaum)
erg-xl@cox.net (Eddie R. Grant)
frankq@hursttech.com (Frank Quinn)
greshaja@westinghouse.com (James Gresham)
james.beard@gene.ge.com (James Beard)
jgutierrez@morganlewis.com (Jay M. Gutierrez)
jim.riccio@wdc.greenpeace.org (James Riccio)
jim@ncwarn.org (Jim Warren)
JJNesrsta@cpsenergy.com (James J. Nesrsta)
Joseph_Hegner@dom.com (Joseph Hegner)
KSutton@morganlewis.com (Kathryn M. Sutton)
kwaugh@impact-net.org (Kenneth O. Waugh)
lynchs@gao.gov (Sarah Lynch - Meeting Notices Only)
maria.webb@pillsburylaw.com (Maria Webb)
mark.beaumont@wsms.com (Mark Beaumont)
matias.travieso-diaz@pillsburylaw.com (Matias Travieso-Diaz)
mcaston@southernco.com (Moanica Caston)
media@nei.org (Scott Peterson)
mike_moran@fpl.com (Mike Moran)
tmitche@eburke.k12.ga.us (Tommy Mitchell)
nirsnet@nirs.org (Michael Mariotte)
eogleyoliver@gmail.com (Emma Ogley-Oliver)
patriciaL.campbell@ge.com (Patricia L. Campbell)
paul.gaukler@pillsburylaw.com (Paul Gaukler)
bobby@waud.org (Bobbie Paul)
Paul@beyondnuclear.org (Paul Gunter)
phinnen@entergy.com (Paul Hinnenkamp)
pshastings@duke-energy.com (Peter Hastings)
RJB@NEI.org (Russell Bell)
RKTemple@cpsenergy.com (R.K. Temple)
Crivard (?)
roberta.swain@ge.com (Roberta Swain)
burkechamber@roelco.net (Ashley Roberts)
sandra.sloan@areva.com (Sandra Sloan)
sfrantz@morganlewis.com (Stephen P. Frantz)
sbooher@aol.com (Sam Booher)
steven.hucik@ge.com (Steven Hucik)
tomccall@southernco.com (Tom McCallum)
diannevalentin@gmail.com (Dianne Valentin)
pvince20@gmail.com (Patricia Vincent)
waraksre@westinghouse.com (Rosemarie E. Warak)

Biological Assessment

U.S. Fish and Wildlife Service

Vogtle Electric Generating Plant
Combined Licenses Application

U.S. Nuclear Regulatory Commission Combined Licenses Application
Docket Nos. 52-025; 52-026

Burke County, Georgia

February 2011

U.S. Nuclear Regulatory Commission
Rockville, Maryland

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Abbreviations/Acronyms

ac	acre(s)
AP1000	Advanced Passive 1000
APP	Avian Protection Program
BA	biological assessment
CCAA	Candidate Conservation Agreement with Assurances
CFR	Code of Federal Regulations
cm	centimeter(s)
COL	combined license
CWS	circulating water system
dBA	decibel(s) (acoustic)
DOE	U.S. Department of Energy
EA	environmental assessment
Eco-Sciences	Eco-Sciences of Georgia
EMFs	electromagnetic fields
EPP	environmental protection plan
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ESP	early site permit
FONSI	Finding of No Significant Impact
FR	Federal Register
ft	foot/feet
FWS	U.S. Fish and Wildlife Service
GDNR	Georgia Department of Natural Resources
GEIS	generic environmental impact statement
GPC	Georgia Power Company
GTC	Georgia Transmission Corporation
ha	hectare(s)
in.	inch(es)
kg/ha/mo	kilograms per hectare per month
km	kilometer(s)
kV	kilovolt(s)
lbs/ac/mo	pounds per acre per month
LWA	Limited Work Authorization
m	meter(s)

mi	mile(s)
MW(t)	megawatts thermal
NEPA	National Environmental Policy Act of 1969, as amended
NRC	U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
Plant Wilson	Allen B. Wilson Combustion Turbine Plant
RDC	Representative Delineated Corridor
ROW	right(s)-of-way
SCDNR	South Carolina Department of Natural Resources
SCE&G	South Carolina Electric and Gas
SEIS	supplemental environmental impact statement
SERPPAS	Southeast Regional Partnership for Planning and Sustainability
SPL	sound pressure level
Southern	Southern Nuclear Operating Company, Inc.
TDS	total dissolved solids
TRC	Third Rock Consultants, LLC
USACE	U.S. Army Corps of Engineers
VEGP	Vogtle Electric Generating Plant
Westinghouse	Westinghouse Electric Company, LLC

1.0 Introduction

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Southern Nuclear Operating Company, Inc. (Southern), acting on behalf of itself and several co-applicants (i.e., Georgia Power Company [GPC], Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia) for combined licenses (COLs) to construct and operate two Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive 1000 (AP1000) pressurized water reactors (Units 3 and 4) on the site of the Vogtle Electric Generating Plant (VEGP) in Burke County, Georgia. The VEGP Site and existing facilities are owned and operated by GPC, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia. Southern is the licensee and operator of the existing VEGP Units 1 and 2, and has been authorized by the VEGP co-owners to apply for COLs to construct and operate two additional units (Units 3 and 4) at the VEGP Site.

On August 26, 2009, the NRC approved issuance of an early site permit (ESP) and a limited work authorization (LWA) for two additional nuclear units at the VEGP Site (NRC 2009) to Southern and the same four co-applicants. This approval was supported by information contained in NUREG-1872, *Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site, Volumes* 1 and 2 and errata (NRC 2008a). The ESP resolved many safety and environmental issues and allowed Southern to "bank" the VEGP ESP Site for up to 20 years. The LWA authorized Southern to conduct certain limited construction activities at the site in accordance with Title 10 of the Code of Federal Regulations (CFR), Sections 50.10 and 52.24(c). As permitted by NRC regulations, the COL application references the VEGP ESP.

Southern's COL application addressed the impacts of constructing and operating two new nuclear units at the existing VEGP Site in Burke County, Georgia. The VEGP Site is approximately 42 km (26 mi) south of Augusta, Georgia. The proposed COL site is completely within the confines of the existing VEGP Site, with the new units to be constructed and operated adjacent to the existing Units 1 and 2 (Figure 1). In October 2009, as part of the COL application, Southern requested a second LWA that would authorize installation of reinforcing steel, sumps, drain lines, and other embedded items along with placement of concrete for the nuclear island foundation base slab.

Independent of the COL application and LWA request, Southern and GPC intend to construct and operate a new 500-kV transmission line to serve the proposed Units 3 and 4. The two new units would use some combination of the new and existing transmission lines. The exact route of the new transmission line has not been determined, but the new transmission line right-of-

way (ROW) would be routed northwest from the VEGP Site, passing west of Fort Gordon, a U.S.

Army facility west of Augusta, Georgia, and then north to the Thomson substation. The Thomson substation is located about 32 km (20 mi) west of Augusta, Georgia. The transmission line ROW would be approximately 46 m (150 ft) wide and approximately 97 km (60 mi) long (NRC 2008a). The new transmission line would require approximately 390 towers (NRC 2008a). Each tower would require foundation excavations. Transmission line siting in Georgia is regulated under Title 22 of the Georgia Code. Construction and operation of the potential transmission line is not authorized by the NRC and approval of that activity is thus not part of the NRC's determination on the COL application. However, that activity is considered in the environmental review in assessing potential impacts of the major Federal action of issuing the requested COLs. Using the Electric Power Research Institute-Georgia Transmission Corporation (EPRI-GTC) Transmission Line Siting Methodology (EPRI-GTC 2006), Southern and GPC (GPC 2007) identified a set of potential transmission routes within what they termed the Representative Delineated Corridor (RDC), as depicted in Figure 2. The RDC was used as the basis for environmental impact analysis. Although the precise route for the planned new transmission line has not yet been determined, it will be within the RDC.

As permitted by NRC regulations in 10 CFR Part 52, which contains NRC's reactor licensing regulations, the COL application references the VEGP ESP. In accordance with the applicable provisions of 10 CFR Part 51, which are the NRC regulations implementing the National Environmental Policy Act of 1969 (NEPA), NRC is required to prepare a supplemental environmental impact statement (SEIS) as part of its review of a COL application referencing an ESP. As required by 10 CFR 51.26, the NRC published the draft SEIS for public comment in the *Federal Register* (FR) on September 3, 2010.

During April, May, and June, 2010, Southern submitted requests for three ESP license amendments associated with the previously authorized LWA construction activities. These amendment requests sought authorization to use Category 1 and Category 2 backfill materials from additional onsite sources, including three new borrow areas, and to change the classification of engineered backfill over the side slopes of the excavations for Units 3 and 4 (Southern 2010a, b, c, d). NRC prepared environmental assessments (EA) and Findings of No Significant Impact (FONSI) for each license amendment request (NRC 2010a, b, c). These ESP license amendments were issued in May 2010 (NRC 2010d), June 2010 (NRC 2010e), and July 2010 (NRC 2010f). The ESP license amendments requesting authorization to use backfill materials from three new borrow areas resulted in changes to the construction footprint on the VEGP Site. The change in the site preparation footprint for additional borrow areas resulted in an additional 108 ha (267 ac) that was cleared and excavated for backfill material.

The SEIS, together with the ESP EIS (NRC 2008a), the ESP hearing proceedings, and the ESP license amendment EAs, provides the NRC staff's evaluation of the environmental effects of constructing and operating two new AP1000 reactors at the VEGP Site.

During the review of the ESP application, as part of the NRC's responsibilities under Section 7 of the Endangered Species Act (ESA), the NRC staff prepared a biological assessment (BA) documenting potential impacts on the Federally listed threatened or endangered species as a result of the site preparation (including construction of the onsite portion of the new 500-kV transmission line) and construction of Units 3 and 4 on the VEGP Site. The BA was submitted to U.S. Fish and Wildlife Service (FWS) on January 25, 2008 (NRC 2008b), and FWS concurred with the findings on September 19, 2008 (FWS 2008).

The NRC staff has concluded that, with respect to site preparation activities and construction of Units 3 and 4 on the VEGP Site (including construction of the onsite portion of the proposed transmission line), the COL action involves similar impacts to the same Federally listed species in the same geographic area as analyzed in the ESP; that no new species have been listed or proposed and no new critical habitat designated or proposed for the action area; and that, with respect to potential impacts to listed species from the activities previously analyzed, no relevant information has changed regarding the project since the earlier BA was submitted. Therefore, pursuant to 50 CFR 402.12(g), the ESA of 1973, as amended, the NRC staff proposes to incorporate the earlier BA by reference. Furthermore, NRC has prepared this BA to document potential impacts on Federally listed threatened or endangered terrestrial species resulting from operation of Units 3 and 4, including potential impacts anticipated from construction and operation of the proposed transmission line ROW. Operation of the transmission lines includes maintenance activities, such as herbicide applications, tree removal, and mowing.

In a letter dated January 7, 2010, NRC requested that the FWS Field Office in Brunswick, Georgia, provide information regarding Federally listed species and critical habitat that may have changed since the 2008 consultation (NRC 2010g). On February 12, 2010, FWS provided a response letter indicating listed species under FWS had been adequately addressed for limited site-preparation activities on the VEGP Site (FWS 2010a). On October 20, 2010, FWS provided an updated list of Federally listed threatened or endangered species that can be expected to occur in the project area (FWS 2010b). In addition to the federally listed species, FWS provided information on the bald eagle (*Haliaeetus leucocephalus*) and the gopher tortoise (*Gopherus polyphemus*) in the response letter.

The bald eagle was Federally delisted under the ESA in August 2007. In May 2007, National Bald Eagle Management Guidelines were published to assist in understanding protections afforded to and prohibitions related to the bald eagle under the Bald Eagle Act (FWS 2010b). There are bald eagle nests in Jefferson and McDuffie Counties in Georgia, and one known location of an active nest in McDuffie County in the vicinity of the proposed new transmission line (FWS 2010b). GPC stated that it would ensure the new transmission line ROW would not

come within 180 m (600 ft) of this known bald eagle nesting site (GPC 2007). Eagle nests on transmission/distribution structures or other electrical equipment have not been documented in Georgia (GPC 2006): nevertheless, one of GPC's procedures in its Avian Protection Program (APP) includes contacting the FWS to advise the agency of the situation and to obtain additional instructions or permits, if an eagle's nest is encountered on a transmission/distribution structure (GPC 2006). Potential impacts to the bald eagle related to construction and operation of proposed Units 3 and 4, including impacts from construction and operation of the proposed transmission line, are discussed in the ESP EIS (NRC 2008a).

The gopher tortoise is a Georgia state threatened species and is currently under review by the FWS to be listed as threatened (FWS 2010b). There are no known populations of the gopher tortoise on the VEGP Site or within the proposed transmission corridor (GDNR 2009; FWS 2010b). Southern submitted a draft Candidate Conservation Agreement with Assurances (CCAA) for the gopher tortoise at the VEGP Site. This CCAA is currently under review by FWS (SERPPAS 2010). The draft CCAA does not include the offsite portions of the proposed transmission line. In the October 20, 2010 letter to NRC, FWS recommended that tortoise surveys be included in surveys that are conducted where sandhills habitat exists. FWS stated that there are several areas within the proposed transmission line corridor that have sandhills habitat that may contain gopher tortoises (FWS 2010b). Potential impacts to the gopher tortoise related to construction and operation of the proposed Units 3 and 4, including impacts from construction and operation of the proposed transmission line, will be included in the final COL SEIS.

Pursuant to Section 7(c) of the ESA of 1973, as amended, NRC has prepared this BA, which examines the potential impacts of facility operation related to the proposed Units 3 and 4 at the VEGP Site on threatened or endangered species, including potential impacts from transmission line construction and operation activities. This BA evaluates the effects of the proposed action on four Federally listed threatened or endangered species identified by FWS in its October 20, 2010, letter that may occur on or in the vicinity of the VEGP Site and/or in habitats crossed by the proposed transmission line (Table 1). The consultation is between NRC and FWS.

Table 1. Federally Listed Species Potentially Occurring on and in the Vicinity of the VEGP Site and the Proposed Transmission Line Right-of-Way

Scientific Name	Common Name	Federal Status[a]
Vascular Plant		
Oxypolis canbyi	Canby's dropwort	E
Birds		
Mycteria americana	wood stork	E
Picoides borealis	red-cockaded woodpecker	E
Reptile		
Drymarchon couperi	Eastern Indigo Snake	T

a. Federal status rankings determined by the FWS under the Endangered Species Act: E = Endangered, T = Threatened.
Source: FWS 2010b

2.0 VEGP Site Description

The VEGP Site is located on the Savannah River shoreline approximately 24 km (15 mi) east-northeast of Waynesboro, Georgia, and 42 km (26 mi) southeast of Augusta, Georgia. The existing site consists of two Westinghouse pressurized water reactors, a turbine building, a switchyard, intake and discharge structures, and support buildings. Two generating units (Units 1 and 2) are currently operating at the site (Figure 1). The Allen B. Wilson Combustion Turbine Plant (Plant Wilson), a six-unit, oil-fueled combustion turbine facility built in 1974 and owned by GPC, and ancillary structures and systems related to Units 1 and 2 also are located onsite. The existing Units 1 and 2 and Plant Wilson would not be affected by this action.

The footprint for Units 3 and 4 is in a previously disturbed area adjacent to the existing VEGP Units 1 and 2 (Figure 1). The existing Units 1 and 2 and the proposed Units 3 and 4 would share certain support structures such as office buildings and water, wastewater, and waste-handling facilities; however, the new intake and discharge facilities for Units 3 and 4 would be separate from the intake and discharge facilities for Units 1 and 2. Each proposed Westinghouse AP1000 reactor would have a rated thermal power level of 3400 megawatts thermal MW(t) (NRC 2008a). For the circulating water cooling system for Units 3 and 4, Southern proposed natural-draft cooling towers, and for the service water system, mechanical-draft cooling towers.

The VEGP Site is approximately 1282.5 ha (3169 ac) in size and is located in the sandhills of the Upper Coastal Plain Region, approximately 48 km (30 mi) southeast of the Fall Line (Eco-Sciences 2007; NRC 2008a). The site has 12 soil types and several major habitat types, including ponds, pine plantations, native upland pines, and the bottomland hardwoods that are

found along stream drainages onsite and adjacent to the Savannah River (NRCS 2003; TRC 2006).

Directly across the Savannah River from the VEGP Site is the Savannah River Site, a U.S. Department of Energy (DOE) facility with restricted access (NRC 2008a). River swamp, bottomland hardwood, and upland pine-hardwood communities occur on the Savannah River Site within 10 km (6 mi) of the VEGP Site (NRC 2008a). The Savannah River Swamp comprises about 3800 ha (9400 ac) and borders the Savannah River on the southwestern edge of the Savannah River Site, adjacent to the VEGP Site (Wike et al. 2006).

2.1 Wildlife Habitat

The VEGP Site is characterized by low, gently rolling sandy hills. Scrub oaks, including turkey (*Quercus laevis*), post (*Q. stellata*), and willow oak (*Q. phellos*), and longleaf pine (*Pinus palustris*) occur in the upland wooded areas that were not previously cultivated. Red oak (*Q. rubra*), water oak (*Q. nigra*), and maple (*Acer* sp.) dominate the lowland hardwood areas. Bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) characterize the Savannah River floodplain.

The longleaf pine-scrub oak community is found on ridge tops as well as south and west slopes in undisturbed upland areas on the VEGP Site. Common canopy species in this habitat include longleaf pine, turkey oak, and bluejack oak (*Q. incana*). The north and east slopes in the undisturbed uplands support the more mesic oak-hickory community. The canopy in this community is mainly composed of white oak (*Q. alba*), white ash (*Fraxinus americana)*, mockernut hickory (*Carya alba*), and flowering dogwood (*Cornus florida)*. A few turkey oaks and a scattering of shortleaf pine (*P. echinata*) are also present (TRC 2006). A steep bluff separates the dry upland forest from the intermittently flooded bottomland along the Savannah River. Common canopy species include oak, mockernut hickory, tuliptree (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), American elm (*Ulmus americana*), basswood (*Tilia americana*), and Florida maple (*A. barbatum*). The planted pine plantations on the VEGP Site are of various ages and differ in the stocking rates. The plantations vary from a nearly closed canopy with very little understory, to areas that resemble old fields with only scattered pine. Loblolly (*P. taeda*) and longleaf pines are the primary overstory species (TRC 2006). Pine plantations are managed through prescribed burning every 3 to 5 years, timber thinning after 20 years, and aesthetic cuts after thinning. Burning is limited to 25 to 30 percent of the upland and planted pine acreage each year (NRC 2008a).

The wetlands associated with the VEGP Site include those near the Savannah River, as well as those near ponds and streams located onsite. Principal water bodies onsite include Mallard Pond and two streams in the southern portion of the VEGP Site (Figure 1). Southern contracted with Eco-Sciences of Georgia (Eco-Sciences) to survey the VEGP Site in December 2006 to determine where jurisdictional waters of the United States occur. Approximately 69 ha (170 ac)

of potential jurisdictional wetlands were identified on the site during the Eco-Sciences survey (NRC 2008a). These include 48 wetlands, 6 perennial streams, 13 intermittent streams, and 3 ephemeral streams.

The proposed transmission line ROW is within the Piedmont and Coastal Plain Physiographic Regions of Georgia. The Piedmont is characterized by rolling hills and irregular plains. The soils are finely textured and can be highly erodible. The Coastal Plain is composed of mostly flat areas with some rolling hills with well-drained soils (GPC 2007). Using the Electric Power Research Institute-Georgia Transmission Corporation (EPRI-GTC) Transmission Line Siting Methodology (EPRI-GTC 2006), Southern and GPC identified a set of potential transmission routes within the RDC (Figure 2) (GPC 2007) that was used as the basis for environmental impact analysis. The RDC ranges from approximately 1.6 km (1 mi) to a little of 5 km (3 mi) in width and is approximately 80 km (50 mi) long. The actual routing of the 45m (150 ft) wide, up to about 97 km (60 mi) long transmission ROW would be within the RDC. The siting model takes into consideration important features, including residential and other developed areas, mining activities, wetlands and sensitive land uses, cultural resources, and endangered and other species of special interest. GPC conducted an aerial field verification of the RDC, and identified a narrowing of the modeled corridor to avoid wetlands and stream crossings and reduce the overall length and land area that potentially would be affected. The RDC depicts areas in which a transmission line should minimize adverse impact on people, places, and cultural resources; protect water resources, plants, and animals; maximize co-location of the new line; and balance these considerations to reduce the overall impact of the transmission line (GPC 2007).

In siting the new transmission line ROW, GPC would consult with the Georgia State Historic Preservation Officer, FWS, the Georgia Department of Natural Resources (GDNR), and the U.S. Army Corps of Engineers (Southern 2008). If wetlands are disturbed, construction would be conducted in accordance with necessary State and Federal permits to protect wetland areas (Southern 2008).

There are no U.S. Forest Service Wilderness Areas, Wild/Scenic Rivers, Wildlife Refuges, State Parks, or National Parks within the RDC (GPC 2007). The Savannah River and Brier Creek, a tributary of the Savannah River, are the primary waterways located in the RDC. The general wildlife habitats within the RDC include forested land, planted pine stands, open land, and open water. The exact habitat types within the new 500-kV transmission line ROW are not known at this time, but it is assumed they comprise similar habitats to those on the VEGP Site. GPC has estimated the total acreage for a 46-m (150-ft)-wide hypothetical representative ROW within the RDC to be 416 ha (1029 ac) (Southern 2007).

3.0 Proposed Federal Actions

The proposed Federal action is issuance of COLs, under the provisions of 10 CFR Part 52, for two AP1000 reactors at the VEGP Site, and an LWA for requested construction activities. The ESP EIS (NRC 2008a) disclosed the staff's analysis of the environmental impacts that could result from the construction and operation of these two new units. The draft COL SEIS (NRC 2010i) evaluated whether any new and potentially significant information has been identified that would alter the staff's conclusions regarding issues resolved in the ESP proceeding. In the draft ESP EIS and the COL SEIS, the NRC staff evaluated the impacts of construction and operation of two AP1000 units, with a total combined thermal power rating of 6800 MW(t). The proposed units would use a closed-cycle cooling system and require a single natural draft cooling tower for each unit.

4.0 Potential Environmental Impacts

This section provides information on the terrestrial impacts related to operation of the proposed Units 3 and 4 at the VEGP Site, including potential impacts from construction and operation of the proposed transmission line ROW. Construction and operation activities associated with the issuance of the COLs and LWA, including cumulative impacts, that could affect the Federally protected terrestrial species based on habitat affinities and life-history characteristics and the nature and spatial and temporal considerations of the activity are listed below:

- Construction
  - Transmission line ROW clearing and grading
  - Installation of new or upgraded transmission lines and towers
- Operation
  - Vegetation control in the transmission line ROW
  - Transmission line repairs or upgrades
  - Avian collisions with structures
  - Cooling tower operation.

4.1 Construction Impacts

The exact extent and types of wildlife habitats within the proposed new transmission line ROW are not known. Currently, Southern and GPC are evaluating the actual ROW alternatives for the transmission line within the RDC. The proposed transmission line ROW would be routed northwest from the VEGP Site, passing through Jefferson, McDuffie and Warren Counties. The ROW would pass west of Fort Gordon, and then continue north to the Thomson substation,

which is approximately 32 km (20 mi) west of Augusta, Georgia. It is anticipated that the transmission line would be about 46 m (150 ft) wide and 97 km (60 mi) long and would cover approximately 416 ha (1029 ac) (Southern 2007). A hypothetical transmission line ROW that represents what the GPC believes is a feasible route within the RDC was identified as part of a 2007 study (GPC 2007). Based on the GPC analysis, habitats within the ROW could include approximately 60 ha (148 ac) of forested habitat, 37 ha (91.5 ac) of forested wetlands, 133 ha (329 ac) of planted pine, 2.6 ha (6.4 ac) of open water, and 64 ha (158 ac) of open land (GPC 2007). Other land-use categories identified as potentially being impacted, such as mine/quarry, utility, transportation, and row crops, provide little value as wildlife habitat. Construction activities would avoid wetlands to the extent practicable. In the event that wetlands are encountered, construction would be conducted in accordance with the necessary permits obtained to protect wetland areas (GPC 2007).

A wide variety of wildlife common to Georgia is expected to occur within the transmission line ROW. The greatest extent of wildlife diversity is expected to occur within areas that support an interspersion of native upland, wetland, and aquatic habitats, and less diversity is expected in disturbed or developed lands. Lower-quality wildlife habitat is represented by areas cleared for utilities, roads, agricultural and residential development; and disturbed habitats such as pastureland, and open land.

Potential impacts on Federally listed threatened and endangered species from construction on the proposed transmission line ROW would include loss of habitat (temporary and permanent), presence of humans, heavy-equipment operation, traffic, noise, and avian collisions. The use of heavy equipment would likely displace or destroy wildlife that inhabit the areas that will be developed. Larger and more mobile animals would likely flee the area, while less mobile animals such as reptiles, amphibians, and small mammals would be at greater risk of death. Although the surrounding forest and wetland habitat would be available for displaced animals, the movement of wildlife into surrounding areas would increase competition for available space and could result in increased predation and decreased fecundity for certain species. These conditions could lead to a temporary localized reduction in population size for particular species. When construction activities are completed, species that can adapt to disturbed or developed areas may readily re-colonize portions of the site where suitable habitat remains, is replanted, or restored.

Forests or forested wetlands within the corridors would be converted to and maintained in an herbaceous or scrub-shrub condition. Species dependent on forest habitats or those that are sensitive to forest fragmentation could decline or be displaced, such as the red-cockaded woodpecker (*Picoides borealis*). Wildlife also would be affected by equipment noise and traffic, and birds could be injured if they collide with new transmission towers and conductors or the equipment used to install these components. However, increased noise levels associated with installation of the transmission lines would be of short duration and likely intermittent. Thus, the

impact on wildlife from noise is expected to be temporary and minor. Similarly, the potential for traffic-related wildlife mortality also is expected to be low because relatively small crews would spend only a limited time in each area as construction progresses over large geographic areas.

GPC would site the transmission line in accordance with Georgia Code Title 22, Section 22-3-161. GPC's procedures for implementing this code include consultation with FWS as well as an evaluation of impacts to special habitats (including wetlands) and threatened and endangered species. In addition, GPC would comply with all applicable laws, regulations, and permit requirements, and would use good engineering and construction practices (Southern 2008). GPC has developed an APP that includes guidelines for siting new transmission lines. When siting new transmission lines, substations, or other GPC facilities, available information on migratory and resident bird populations will be taken into account to ensure that the lines or facilities will have as little adverse impact as practicable on these bird species (GPC 2006).

In areas where agencies are concerned about the safety of protected birds, consideration of appropriate siting and placement will reduce the likelihood of collisions. When possible, areas with known bird concentrations will be avoided, and such vegetation or topographic characteristics that would naturally lead to shielding the birds from collision will be used. If this is not possible, installing visibility devices also may reduce the risk of collision. Examples of these devices are marker balls or other line visibility devices placed in varying configurations, depending on the line or locations. The effectiveness of these devices has been validated by Federal and state agencies in conjunction with Edison Electric Institute (GPC 2006).

When designing power transmission lines in high–bird-use areas or on Federal Lands, GPC construction standards for transmission, distribution, and substation equipment and facilities will reflect the most appropriate and practicable "raptor-safe" stands for new construction consistent with available information. The objective is to provide 1.5 m (60 in.) between energized conductors and grounded hardware, or to insulate energized hardware if such spacing is not possible. The design standards are consistent with raptor-safe specifications recommended by Federal wildlife agencies (GPC 2006).

4.2 Operational Impacts

Potential impacts on terrestrial habitats and Federally listed species related to the operation of the proposed Units 3 and 4 may result from cooling-system operation and operation of the transmission system. The proposed cooling system for Units 3 and 4 is a closed-cycle system employing natural draft cooling towers. The heat would be transferred to the atmosphere in the form of water vapor and drift. Vapor plumes and drift may affect wildlife habitat. In addition, bird collisions and noise-related impacts are possible with natural draft cooling towers.

Electric transmission systems potentially can affect terrestrial habitat and Federally listed species through ROW maintenance, bird collisions with transmission lines, and electromagnetic

fields (EMFs). Southern estimates that one additional 500-kV transmission line would be necessary to distribute the additional power generated by Units 3 and 4 (Southern 2008). Maintenance activities on the new transmission line ROW would be the responsibility of GPC (Southern 2008). Each of these topics is discussed in the following paragraphs.

4.2.1 Impacts on Vegetation

Impacts on Federally listed species may result from cooling tower drift, icing, fogging, or increased humidity. Through the process of evaporation, the total dissolved solids (TDS) concentration in the circulating water system (CWS) increases. A small percentage of the water in the CWS is released into the atmosphere as fine droplets containing elevated levels of TDS that can be deposited on nearby vegetation. Operation of the CWS would be based on four-cycles of concentration, which means the TDS in the make-up water would be concentrated approximately four times before being released.

Depending on the make-up source water body, the TDS concentration in the drift can contain high levels of salts that, under certain conditions and for certain species, can be damaging. Vegetation stress can be caused from drift with high levels of deposited TDS, either directly by deposition onto foliage or indirectly from the accumulation in the soils. The maximum estimated cumulative deposition rate is less than 10.0 kg/ha/mo (9 lbs/ac/mo) at 490 m (1600 ft) north of the cooling towers (NRC 2008a). The location of the maximum deposition rate is in the vicinity of the proposed switchyard for Units 3 and 4, which is more than 1.6 km (1 mi) from the northern site boundary. General guidelines for predicting effects of drift deposition on plants suggest that many species have thresholds for visible leaf damage in the range of 10 to 20 kg/ha/mo (9 to 18 lbs/ac/mo) on leaves during the growing season (NRC 1996). The maximum deposition for the proposed Units 3 and 4 is below the level that could cause visible leaf damage in many common species.

Southern expects the longest vapor plume associated with the new towers would be 10 km (6 mi), but would only occur 3.9 percent of the time (NRC 2008a). The longest plume length would occur in the winter months and the shortest in the summer months. Ground-level fogging and icing do not occur currently at the cooling towers for the existing Units 1 and 2 and are not expected to occur at the new cooling towers associated with the proposed Units 3 and 4.

4.2.2 Bird Collisions with Cooling Towers

The natural draft cooling towers associated with the proposed Units 3 and 4 would be 180 m (600 ft) high (Southern 2008). The VEGP Site is located adjacent to the Savannah River, and although migratory birds pass through the vicinity of the VEGP Site, it is not located on a major American flyway. No formal bird collision surveys have been conducted at the VEGP Site. However, the Environmental Protection Plan (EPP) for VEGP Units 1 and 2 stipulates that any excessive bird-impact events be reported to NRC within 24 hours (Southern 1989). No

excessive bird-impact events have been reported onsite. The conclusion presented in the *Generic Environmental Impact Statement (GEIS) for License Renewal of Nuclear Plants* is that bird collisions with natural draft cooling towers are of small significance at all operating nuclear plants, including those with multiple cooling towers (NRC 1996).

4.2.3 Noise

The effects of noise on most wildlife species are not well understood partly because noise disturbance cannot be generalized across species or genera, and there may be response differences among individuals or groups of individuals of the same species (Larkin 1996; AMEC Americas Limited 2005). An animal's response to noise can depend on a variety of factors including the noise level, frequency distribution, duration, background noise, time of year, animal activity, age, and sex (AMEC Americas Limited 2005). The potential effects of noise on wildlife include acute or chronic physiological damage to the auditory system; increased energy expenditure; physical injury incurred during panic responses; and interference with normal activities, such as feeding; and impaired communications among individuals and groups (AMEC Americas Limited 2005). The impacts of these effects might include habitat loss through avoidance, reduced reproductive success, and mortality. Long-term noise thresholds have not been established for wildlife; evidence for habituation is limited; long-term effects are generally unknown; and how observed behavioral and physiological response might be manifested ecologically and demographically are poorly understood (AMEC Americas Limited 2005).

The noise levels from natural-draft cooling tower operation and diesel generators are estimated to be approximately 55 decibels (dBA) SPL (sound pressure level) at 300 m (1000 ft) (NRC 2008a). Researchers have found that dBA measurements contain frequencies that are out of the hearing bandwidth of birds and some mammals and are not inclusive of the total hearing range for other animals. Consequently, the dBA weighting system does not accurately characterize sound exposure or hearing response for wildlife (Dooling 2002; AMEC Americas Limited 2005). Natural-draft cooling towers emit broadband noise that is spectrally very similar to environmental (wind) noise. In the case of relatively flat spectra, the spectrum level of cooling tower and diesel generator noise, given the estimated dBA SPL, would be approximately 15 dB SPL. Cooling tower noise does not change appreciably with time (i.e., it is at steady state), and the estimated noise level at 300 m (984 ft) is well below the 80 to 85-dBA SPL threshold at which birds and small mammals are startled or frightened (Golden et al. 1980). Using the startle criterion reported by Golden et al. (1980), the noise level expected to be generated by cooling tower and diesel generator operations would only approach startle levels in the immediate vicinity (within 5 m [16.4 ft]) for noise with approximately 60 dBA SPL at 300 m [984 ft]) of the tower or generator. In addition, birds and other animals show habituation to acoustic deterrents (complex sounds designed with spectral components to be within the hearing band of the target animal). Thus, noise generated by natural draft cooling towers would be unlikely to disturb

transient wildlife beyond the VEGP Site perimeter fence, which is over 300 m (984 ft) from the towers. Seasonal or long-term resident wildlife could be expected to habituate to cooling tower and generator noise.

Impacts to species as a result of their response to noise (i.e., ranging from startle to avoidance) within the distance of the VEGP perimeter fence, if any, would be negligible because of the large expanses of open habitat available into which mobile wildlife species could move if disturbed. In addition, the new towers would be near the existing VEGP Unit 1 and 2 facilities, where wildlife have likely acclimated to typical operating facility noise levels. Consequently, the potential for startle and avoidance responses by wildlife posed by the incremental noise resulting from the operation of the two new natural-draft cooling towers for the proposed Units 3 and 4 and other facilities at the VEGP Site would be minimal.

4.2.4 Transmission Line Right-of-Way Management (Cutting and Herbicide Application)

Southern stated that the same vegetation management practices currently employed by GPC for the existing Units 1 and 2 transmission line ROWs (such as hand-cutting on an as-needed basis) would be applied to the proposed new 500-kV transmission line ROW (Southern 2008).

GPC performs aerial inspections of transmission line ROWs five times each year to support routine maintenance activities. These surveys are normally conducted using a helicopter. The noise may startle and temporarily displace wildlife. However, these impacts are of short durations and occur in very localized areas. Woody growth is cleared from transmission line ROWs on a 5-year maintenance cycle. This cycle may vary based on public concerns, local ordinances, line maintenance, or environmental considerations. Vegetation management includes use of herbicides, hand tools, and light equipment. Hand cutting or herbicides are used in areas that cannot be mowed either because it is impractical or because of environmental concerns. Herbicide use is conducted in accordance with manufacturer specifications and by licensed applicators. Any spills of fuel and/or lubricants that occur as a result of equipment use in the transmission line ROWs are immediately cleaned up and reported. GPC cooperates with GDNR to manage sites considered environmentally sensitive within the transmission line ROWs (Southern 2008). GPC has developed recommendations for maintenance practices for the protection of pitcher plants, caves, nests, rookeries, and habitat such as rock outcrops that occur within GPC transmission line ROWs (Southern 2007).

GPC also has developed an APP that includes recommendations on procedures for GPC personnel to follow if a Federally Endangered Species nest is encountered within the transmission line ROW. The GPC Environmental Field Service office will provide GPC staff with FWS-compliant guidelines and/or recommendations for management of these nests (GPC 2006).

Avian mortalities resulting from collisions with conductors, guy wires, and overhead ground (static) wires have not been specifically documented on GPC system components, but are known to occur on other utilities' systems and communication systems. GPC has installed spiral vibration dampers to increase visibility on some of the transmission lines, especially along the coastal areas where the wood stork is known to nest and forage (GPC 2006). Section 4.1 of the EPP for the existing Units 1 and 2 stipulates that any excessive bird-impact events be reported to NRC within 24 hours (Southern 1989). Transmission line and ROW maintenance personnel have not reported bird deaths attributed to collisions or contact with Units 1 and 2 transmission lines (Southern 2008).

EPRI (1993) notes that factors appearing to influence the rate of avian impacts with structures are diverse and related to bird behavior, the structure attributes, and weather. Structure height, location, configuration, and lighting also appear to play a role in avian mortality. Weather such as low cloud ceilings, advancing fronts, and fog also contribute to this phenomenon. Larger birds such as waterfowl are more prone to collide with transmission lines, especially when they cross wetland areas used by large concentrations of birds (EPRI 1993).

EPRI (1993) documents electrocution of large birds, particularly eagles, as a source of mortality that could be significant to listed species. However, electrocutions do not normally occur on lines whose voltages are greater than 69 kV because the distance between lines is too great to be spanned by birds (EPRI 1993). The voltage of the proposed new transmission line is greater than 69 kV; therefore, bald eagles and other large bird populations should not be noticeably affected by transmission-line electrocutions. GPC has implemented an APP to monitor and address the impacts of transmission lines on birds. Any impact events would be coordinated with GPC's Environmental Field Services and, if necessary, coordination also would involve FWS (GPC 2006).

4.2.5 Impact of EMFs on Flora and Fauna

Electromagnetic fields (EMFs) are unlike other agents that have an adverse impact (e.g., toxic chemicals and ionizing radiation) in that dramatic acute effects cannot be demonstrated and long-term effects, if they exist, are subtle (NRC 1996). As discussed in the GEIS (NRC 1996), a careful review of biological and physical studies of EMFs did not reveal consistent evidence linking harmful effects with field exposures. Thus, the conclusion presented in the GEIS (NRC 1996) was that the impacts of EMFs on terrestrial flora and fauna were of small significance at operating nuclear power plants, including transmission systems with variable numbers of transmission lines. Since 1997, over a dozen studies have been published that looked at cancer in animals that were exposed to EMFs for all or most of their lives (Moulder 2003). These studies have found no evidence that EMFs cause any specific types of cancer in rats or mice (Moulder 2003).

5.0 Evaluation of Impacts on Threatened or Endangered Species

This section describes Federally listed threatened or endangered terrestrial species and designated and proposed critical habitat that may occur on or in the vicinity of the VEGP Site and/or in habitats that would be crossed by the proposed transmission line ROW (Table 1). This list is composed of the Federally listed species identified in the October 20, 2010, FWS letter to NRC (FWS 2010b).

Surveys for species of interest, including those Federally listed species classified as threatened or endangered, proposed for listing, or candidate species were performed in spring, summer, and fall 2005 at the VEGP Site by Third Rock Consultants, LLC (TRC). The surveys were conducted on 675 ha (1669 ac) of the 1283 ha (3169 ac) that comprise the VEGP Site (TRC 2006). The American alligator (*Alligator mississippiensis*) was the only Federally listed species observed on the VEGP Site during the 2005 surveys. One adult alligator was observed in Mallard Pond during the summer survey (TRC 2006). It is Federally listed as threatened because it is similar in appearance to the endangered American crocodile (*Crocodylus acutus*). It is not included in this assessment based on input from FWS in its October 20, 2010 letter to NRC (FWS 2010b). Furthermore, based on the contents of the October 2010 letter, three other species that were addressed in the ESP BA (the smooth coneflower, relict trillium, and flatwoods salamander) were not further considered in this assessment because they were not identified as occurring in the project area or the proposed transmission line ROW.

The RDC is based on the EPRI-GTC siting model, developed in Georgia, to identify a reasonable corridor for locating the proposed 500 kV transmission line. The siting model takes into consideration important features, including wetlands and sensitive land uses and endangered and other species of special interest. The RDC represents a narrowing of the modeled corridor to avoid wetlands and stream crossings and reduce the overall length and land area potentially affected (GPC 2007). GPC would site the transmission line in accordance with Georgia Code Title 22, Section 22-3-161, and has developed an APP that includes provisions for siting new transmission lines (GPC 2006). GPC's procedures for implementing this code include consultation with FWS as well as an evaluation of impacts to special habitats (including wetlands) and threatened and endangered species (Southern 2008). At this time, on-the-ground surveys for Federally listed species have not been conducted in the RDC.

Four Federally listed terrestrial plant and animal species may occur on or in the vicinity of the VEGP Site and/or in the vicinity of the RDC (FWS 2010b). These four species – the red cockaded woodpecker (*Picoides borealis*), the wood stork (*Mycteria americana*), Canby's dropwort (*Oxypolis canbyi*), and the Eastern indigo snake (*Drymarchon couperi*) – are discussed below. No designated or proposed critical habitat for terrestrial species occurs on or in the general area of the site or the RDC.

5.1 Red-Cockaded Woodpecker – Endangered

The red-cockaded woodpecker (*Picoides borealis*), was listed by the FWS as endangered in 1970 (35 FR 16047). The red-cockaded woodpecker's historic range extended from north Florida to New Jersey and Maryland, as far west as Texas and Oklahoma, and inland to Missouri, Kentucky, and Tennessee. This species has been extirpated in New Jersey, Maryland, Tennessee, Missouri, and Kentucky (FWS 2007a), and currently, it is estimated that about 6000 family groups of red-cockaded woodpeckers, or 15,000 birds, remain from Florida north to Virginia and west to southeast Oklahoma and eastern Texas. Critical habitat has not been established for red-cockaded woodpeckers (FWS 2007b). In 1998, there were 665 family groups of red-cockaded woodpeckers in Georgia (GDNR 1999).

The red-cockaded woodpecker is endemic to open, mature, and old growth pine ecosystems in the southeastern United States. Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat for family groups (clusters). Large old pines are required as cavity trees because the cavities are excavated completely within inactive heartwood and the higher incidence of heartwood decay in older trees greatly facilitates excavation. Cavity trees must be in open stands with little or no hardwood midstory and few or no overstory hardwoods. Suitable foraging habitat consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers (FWS 2003).

Red-cockaded woodpeckers are a cooperatively breeding species, living in family groups that typically consist of a breeding pair with or without one or two male helpers. In red-cockaded woodpeckers (and other cooperative breeders), a large pool of helpers is available to replace breeders when they die. Helpers do not disperse very far and typically occupy vacancies on their natal territory or a neighboring one (FWS 2003). A typical territory for an active group ranges from approximately 51 to 80 ha (125 to 200 ac), but can be as large as 240 ha (600 ac). The size of the particular territory is related to both habitat quality and population density (FWS 2007a). Dispersal is primarily undertaken by young birds; mate loss and an apparent avoidance of inbreeding sometimes cause adults to disperse, and adults may also occasionally move to neighboring territories for unknown reasons (Walters et al. 1988). In a North Carolina study, females dispersed a maximum of 31.4 km (19.5 mi) and males a maximum of 21.1 km (13.1 mi) (Walters et al. 1988).

In June 2007, Southern enrolled approximately 380 ha (940 ac) of the VEGP Site in the GDNR Safe-Harbor Program for red-cockaded woodpeckers (Southern 2010c, e). Safe-Harbor Agreements are arrangements that encourage voluntary management for red-cockaded woodpeckers while protecting the participating landowners and their rights for development in the event these woodpeckers become established on the private property. Landowners entering into safe-harbor agreements must establish a baseline number of individuals that would be maintained in the event that they are observed. Currently, Southern has no baseline

responsibilities under the red-cockaded woodpecker safe-harbor agreement because there are no active clusters or nest trees onsite, and there are no red-cockaded woodpecker clusters on neighboring lands within foraging distance (Southern 2010c, e; NRC 2010h).

Surveys at the VEGP Site conducted in February 2006 found no occurrence of red-cockaded woodpeckers onsite (NRC 2008a). There are no recorded occurrences of the red-cockaded woodpecker in Burke County, Georgia (GDNR 2007, GDNR 2009), and no active colonies exist within 16 km (10 mi) of the VEGP Site in South Carolina (SCDNR 2007; SCDNR 2009; Wike et al. 2006). There are no known occurrences of the red-cockaded woodpecker in the proposed RDC (GDNR 2007; GDNR 2009). However, red-cockaded woodpeckers are listed as having the potential to occur in the project area (FWS 2010b). The red-cockaded woodpecker has been recorded on Fort Gordon (Mitchell 1999), which is located in Richmond County adjacent to the RDC. In 1998, there were two active groups on Fort Gordon representing less than 1 percent of the total number of groups in Georgia. At this time, surveys for red-cockaded woodpeckers have not been conducted in the RDC, and it is not known if suitable nesting or foraging habitats exist in the vicinity of the proposed 500-kV transmission line ROW.

Red-cockaded woodpeckers are found mainly in large stands of old longleaf pine, and this type of habitat would not be disturbed during operation of Units 3 and 4. Based on the distance to the closest known active colony, and the fact that red-cockaded woodpeckers have not been recorded on the VEGP Site or in the general vicinity of the site, it is unlikely that red-cockaded woodpeckers would be affected during operational activities onsite.

Clearing activities (e.g., tree removal, noise, increased habitat fragmentation, etc.) in the transmission line ROW have the potential to affect the red-cockaded woodpecker and its habitat. Because the final transmission line ROW would be narrow (46-m [150-ft] wide), the actual extent of clearing would be limited, thereby minimizing the potential for impact on redcockaded woodpeckers. However, increased habitat fragmentation and/or removal of cavity trees could negatively impact the red-cockaded woodpecker. GPC would site the transmission line ROW in accordance with Georgia Code Title 22, Section 22-3-161. GPC's procedures for implementing this code include consultation with FWS. GPC also has developed an APP that includes guidelines for siting new transmission lines. Available information on resident bird populations will be taken into account to ensure that the lines will have as little adverse impact as practicable on bird populations (GPC 2006).

Potential operational impacts associated with the transmission line ROW maintenance include mowing close enough to an active colony to disturb the nesting effort and removing trees during side clearing or building access roads. GPC has implemented procedures that recommend identification of all active colony areas within 3.2 km (2 mi) of a transmission line ROW and to identify active "hot-spots" within 229 m (750 ft) of a ROW. GPC recommends maintenance activities around "hot-spots" be conducted during non-breeding periods (Southern 2007). Avian mortalities resulting from collisions with conductors, guy wires, and overhead ground (static)

wires have not been specifically documented on the GPC system components. However, electrocution of birds is unlikely on lines with voltages greater than 69 kV because the distance between lines is too great to be spanned by birds (EPRI 1993). Therefore, it is unlikely that operational impacts would adversely affect the red-cockaded woodpecker.

In summary, based on the distance to the closest known active colony, and the fact that red-cockaded woodpeckers have not been recorded on the VEGP Site, it is unlikely that red-cockaded woodpeckers are foraging on the VEGP Site, and there is no evidence of nesting onsite. It is unlikely that red-cockaded woodpeckers would be encountered during operational activities onsite with the exception of possible transient individuals. There are no known occurrences of red-cockaded woodpeckers within the RDC; however, on-the-ground surveys have not been conducted at this time. If nest trees are removed during clearing for the proposed transmission line, red-cockaded woodpeckers could be affected. However, as previously noted, there are no known nest locations within the RDC. GPC has procedures to protect red-cockaded woodpeckers encountered during maintenance activities, and electrocution of birds is unlikely. Therefore, operation of the transmission system is not likely to adversely affect the red-cockaded woodpecker.

Based on the available information, the NRC staff has determined that operation of the proposed Units 3 and 4 and construction and operation of the proposed transmission system may affect, but are not likely to adversely affect, the red-cockaded woodpecker.

5.2 Wood Stork – Endangered

Breeding populations of the wood stork (*Mycteria americana*), which are Federally listed as endangered, currently occur or have recently occurred only in Florida, Georgia, South Carolina, and North Carolina (FWS 2007c). From 1975 to 1984, Georgia averaged three colonies and had an average total of 210 nesting pairs. Beginning in 1992, surveys in Georgia were expanded, and 1091 breeding pairs were documented at nine colonies. In 2005, 1817 breeding pairs were documented at 19 colonies. In 2006, there were 1928 breeding pairs at 21 colonies. Wood storks have nested at 43 different locations in the Georgia coastal plain, and the number of colonies averaged 14 during the years from 1997 to 2007 (FWS 2007c). No critical habitat has been designated for this species (FWS 2007d).

The wood stork is a highly colonial species, usually nesting and feeding in flocks. Its habitat includes freshwater and brackish wetlands, and it normally nests in bald cypress or red mangrove (*Rhizophora mangle*) swamps. At freshwater sites, nests are often constructed in bald cypress and swamp tupelo (*Nyssa biflora*). Wood storks in Georgia and South Carolina lay eggs from March to late May, with fledging occurring in July and August (FWS 1997).

Wood storks have a unique feeding technique (tacto-location) and typically require higher prey concentrations than other birds. They tend to rely on depressions in marshes or swamps where

prey can become concentrated during low-water periods (FWS 1997). A study from a wood stork colony in east-central Georgia found the diet was mostly composed of fish, including sunfishes (*Lepomis* spp.), bowfin (*Amia calva*), redfin pickerel (*Esox americanus americanus*), and lake chubsuckers (*Erimyzon* spp.) (FWS 1997).

Although forage areas may be 60 to 70 km (37 to 43 mi) from the colony, 85 percent are within 19 km (12 mi) (Coulter and Bryan 1993). Wood storks in east-central Georgia forage in a wide variety of wetland habitats, including hardwood and cypress swamps, ponds, marshes, drainage ditches, and flooded logging roads. Typical wood stork foraging sites have reduced quantities of both submerged and emergent macrophytes. The water in the foraging areas is either still or very slowly moving, and the depth is normally between 5 and 41 cm (2 and 16 in.). It has been suggested storks may have difficultly feeding in water with a depth more than 50 cm (20 in.) (Coulter and Bryan 1993).

Differences among seasons, rainfall, and surface-water patterns often cause storks to change where and when certain habitats are used for nesting, feeding, or roosting. These hydrological changes may cause storks to shift the timing or intensity of feeding at a local wetland, or cause entire regional populations of birds to make large geographic shifts between one year and the next. Successful colonies are those that are in regions where birds have options to feed under a variety of rainfall and surface-water conditions. Maintaining a wide range of feeding site options requires that many different types of wetlands, both large and small, and relatively long and short annual hydro-periods be available for foraging (FWS 1997).

Wood storks have the potential to occur in the project area (FWS 2010b). However, no wood storks were identified in the VEGP threatened and endangered species surveys completed in 2005, and there are no known records of wood storks occurring on the VEGP Site or within the RDC (NRC 2008a; TRC 2006; GDNR 2007; GDNR 2009). The closest known wood stork colonies to the VEGP Site are located in Jenkins and Screvin Counties, Georgia, which are south of the project area. The Birdsville colony is located at Big Dukes Pond, a 570-ha (1400-ac) cypress swamp, which is 12.6 km (7.8 mi) northwest of Millen in Jenkins County, Georgia. The VEGP Site is approximately 45 km (28 mi) from the Birdsville colony. The Chew Mill Pond colony in Jenkins County is approximately 6 km (3.7 mi) southwest of the Birdsville colony. Chew Mill Pond has a history of being a wood stork foraging site and a wading bird rookery. Researchers consider it to be an overflow or satellite colony of the Birdsville colony (Wike et al. 2006). The Jacobsons Landing colony in Screven County is approximately 43 km (27 mi) southeast of the VEGP Site. In 1996, it contained an estimated 40 wood stork nests. The distance from the VEGP Site to these colonies is within the maximum radius that wood storks travel during daily feeding flights (i.e., 60 to 70 km [37 to 43 mi]) (Coulter and Bryan 1993). Foraging wood storks have been recorded throughout Burke County, Georgia (Coulter and Bryan 1993; Wike et al. 2006), and in the Savannah River Swamp on DOE's Savannah River Site in South Carolina, which is adjacent to the VEGP Site (Wike et al. 2006).

Wood storks were reported in the vicinity of the Savannah River Site before the site was established in 1952, and before the discovery of the Birdsville colony. Storks have been followed from the Birdsville colony to the Savannah River Site. However, data from the aerial wood stork surveys of the Savannah River Swamp and the studies at the Birdsville colony suggest that the Savannah River Swamp probably is not used extensively during the breeding or pre-fledging phases of the Birdsville colony. Most of the observations of storks on the Savannah River Site occur during the late-nestling or the post-fledging period, which occurs between June and September. Some of the birds observed foraging in the Savannah River Swamp may be storks from farther south, either non-breeders or birds that already have finished breeding for the year (Wike et al. 2006).

Foraging habitats for wood storks exist on the VEGP Site and in the RDC, and wood storks have been seen within 3.2 km (2 mi) of the site in the Savannah River Swamp and on Fort Gordon, which is adjacent to a portion of the RDC. In the October 20, 2010, letter from FWS to NRC, FWS noted that there are no documented occurrences of wood stork rookeries in the project area; however, FWS stated that foraging wood storks may occur in the project streams and wetlands, and their locations should be noted (FWS 2010b). Foraging from June to September on the VEGP Site and on the RDC appears possible in wetland areas along stream drainages, ponds, drainage ditches. However, there are no records of wood stork colonies in the RDC or on the VEGP Site or within 32 km (20 mi) of the site and the proposed transmission line. This species does not likely nest in the RDC or on the VEGP Site. The wood stork is highly mobile and impacts associated with foraging during operation on the VEGP Site and construction and operation activities within the proposed transmission line ROW would be negligible.

GPC maintenance recommendations include identifying all active nesting wood stork colony rookeries that are within 1.6 km (1 mi) of a transmission line ROW. In areas within 230 m (750 ft) of an active rookery, GPC recommends mowing during the non-nesting season (Southern 2007). Therefore, activities related to the maintenance of the transmission line ROW are not expected to adversely affect the wood stork.

Based on the available information, the NRC staff has determined that operation of the proposed Units 3 and 4 and construction and operation of the proposed transmission system may affect, but are not likely to adversely affect, the wood stork.

5.3 Canby's Dropwort – Endangered

Canby's dropwort (*Oxypolis canbyi*) was listed as endangered by the FWS in 1986 (51 FR 6690). This species is native to the Coastal Plain from Delaware (historical only), Maryland, North Carolina, South Carolina, and Georgia. Historically, this plant was found in Burke, Dooly, Lee, and Sumter Counties in Georgia. There is no critical habitat designated for this species (FWS 1990).

Canby's dropwort has been found in a variety of habitats, including ponds dominated by pond cypress (*Taxodium ascendens*), grass-sedge-dominated Carolina bays, wet-pine savannahs, shallow-pineland ponds, and cypress-pine swamps or sloughs. The largest and most vigorous populations occur in open bays or ponds, which are wet throughout most of the year and have little or no canopy cover. Sites occupied by this species generally have infrequent and shallow inundations (5 to 30 cm [2 to 12 in.]). The species water requirements are narrow, with too little or too much water being detrimental (FWS 1990). Suitable habitat is normally on a sandy loam or loam soil underlain by a clay layer, which along with the slight gradient of the areas results in the retention of water.

Canby's dropwort has the potential to occur in the project area (FWS 2010b). However, Canby's dropwort was not found on the VEGP Site during the 2005 threatened and endangered species surveys, and there are no historical records of it occurring onsite (NRC 2008a, TRC 2006). There are two historical records of occurrence in Burke County around Waynesboro, Georgia (51 FR 6690), and these populations are currently thought to be extirpated (FWS 1990). There are no recorded occurrences within 16 km (10 mi) of the VEGP Site (GDNR 2007, GDNR 2009). Known soil types that support populations of Canby's dropwort are Rembert loam, Portsmouth loam, McColl loam, Grady loam, Coxville fine sandy loam, and Rains sandy loam. These soil types are similar in that they have a medium-to-high organic matter content, a high water table, and are deep, poorly drained, and acidic (FWS 1990). None of these soil types occur on the VEGP Site. Soil types found on the site include soils in the Chastain-Tawcaw association; Lucy, Osier, and Bibb soils; the Tawcaw-Shellbluff association; and Fuquay, Bonifay, and Troup series soils (NRCS 2003). It is unlikely that the VEGP Site contains suitable habitat for Canby's dropwort. Because of the lack of suitable habitat, it is unlikely there would be adverse impacts during operational activities at the VEGP Site.

There are no known occurrences of Canby's dropwort within the RDC. The nearest known occurrence is about 5.6 km (3.5 mi) from the RDC in Burke County (GDNR 2007). Soils known to support Canby's dropwort occur in the RDC (USGS 2001). These soils are associated with pond or wetland areas. GPC has committed to avoiding wetlands to the extent practicable during construction. In the event that wetlands are encountered, construction would be conducted in accordance with the necessary permits to protect wetland areas (GPC 2007). Therefore, it is unlikely that Canby's dropwort will be adversely affected during construction and operation activities along the transmission line ROW. GPC has implemented transmission line ROW maintenance procedures that include hand cutting in areas, such as wetlands, that have special environmental concerns (Southern 2008). In the October 20, 2010, letter from FWS to NRC, FWS noted that there are no documented occurrences of Canby's dropwort in the direct project area; however, FWS recommends that Canby's dropwort should be surveyed for, if habitat is encountered (FWS 2010b).

Based on the available information, the NRC staff has determined that operation of the proposed Units 3 and 4 and construction and operation of the proposed transmission system may affect, but are not likely to adversely affect, Canby's dropwort.

5.4 Eastern Indigo Snake – Threatened

The eastern indigo snake (*Drymarchon couperi*) was Federally listed as threatened by FWS in 1978 (FWS 1978). Historically, the eastern indigo snake occurred through Florida and in the coastal plain of Georgia, Alabama, and Mississippi (FWS 2006). Most, if not all, of the remaining viable populations of the eastern indigo snake occur in Georgia and Florida. Diemer and Speak (1983) conducted a 2-year study to survey the distribution of the eastern indigo snake and to characterize and delineate its habitat in Georgia. Results from this study indicated that the stronghold for the species was in a contiguous block of approximately 41 southeastern and south-central Georgia counties. The status and distribution in Georgia was recently reviewed by Stevenson (2006). He determined that populations of eastern indigo snakes still remain widespread in Georgia with recent records from 25 of the original 41 counties identified in the study by Deimer and Speak (1983). There are no historic or recent records for the upper Coastal Plain or Fall Line sandhill region of Georgia, including Burke, McDuffie, Jefferson, and Warren Counties (FWS 2006; Deimer and Speake 1983; Stevenson 2006). In its October 20, 2010, letter to NRC, FWS noted that there are no documented occurrences of the indigo snake in the area; however, FWS recommends that any pedestrian surveys of sandhill habitats, especially those with gopher tortoise burrows, should include cursory indigo snake surveys (FWS 2010b).

The eastern indigo snake occupies a broad range of habitats, including pine flatwoods, scrubby flatwoods, high pine, dry prairie, edges of freshwater marshes, agricultural fields, and human altered habitats (FWS 1982). In the northern parts of its range, including southeastern Georgia, eastern indigo snakes are tied to the use of gopher tortoise burrows and longleaf pine habitat (FWS 2006). The gopher tortoise burrows are used by the eastern indigo snakes not only to protect against cold in the winter and heat in the summer, but also for foraging, nesting, mating, and shelter prior to shedding (FWS 2006). Habitat use often varies seasonally between upland and wetland areas in Georgia (FWS 2006). Movement between habitat types may relate to the needs for thermal refugia, differences in habitat use by the juveniles and adults, or seasonal differences in availability of food resources. For these reasons, it is particularly vulnerable to habitat fragmentation (FWS 2006).

The eastern indigo snake is not documented in Burke County or any of the counties crossed by the proposed transmission line ROW. Suitable habitat may occur in the RDC, and gopher tortoise burrows are in the vicinity. However, the project area is outside the historic and current range of the eastern indigo snake.

Based on the available information, the NRC staff has determined that operation of the proposed Units 3 and 4 and construction and operation of the proposed transmission system may affect, but are not likely to adversely affect, the eastern indigo snake.

6.0 Cumulative Effects

Construction and operation of two new nuclear units at the VEGP Site were evaluated to determine the magnitude of their contribution to regional cumulative adverse impacts on terrestrial ecological resources. An assessment of potential impacts caused by plant construction was made for important terrestrial species (animal and plant) and habitats (as defined in the publication *Standard Review Plans for Environmental Reviews for Nuclear Power Plants* [NRC 2000]) by evaluating the impact of construction in light of other past, present, and future actions in the region. An assessment of potential impacts caused by plant operation was made for resource attributes normally affected by cooling tower operation, transmission line operation, and ROW maintenance. For this analysis, the geographic region encompassing past, present, and foreseeable future actions is the area immediately surrounding the VEGP Site, including adjoining sections of the Savannah River bottomland. GPC completed a transmission line study in 2007 to identify potential ROWs for the proposed 500-kV transmission line (GPC 2007). For the analysis of cumulative impacts related to the addition of the transmission line and its ROW, the geographic region encompassing past, present, and foreseeable future actions is the original study area identified by the GPC (GPC 2007).

6.1 VEGP Site

Approximately 353 ha (873 ac) of land would be disturbed by construction of the proposed Units 3 and 4 (NRC 2010i), including hardwood forest, planted pine plantations, open fields, and previously disturbed industrial areas. An estimated 3.7 ha (9.23 ac) of wetlands habitat on the site would be disturbed (USACE 2010). Most of the wetlands acreage involved would be in the Savannah River floodplain. The amount of wetland acreage that would be disturbed represents about 5 percent of the total 69 ha (170 ac) of wetlands currently present onsite. There are no Federally listed threatened or endangered species that would be adversely affected during construction of the proposed Units 3 and 4 (NRC 2008b; FWS 2008).

The area around the VEGP Site is rural and primarily forested and farmland. The habitats that would be disturbed at VEGP are not considered to be critical for the survival of any species, including those that are Federally protected. In addition, the percent of wetlands that would be disturbed represents only a small portion of the available wetlands in the vicinity of the site. Therefore, the staff concludes that the impact of development of the VEGP Site on the cumulative habitat loss and important species in the region associated with construction impacts would be negligible.

There are five fossil-fueled power generating stations within 145 km (90 mi) of the VEGP Site: the South Carolina Electric and Gas (SCE&G) Urquhart station, 34 km (21 mi) from the VEGP

Site; the SCE&G D area powerhouse station, 32 km (20 mi) from the VEGP Site; the GPC Plant McIntosh, 134 km (83 mi) from the VEGP Site; the GPC Port Wentworth, 124 km (77 mi) from the VEGP Site; and Plant Wilson, located on the VEGP Site. Fossil-fueled power plants release a variety of emissions to the air, including carbon dioxide, mercury, nitrous oxides, and sulfur dioxide. Nitrous oxides and sulfur dioxides can combine with water to form acid rain, which can lead to erosion and changes in soil pH levels. Mercury can deposit on soils and surface water, which may then be taken up by terrestrial plant and animal species, and poses the risk of bioaccumulation in the soil. For these reasons, these fossil-fueled power plants are likely to have current and future impacts to the environment on the VEGP Site and surrounding area (NRC 2008a).

There are three non-power generating plants that are on the Savannah River within the geographic area: the International Paper Corporation, the Savannah Industrial and Domestic Water plant, and the Beaufort-Jasper Water and Sewer authority wastewater treatment plant chemical discharges and the resulting bioaccumulation from these plants have the potential to have impacts on the surrounding area, including vegetation, wildlife, and wetlands (NRC 2008a).

DOE's Savannah River Site could impact terrestrial habitats, including habitats used by Federally listed threatened or endangered species. The Savannah River Site facility includes non-operational nuclear reactors, a currently operational coal-fired generating plant, and a proposed facility to convert weapons-grade plutonium into nuclear reactor fuel. The Savannah River Site, when originally constructed, added runoff from additional roads and impervious surfaces, increased development on wetlands and riparian zones, and decreased forest habitat. Current operations at the Savannah River Site, through chemical discharges and water withdrawal, could also have a cumulative impact on the geographic area. Future actions, such as additional construction and maintenance of buildings and facilities could affect the VEGP Site and the surrounding area (NRC 2008a).

Because the proposed Units 3 and 4 are nuclear plants, there would be little additional impact to the nearby environment from airborne releases typical of fossil fuel or other industrial facilities. Therefore, even when combined with emissions from the facilities described above, the operation of Units 3 and 4 would not result in unacceptable deposition rates of airborne pollutants. Furthermore, terrestrial habitat loss or alteration for the proposed action would be confined primarily to the VEGP Site. This loss or alteration of habitat, even in combination with chemical discharges and habitat modification associated with the other facilities in the region as discussed above, would not destabilize terrestrial resources, including Federally listed threatened or endangered species.

No other past, present, or future actions in the region were identified that could significantly affect Federally listed threatened or endangered species and critical habitat in ways similar to those associated with the proposed Units 3 and 4 site cooling tower operation (cooling tower

noise, drift from cooling towers, and bird collisions with cooling towers). The impacts associated with cooling tower operation were considered to be negligible for the VEGP Site; the cumulative adverse impact of these types of activities in the region also would be considered to be minor. Consequently, the NRC staff concludes that contributions of VEGP Site cooling tower operation to cumulative impacts on Federally listed threatened or endangered species and critical habitat in the region would be minimal.

6.2 Transmission Line ROW

The exact extent and type of wildlife habitat within the proposed new transmission line ROW is not known at this time because Southern and the GPC are evaluating ROW alternatives within the RDC. It is anticipated that the transmission line would cross Burke, Jefferson, McDuffie, and Warren Counties and would be 45 m (150 ft) wide and 97 km (60 mi) long (NRC 2008a). There are no U.S. Forest Service Wilderness Areas, Wild/Scenic Rivers or Wildlife Refuges, or State or National Parks within the RDC (GPC 2007). If possible, wetland areas would be avoided in the routing (GPC 2007).

A hypothetical transmission line ROW that represents what the GPC believes is a feasible route within the RDC was identified as part of a 2007 study (GPC 2007). Based on the GPC analysis, habitats within the ROW could include approximately 60 ha (148 ac) of forested habitat, 37 ha (91.5 ac) of forested wetlands, 133 ha (329 ac) of planted pine, 2.6 ha (6.4 ac) of open water, and 64 ha (158 ac) of open land (GPC 2007). Other land-use categories identified as potentially being impacted, such as mine/quarry, utility, transportation, and row crops, provide little value as wildlife habitat. In the region surrounding the proposed transmission line ROW, there are approximately 18,085 ha (44,688 ac) of forest, 16,956 ha (41,898 ac) of forested wetlands, 1354 ha (3346 ac) of open water, and 17,262 ha (42,656 ac) of open land (GPC 2007). Assuming the actual routing would be similar to the hypothetical route, the number of acres of forested habitat, forested wetlands, open water, open land, and planted pine forest that would be affected represent a very small portion of the available habitat. If the actual route would be similar to the hypothetical route, impacts on wildlife habitat in the region would be negligible. However, if the actual route differs from the hypothetical route, wildlife habitat impacts could either be greater or smaller.

There are no known occurrences of Federally listed threatened and endangered species within the RDC. However, suitable habitat for the red-cockaded woodpecker (*Picoides borealis)*, wood stork (*Mycteria americana*), Canby's dropwort (*Oxypolis canbyi*), and the eastern indigo snake (*Drymarchon couperi*) could exist within the RDC. The GPC would site the transmission line in accordance with Georgia Code Title 22, Section 22-3-161. Part of the GPC procedures for implementing this regulation include consultation with FWS and GDNR and an evaluation of impacts to special habitats and threatened and endangered species. In addition, the GPC has guidelines for transmission line maintenance practices for nests and rookeries in Georgia (Southern 2007), has developed an APP that provides guidance for minimizing impacts to bird

species when siting new transmission lines (GPC 2006), would use good engineering and construction practices, and would comply with all applicable laws, regulations, and permit requirements (Southern 2008). Based on this review, cumulative impacts on important species and habitat loss in the region associated with construction of the transmission line ROW would be negligible.

No other past, present, or future actions in the region were identified that could significantly affect Federally listed threatened or endangered species and critical habitat in ways similar to those associated with transmission line operation and ROW maintenance (i.e., bird collisions with transmission lines, flora and fauna affected by EMFs and ROW maintenance, and floodplains and wetlands affected by ROW maintenance). Therefore, because these impacts were considered negligible for the VEGP Site transmission line operation and ROW maintenance, the cumulative adverse impacts of these types of activities in the region also would be minor. Consequently, the staff concludes that the contribution of transmission line operation and the maintenance of transmission line ROWs to cumulative impacts on wildlife and wildlife habitat in the region would be minimal.

6.3 Summary

The cumulative terrestrial resource impacts of the proposed action, including to Federally listed threatened or endangered species, may be detectable, but they are expected to be minor and not destabilizing to the resource. Therefore, the NRC staff concludes that cumulative impacts to terrestrial resources resulting from construction and operation of the proposed Units 3 and 4, including consideration of impacts from transmission line ROW construction and operation, would be minor.

7.0 Conclusions

The potential impacts to the protected species listed in Table 1 from operating the proposed Units 3 and 4 at the VEGP Site, considered cumulatively with the potential impacts of construction and operation of the offsite transmission line, are shown in Table 2. The known distributions and records of these species, in combination with the potential ecological impacts of the proposed action on the species, their habitat, and their prey, have been considered in making the impact determinations in this BA.

Table 2. Federally Listed Species Potentially Affected by Operation of the Proposed Units 3 and 4 at the VEGP Site and Construction and Operation of the Proposed Transmission Line Right of Way

Scientific Name	Common Name	Federal Status	Determination
Birds			
Mycteria americana	wood stork	E	May affect, not likely to adversely affect
Picoides borealis	red-cockaded woodpecker	E	May affect, not likely to adversely affect
Reptile			
Drymarchon couperi	Eastern Indigo Snake	T	May affect, not likely to adversely affect
Vascular Plant			
Oxypolis canbyi	Canby's dropwort	E	May affect, not likely to adversely affect

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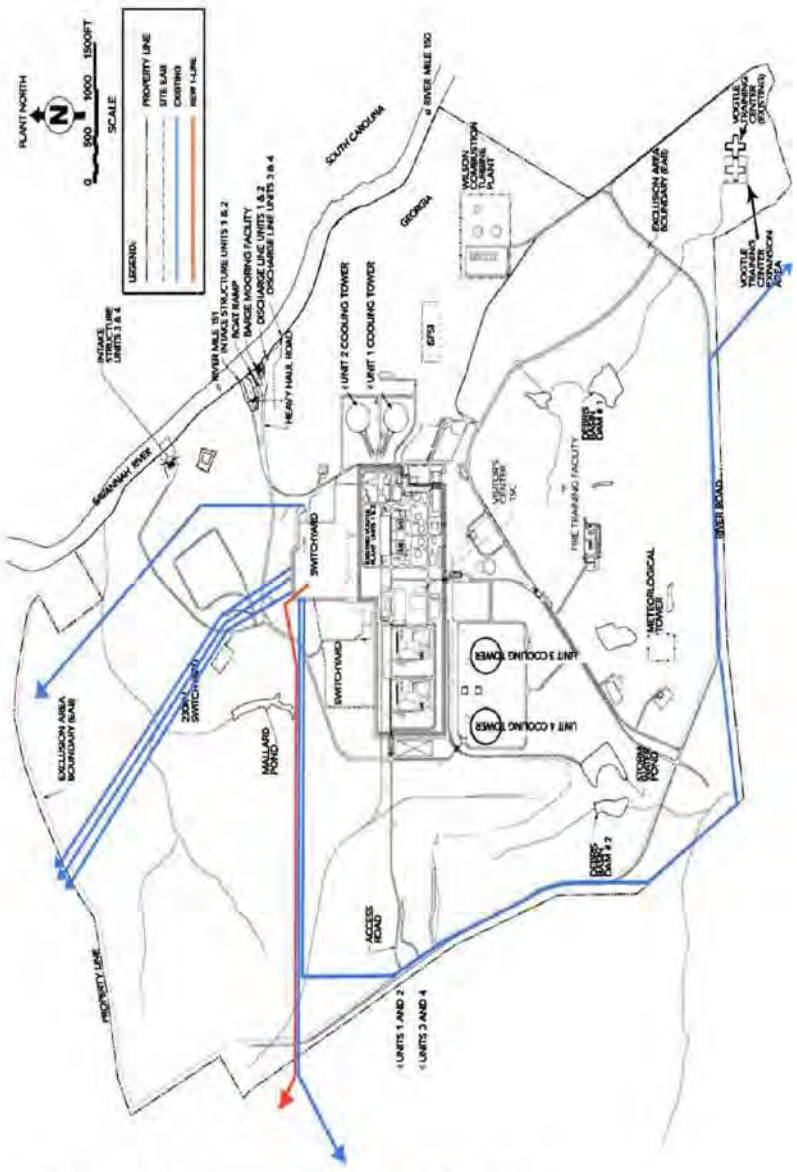

Figure 1. Proposed VEGP Site Footprint

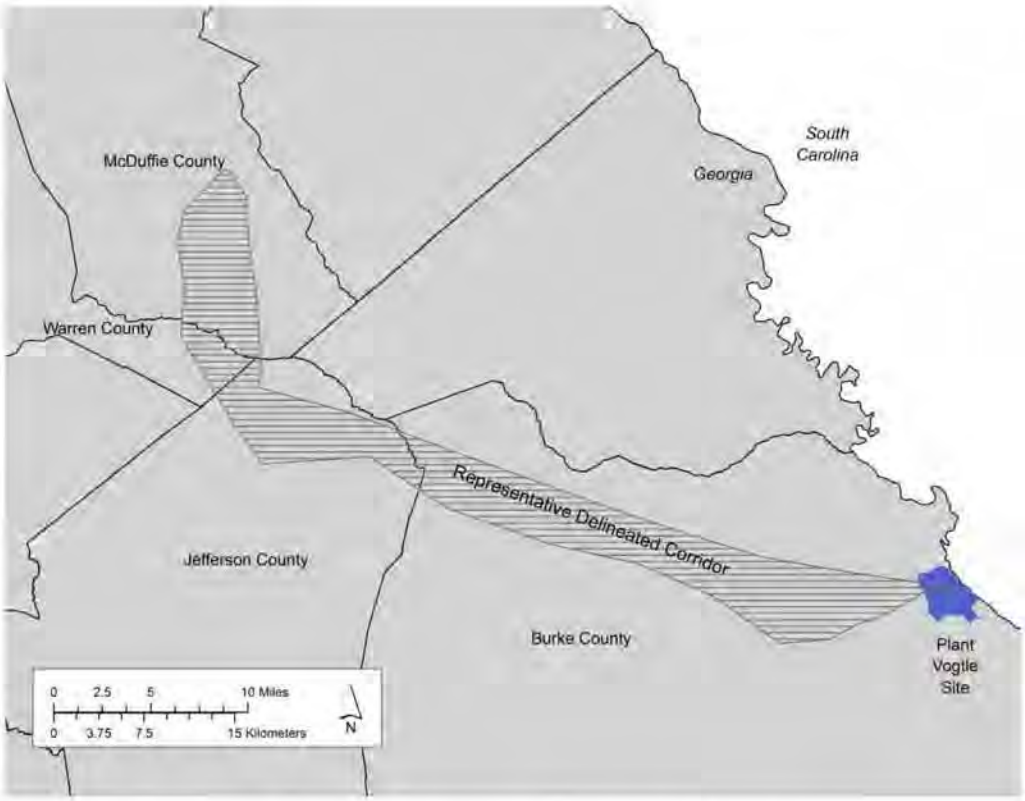

Figure 2. Representative Delineated Corridor

March 2, 2011

Mr. David Bernhart
Assistant Regional Administrator
for Protected Resources
National Marine Fisheries Service
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SUBJECT: CONFERENCE CONSULTATION FOR THE ATLANTIC STURGEON FOR THE VOGTLE ELECTRIC GENERATING PLANT, UNITS 3 AND 4 COMBINED LICENSES APPLICATION

Dear Mr. Bernhart:

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application, submitted on March 31, 2008, from Southern Nuclear Operating Company, Inc (Southern) and its four co-applicants for combined licenses (COLs) to construct and operate two Westinghouse AP1000 pressurized water reactors at the Vogtle Electric Generating Plant (VEGP) site in Burke County, GA. The COL application referenced an early site permit (ESP) for the VEGP site that was issued to Southern and its co-applicants in 2009. As part of the ESP process, the NRC staff developed a draft and final environmental impact statement.

As part of the NRC's responsibilities under Section 7 of the Endangered Species Act (ESA), the NRC staff prepared a biological assessment (BA) in connection with the VEGP ESP review documenting potential impacts on the shortnose sturgeon (*Acipenser brevirostrum*) as a result of preconstruction site-development activities of the two new units at the VEGP site. That BA, which was submitted to your office on January 25, 2008, concluded that the proposed action is not likely to adversely affect the shortnose sturgeon. The National Marine Fisheries Service (NMFS) concurred with that determination in a letter dated August 11, 2008. In a letter dated September 3, 2010, the NRC confirmed with your office that the ESP-stage consultation encompassed the proposed actions included in the COL application.

The shortnose sturgeon was the only applicable listed or proposed species under the purview of the NMFS during the NRC staff's ESP-stage consultation. On October 6, 2010, NMFS, published in the Federal Register (75 FR 61904), a proposed rule for listing the Carolina and South Atlantic distinct population segments of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) as endangered under the ESA. To address this development, the NRC has prepared the enclosed document which describes the potential effects of the construction and operation of two new nuclear units at the VEGP site on the Atlantic sturgeon and serves as our conference consultation under Title 50 of the Code of Federal Regulations (CFR) Part 402, subpart B, Section 402.10 (50 CFR 402). This document is limited to consultation on the Atlantic sturgeon and does not affect the prior NRC or NMFS assessment regarding the shortnose sturgeon. The NRC is requesting NMFS concurrence with the NRC staff's determination that the proposed action is unlikely to adversely affect the Atlantic sturgeon.

If you have any questions regarding this consultation letter or the staff's request, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager via telephone at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
As stated

cc w/o encl: See next page

If you have any questions regarding this consultation letter or the staff's request, please contact Ms. Mallecia Sutton, NRC Environmental Project Manager via telephone at 301-415-0673 or via e-mail to Mallecia.Sutton@nrc.gov.

Sincerely,

/RA/

Gregory Hatchett, Chief
Environmental Projects Branch 1
Division of Site and Environmental Reviews
Office of New Reactors

Docket Nos.: 52-025
52-026

Enclosure:
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Mr. M. Stanford Blanton
Esquire
Balch and Bingham, LLP
P.O. Box 306
Birmingham, AL 35201

Ms. Michele Boyd
Legislative Director
Energy Program
Public Citizens Critical Mass Energy
and Environmental Program
215 Pennsylvania Avenue, SE
Washington, DC 20003

Mr. Marvin Fertel
Senior Vice President
and Chief Nuclear Officer
Nuclear Energy Institute
1776 I Street, NW
Suite 400
Washington, DC 20006-3708

Lucious Abram
County Commissioner
Office of the County Commissioner
Burke County Commission
PO Box 1626
Waynesboro, GA 30830

O. C. Harper, IV
Vice President - Resources Planning and
Nuclear Development
Georgia Power Company
241 Ralph McGill Boulevard
Atlanta, GA 30308

Mr. Steven M. Jackson
Senior Engineer - Power Supply
Municipal Electric Authority of Georgia
1470 Riveredge Parkway, NW
Atlanta, GA 30328-4684

Mr. Louis B. Long
Vice President Technical Support
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Director
Consumer's Utility
Counsel Division
Governor's Office of Consumer Affairs
2 Martin Luther King, Jr. Drive
Plaza Level East, Suite 356
Atlanta, GA 30334-4600

Mr. Arthur H. Domby, Esquire
Troutman Sanders
Nations Bank Plaza
600 Peachtree Street, NE
Suite 200
Atlanta, GA 30308-2216

Mr. Jeffrey T. Gasser
Executive Vice President
Southern Nuclear Operating Company,Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Laurence Bergen
Oglethorpe Power Corp.
2100 E Exchange Pl,
PO Box 1349
Tucker, GA 30085-1349

Mr. Charles R. Pierce
Vogtle Deployment Licensing Manager
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

Resident Inspector
Vogtle Plant
8805 River Road
Waynesboro, GA 30830

Southern Nuclear - Vogtle Mailing List

Resident Manager
Mr. Reece McAlister
Executive Secretary
Georgia Public Service Commission
Atlanta, GA 30334

Mr. Thomas O. McCallum
Site Development Project Engineer
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

Mr. Joseph (Buzz) Miller
Executive Vice President
Southern Nuclear Operating Company, Inc.
P.O. Box 1295
Birmingham, AL 35201-1295

Mr. Thomas Moorer
Environmental Project Manager
Southern Nuclear Operating Co., Inc.
PO Box 1295
Birmingham, AL 35201-1295

David Bernhart
Assistant Regional Administrator
for Protect Resources
National Marine Fisheries Service
263 13th Avenue South
St. Petersburg, Florida 33701

Sam Booher
Concerned Citizen
4387 Roswell Drive
Augusta, GA 30907

Claude Howard
394 Nathaniel Howard Rd
Waynesboro, GA 30830

Glenn Carroll
Nuclear Watch South
PO Box 8574
Atlanta, GA 31106

Oglethorpe Power Corporation
Alvin W. Vogtle Nuclear Plant
7821 River Road
Waynesboro, GA 30830

Mr. Jerry Smith
Commissioner
District 8
Augusta-Richmond County Commission
1332 Brown Road
Hephzibah, GA 30815

Mr. Robert E. Sweeney
IBEX ESI
4641 Montgomery Avenue
Suite 350
Bethesda, MD 20814

Bentina C. Terry
Southern Nuclear Operating Company,Inc.
PO Box 1295, BIN B-022
Birmingham, AL 35201-1295

Courtney Hanson
250 Georgia Avenue
Atlanta, GA 30312

Annie Laura Stephens
146 Nathanield Howard Rd
Waynesboro, GA 30830

Lucious Abrams
Burke County Commissioner
2032 Bough Red Hill
Keysville, GA 30816

Richard H. Byne
537 Jones Avenue
Waynesboro, GA 30830

Southern Nuclear - Vogtle Mailing List

Tommy Mitchell
Burke County Schools
352 Southside Dr
Waynesboro, GA 30830

George DeLoach
Mayor of Waynesboro
201 Oak Lane
Waynesboro, GA 30830

Robin Baxley
Best Office Solutions
142 S. Liberty St
Waynesboro, GA 30830

Email

APH@NEI.org (Adrian Heymer)
awc@nei.org (Anne W. Cottingham)
robin@bestofficesolutions.net (Robin Y. Baxley)
BrinkmCB@westinghouse.com (Charles Brinkman)
deloachjane@hotmail.com (George DeLoach)
chris.maslak@ge.com (Chris Maslak)
crpierce@southernco.com (C.R. Pierce)
cwaltman@roe.com (C. Waltman)
david.hinds@ge.com (David Hinds)
david.lewis@pillsburylaw.com (David Lewis)
dlochbaum@UCSUSA.org (David Lochbaum)
erg-xl@cox.net (Eddie R. Grant)
frankq@hursttech.com (Frank Quinn)
greshaja@westinghouse.com (James Gresham)
james.beard@gene.ge.com (James Beard)
jgutierrez@morganlewis.com (Jay M. Gutierrez)
jim.riccio@wdc.greenpeace.org (James Riccio)
jim@ncwarn.org (Jim Warren)
JJNesrsta@cpsenergy.com (James J. Nesrsta)
Joseph_Hegner@dom.com (Joseph Hegner)
KSutton@morganlewis.com (Kathryn M. Sutton)
kwaugh@impact-net.org (Kenneth O. Waugh)
lynchs@gao.gov (Sarah Lynch - Meeting Notices Only)
maria.webb@pillsburylaw.com (Maria Webb)
mark.beaumont@wsms.com (Mark Beaumont)
matias.travieso-diaz@pillsburylaw.com (Matias Travieso-Diaz)
mcaston@southernco.com (Moanica Caston)
media@nei.org (Scott Peterson)
mike_moran@fpl.com (Mike Moran)
tmitche@eburke.k12.ga.us (Tommy Mitchell)
nirsnet@nirs.org (Michael Mariotte)
eogleyoliver@gmail.com (Emma Ogley-Oliver)
patriciaL.campbell@ge.com (Patricia L. Campbell)
paul.gaukler@pillsburylaw.com (Paul Gaukler)
bobby@waud.org (Bobbie Paul)
Paul@beyondnuclear.org (Paul Gunter)
phinnen@entergy.com (Paul Hinnenkamp)
pshastings@duke-energy.com (Peter Hastings)
RJB@NEI.org (Russell Bell)
RKTemple@cpsenergy.com (R.K. Temple)
Crivard (?)
roberta.swain@ge.com (Roberta Swain)
burkechamber@roelco.net (Ashley Roberts)
sandra.sloan@areva.com (Sandra Sloan)
sfrantz@morganlewis.com (Stephen P. Frantz)
sbooher@aol.com (Sam Booher)
steven.hucik@ge.com (Steven Hucik)
tomccall@southernco.com (Tom McCallum)
diannevalentin@gmail.com (Dianne Valentin)
pvince20@gmail.com (Patricia Vincent)
waraksre@westinghouse.com (Rosemarie E. Warak)

Analysis Regarding Potential Impacts on Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)

Background

The U.S. Nuclear Regulatory Commission (NRC) is reviewing an application from Southern Nuclear Operating Company, Inc. (Southern), acting on behalf of itself and co-applicants (Georgia Power Company [GPC], Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia). The application is for combined licenses (COLs) to construct and operate two Westinghouse Electric Company, LLC (Westinghouse) Advanced Passive 1000 (AP1000) pressurized water reactors (i.e., Units 3 and 4) on the site of the Vogtle Electric Generating Plant (VEGP) in Burke County, Georgia. The COL application (Southern 2009) referenced an early site permit (ESP) for the VEGP site that was issued to Southern and the same co-applicants in 2009 (NRC 2009a). As part of the ESP process the NRC staff developed a draft and final environmental impact statement (EIS) (NRC 2007 and 2008a).

As part of the NRC's responsibilities under Section 7 of the Endangered Species Act (ESA), the NRC staff prepared a biological assessment (BA) in connection with the VEGP ESP review. The BA, which documented potential impacts on the shortnose sturgeon (*Acipenser brevirostrum*) as a result of preconstruction site-development activities of two new units at the VEGP site, was submitted to the National Marine Fisheries Service (NMFS) on January 25, 2008, (NRC 2008b). In the BA, the staff concluded that the overall impact of preconstruction-related activities (including constructing the intake and discharge systems and modifying the barge slip) would be temporary and unlikely to adversely impact shortnose sturgeon in the Savannah River. In its draft and final EIS (NRC 2007, 2008a) supporting the review of the ESP application, the NRC staff also analyzed the impacts of operation of two new nuclear units at the VEGP site and concluded that operation is unlikely to adversely impact shortnose sturgeon.

NMFS reviewed the BA and the September 2007 draft ESP EIS (NRC 2007) and, in a letter dated August 11, 2008, (NMFS 2008), concluded that "… effects on the species caused by exclusion from and temporary loss of spawning habitat due to construction activities are expected to be insignificant…" NMFS's basis for this conclusion was that, "… neither the water depths, substrate bottom type, time of year for construction [i.e., outside of the spawning season], nor the shape of the river at this location are conducive to shortnose sturgeon spawning. Shortnose sturgeon generally do not inhabit this section of the Savannah River at this time of year [i.e., outside of the spawning season]; sturgeon are generally found upstream from the site during the proposed construction months and no spawning studies have observed them in the river adjacent to the Vogtle Site." Further, based on its review of the draft ESP EIS, NMFS indicated that, "… the potential effect from thermal discharge will be insignificant as it is expected that fish and other organisms would avoid the elevated temperatures, as they can move through this part of the river unencumbered by any structures or physical features that would retain them in the plume; this also reduces the likelihood of cold shock when moving outside of the plume." NMFS concluded that, "… the risk of sturgeon impingement within the intake structures will be discountable due to the very small chance of sturgeon being trapped." Finally, NMFS concluded "… potential effects from chemical effluents will be insignificant." In summary, after considering impacts of both construction and operation of two new units at the VEGP site, NMFS concluded that the proposed action is not likely to adversely affect shortnose sturgeon.

The shortnose sturgeon was the only applicable listed or proposed species under the purview of the NMFS during the NRC staff's ESP-stage consultation. On October 6, 2010, NMFS

published in the Federal Register (75 FR 61904) a proposed rule for listing the Carolina and South Atlantic distinct population segments of the Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) as endangered under the ESA. To address this development, this document describes the potential effects of the construction and operation of two new nuclear units at the VEGP site on the Atlantic sturgeon, and serves as our conference consultation under Title 50 of the Code of Federal Regulations (CFR) Part 402, subpart B, Section 402.10 (50 CFR 402). This document is limited to consultation on the Atlantic sturgeon and does not affect the prior NRC or NMFS assessment regarding the shortnose sturgeon. In a letter dated September 3, 2010 (NRC 2010a), NRC notified NMFS of the issuance and request for comments for the Vogtle draft supplemental EIS (SEIS) for the COL application. The letter further stated that no relevant information had changed regarding the project since the earlier BA was submitted. The NRC staff has incorporated by reference the ESP-stage consultation with respect to the shortnose sturgeon, pursuant to 50 CFR 402.12(g). However, because of the similarities between the Atlantic sturgeon and the shortnose sturgeon, material supporting the previous consultation is referenced or included here as appropriate.

Description of the Action

NRC is reviewing an application, submitted on March 31, 2008, from Southern and the aforementioned co-applicants for COLs to construct and operate two Westinghouse AP1000 pressurized water reactors at the VEGP site in Burke County, Georgia. The VEGP site and existing facilities are owned and operated by GPC, Oglethorpe Power Corporation, Municipal Electric Authority of Georgia, and the City of Dalton, Georgia. Southern is the licensee and operator of the existing VEGP, Units 1 and 2 and has been authorized by the VEGP co-owners to apply for COLs for the new Units 3 and 4.

On August 26, 2009, NRC approved issuance to Southern and co-applicants of an ESP and a Limited Work Authorization (LWA) for two additional nuclear units at the VEGP site (NRC 2009a). This approval was supported by information contained in NUREG-1872, Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site (ESP EIS) (NRC 2008a) and errata. The ESP EIS considered the environmental issues and impacts of constructing and operating two new nuclear units at the VEGP site. Issuance of the ESP allowed Southern to "bank" the VEGP ESP site for up to 20 years. The LWA authorized Southern to conduct certain limited construction activities at the site in accordance with 10 CFR 50.10 and 52.24(c). As permitted by NRC regulations, Southern's COL application references the ESP.

Southern has performed, or plans to initiate, the following site-preparation activities for the two new Units 3 and 4 at the VEGP site which were considered in the BA prepared for the shortnose sturgeon and in the ESP EIS:

- Prepare the site for construction of the facilities (including such activities as clearing, grading, constructing temporary access roads, and preparing borrow areas),
- Install temporary construction support facilities (including items such as warehouses, shop facilities, utilities, concrete mixing plants, docking and unloading facilities, and construction-support buildings),
- Excavate for facility structures,

- Construct service facilities (including items such as roadways, paving, railroad spurs, fencing, exterior utility and lighting systems, transmission lines, and sanitary sewage treatment facilities), and

- Construct structures, systems, and components that do not prevent or mitigate the consequences of postulated accidents that could cause undue risk to the health and safety of the public. These structures, systems, and components include, but are not limited to the following:
  - Cooling towers
  - Intake and discharge structures
  - Circulating water lines
  - Fire protection equipment
  - Switchyard and onsite interconnections.

The ESP BA concerning the shortnose sturgeon also described modification of a barge slip (NRC 2008b). Since then, Southern has decided not to modify the barge slip because large components will be delivered by rail (Southern 2010a) thus precluding the need to modify the barge slip.

Under 10 CFR Part 52, which contains NRC's reactor licensing regulations and in accordance with the applicable provisions of 10 CFR Part 51, which are the NRC regulations implementing the National Environmental Policy Act of 1969 (NEPA), the NRC is required to prepare a SEIS (NRC 2010b) as part of its review of a COL application referencing an ESP. As required by 10 CFR 51.26, the NRC published a notice of availability of the draft SEIS for public comment in the *Federal Register* (FR) on September 3, 2010, (75 FR 54145). The SEIS, together with the ESP EIS (NRC 2008a), the ESP hearing proceedings, and specifically the NRC staff's prefiled testimony (NRC 2009b), and environmental assessments for three ESP license amendments concerning onsite backfill activities authorized by the LWA, (NRC 2010c, NRC 2010d, NRC 2010e) provide the NRC staff's evaluation of the environmental effects of constructing and operating two AP1000 reactors at the VEGP site.

VEGP Site Description

The VEGP site is located in Burke County, Georgia, adjacent to the Savannah River between river kilometers (RKM) 241 and 244 (river miles [RM] 150 and 152). The site is approximately 24 km (15 mi) east-northeast of Waynesboro, Georgia and 42 km (26 mi) southeast of Augusta, Georgia (see Figure 1). The proposed COL site is completely within the confines of the existing VEGP site with the new units to be constructed and operated adjacent to the existing Units 1 and 2 (Figure 2). A more detailed site description was provided in the ESP BA (NRC 2008b).

Figure 1. VEGP Site and the Vicinity within an 80-km (50-mi) Radius (Southern 2007)

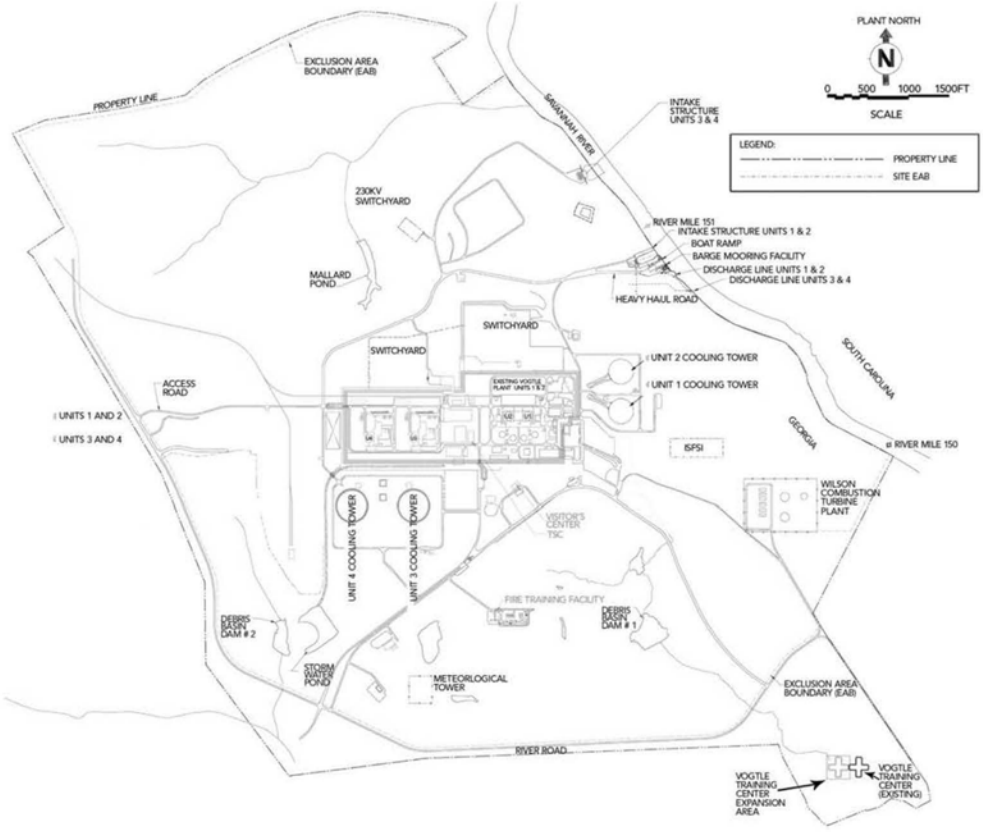

Figure 2. VEGP Site Footprint with the Existing and Proposed Nuclear Units (Southern 2010b)

Potential Environmental Impacts from Preconstruction Site-Preparation Activities

The activities that could potentially affect the habitat for the Atlantic sturgeon during construction of the intake and discharge structures are the same as those described in the ESP BA (NRC 2008b), with the exception of the construction of a barge slip, dredging from the barge slip to the Savannah River Navigation Channel, and maintenance dredging of the Savannah River Navigation Channel, which are no longer planned to occur (Southern 2010a).

On September 29, 2010, the Department of the Army issued an individual Section 10/404 permit (Permit Number SAS-2007-01837) to Southern authorizing impacts to 9.23 acres of jurisdictional wetland, 734 linear feet of stream (only the Georgia side of the Savannah River, equivalent of 1.42 acres of open water), and 0.07 acre of ephemeral stream in the southeast corner of the site near the debris basins (USACE 2010a). Southern also received a Section 401 Water Quality Certification from the Georgia Department of Natural Resources (GDNR) dated June 1, 2010, (USACE 2010a).

The design and location of the cooling water intake structure for proposed Units 3 and 4 has changed since the original BA was sent to NMFS in January 2008. The cooling water intake structure has been repositioned upstream approximately 46 m (150 ft), which places it approximately 650 m (2130 ft) upstream of the existing intakes for Units 1 and 2 and approximately 427 m (1400 ft) downstream of the outlet to the unnamed tributary of Mallard Pond. Southern also described a change in the dimensions of the intake structure (Southern 2010b); this change will lower the intake structure floor from elevation 38.1 m to 32.0 m (125 to 105 ft). In addition, there will be a slight bend (i.e., approximately 30 degrees) about halfway down the canal to orient the mouth of the intake canal perpendicular to the river. Figure 3 illustrates the revised intake structure and the wetlands in its vicinity. The design changes (Southern 2010b) do not substantially modify the width of the intake canal or the length of the canal extending beyond the existing river bank. The new location and design modifications did not alter the basis for the NRC staff's analysis of construction impacts in the COL SEIS.

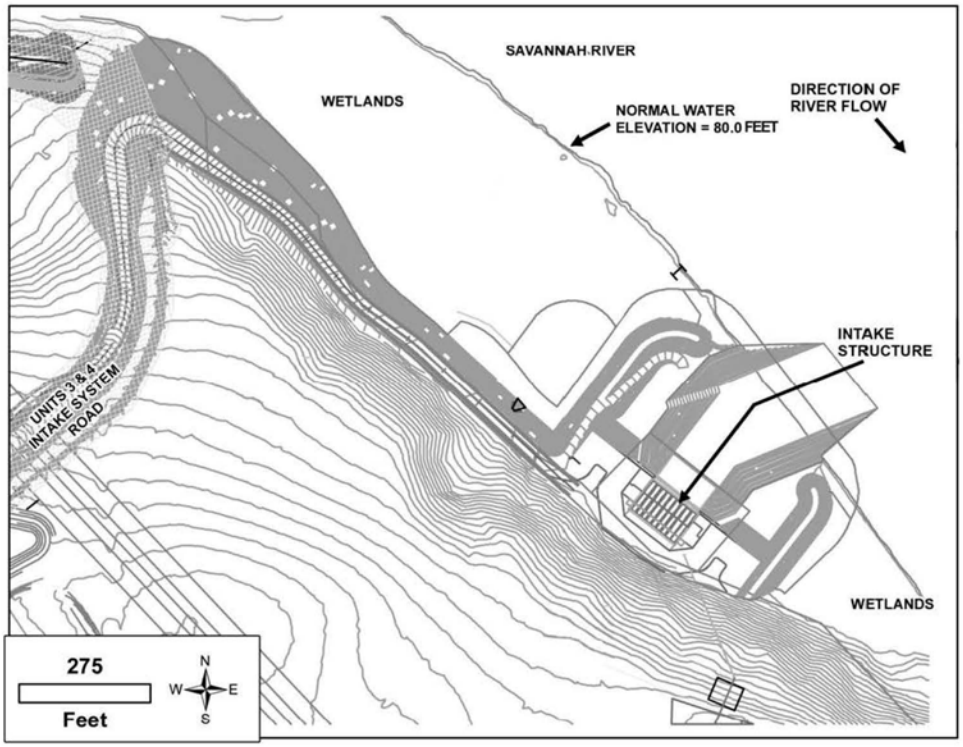

Figure 3. Revised Intake Structure and Surrounding Wetlands (Southern 2010b)

As discussed in the ESP BA (NRC 2008b), the proposed discharge structure will be placed near the southwest bank of the Savannah River, extending about 15 m (50 ft) into the river (Southern 2007). Details related to the design and placement of the discharge structure did not change.

Potential Environmental Impacts of Operational Activities

The potential impacts to the Atlantic sturgeon from the operation of the proposed Units 3 and 4 would include the loss of habitat from the consumption of water from the Savannah River, the entrainment of fish eggs or larvae, impingement against intake screens, the discharge of heated effluents, the discharge of chemicals, and the physical impact of bottom scouring from the discharge into the Savannah River.

Although the design and location of the cooling water intake structure has changed, the orientation of the mouth of the intake canal in relation to the river (perpendicular) has not changed. There is a slight bend in the intake canal (approximately 30 degrees) as shown in Figure 3; however, the orientation of the mouth of the intake canal relative to the river will not change. The new location of the intake canal is in habitat similar to that in the previous location (i.e., on a straight portion of the river and in the same floodplain.) No changes were made to the water withdrawal rates, through-screen velocities, traveling screen mesh size, or the hydraulic zone of influence, which are the main factors that would impact entrainment or impingement rates of aquatic biota during operation of the cooling water intake structure (Southern 2010b).

The staff evaluated the potential for fish, including the Atlantic sturgeon to be affected by the withdrawal of water from the Savannah River in the ESP EIS (NRC 2008a). The combined normal withdrawal rate of 2.35 m^3/s (83 cfs) for both VEGP Units 3 and 4 represents 0.9 percent of the average river discharge measured at the Augusta gauge. This is significantly less than the U.S. Environmental Protection Agency (EPA) national performance requirement of 5 percent for a cooling water intake structure located in a freshwater river or stream.

The staff also considered in the ESP EIS, the percentage of water withdrawn during normal operations for the proposed Units 3 and 4 from the Savannah River at Drought Level 3 river flow levels (108 m^3/s [3800 cfs]). At normal withdrawal rates, Units 3 and 4 would withdraw 2.2 percent of the river flow at the Drought Level 3 flow rates (NRC 2008a). Historically, these drought levels have occurred for short periods of time and this withdrawal rate is a small fraction of the water in the Savannah River at this location in the river.

As part of the evaluation process for the ESP EIS and the COL SEIS, the NRC staff considered several factors related to the operation of the discharge structure: (1) the physical and thermal characteristics of the plume in relation to the receiving water body, (2) the potential for cold shock, and (3) impacts from the discharge of chemicals from operation of the two proposed units. Regarding the physical and thermal characteristics of the plume in relation to the receiving water body, at the location of the discharge outfall and at a Drought Level 3 flow rate, the Savannah River is approximately 95-m (312-ft) wide (NRC 2008a). In its COL Environmental Report (ER), Southern (2009) indicated that there would be a 3 percent increase in the discharge flow beyond what was assessed in the ESP EIS. Using the same conservative assumptions employed in the ESP EIS analysis, this change would result in only a small increase in the size of the 2.8°C (5°F)-above-ambient isotherm, from 4.6 m (15 ft) to 5.2 m (17 ft) in width and from 29.6 m (97 ft) to 33.6 m (110 ft) in length (NRC 2010b). Because the estimated extent of the thermal plume remains small in relation to the width of the Savannah River at the VEGP site, the staff concluded the thermal plume still would not impede fish passage up and down the river. The staff concluded that consistent with the reasoning

identified by the ESP EIS analysis, fish and other organisms likely would avoid the elevated temperatures and would be able to move through this part of the river unencumbered by any structures or physical features that would retain them in the plume. In addition, the staff determined that the thermal plume would not create a barrier to the upstream or downstream movement of migratory fish (NRC 2010b).

Operation of the proposed Units 3 and 4 could potentially result in cold shock, which occurs when aquatic organisms that have become acclimated to warm water such as fish in a power plant's discharge canal are exposed suddenly to a lower temperature. The staff concluded that cold shock would be less likely to occur at the VEGP site because multiple units would be operating, thus lowering the possibility of simultaneous shutdown of all the units. In addition, the volume of the discharge plume would be very small in comparison with the river flow (NRC 2008a).

Regarding the discharge of chemicals from operation of the two proposed units, the cooling water will be treated with biocides and chemicals to control scaling, corrosion, and solids deposition. Operation of the cooling towers would be based on four cycles of concentration, which means that the total dissolved solids in the make-up water would be concentrated four times before being discharged. Thus, the levels of solids and organics in the cooling tower blowdown would be approximately four times higher than ambient or upstream concentrations. Cooling water chemical treatment for the proposed Units 3 and 4 would be similar to that used for the existing units. The final plant discharge from the proposed Units 3 and 4 would be composed of circulating service water blowdown and other site wastewater streams, including sanitary waste, miscellaneous low-volume waste, and treated liquid radwaste. Blowdown from the cooling towers would be discharged to a common blowdown sump to provide retention time for settling of solids or treatment, if required to remove biocide residuals before the water is discharged to the Savannah River. Calculations performed by Southern and confirmed by the staff give an estimated in-river dilution factor of 60 to 120 during periods of average Savannah River discharge, depending on the time of the year and the river flow rate (NRC 2008a).

The use of chemicals in the existing VEGP Units 1 and 2 is regulated by the GDNR, as set forth in a National Pollutant Discharge Elimination System (NPDES) permit. The chemical concentrations at the outfall for the existing units meet the NPDES limits. The chemical concentrations from Units 3 and 4 are anticipated to be the same as those for Units 1 and 2. No impacts to the aquatic ecology of the Savannah River have been observed from the operation of Units 1 and 2 and no impacts are anticipated from operation of Units 3 and 4. Southern would be required to obtain a NPDES permit from GDNR prior to operation of Units 3 and 4. To protect the aquatic environment, the NPDES permit will specify discharge limits for the various water-treatment chemicals. The NRC staff has determined that impacts to the aquatic environment from chemical discharges to the Savannah River during operation would be minimal (NRC 2008a).

Life History of Atlantic Sturgeon

Based on information published by Marcy et al. (2005), the staff identified the Atlantic sturgeon as being present in the Middle Savannah River Basin. The Atlantic sturgeon is a member of the family Acipenseridae, which is a long-lived group of ancient anadromous and freshwater fishes. Historically, the Atlantic sturgeon was present in 38 rivers in the United States, ranging from St. Croix, Maine, to the Saint Johns River in Florida. Historical spawning populations were confirmed in 35 of the rivers. Currently, Atlantic sturgeon populations are present in 35 rivers and spawning occurs in at least 20 rivers, including the Savannah River (ASSRT 2007)

Although the life history of the Atlantic sturgeon has been studied intensely since the 1970s, important aspects of the life history are still unknown. Generally, the Atlantic sturgeon is anadromous and spends the majority of its life in marine waters, but it reproduces in a freshwater habitat. Spawning is believed to occur in flowing water between the salt wedge and the fall line of large rivers. Like the shortnose sturgeon, spawning adults generally migrate upriver during the spring (February to March) in southern rivers. A fall-spawning migration also may occur in some southern rivers (ASSRT 2007). This appears to have first been reported by Smith (1985) indicating the occurrence of a fall run of fish that are in spawning condition in the south. Smith et al. (1984) note that the fall-run fish are typically smaller than those caught in the spring. Collins et al. (2000) provided additional evidence of a fall spawning period in the Ashepoo, Combahee, and Edisto river basins in South Carolina. This finding was based on movements of two male fish that spent the summer in the lower Edisto River and then moved upriver to RKM 190 during October 1998. In addition, a female Atlantic sturgeon that had recently spawned was captured near RKM 56 of the Edisto River during the fall during this study; however, no spawning sites were confirmed.

Atlantic sturgeon eggs are highly adhesive and are deposited on the bottom substrate, usually on hard surfaces. Hatching occurs within approximately 94 to 140 hours after egg deposition at temperatures of 20°C and 18°C (68°F and 64.4°F), respectively. Embryos (age 1 to 8 days old) tend to seek cover and stay near the bottom after hatching (Kynard and Horgan 2002). When the yolk-sac larval stage is complete (after 8 to 12 days), the larvae move downstream over a 6- to 12-day period to rearing grounds. Larvae are demersal and stay near the bottom of the water column (ASSRT 2007). During the first half of their migration, movement is limited to the night and during the day, they use the bottom (e.g., a gravel matrix) as refugia. As the larvae develop further, migration occurs during both the day and the night (Kynard and Horgan 2002). Juvenile sturgeon eventually arrive in estuarine waters, where they remain for months or years. Sub-adults may move to coastal waters and may make long migrations (ASSRT 2007).

Status of Atlantic Sturgeon in the Savannah River

Atlantic sturgeon have been found in the Savannah River, with records documenting 70 individuals having been captured since 1999 (ASSRT 2007). It appears that they are spawning in the river, although specific spawning locations have not been identified. In 1997, a single running ripe male was found at the base of the dam near Augusta in the late summer (ASSRT 2007) pointing to a potential fall migration in the Savannah also.

Ichthyoplankton studies conducted during a four-year period (1982-1985) near the Savannah River Site which is across the river from the VEGP site resulted in a total of 43 sturgeon larvae being collected. The larvae were taken from the river between RM 120 and 176. Differentiating shortnose sturgeon larvae from Atlantic sturgeon larvae is difficult because of the similarity in appearance; however, a total of 31 of the 43 sturgeon larvae were identified as Atlantic

sturgeon. Of the 31 larvae, four were identified as being collected from near the top of the water column. The remainder were from near the bottom. The Atlantic sturgeon larvae were collected during April. Sampling was conducted from February through July, so a fall spawning season would not have been noticed (Paller et al. 1986). In addition, Collins et al. (2000) documented an early larval *Acipenser* sp., tentatively identified as an Atlantic sturgeon located at RKM 42 (RM 26) in the Savannah River.

Cumulative Impacts

On November 15, 2010, the U.S. Army Corps of Engineers published a draft General Re-Evaluation Report (GRR) (USACE 2010b) and a Tier II EIS (USACE 2010c) related to determining the feasibility of improvements to the Federal navigation project at Savannah Harbor. The GRR and EIS assess mitigation plans for alternative channel depths from -42 to -48 ft mean lower low water. The Savannah Harbor expansion project has the potential to result in the loss of several hundred acres of habitat for fish that use the estuary. Many mitigation measures are being considered in connection with this project, including building a fish-way round the New Savannah Bluff Lock and Dam at Augusta, Georgia, which would open up an additional 32 km (20 mi) of habitat upstream of the dam (USACE 2010c). As explained previously, construction of the proposed units at the VEGP site would temporarily affect less than 0.6 ha (1.5 ac) of sturgeon migratory habitat. Water withdrawal rates during operation would be less than 1 percent of Savannah River flow during average flow conditions and the small zone of influence would have a negligible impact on pelagic spawning (NRC 2008a). Furthermore, the proposed activities associated with the VEGP expansion would not impede the mitigation measures being considered for the Savannah River expansion project. Accordingly, construction and operation of the proposed VEGP units would not have an adverse cumulative impact on important fish species when considered together with the Savannah Harbor expansion project.

Evaluation of Potential Impacts from Preconstruction Site-Preparation Activities

The construction activities previously described are expected to have minimal impacts on the aquatic ecology of the Savannah River. The extent of benthic habitat altered during construction of the intake canal would be small because most of the major construction activities would occur in the floodplain. Likewise, there would be limited disturbance of the benthic habitat during construction of the discharge structure. Disruption of silt and debris and its subsequent movement downstream during construction is expected to be minor because siltation curtains and cofferdams will be used, as discussed in the ESP BA. Noise impacts from pile-driving activities would be transient. Fish, including Atlantic sturgeon that may be inhabiting the river in the vicinity of the construction activities, would likely leave temporarily or avoid the Georgia side of the river. This temporary habitat loss would be a very small percentage of the total aquatic habitat in this area of the Savannah River.

The NRC staff has concluded that, because of the limited scope of the activities and the best management practices employed by Southern, site preparation activities addressed in this analysis would be temporary and would be unlikely to adversely affect Atlantic sturgeon.

Evaluation of Potential Impacts from Operational Activities

The operational impacts previously described are expected to have minimal impact on the aquatic ecology of the Savannah River. The anticipated volume of water to be withdrawn from

the river by the closed-cycle cooling system is a small fraction (1.2 percent) of the water in the river.

The anticipated approach velocities (about 3 cm/sec [0.1 ft/sec]) in the proposed intake canal and a designed through-screen intake velocity of less than 15 cm/sec (0.5 ft/sec) are low enough that healthy Atlantic sturgeon would be able to avoid impingement. Further, the staff is not aware of any documented case of healthy Atlantic sturgeon being impinged at any nuclear power station along the Atlantic coast including stations that employ once-through cooling systems. Sturgeon that migrate both upstream and downstream in the Savannah River are accustomed to flow rates higher than 15 cm/sec (0.5 ft/sec). An impingement study undertaken from March 10, 2008 through February 26, 2009 at VEGP Units 1 and 2 which are similar in design to the proposed Units 3 and 4, resulted in a total of 168 organisms being impinged (GPC 2009). Extrapolation of the results for a full year (365 days) of cooling-water withdrawal provided an estimate of 2580 impinged organisms with a biomass of 15 kg (33.1 lbs). No sturgeon were impinged.

An entrainment study undertaken by Southern from March 10, 2008 through July 29, 2008, resulted in entrainment of a total of 910 fish eggs and larvae from 23 taxa, representing 13 taxonomic families (GPC 2008). No sturgeon eggs or larvae were collected in either the source water or the entrainment samples.

According to the Atlantic Sturgeon Status Review Team, it is believed that the inherent behavior of larval sturgeon to maintain an active migration and to seek deep water plays a role in helping them to avoid intake structures (ASSRT 2007). Thus, they would not be susceptible to entrainment or impingement.

The size of the modeled thermal plume is small in comparison to the width of the Savannah River at the VEGP site; therefore, the plume created by operations at VEGP would not create a barrier to the upstream or downstream migration of fish species, including the Atlantic sturgeon, in the Savannah River.

Chemical discharges at the outfall for the existing Units 1 and 2 meet the limits specified in the NPDES permit and the discharge from the proposed Units 3 and 4 will be similar. No impacts to the aquatic ecology of the Savannah River have been observed from the operation of Units 1 and 2, and no impact from chemical discharges from Units 3 and 4 would be expected for Atlantic sturgeon.

Conclusion

Based on its review of the proposed action and the biology of the Atlantic sturgeon, the staff concludes that the overall impact of the VEGP Units 3 and 4 construction- and operation-related activities would be unlikely to adversely affect Atlantic sturgeon in the Savannah River.

References

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F.1 Reference

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Appendix G

Supporting Documentation for Radiological Dose Assessment

Appendix G

Supporting Documentation for Radiological Dose Assessment

Appendix G of the Vogtle Electric Generating Plant early site permit (ESP) environmental impact statement (EIS) (NRC 2008) provided information regarding the methodology and input data for dose estimates to the public from liquid effluents, from gaseous effluents, cumulative dose estimates, and dose estimates to biota from liquid and gaseous effluents. Southern Nuclear Operating Company, Inc. (Southern) indicated in the Environmental Report (ER) included in its combined operating license (COL) application that there is no new and significant information regarding construction, operation, and cumulative radiological impacts (Southern 2009). During its review of the COL application, the NRC staff independently verified that there is no new and significant information related to radiological impacts (see Sections 4.9, 5.9, and 7.8) by reviewing Southern's ER, auditing Southern's process for identifying new and significant information, examining other information available at the site audit, and considering applicable regulations and reference documents. While the ESP EIS is based on information from Revision 15 of the AP1000 Design Control Document (DCD) (Westinghouse 2005), this SEIS is based on information from Revision 17 of the DCD (Westinghouse 2008). No significant changes in radiation doses result from using the information from Revision 17 of the DCD rather than information provided in Revision 15. Based on this review, the staff determined that the information presented in Appendix G of the ESP EIS remains valid.

G.1 References

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Appendix H

Authorizations and Certifications

Appendix H

Authorizations and Certifications

This appendix contains a list of the authorizations, permits, and certifications potentially required by Federal, State, regional, local and affected Native American Tribal agencies related to the site preparation, construction, and operation of the proposed Units 3 and 4 at the Vogtle Electric Generating Plant site. Tables 1.5-1 through 1.5-5 of the Environmental Report submitted by Southern Nuclear Operating Company, Inc. on September 23, 2009 (Southern 2009) to the U.S. Nuclear Regulatory Commission, as amended by information provided in Southern's response to a request for additional information (2010a) Southern's comments on the draft supplemental environmental impact statement (2010c), are reproduced in this appendix as Table H-1, Table H-2, Table H-4,Table H-5, and Table H-6. Table H-3 is reproduced from Table 1.4-1 in the Environmental Report for the Limited Work Authorization Request (Southern 2010b). Table H-1 also contains additional information, not provided by Southern, concerning Endangered Species Act consultations with the U.S. Fish and Wildlife Service and National Marine Fisheries Service. Tables H-2 and H-5 contain information concerning permits from the U.S. Army Corps of Engineers (USACE 2010).

Table H-1. Authorizations Required for Early Site Permit

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
U.S. Fish and Wildlife Service (USFWS)	Endangered Species Act	Consultation regarding potential to adversely impact protected species (non-marine species)	NA	NA	Concurrence with no adverse impact or consultation on appropriate mitigation measures.	On Oct 12, 2006, the NRC wrote the USFWS describing the project and asking for a list of protected species and habitats at the proposed site and alternative sites, and for any information under the jurisdiction of the USFWS that the agency considered pertinent to the project. In a letter dated January 25, 2008, the NRC submitted a biological assessment to USFWS documenting potential impacts on threatened or endangered species as a result of the limited site-preparation activities at the VEGP site (In a letter dated September 19, 2008, the USFWS concurred with the NRC findings that limited site-preparation activities would not likely adversely affect threatened or endangered species at the VEGP site. By letter dated February 24, 2011, the NRC submitted a second biological assessment to USFWS concerning potential impacts of operation of Units 3 and 4 at the VEGP site and of construction and operation of the proposed new

transmission line.

Table H-1. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
National Marine Fisheries Service (NMFS)	Endangered Species Act	Consultation regarding potential to adversely impact protected species (marine species)	NA	NA	Concurrence with no adverse impact or consultation on appropriate mitigation measures.	On Oct 12, 2006, the NRC wrote the NMFS describing the project and asking for a list of protected species and habitats at the proposed site and alternative sites, and for any information under the jurisdiction of the NMFS that the agency considered pertinent to the project. NMFS responded on Oct 24, 2006 with a list of federally protected species under the jurisdiction of NMFS in Georgia and Alabama. In a letter dated January 25, 2008, The NRC submitted a biological assessment to NMFS documenting potential impacts on shortnose sturgeon as a result of the limited site-preparation activities at the VEGP site. In a letter dated August 11, 2008, NMFS responded to the NRC biological assessment prepared for the ESP and concurred that the project is not likely to adversely affect the protected species under their jurisdiction.

Table H-1. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
South Carolina Department of Archives and History	National Historic Preservation Act (36 CFR 800)	Consultation regarding potential to adversely affect historic resources	NA	NA	Confirm site construction or operation would not affect protected historic resources.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
Alabama Historical Commission	National Historic Preservation Act (36 CFR 800)	Consultation regarding potential to adversely affect historic resources	NA	NA	Confirm site construction or operation would not affect protected historic resources.	On Oct 12, 2006, the NRC wrote the Alabama Historical Commission describing the project and inviting the SHPO to consult with the NRC regarding the proposed project. The SHPO responded without comment on Oct 20, 2006.
Georgia Department of Natural Resources (GDNR)	National Historic Preservation Act (36 CFR 800)	Consultation regarding potential to adversely affect historic resources	NA	NA	Confirm site construction or operation would not affect protected historic resources.	On Oct 12, 2006, the NRC wrote the Georgia SHPO describing the project and inviting the SHPO to consult with the NRC regarding the proposed project. The Georgia SHPO responded on Dec 27, 2007 and provided their assessment of the eligibility of sites at VEGP and suggested measures to protect eligible sites during construction and after.

Table H-1. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
						SNC submitted a Memorandum of Understanding (MOU) to the Georgia SHPO on January 4, 2010 for review and approval. The MOU is for the installation of the river water intake piping and associated duct bank and to preserve the balance of archaeological site 9BK416 for future investigations as directed by the Georgia SHPO.
GDNR	Federal Clean Water Act (33 U.S.C. 1251 et seq.) (CWA)	Section 401 Certification	NA	NA	Compliance with water quality standards.	GDNR issued a 401 Certification by letter to SNC, dated June 1, 2010 (Southern 2010c).
Native American Nations: Cherokee Nation of Oklahoma Chickasaw Nation Chickasaw Nation of Oklahoma Georgia Tribe of Eastern Cherokee Alabama-Quassarte Tribal Town Seminole Nation of Oklahoma	Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions (10 CFR 51) require Protection of Historic Properties (36 CFR 800)	Consultation regarding protection of traditional Native American religious or cultural resources	NA	NA	Confirm that traditional Native American religious or cultural resources are protected	On Oct 12, 2006 and Oct 16, 2006 the NRC wrote the listed Native American groups describing the project and inviting them to consult with the NRC regarding the proposed project. The Miccosukee Tribe responded on Oct 16, 2006 that it limited itself to matters within the State of Florida. The United Keetoowah Band of Cherokee Indians in Oklahoma responded on Oct 22, 2006 that it had no objections to the referenced

Table H-1. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Eastern Band of Cherokee Indians						project. The Seminole Nation of Oklahoma responded on Oct 13, 2006 that it was not interested in the project.
United Keetoowah Band of Cherokee Indians						
Poarch Band of Creek Indians						
Coushatta Tribe of Louisiana						
Absentee-Shawnee Tribe of Oklahoma						
Muscogee (Creek) Nation of Oklahoma						
Alabama-Coushatta Tribe of Texas						
Catawba Indian Tribe						
Seminole Tribe of Florida						
Mississippi Band of Choctaw Indians						

Table H-1. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Kialegee Tribal Town						
Miccosukee Tribe of Indians of Florida						
Thlopthlocco Tribal Town						
Muscogee (Creek) Nation						

Table H-2. Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
U.S. Army Corps of Engineers (USACE)	CWA	Section 404 Permit	SAS-2007-01837	9/30/2015	Disturbance or crossing wetland areas or navigable waters. For site and rail corridor upgrade[(a)]	SNC has completed jurisdictional determinations for all site wetlands with the exception of the required metes and bounds survey. SNC has submitted a joint application package for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010. The USACE issued to SNC an individual Department of the Army permit on September 30, 2010 (USACE 2010).
USACE	33 CFR 323	Dredge and Fill Discharge Permit	SAS-2007-01837	9/30/2015	Construction/ modification of intake/ discharge to Savannah River. For site and rail corridor upgrade.[(a)]	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. SNC has submitted a joint application package for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010. The USACE issued to SNC an individual Department of the Army permit on September 30, 2010 (USACE 2010).

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
USACE	Rivers and Harbors Act	Section 10 Permit	SAS-2007-01837	9/30/2015	Barge slip modification impacts to navigable waters of the U.S.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. SNC has submitted a joint application package for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010. In February 2010, SNC deleted the barge slip modification.
U.S. Department of Transportation (USDOT)	49 CFR 107, Subpart G	Certificate of Registration	051409 551 044R	06/30/2010	Transportation of hazardous materials.	USDOT has provided the certificate.
USFWS	Migratory Bird Treaty Act, 50 CFR 21	Federal permit			Adverse impacts on protected species and/or their nests. For site and rail corridor upgrade.[(a)]	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
Federal Aviation Administration (FAA)	49 USC 1501 14 CFR 77	Construction Notice			Notice of erection of structures (>200 feet high) potentially impacting air navigation.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Georgia Public Service Commission (GPSC)	GA Public Utilities Act (O.C.G.A. Section 46-3-1 et seq.), GA Rules and Regulations 515-3-4-.07	Certificate of Public Convenience and Necessity			Present and future public convenience and necessity require the operation of such equipment or facility.	SNC received GPSC certification of the project on March 17, 2009.
GDNR	GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391-4- 10	Depredation Permit			Adverse impacts on state designated protected species and/or their habitat. For site and rail corridor.[(a)]	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	Federal Clean Air Act (CAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Part 70 Air Quality Construction Permit	1629-033-0039-S-01- 0		Construction air emission sources.	Shaw was issued its SIP Air Quality permit on June 18, 2009. SNC PSD permit application currently under review by GA EPD.
GDNR	CWA, GA Water Quality Control Act	Revision of existing National Pollutant Discharge Elimination System Permit			Regulates limits of pollutants in liquid discharge to surface water	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects.	GAR 100003	07/31/2013	Discharge storm water from site during construction	SNC does not expect to have to file for coverage under GAR 100003. No Erosion, Sedimentation and Pollution Control plans have been developed for submittal under GAR 100003.

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR 100002	07/31/2013	Discharge storm water from linear construction sites (e.g., roadways and rail corridor)	SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100002.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	Permit to operate a public water system			Operate a public, nontransient, non-community water system.	Based on discussions with GDNR, the potable water system for VEGP Units 3 & 4 will be a new system. SNC submitted the potable water permit application and construction design details on June 16, 2009. GDNR approved the construction design on July 14, 2009, which allows SNC to initiate construction of the potable water system and drill two wells for potable water use.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	Permit to operate a public water system				
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2- .03	Modification of Existing Permit to Use Groundwater	017-0003	08/06/2012	Consumptive use of 100,000 gallons per day or more of groundwater.	Received.

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2- .09	Permit to Withdraw Groundwater	017-0006	03/13/2012	Dewater for foundation if needed for more than 60 days.	Received.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2- .14	Certification of Abandoned Wells			Abandoned wells have been filled, plugged and sealed.	SNC provided a notification to EPD regarding Well SW-5, one of two wells to be taken out of service, on February 18, 2009. The remaining well, MU-2a, is scheduled to be removed from service in 2012.
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7	Land Disturbing Activity Permit	GAR 100001	07/31/2013	Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor upgrade.[(a)]	SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100001.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4- .06	Permit by Rule - Inert Landfill Permit			On-site disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A.	Private Industry Landfill Permit			Onsite disposal of solid waste consisting of construction and demolition debris.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
	12-8-20 et seq.), GA Rules and Regulations 391-3-4					
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	Federal Clean Air Act (FCAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Revision of existing Title V Operating Permit			Operation of air emission sources.	SNC submitted a request for modification to this permit along with the PSD/NSR permit application submitted on May 26, 2009.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26- 331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County.	As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Burke County). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002.

Table H-2. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26- 336	Building Permit			Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.

(a) The VEGP rail spur was recently upgraded, and SNC will verify that additional upgrades are not needed. For completeness, this table assumes upgrades to the rail corridor will be made.

Table H-3. Permits and Authorizations Required for Limited Work Authorization Activities

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	Georgia Groundwater Use Act (O.C.G.A. 12-5-90 et seq.); Georgia Rules and Regulation 391-3-2-09	Permit to withdraw groundwater	017-0006	03/13/2012	Dewater for foundation if needed for no more than 60 days.	Received
GDNR	Federal Clean Air Act; Georgia Air Quality Act (O.C.G.A. 12-9-1 et seq.); Georgia Rules and Regulation 391-3-1	Part 70 Air Quality Construction Permit	1629-033-0039-S-01-1		Construction of air emission sources.	Received
GDNR	Georgia Erosion and Sedimentation Act (O.C.G.A. 12-7-1 et seq.); Georgia Rules and Regulation 391-3-7	Land-Disturbing Activity Permit	GAR 100001	07/31/2013	Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site (and rail corridor) upgrades.	SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to the Georgia Environmental Protection Division for coverage under GAR 100001
GDNR	Federal Clean Water Act (CWA); Georgia Water Quality Control Act (O.C.G.A. 12-5-31 et seq.); Georgia Rules and Regulation 391-3-6	Permit to discharge process waste water	GA0039276 (pending EPD issuance)	5 years from date of issuance	Ready-mix concrete batch plant process wastewater discharges	EPD has issued a draft permit for public comment. Issuance of final permit expected in March 2010.
GDNR	CWA, Georgia Water Quality Control Act (O.C.G.A. 12-5-31 et seq.); Georgia Rules and Regulation 391-3-6	Industrial Storm Water Permit	GAR 000000	07/31/2011	Permit to discharge storm water associated with industrial activity.	SNC is preparing to submit to EPD a Storm Water Pollution Prevention Plan and Notice of Intent for coverage under GAR 000000.

Table H-4. Authorizations Required for Redress Activities

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
USACE	CWA	Section 404 Permit			Disturbance or crossing wetland areas or navigable waters.	If redress activities were required SNC would seek the necessary permits.
USDOT	49 FR 107, Subpart G	Certificate of Registration			Transportation of hazardous materials.	If redress activities were required SNC would seek the necessary permits.
GDNR	CWA	Section 401 Certification			Compliance with water quality standards.	If redress activities were required SNC would seek the necessary permits.
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects			Discharge storm water from site during construction.	If redress activities were required SNC would seek the necessary permits.
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects			Discharge storm water linear construction sites (e.g., roadways, transmission lines) during construction.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391-3-7	Land Disturbing Activity Permit			Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For site and rail corridor.	If redress activities were required SNC would seek the necessary permits.

Table H-4. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	CAA, GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Part 70 Air Quality Construction Permit			Construction air emission sources.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	Notice of Termination (NOT) - Permit to operate a Public Water System			Operate a public, non-transient, non-community water system.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Safe Drinking Water Act (O.C.G.A. 12-5-170 et seq.), GA Rules and Regulations 391-3-5	NOT - Permit to operate a Public Water System			Operate a public, transient, non-community water system.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.03	NOT - Permit to Use Groundwater			Consumptive use of 100,000 gallons per day or more of groundwater.	If redress activities were required SNC would seek the necessary permits.

Table H-4. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.09	Permit to Withdraw Groundwater			Dewater for foundation if needed for more than 60 days.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2-.14	Certification of Abandoned Wells			Abandoned wells have been filled, plugged and sealed.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4- .06	Permit by Rule - Inert Landfill Permit			Onsite disposal of solid waste consisting of earth and earth-like products, concrete, cured asphalt, rock, bricks, and land clearing debris.	If redress activities were required SNC would seek the necessary permits.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Private Industry Landfill Permit			Onsite disposal of solid waste consisting of construction and demolition debris.	If redress activities were required SNC would seek the necessary permits.

Table H-4. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.	If redress activities were required SNC would seek the necessary permits.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26- 331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County	If redress activities were required SNC would seek the necessary permits.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26- 336	Building Permit			Construction, alteration, repair, or demolition of any building or structure within the boundaries of Burke County.	If redress activities were required SNC would seek the necessary permits.

Table H-5. Authorizations Required for Construction[(a)]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
NRC	10 CFR 52, Subpart C or	Combined Operating License or			Safety-related construction for a nuclear power facility.	
	10 CFR 50.10(e)(3)	Limited Work Authorization	LWA is part of permit ESP-004	09/26/2029		NRC issued LWA on August 26, 2009 as part of ESP-004.
FAA	49 USC 1501 14 CFR 77	Construction Notice			Notice of erection or structures (>200 feet high) potentially impacting air navigation.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
USACE	CWA	Section 404 Permit	SAS-2007-01837	09/30/2015	Disturbance or crossing wetland areas or navigable waters. For transmission line corridor.	SNC has completed jurisdictional determinations for all site wetlands with the exception of the required metes and bounds survey. SNC submitted a joint application package for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010. The USACE issued to SNC an individual Department of the Army permit on September 30, 2010 (USACE 2010).

Table H-5. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
USACE	33 CFR 323	Dredge and Fill Discharge Permit	SAS-2007-01837	09/30/2015	Construction/ modification of intake/ discharge to Savannah River. For transmission line corridor.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. SNC submitted a joint application package for all permits under the jurisdiction of the USACE (Section 404, Section 10, and Dredge and Fill) on January 7, 2010. The USACE issued to SNC an individual Department of the Army permit on September 30, 2010. (USACE 2010)
USFWS	Migratory Bird Treaty Act, 50 CFR 21	Federal Depredation Permit			Adverse impacts on protected species and/or their nests. For site transmission line corridor.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	GA Endangered Wildlife Act (O.C.G.A. Section 27-3-130 et seq.), GA Rules and Regulations 391- 4-10	Depredation permit			Designated protected species and/ or their habitat. For transmission line corridor.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	CAA, GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and	Part 70 Air Quality Construction Permit	1629-033-0039-S-01-0		Construction air emission sources.	Shaw was issued its SIP Air Quality permit on June 18, 2009. Southern PSD permit application currently under review by GA EPD.

Table H-5. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
	Regulations 391- 3-1					
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12-5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Infrastructure Construction Projects	GAR 100002	07/31/2013	Discharge storm water from linear construction sites (e.g., roadways, transmission lines) during construction.	SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100002.
GDNR	GA Comprehensive Solid Waste Management Act (O.C.G.A. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Solid Waste Handling Permit			Disposal of industrial solid wastes. Transportation of putrescible waste for disposal in a permitted landfill.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	GA Erosion and Sedimentation Act (O.C.G.A. Section 12-7-1 et seq.), GA Rules and Regulations 391- 3-7	Land Disturbing Activity Permit	GAR 100001	07/31/2013	Permission to conduct land disturbing activities of one acre or larger, or within 200 feet of the bank of any state waters. For transmission line corridor.	SNC has developed Erosion, Sedimentation, and Pollution Control Plans and submitted Notices of Intent to GA EPD for coverage under GAR 100001.
GDNR	CWA, GA Water Quality Control Act (O.C.G.A. 12- 5-20), GA Rules and Regulations 391-3-6	General Permit Registration for Storm Water Discharges Associated with Construction Activity for Common Development Projects	GAR 100003		Discharge storm water from site during construction.	SNC currently does not expect to have to file for coverage under GAR 100003. No Erosion, Sedimentation and Pollution Control plans have been developed for submittal under GAR 100003.

Table H-5. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Georgia Department of Transportation (GDOT)	23 CFR 1.23	Permit			Utility right-of-way easement.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
Burke County Building Office	Burke County Code of Ordinances, Article VII, Sec. 26-331	Land Disturbing Activity Permit			All land disturbing activities within the boundaries of Burke County.	As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Burke County). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002.
Various county offices responsible for land disturbing activities	Jefferson, Warren, and McDuffie County Ordinances	Land Disturbing Activity Permit			Land disturbing activities within county boundaries for transmission line corridor.	As a utility regulated by the GA PSC, SNC is exempt from having to submit a Land Disturbing Activity request to a Local Issuing Authority (Jefferson, Warren and McDuffie Counties). Instead, a Land Disturbing Activity request is submitted directly to the GA EPD through GAR 100001 and GAR 100002.

(a) Assumes that SNC obtained the authorizations that Table 1.5-2 identifies.

Table H-6. Authorizations Required for Operation[(a)]

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
GDNR	CWA, GA Water Quality Control Act	Revision of existing National Pollutant Discharge Elimination System Permit			Regulates limits of pollutants in liquid discharge to surface water.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GDNR	Federal Clean Air Act (CAA), GA Air Quality Act (O.C.G.A. Section 12-9-1 et seq.), GA Rules and Regulations 391-3-1	Revision of existing Title V Operating Permit			Operation of air emission sources.	SNC submitted a request for modification to this permit along with the PSD/NSR permit application submitted on May 26, 2009.
GDNR	GA Groundwater Use Act (O.C.G.A. 12-5-90 et seq.), GA Rules and Regulations 391-3-2- .03	Revision of existing Permit to Use Groundwater	017-0003	08/06/2010	Consumptive use of 100,000 gallons per day or more of groundwater.	Received.
GDNR	GA Water Quality Control Act (O.C.G.A. 12-5-31 et seq.), GA Rules and Regulations 391-3-6	Revision of existing Surface Water Withdrawal Permit to Withdraw, Divert or Impound Surface Water			Withdraw water from the Savannah River for cooling makeup and in-plant use.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.

Table H-6. (contd)

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
State of Tennessee Department of Environment and Conservation Division of Radiological Health	Tennessee Department of Environment and Conservation Rule 1200-2-10.32	Revision of existing Tennessee Radioactive Waste License-for-Delivery			Transportation of radioactive waste into the State of Tennessee.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
State of Utah Department of Environmental Quality Division of Radiation Control	R313-26 of the Utah Radiation Control Rules	Revision of existing General Site Access Permit			Transportation of radioactive materials into the State of Utah.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
GPSC	GA Radiation Control Act (O.C.G.A. 31-13- 1 et seq.), GA Rules and Regulations 391- 3-17-.06	Revision of existing General Permit – Transportation of Radioactive Materials			Transportation of radioactive materials in the State of Georgia.	SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.

(a) Assumes that SNC obtained the authorizations that Tables 1.5-2 and 1.5-4 identify.

H.1 References

Southern Nuclear Operating Company, Inc. (Southern). 2009. *Vogtle Electric Generating Plant, Units 3 and 4, COL Application: Part 3. Environmental Report*. Revision 1, September 23, 2009. Southern Company, Birmingham, Alabama. Accession No. ML092740400.

Southern Nuclear Operating Company, Inc. (Southern). 2010a. Response to Request for Additional Information Letter on Environmental Issues, January 8, 2010. Southern Company, Birmingham, Alabama. Accession No. ML100120479.

Southern Nuclear Operating Company (Southern). 2010b. Environmental Report in Support Revision 1 to Part 6 , Limited Work Authorization Request, of the Vogtle Electric Generating Plant Units 3 and 4 Combined License Application. Southern Company, Birmingham, Alabama. Accession No. ML100470600.

Southern Nuclear Operating Company (Southern). 2010c. Comments on Draft Supplemental Environmental Impact Statement, November 23,1010. Southern Company, Birmingham, Alabama. Accession No. ML103300035.

U.S. Army Corps of Engineers (USACE). 2010. Letter from Carol Bernstein (USACE Chief, Coastal Branch) to Thomas Moorer (Southern), "Subject:: Signed Department of the Army Permit for the expansion of the existing Vogtle Electric Generating Plant." SAS-2007-01837.

Appendix I

Vogtle Electric Generating Plant Site Characteristics, AP1000 Design Parameters and Site Interface Values

Appendix I

Vogtle Electric Generating Plant Site Characteristics, AP1000 Design Parameters and Site Interface Values

Appendix I of the Vogtle Electric Generating Plant (VEGP) early site permit (ESP) environmental impact statement (EIS) provides the site characteristics, AP1000 design parameters, and site interface values (NRC 2008). Table 3.0-1 of Southern Nuclear Operating Company, Inc.'s Environmental Report (ER), Revision 1, dated September 23, 2009 (Southern 2009), reproduced on the following pages as Table I-1, shows that most of the site characteristics, design parameters, and site interface values considered in this combined license (COL) application fall within those described in the ESP. These characteristics and parameters were used by the U.S. Nuclear Regulatory Commission staff in its independent evaluation of the new and significant information related to the environmental impacts of the proposed new units.

Table I-1. VEGP Site Characteristics, AP1000 Design Parameters, and Site Interface Values

Part I Site Characteristic Item	ESP			COL		
	Single Unit [Two Unit] Value		Description and Reference	Single Unit [Two Unit] Value		Comments
Airborne Effluent Release Point						
Minimum Distance to Exclusion Area Boundary (EAB)	½ mi (~800 m)		The lateral distance from the release point (power block area) to the modeled EAB for dose analysis.	½ mi (~800 m)		Unchanged from ESP.
Atmospheric Dispersion (χ/Q) (Accident)	**The atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases.**					
	Time (hour)	Site (χ/Q)	Atmospheric dispersion coefficients used to estimate dose consequences of accident airborne releases. (From Table 5-13 of the ESP EIS)	Time (hour)	Site (χ/Q)	Unchanged from ESP.
EAB (χ/Q)	0 - 2 EAB	7.38E-5 sec/m3		0 - 2 EAB	7.38E-5 sec/m3	
Low Population Zone (LPZ) (χ/Q)	0 - 8 LPZ 8 - 24 LPZ 24 - 96 LPZ 96 - 720 LPZ	1.40E-5 sec/m3 1.22E-5 sec/m3 9.15E-6 sec/m3 6.04E-6 sec/m3		0 - 8 LPZ 8 - 24 LPZ 24 - 96 LPZ 96 - 720 LPZ	1.40E-5 sec/m3 1.22E-5 sec/m3 9.15E-6 sec/m3 6.04E-6 sec/m3	
Gaseous Effluents Dispersion, Deposition (Annual Average)						
Atmospheric Dispersion (χ/Q)	See Table 3.0-2		The atmospheric dispersion coefficients used to estimate dose consequences of normal airborne releases.	χ/Q values as described in ESP		Unchanged from ESP.
Population Density						
Population density over the lifetime of the new units until 2090	Population density meets the guidance of RS-002, Attachment 3			Population density meets the guidance of RS-002, Attachment 3		Unchanged from ESP.

Table I-1. (contd)

Part I Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Population density over the lifetime of the new units until 2090	Population density meets the guidance of RS-002, Attachment 3	Population density meets the guidance of RS-002, Attachment 3	Unchanged from ESP.	
EAB	Refer to Figure 2-1 in the EIS	The exclusion area boundary generally follows the plant property line.	Refer to Figure 3.2-1 in the ER	Unchanged from ESP.
LPZ	A 2-mile-radius from the midpoint between the containment buildings of Units 1 and 2	The LPZ is a circle with a radius of 2 miles, centered on the midpoint between Unit 1 and Unit 2 containment buildings	A 2-mile-radius from the midpoint between the containment buildings of Units 1 and 2	Unchanged from ESP.
Height	234 ft 0 in	The height from finished grade to the top of the tallest power block structure, excluding cooling towers	229 ft 0 in	(DCD Rev 17, Table 3.3-5) (Westinghouse 2008) The height affects aesthetic impacts and the potential for bird collisions. Because this height is lower than that analyzed in the ESP application, the impacts are bounded by those impacts

Table I-1. (contd)

Part II Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Facility Characteristics				
Foundation Embedment	39 ft 6 in to bottom of basemat from plant grade	The depth from finished grade to the bottom of the basemat for the most deeply embedded power block structure.	39 ft 6 in to bottom of basemat from plant grade	Unchanged from ESP.
Max Inlet Temp Condenser / Heat Exchanger	91°F	The maximum acceptable design circulating water temperature at the inlet to the condenser or cooling water system heat exchangers.	91°F	Unchanged from ESP.
Condenser / Heat Exchanger Duty	7.55E9 BTU/hr [1.51E10 BTU/hr]	Design value for the waste heat rejected to the circulating water system across the condensers. Selected value includes part of the service water system heat duty (from turbine equipment heat exchanger).	7.63E9 BTU/hr [1.53E10 BTU/hr]	The COL value was provided in Southern (2007) and was considered in the ESP analysis

Table I-1. (contd)

Part II Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Cooling Tower Temperature Range	25.2°F	The temperature difference between the hot water entering the tower and the cold water leaving the tower.	25.2°F	Unchanged from ESP.
Cooling Tower Cooling Water Flow Rate	600,000 gpm [1,200,000 gpm]	The total nominal cooling water flow rate through the condenser/ heat exchangers.	631,000 gpm [1,262,000 gpm]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
Auxiliary Heat Sink				
Component Cooling Water (CCW) Heat Exchanger Duty	8.3E7 BTU/hr normal 2.96E8 BTU/hr shutdown [1.66E8 BTU/hr normal 5.92E8 BTU/hr shutdown]	The heat transferred from the CCW heat exchangers to the service water system for rejection to the environment.	8.3E7 BTU/hr normal 2.96E8 BTU/hr shutdown [1.66E8 BTU/hr normal 5.92E8 BTU/hr shutdown]	Unchanged from ESP.
Service Water System (SWS) Cooling Tower Cooling Water Flow Rate	9,000 gpm normal 18,000 gpm shutdown [18,000 gpm normal 36,000 gpm shutdown]	The total nominal cooling water flow rate through the SWS.	9,000 gpm normal 18,000 gpm shutdown [18,000 gpm normal 36,000 gpm shutdown]	Unchanged from ESP.
Plant Characteristics				
Rated Thermal Power (RTP)	3,400 MWt	The thermal power generated by the core.	3,400 MWt	Unchanged from ESP.

Table I-1. (contd)

Part II Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Rated Nuclear Steam Supply System (NSSS) Thermal Output	3,415 MWt [6,830 MWt]	The thermal power generated by the core plus heat from the reactor coolant pumps.	3,415 MWt [6,830 MWt]	Unchanged from ESP.
Average Fuel Enrichment	2.35 wt % to 4.45 wt %	Concentration of U-235 in fuel - initial load.	2.35 wt % to 4.45 wt %	Unchanged from ESP.
	4.51 wt %	Average concentration, in weight percent, of U-235 in reloads	4.51 wt %	
Fuel Burn-up	60,000 MWd/MTU (design max) 48,700 MWd/MTU (expected)	Value derived by multiplying the reactor thermal power by time of irradiation divided by fuel mass (expressed in megawatt - days per metric ton of uranium fuel).	60,000 MWd/MTU (design max) 48,700 MWd/MTU (expected)	Unchanged from ESP.
Normal Releases				
Liquid Source Term	See Table G-1 of the EIS 0.26 curies total nuclides except tritium [0.52 curies]	The annual activity, by isotope, contained in routine liquid effluent streams.	0.26 curies total nuclides except tritium [0.52 curies]	Unchanged from ESP.

Table I-1. (contd)

Part II Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Tritium (liquid)	1010 curies [2020 curies	The annual activity of tritium contained in routine liquid effluent streams	1010 curies [2020 curies]	Unchanged from ESP.
Gaseous Source Term	See Table G-4 of the EIS 11,000 curies total nuclides except tritium [22,000 total curies]	The annual activity, by isotope, contained in routine plant airborne effluent streams.	11,000 curies total nuclides except tritium [22,000 total curies]	Unchanged from ESP.
Tritium (gaseous)	350 curies [700 curies]	The annual activity of tritium contained in routine plant airborne effluent streams.	350 curies [700 curies]	Unchanged from ESP.
Solid Waste Activity	1764 curies [3528 curies]	The annual activity contained in solid radioactive wastes generated during routine plant operations.	1764 curies [3528 curies]	Unchanged from ESP.
Dry Active (“Solid”) Waste Volume	4994 ft^3 [9988 ft^3]	The expected volume of solid radioactive wastes generated during routine plant operations.	4994 ft^3 [9988 ft^3]	Unchanged from ESP.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Accident Releases				
Elevation (Post Accident)	Groundlevel at edge of power block circle	The elevation above finished grade of the release point for accident sequence release analyses	Groundlevel at edge of power block circle	Unchanged from ESP
Gaseous Source Term (Post-Accident)	See ESP Application ER Table 7.1-11	The activity, by isotope, contained in post-accident airborne effluents.	See DCD, Rev 17, Table 15A-5 (Westinghouse 2008).	Doses resulting from design basis accidents (DBAs) are presented and discussed in ER Table 5.10-1 and SEIS Table 5-1.
Normal Plant Heat Sink (condenser and turbine auxiliary cooling)				
Cooling water system (CWS) Cooling Tower Acreage	38 acres [69.3 acres]	The land required for CWS natural draft cooling towers, including support facilities such as equipment sheds, basins, or canals,	38 acres [69.3 acres]	Unchanged from ESP
CWS Cooling Tower Approach Temperature	11°F	The difference between the cold water temperature leaving the tower and the ambient wet bulb temperature.	11°F	Unchanged from ESP

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
CWS Cooling Tower Blowdown Temperature	91°F	The design maximum expected blowdown temperature at the point of discharge to the receiving water body.	91°F	Unchanged from ESP
CWS Cooling Tower Evaporation Rate	13,950 gpm (14,440 gpm) [27,900 gpm (28,880gpm)]	The expected (and maximum) rate at which water is lost by evaporation from the cooling water systems.	14,550 gpm (15,280 gpm) [29,100 gpm (30,560 gpm)]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
CWS Cooling Tower Drift Rate	12 gpm [24 gpm]	The maximum rate at which water is lost by drift from the cooling water systems.	12.5 gpm [25 gpm]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
CWS Cooling Tower Height	600 ft	The vertical height above finished grade of the natural draft cooling tower.	600 ft	Unchanged from ESP.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
CWS Cooling Tower Make-up Flow Rate	18,612 gpm (28,892 gpm) [37,224 gpm (57,784 gpm)]	The expected (and maximum) design rate of removal of water from the Savannah River to replace water losses from circulating water systems. The make-up flow rate is a calculated value based on the sum of the evaporation rate plus the blowdown flow rate plus drift.	19,412 gpm (30, 572 gpm) [38,825 gpm (61,145)]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
CWS Cooling Tower Offsite Noise Levels	<30 to <40 dBa	The maximum expected sound level at the site boundary.	<30 to <40 dBa	Unchanged from ESP.
CWS Cooling Tower Heat Rejection Rate (Blowdown)	4650 gpm (expected), 14,440 gpm (max) @91°F [9300 gpm (expected), 28,880 gpm (max] @91°F	The expected heat rejection rate to a receiving water body, expressed as flow rate in gallons per minute at a temperature in degrees Fahrenheit.	4850 gpm (expected) 15,280 gpm (max) @91°F [9700 gpm (expected) 30,560 gpm (max)] @ 91°F	The NRC staff analysis of the revised discharge rates is discussed in Section 5.3 of the SEIS.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
CWS Cooling Tower Maximum Consumption of Raw Water	14,452 gpm [28,904 gpm]	The expected maximum short-term consumptive use of water by the circulating water systems (evaporation and drift losses).	15,292 gpm [30,585 gpm]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
CWS Cooling Tower Expected Consumption of Raw Water	13,692 gpm [27,924 gpm]	The expected normal operating consumptive use of water by the circulating water systems (evaporation and drift losses).	14,562 gpm [29,125 gpm]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
SWS Cooling Tower Makeup Rate	269 gpm (1177 gpm) [537 gpm (2353 gpm)]	The expected (maximum) rate of removal of water from wells to replace water losses from auxiliary heat sink.	269 gpm (800 gpm) [537 gpm (1600 gpm)]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Airborne Effluent Release Point				
Normal Dose Consequences to the Maximally Exposed Individual	Total body: 1.12 mrem [2.24 mrem]	The estimated annual design radiological dose consequences due to gaseous releases from normal operation of the plant (Table 3.0-1 of ESP Application ER Rev 4) is not correct. See Section 5.4.2.2.	Total body: 1.12 mrem [2.24 mrem]	Unchanged from ESP.
Post-Accident Dose Consequences	See Tables 5-14 in the ESP EIS.	The estimated design radiological dose consequences due to gaseous releases from postulated accidents.	See ER Table 5.10-1, SEIS Table 5-1.	Design-basis accidents were recalculated using updated information from DCD, Rev 17 (Westinghouse 2008). All dose consequences remained the same or decreased except those for a loss-of-coolant accident, which increased by 2.86 percent, but remains below the regulatory criterion of 25 rem.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Normal Dose Consequences	10 CFR 50, App I, 10 CFR 20 40 CFR 190	The estimated design radiological dose consequences due to liquid effluent releases from normal operation of the plant.	10 CFR 50, App I, 10 CFR 20 40 CFR 190	Unchanged from ESP.
Plant Characteristics				
Total Acreage	310 acres for 2 units	The land area required to provide space for all plant facilities, including power block, switchyard, spent fuel storage, and administrative facilities.	376 acres for 2 units	Acreage increased by 66 acres. Acreages for many of the permanent facilities increased or decreased by a few acres between ESP and COL. The new acreage estimate includes the fire training facility and the simulator building, which were not included in previous estimates, and together account for 44 of the additional 66 acres. The NRC staff evaluation of this change is provided in Section 4.1 of the SEIS.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Groundwater Consumptive Use	376 gpm (1570 gpm) [752 gpm (3140 gpm)]	The expected (maximum) rate of withdrawal of groundwater to serve the new units. (Table 3.0-1 in the ESP Application listed the expected gpm for 2 units as 762, which was a typographical error.)	376 gpm (1398.5 gpm) [752 gpm (2797 gpm)	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
Operation	345 [600]	The number of people required to operate and maintain the plant	400 [800]	The COL value was provided in Southern (2007) and was considered in the ESP analysis.
Refueling / Major Maintenance	1000	The additional number of temporary staff required to conduct refueling and major maintenance activities	1000	Unchanged from ESP.

Table I-1. (contd)

Part III Site Characteristic Item	ESP		COL	
	Single Unit [Two Unit] Value	Description and Reference	Single Unit [Two Unit] Value	Comments
Construction	1576 people monthly average [3152 people monthly average]	The monthly average estimated construction workforce staffing for two AP1000 units being constructed simultaneously. This assumes a site preparation schedule of 18 months, 48 months from first concrete to fuel load, with 6 months from fuel load to commercial operation and 12 months between commercial operation of each unit. This assumes 20.5 job hours per net kilowatt installed, giving credit for offsite modular construction. The peak number of construction workforce personnel could reach the 4400 range.	[3500], excluding SNC and NRC employees	The COL value was provided in Southern (2007) and was considered in the ESP analysis.

I.1 References

Southern Nuclear Operating Company, Inc. (Southern). 2007. Southern Nuclear Operating Company, Vogtle Early Site Permit Application, Comments on Draft Environmental Impact Statement. Letter from Southern Nuclear Operating Company (Birmingham, Alabama) to the U.S. Nuclear Regulatory Commission (Washington, DC), December 26, 2007. Southern Company, Birmingham, Alabama. Accession No. ML073620401.

Southern Nuclear Operating Company, Inc. (Southern). 2009. *Vogtle Electric Generating Plant, Units 3 and 4, COL Application, Part 3 Environmental Report*. Revision 1, September 23, 2009, Southern Company, Birmingham, Alabama. Accession No. ML092740400.

U.S. Nuclear Regulatory Commission (NRC). 2008. *Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site.* NUREG-1872, Vols. 1 and 2, Washington, D.C.

Westinghouse Electric Company, LLC (Westinghouse). 2008. AP1000 Design Control Document. AP1000 Document. APP-GW-GL-700, Revision 17, Westinghouse Electric Company, Pittsburgh, Pennsylvania. Accession No. ML083230167.

Appendix J

Statements Made in the Environmental Report Considered in the U.S. Nuclear Regulatory Commission Staff's Environmental Review

Appendix J

Statements Made in the Environmental Report Considered in the U.S. Nuclear Regulatory Commission Staff's Environmental Review

Appendix J of the Vogtle Electric Generating Plant early site permit (ESP) environmental impact statement (EIS) (NRC 2008) outlined representations and assumptions in Southern Nuclear Operating Company, Inc.'s ESP environmental report that the U.S. Nuclear Regulatory Commission (NRC) staff relied upon to reach its conclusions in the ESP EIS. Appendix J of the ESP EIS was created primarily as a tool to help reviewers of a future construction permit or combined license (COL). The NRC staff relied on these representations and assumptions in assessing the environmental impacts associated with construction and operation of the proposed Units 3 and 4.

Southern submitted a COL application referencing an ESP in March 2008 (Southern 2008). The staff of the Southern Nuclear Operating Company, Inc. and the NRC considered Appendix J of the ESP EIS (NRC 2008) in their review of new and significant information. New and significant information considered in the staff's review of the COL application is addressed in the appropriate section of this supplemental EIS.

J.1 Reference

Southern Nuclear Operating Company (Southern). 2008. *Vogtle Electric Generating Plant, Units 3 and 4, COL Application.* Revision 0, March 28, 2008, Southern Company, Birmingham, Alabama.

U.S. Nuclear Regulatory Commission (NRC). 2008. *Final Environmental Impact Statement for an Early Site Permit (ESP) at the Vogtle Electric Generating Plant Site. Appendixes*. NUREG-1872, Vol. 2, Washington, D.C.

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Docket Nos. 52-025 and 52-026

11. ABSTRACT *(200 words or less)*

This final supplemental environmental impact statement (FSEIS) documents the U.S. Nuclear Regulatory Commission (NRC) staff's analysis and conclusion regarding the environmental impacts of constructing and operating two new nuclear units (Units 3 and 4) at the Vogtle Electric Generating Plant (VEGP) site near Waynesboro, Georgia, and the mitigation measures available for reducing and avoiding adverse environmental impacts.

The NRC staff recommendation to the Commission related to the environmental aspects of the proposed action is that the combined licenses (COLs) and limited work authorization (LWA) should be issued. This recommendation is based on (1) the applicant's environmental report (ER) and responses to staff requests for additional information; (2) the staff's review conducted for the referenced early site permit (ESP) application and the assessment documented in the ESP EIS; (3) consultation with Federal, State, and Tribal agencies,;(4) the staff''s own independent review of potential new and significant information available since preparation and publication of the ESP EIS; and (5) the assessments summarized in the SEIS, including the potential mitigation measures identified and consideration of public comments received on the draft SEIS. Finally, the staff concludes that the requested LWA construction activities defined at 10 CFR 50.10(a) described in the site redress plan would not result in any significant adverse environmental impacts that cannot be redressed.

12. KEY WORDS/DESCRIPTORS *(List words or phrases that will assist researchers in locating the report.)*

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