

**Southern Nuclear  
Operating Company, Inc.**  
40 Inverness Center Parkway  
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**JAN 08 2010**

Docket Nos.: 52-025  
52-026

ND-10-0023

U.S. Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555-0001

Southern Nuclear Operating Company  
Vogtle Electric Generating Plant Units 3 and 4 Combined License Application  
Response to Request for Additional Information Letter on Environmental Issues

Ladies and Gentlemen:

By letter dated March 28, 2008, Southern Nuclear Operating Company (SNC) submitted an application for combined licenses (COLs) for proposed Vogtle Electric Generating Plant (VEGP) Units 3 and 4 to the U.S. Nuclear Regulatory Commission (NRC) for two Westinghouse AP1000 reactor plants, in accordance with 10 CFR Part 52. During the NRC's detailed review of this application, and an NRC site audit conducted on September 28 - October 1, 2009, the NRC identified a need for additional information, involving environmental issues, required to complete their review of Part 3 of the COL application, "Applicant's Environmental Report – Combined License Stage." By letter dated December 10, 2009, the NRC provided SNC with a request for additional information (RAI) letter concerning this information need. That RAI letter contained twelve RAI questions. The enclosure to this letter provides SNC's response to those RAIs.

If you have any questions regarding this letter, please contact Mr. Wes Sparkman at (205) 992-5061.

1092  
NRC

Mr. Charles R. Pierce states he is the AP1000 Licensing Manager of Southern Nuclear Operating Company, is authorized to execute this oath on behalf of Southern Nuclear Operating Company and to the best of his knowledge and belief, the facts set forth in this letter are true.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

*Charles R. Pierce*

Charles R. Pierce

Sworn to and subscribed before me this 8th day of January, 2010

Notary Public: Deborah A. Jaworski

My commission expires: October 24, 2012



CRP/BJs/dmw

Enclosure: Response to NRC RAI Letter Dated December 10, 2009 on the VEGP Units  
3 and 4 COL Application Involving Environmental Issues

cc: Southern Nuclear Operating Company

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Document Services RTYPE: AR01.1053  
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**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure**

**Response to NRC RAI Letter Dated December 10, 2009**

**on the**

**VEGP Units 3 and 4 COL Application**

**Involving**

**Environmental Issues**

RAI Number	RAI	Additional Background Information
<b>General</b>		
<p>G1 Multiple sections and resource areas</p>	<p>If SNC is aware of new information concerning onsite or offsite infrastructure alterations (in connection with how the large reactor components and other materials will be delivered to the site), please describe those alterations and explain whether that information is significant with respect to the conclusions in the ESP review regarding the applicable resource areas. If available, provide a copy of the Shaw / Westinghouse transportation study.</p>	<p>If SNC plans or is aware of planned infrastructure alterations for transport of components (whether by road, rail, or barge), describe them. Explain whether any modifications or upgrades that will be required -- especially those with the potential to affect land use, terrestrial or aquatic ecological resources, cultural resources, water quality or other resources areas -- are significant with respect to the conclusions in the ESP proceeding regarding those resource areas.</p>
<b>SNC Response:</b>		
<p>As discussed in detail with the staff at the September 2009 Site New and Significant Information Audit, the Shaw/Westinghouse Consortium is responsible for the transportation of large reactor components and other materials to the Vogtle site to support construction of Vogtle Units 3 and 4. The Consortium has been evaluating for some time the barge vs. rail transportation options to support a final decision on transportation and to develop a Transportation Plan. In a letter dated October 1, 2009, the Consortium informed SNC that rail was the "preferred" option for delivery of heavy equipment and components to the Vogtle site for construction of Vogtle Units 3 and 4. SNC responded to the Consortium in SNC Letter ND-10-0024, dated January 6, 2010, stating that SNC does not object to the rail option, provided it does not result in schedule delays. SNC further requested that the Consortium notify SNC of its final decision, and confirm, in writing, whether the Savannah River Navigation Channel will be used to transport any components, equipment or other materials to the Vogtle 3 and 4 site. A response to this correspondence is expected in the near future.</p> <p>The Consortium began work with Norfolk-Southern Railroad in the spring of 2009 on a Transportation Plan and a final plan is expected in early 2010. SNC understands, at this time, that there will be no substantive changes made to the Norfolk-Southern Main Line infrastructure from Savannah, Georgia to Millen, Georgia, where the line connects with the spur line to Plant Vogtle to support rail shipments. In addition, it is understood that no major infrastructure changes or upgrades would be necessary for the Vogtle spur line to support the shipments. Modifications will be needed for the onsite rail yard to support storage and unloading of equipment and materials delivered by rail. The ESP currently describes an onsite rail spur and rail yard to support delivery of material to the site including commodities for the batch plant and other uses. The ESP layout will need to be modified to support the additional needs for unloading and management of heavy components and equipment. These changes are not anticipated to significantly alter the original onsite rail footprint described in the ESP. The rail yard is located in an area of the site previously disturbed by Vogtle Units 1 and 2 construction and evaluated in the Vogtle ESP. No significant environmental impact is expected from these changes and SNC does not believe that this action has potential to alter conclusions stated in the Vogtle Final Environmental Impact Statement (FEIS). The Consortium is developing design information on the onsite rail changes and that information should be available in early 2010. (Cont'd.)</p>		

RAI Number	RAI	Additional Background Information
<p>In summary, none of the changes associated with rail transportation are expected to have any significant potential to affect land use, terrestrial or aquatic ecological resources, cultural resources, water quality or other resource areas and are not believed to be significant with respect to the conclusions in the ESP proceeding regarding those resource areas. No significant environmental impact is expected to result from these changes to the transportation process. Based on the above information, SNC believes that, while these transportation changes are new information, they do not result in significant environmental impact and do not have potential to negatively alter the conclusions on transportation currently stated in the Vogtle FEIS.</p>		
<p>G2 SEIS 1.5</p>	<p>Provide a current update to the list of permits and authorizations presented in ER Tables 1.5-1 through 1.5-5.</p>	<p>Provide a current update to the list of permits and authorizations presented in ER Tables 1.5-1 through 1.5-5. Include the status of any permit applications under review by the appropriate state or federal agencies.</p>
<p><b>SNC Response:</b></p>		
<p>An update to information contained in VEGP 3 and 4 COL Application ER Tables 1.5-1 through 1.5-5 is included in Attachment 1 to this Enclosure.</p>		
<p>G3 SEIS 11.5</p>	<p>If there are changes to the estimates of irreversible commitments of resources as described in Section 11.5 of the Vogtle ESP EIS (NUREG-1872), please describe whether and how those changes are significant.</p>	
<p><b>SNC Response:</b></p>		
<p>SNC reviewed Section 11.5 of the Vogtle ESP EIS (NUREG-1872) for any new information. Based on that review, Section 11.5 remains accurate and no additional information is currently available. The estimates were developed using the U.S. Department of Energy's (DOE's), <i>Study of Construction Technologies and Schedules, O&amp;M Staffing and Cost, Decommissioning Costs and Funding Requirements for Advanced Reactor Designs</i>, dated May 27, 2004. A review of available DOE literature did not indicate the referenced document has been revised.</p>		

RAI Number	RAI	Additional Background Information
<b>Aquatic Ecology</b>		
AE 4.4.2.1  ESRP 4.3.2 which refers to 3.4.2	If SNC intends any changes to the construction process for the intake, discharge, and barge structures from the description provided in the FEIS for the ESP, please identify whether those changes are significant. Specifically indicate any changes to the amount of river bottom to be disturbed at each location in square feet. If SNC is aware of any new information regarding planned wetlands mitigation, summarize that information.	
<b>SNC Response:</b>		
<p>SNC reviewed the ESP FEIS and the response to RAI E3.9-4 included in SNC Letter AR-07-0061, dated January 30, 2007 (ADAMS Accession Number ML070810702) regarding anticipated construction processes for the intake, discharge and barge slip. Based on this review, SNC believes that there are no significant changes from what was previously stated and that these structures will be constructed in a manner very similar to those described in the ESP FEIS. Specifically, SNC still anticipates that the intake canal and discharge line will be excavated "in the dry" through the use of sheet pile walls and/or coffer dams.</p> <p>In the ESP FEIS, the staff estimated that approximately 21.0 acres of wetlands would be impacted by Units 3 &amp; 4 construction activities. In the pending application to the U.S. Army Corps of Engineers (USACE), SNC is requesting authorization to impact up to 8.24 acres of wetlands and 1.42 acres of open waters of the Savannah River. SNC currently estimates that the total area of open waters (river bottom) to be dredged during construction of the Units 3 &amp; 4 intake structure and discharge line will be approximately 0.55 acres (23,958 square feet) and 0.30 acres (13,068 square feet), respectively. These activities are primarily along the bank and are required to connect the intake and discharge systems to the river. The 0.30 acres of impacts associated with the discharge line are temporary. SNC believes that these values represent a refinement of previous Waters of the United States impact estimates from the ESP FEIS, resulting in reduced environmental impacts and are, therefore, not significant.</p> <p>SNC, as part of the Section 404 permitting process is negotiating with USACE on the proposed mitigation plan. Once finalized and approved, SNC plans to purchase wetland credits from the Phinizy Swamp mitigation bank. A copy of the Section 404 Permit application is included in Attachment 2 to this Enclosure.</p>		

RAI Number	RAI	Additional Background Information
AE 4.4.2.2.2-2 ESRP 4.3.2	Provide the summaries that update the Erosion, Sedimentation, and Pollution Control Plan to mitigate impacts of erosion and sedimentation. State whether this plan was submitted by Southern as part of the general Stormwater Permit.	
<b>SNC Response:</b>		
<p>Erosion Sedimentation and Pollution Control (ES&amp;PC) plans were prepared for each project area prior to the start of site preparation and/or construction activities in that area. Each ES&amp;PC plan was designed by Georgia Water and Soil Conservation Commission certified design professionals in accordance with EPD regulations and the Manual for Erosion and Sediment Control in Georgia. Once completed the ES&amp;PC plans were submitted to the EPD for review along with Notices of Intent (NOIs) for coverage under the Construction Storm Water General Permit (GAR 100001).</p> <p>A summary table updating each NOI submitted to the EPD was included as reference SNC 2009d in the response to the Post New and Significant Audit Supporting Information (Key Inputs S4.7-1, S4.10-1 and S4.10-22) provided to the NRC in SNC Letter ND-09-1673, dated October 15, 2009.</p> <p>In connection with the construction storm water permit process, the EPD has visited the site on several occasions to review SNC's implementation of the ES&amp;PC plans. On December 8 &amp; 9, 2009, the EPD conducted an inspection of the site's construction storm water program. In the exit meeting, the EPD stated that no permit violations were observed.</p>		

RAI Number	RAI	Additional Background Information
<p>AE 5.4.2.2 ESRP 4.3.2 which refers to ESRP 3.1; and 3.4.2</p>	<p>If SNC has seen any fluctuations in water level in Mallard Pond since the excavation, describe any mitigation plans if water level changes. If SNC intends to alter the location of the proposed intake canal and structure, describe the new location, including the distance to the Mallard Pond outlet stream and to the existing intake canal for Units 1 and 2. If any design changes are planned to the intake structure, intake canal, and/or intake screens, provides a description of how these design changes might affect the flow and flow rate of water and ichthyoplankton into the structure. Include a description of any specific structures that are to be installed to selectively pull water from specific parts of the water column, as well as a description of the movement of water as a result of these structures, an indication of whether the design changes will impact the entrainment or impingement of the aquatic organisms and the magnitude of these changes, and whether the design changes would affect the hydraulic zone of influence.</p>	<p>During the discussions at the site audit, the NRC/PNNL staff was told that the intake floor would be lowered in a new design.</p>
<p><b>SNC Response:</b></p>		
<p>In December 2008, SNC installed a flow meter in the Mallard Pond outlet pipe and began monitoring discharge flows. Approximately eight months of baseline flow data were collected prior to the start of dewatering activities in late August 2009. In the four months following the start of excavation dewatering, only flow fluctuations corresponding to rainfall events and prolonged dry periods have been noted. No flow reductions attributable to dewatering have been observed at the Mallard Pond discharge. However, if flow reductions are observed in the future, SNC has several mitigation options to maintain pond levels, including diverting a portion of the Units 3 &amp; 4 dewatering system flow and/or diverting site storm water flows into Mallard pond.</p> <p>The cooling water intake structure has been moved upstream approximately 150 feet and rotated slightly from the location considered in the ESP FEIS. These changes were recommended by Shaw Group to improve the constructability of the intake structure and to align the intake structure with the bluff. The new Intake location is located approximately 2130 feet upstream of the existing Units 1 &amp; 2 intake and approximately 1400 feet downstream of the outlet to the unnamed tributary of Mallard Pond. A figure showing the preliminary layout of the intake structure and canal is included in Attachment 3 to this Enclosure. (Cont'd.)</p>		

RAI Number	RAI	Additional Background Information
<p>Currently, Shaw Group is finalizing the design of the cooling water intake structure. While Shaw Group has proposed some minor design changes, such as lowering the intake structure floor from elevation 125 ft to 105 ft, these modifications will not change the impingement or entrainment rates considered in the ESP-FEIS. No changes have been made to water withdrawal rates, through-screen velocities or traveling screen mesh size. Accordingly, there are no significant changes to the hydraulic zone of influence. Current drafts of the intake canal construction drawings show a slight bend (approximately 30 degrees) roughly half way down the canal. This adjustment is being made to orient the mouth of the intake canal perpendicular to the river, reducing the potential for debris to enter the canal.</p> <p>As discussed in the ESP FEIS, SNC expects the Units 3 &amp; 4 intake canal to be constructed similarly to the Units 1 &amp; 2 intake canal. As such, the Units 3 &amp; 4 intake canal will contain a weir wall arrangement near the mouth of the canal, which extends up approximately 1 foot from the bottom of the canal. This feature impedes the movement of bottom dwelling fish into the intake canal thereby, reducing the potential for impingement.</p>		
<p><b>Cultural Resources</b></p>		
<p>CR 4.6-1  ESRP 2.2.4 ESRP 4.1.3 ESRP 5.1.3 10 CFR 51.92(e) 36 CFR 800 36 CFR 63</p>	<p>Provide a copy of the signed MOU between Southern and the Georgia State Historic Preservation Office (SHPO) along with the concurrence letter from the SHPO.</p>	<p>The MOU documents how the new intake structure will impact archaeological site 9BK416. This site is a large multi-component prehistoric site and has been determined eligible for the National Register of Historic Places.</p>
<p><b>SNC Response:</b></p>		
<p>SNC submitted a Memorandum of Understanding (MOU) regarding the installation of the river water intake piping, with associated duct bank, to the Georgia SHPO on January 4, 2010 for review and approval. The purpose of the MOU is to allow the river water intake pipe construction activities in a portion of archaeological site 9BK416 and to preserve the balance of site 9BK416 for future investigations as directed by the Georgia SHPO. When returned from the Georgia SHPO, a copy of the signed MOU will be provided to the NRC. A copy of SNC's letter to the Georgia SHPO is included in Attachment 4 to this Enclosure.</p>		

RAI Number	RAI	Additional Background Information
<b>Hydrology</b>		
H 3.2.1-1 ESRP 3.3.1	Provide correct values for ER Revision 1, Table 3.2-2.	The values for total plant effluent discharge to the river provided in ER Rev. 1 Table 3.2-2 do not match the values reported in the FEIS. There appears to be an arithmetic error in the plant effluent portion of Table 3.2-2; specifically, it appears that the service water system blowdown values were not included in the total effluent volume, in contradiction to FEIS Figure 3-3. Provide a confirmation of the correct values for this table.
<b>SNC Response:</b>		
Included in Attachment 5 to this Enclosure is an update to information contained in VEGP Units 3 and 4 COLA ER Table 3.2-2.		
<b>Non Radiological Health</b>		
NRHH 5.8-1  No ESRP section 10 CFR 51.92(e)	Discuss any new information regarding occurrences of adverse occupational-related health issues resulting from exposure to thermophilic microorganisms during operations/maintenance at VEGP Units 1 and 2 (e.g., Legionellosis, Salmonellosis, Shigellosis, primary amoebic meningoencephalitis). The discussion should include a description of any new information regarding measures taken to protect employees from such exposures.	
<b>SNC Response:</b>		
<p>As included in the New and Significant Matrix, Key Input S 5.8-11:</p> <p>CORMIX modeling calculated temperatures (above ambient) associated with discharges that were presented in the ESP application's Environmental Report. Average increases in temperature 404 feet from discharge are less than 1°F. Average increase in temperature at the point of discharge is 8.5 °F. The CORMIX-calculated maximum blowdown temperature is 91.5°F and is expected in July. Blowdown temperatures exceeding 90 °F are expected less than 7 hours a year. An increase in blowdown volume of 6 percent may increase the temperature slightly above that calculated by CORMIX; however, no significant effects are expected from these minor fluctuations in temperature. The &lt;90 °F thermal plume will occupy a maximum of 62 ft<sup>3</sup> of the Savannah River. Temperature plumes that are 5 °F above ambient will occupy a maximum of 782 ft<sup>3</sup> of the Savannah River. (Cont'd.)</p>		

RAI Number	RAI	Additional Background Information
<p>SNC is aware of concerns among public health officials relative to six deaths in 2007 from <i>Naegleria fowleri</i>. Although thermophilic microorganisms can increase in density within thermal plumes introduced into cooling water bodies such as the Savannah River, documented cases of disease from these organisms in the Southeast are low. The thermal plumes will occupy very little of the Savannah River and increases in levels of <i>Naegleria fowleri</i> remain a very low risk.</p> <p><u>Post-FEIS: Centers for Disease Control (CDC) website has no additional information beyond 2007 report of six deaths (CDC 2009).</u></p> <p>As for occupational health issues regarding plant staff, the staff rarely conducts work related activities within the vicinity of the discharge in the Savannah River or in operational cooling towers. Therefore, SNC is not aware of any adverse impacts associated with thermophilic microorganism exposure and plant employees.</p>		
Terrestrial Ecology		
<p>TE 4.4-1  ESRP 2.4.1 ESRP 4.3.1</p>	<p>Address the significance of any new information related to the anticipated quantity and disposition of dredge spoils.</p>	<p>Page 4-17 of the FEIS states that “Southern anticipates only having to [dredge] during construction of the barge facility (Southern 2007b). The dredge material associated with construction of the barge facility (approximately 230 m<sup>3</sup> [300 yd<sup>3</sup>] would be transported and placed in an uplands spoils area.” The Table submitted after the site audit, identified as SNC 2009c “Vogle Units 3&amp;4 Estimates of USACE Jurisdictional Impacts” suggests that slightly over 150,000 yd<sup>3</sup> will be dredged during activities related to construction or modification of the intake system, access road, outfall, barge slip, barge mooring area, and “access from the river.” Explain this discrepancy and whether this constitutes new information. If a significant change in the quantity of dredged material is expected, describe where the dredged material will be stored or disposed of and describe the expected environmental impacts. The Table also suggests dredging occurring in the uplands; describe what will be “dredged” in the uplands area.</p>

RAI Number	RAI	Additional Background Information
<b>SNC Response:</b>		
<p>In the ESP FEIS, the staff estimated that approximately 21.0 acres of wetlands would be impacted by Units 3 &amp; 4 construction activities. In the pending Section 404 application to the USACE (Attachment 2 to this Enclosure), SNC is requesting authorization to impact up to 8.34 acres of wetlands and 1.42 acres of open waters of the Savannah River. As part of the application, SNC estimated that construction of the Units 3 &amp; 4 intake structure and canal will remove approximately 35,700 yd<sup>3</sup> of material from wetland areas (13,000 yd<sup>3</sup> are temporary impacts) and 12,500 yd<sup>3</sup> from the Savannah River. An additional 84,900 yd<sup>3</sup> will be removed from upland portions of the site for construction of the intake structure. During construction of the Units 3 &amp; 4 discharge, SNC estimates that approximately 900 yd<sup>3</sup> will be removed from the wetland areas and 800 yd<sup>3</sup> from the river. An additional 200 yd<sup>3</sup> may be removed from the Savannah River to allow for construction access. The activities in the River are primarily along the bank and are required to connect the intake and discharge systems to the river.</p> <p>SNC believes that these values represent a refinement of previous Waters of the United States impact estimates from the ESP FEIS, resulting in reduced environmental impacts and, therefore, are not significant.</p> <p>All construction activities taking place in Waters of the United States will be conducted under, and in accordance with, a Section 404 permit and will meet all applicable Section 401 State water quality certification standards. All excavated soils will be transported and stockpiled in an upland spoils disposal site.</p> <p>The term 'dredged' as used in the FEIS refers to the general use of a dredge or scoop to remove material from the Savannah River channel. The Table submitted after the site audit and identified above as SNC 2009c "Vogle Units 3&amp;4 Estimates of USACE Jurisdictional Impacts" was taken from SNC's draft Section 404 application to the USACE. There, the term 'dredged' is used in a regulatory context to mean material that is excavated or dredged from any Waters of the United States, including wetlands. (33CFR323.2)</p>		
<p>TE 4.4-2</p> <p>ESRP 2.4.1</p> <p>ESRP 4.3.1</p>	<p>Provide information on agreements that have been made with the state regarding threatened and endangered species along the new transmission corridor and onsite.</p>	<p>During the audit, Southern described a cooperative agreement in place with GA DNR regarding T/E species.</p>
<b>SNC Response:</b>		
<p>In addition to the Safe Harbor Agreement for the Red Cockaded Woodpecker, which is discussed in the ESP FEIS, SNC is working with The Georgia Department of Natural Resources (DNR) and U.S. Fish and Wildlife (FWS) to enter into a Candidate Conservation Agreement (CCA) for the Gopher Tortoise. (Cont'd.)</p>		

RAI Number	RAI	Additional Background Information
<p>In 2008, the States of Alabama, Florida, Georgia, and South Carolina, became signatories to the CCA for the Gopher tortoise, which recognizes threats to the Gopher tortoise and resolves to reduce them such that federal listing of the gopher tortoise as threatened will not be necessary. The CCA for the Gopher Tortoise states two main goals 1) addressing gopher tortoise conservation holistically across its eastern range, and 2) managing gopher tortoise conservation actions in a proactive and collaborative manner. As such, these four states are cooperating in a broad, regional effort to conserve the gopher tortoise and its habitat. As part of the CCA, land at VEGP may be used to relocate displaced gopher tortoises. The agreement between SNC, DNR and FWS is in the final draft stages and expected to be signed by FWS in 2010.</p> <p>The areas of the VEGP site designated for potential coverage under the CCA are also areas currently being managed under the Safe Harbor agreement.</p>		
Additional Information		
HB	Provide additional information regarding the impacts associated with D-Area powerhouse phase out and water use by new biogen plant.	Per commitment made in SNC's Post New & Significant Audit Supporting Information Letter ND-09-1673, dated October 15, 2009.
SNC Response:		
<p>Payne (2007) reported Savannah River Site (SRS) usage of the Savannah River as approximately 40,000 gpm, with most of that being returned to the Savannah River. Payne (2009a) verified that the water usage was unchanged since 2007. In a telephone call, Mr. Payne noted that the 40,000 gpm estimate was based on the volume of the pumps and not on actual flow measurements (Patterson 2009).</p> <p>SRS is replacing the D-Area powerhouse (which is the user of most of the Savannah River water pumped by SRS [Patterson 2009]) with a biomass cogen plant to serve the facilities in central SRS (the "New Burma Road Biomass Plant"), and two much smaller plants at K- and L-Areas. The K-Area boiler will use domestic (ground) water and the L-Area boiler will use Savannah River water, both at the rate of approximately 3.81 gpm. (Payne 2009b)</p> <p>The New Burma Road Biomass Plant is estimated to use less water than the D-Area Powerhouse. Current estimates are that the new plant will require 30,000 to 33,000 gpm. Again, most of this water will be returned to the Savannah River. Actual consumption of river water by the new plant is estimated to be 346 million gallons a year or an average of 658 gpm. (Payne 2009b)</p>		

**References:**

(Patterson 2009). B. Payne 2009. Interview with K. Patterson, Tetra Tech. Savannah River Site. November 5, 2009  
 (Payne 2007). B. Payne 2007. Email correspondence with K. Patterson, Tetra Tech. Savannah River Site. October 24, 2007  
 (Payne 2009a). B. Payne 2009. Email correspondence with K. Patterson, Tetra Tech. Savannah River Site. June 4, 2009  
 (Payne 2009b). B. Payne 2009. Email correspondence with K. Patterson, Tetra Tech. Savannah River Site. November 9, 2009

**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure Attachment 1**

**NOTE:** Attached is stand-alone document 20 pages in length.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-1 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.
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.	<p>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.</p> <p>NMFS responded on Oct 24, 2006 with a list of federally protected species under the jurisdiction of NMFS in Georgia and Alabama.</p> <p>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.</p>

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-1 Authorizations Required for Early Site Permit (Continued)**

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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-1 Authorizations Required for Early Site Permit (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
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.	<p>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.</p> <p>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.</p>
GDNR	Federal Clean Water Act (33 U.S.C. 1251 et seq.) (CWA)	Section 401 Certification	NA	NA	Compliance with water quality standards.	<p>SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue. SNC submitted a request for 401 Water Quality Certification to the Georgia EPD on January 7, 2010.</p>

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-1 Authorizations Required for Early Site Permit (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Native American Nations:	Environmental Protection	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.
Cherokee Nation of Oklahoma	Domestic Licensing and Related Regulatory Functions (10 CFR 51) require Protection of Historic Properties (36 CFR 800)					
Chickasaw Nation						
Chickasaw Nation of Oklahoma						The Miccosukee Tribe responded on Oct 16, 2006 that it limited itself to matters within the State of Florida.
Georgia Tribe of Eastern Cherokee						
Alabama-Quassarte Tribal Town						The United Keetoowah Band of Cherokee Indians in Oklahoma responded on Oct 22, 2006 that it had no objections to the referenced project.
Seminole Nation of Oklahoma						
Eastern Band of Cherokee Indians						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						

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-1 Authorizations Required for Early Site Permit (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
Muscogee (Creek) Nation of Oklahoma						
Alabama-Coushatta Tribe of Texas						
Catawba Indian Tribe						
Seminole Tribe of Florida						
Mississippi Band of Choctaw Indians						
Kidegee Tribal Town						
Miccosukee Tribe of Indians of Florida						
Thlopthlocco Tribal Town						
Muscogee (Creek) Nation						

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-2 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			Disturbance or crossing wetland areas or navigable waters. For site and rail corridor upgrade <sup>1</sup> .	SNC has completed jurisdictional determinations for all site wetlands with the exception of the required metes and bounds survey.
USACE	33 CFR 323	Dredge and Fill Discharge Permit			Construction/ modification of intake/ discharge to Savannah River. For site and rail corridor upgrade <sup>1</sup> .	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.  SNC has initiated preliminary discussions with permitting agency regarding permits and compliance actions relative to this issue.
USACE	Rivers and Harbors Act	Section 10 Permit			Barge slip modification impacts to navigable waters of the U.S.	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.  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.

**Vogle Electric Generating Plant, Units 3 & 4**  
**COL Application**  
**Part 3 – Environmental Report**

**Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
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 Depredation Permit			Adverse impacts on protected species and/or their nests. For site and rail corridor upgrade <sup>1</sup> .	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.
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 approval 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 <sup>1</sup> .	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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)**

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	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.
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, non-transient, 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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
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, transient, non-community water system.	SNC submitted the potable water permit application and construction design details on September 10, 2009. GNDR approved the construction design on October 14, 2009, which allows SNC to initiate construction of the potable water system and drill the well for potable water use.
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.
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.	Recieved.
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.

**Vogtle Electric Generating Plant, Units 3 & 4**  
**COL Application**  
**Part 3 – Environmental Report**

**Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
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 <sup>1</sup> .	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. 12-8-20 et seq.), GA Rules and Regulations 391-3-4	Private Industry Landfill Permit			On-site 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.
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.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-2 Authorizations Required for Site Preparation Activities that Do Not Require a Limited Work Authorization (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
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..
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.

<sup>1</sup>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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-3 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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-3 Authorizations Required for Redress Activities (Continued)**

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.
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.

**Vogtle Electric Generating Plant, Units 3 & 4**  
**COL Application**  
**Part 3 – Environmental Report**

**Table 1.5-3 Authorizations Required for Redress Activities (Continued)**

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-.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.	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			On-site disposal of solid waste consisting of construction and demolition 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	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.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-4 Authorizations Required for Construction Activities<sup>1</sup>**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
NRC	10 CFR 52, Subpart C	Combined Operating License			Safety-related construction for a nuclear power facility.	
	or  10 CFR 50.10(e)(3)	or  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			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.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-4 Authorizations Required for Construction Activities<sup>1</sup> (Continued)**

Agency	Authority	Requirement	License/ Permit No.	Expiration Date	Activity Covered	Status
USACE	33 CFR 323	Dredge and Fill Discharge Permit			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.
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			Adverse impacts on state 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 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.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-4 Authorizations Required for Construction Activities<sup>1</sup> (Continued)**

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, 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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-4 Authorizations Required for Construction Activities<sup>1</sup> (Continued)**

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.

<sup>1</sup> Assumes that SNC obtained the authorizations that Table 1.5-2 identifies.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-5 Authorizations Required for Operation<sup>1</sup>**

Agency	Authority	Requirement	License/ Permit No. <sup>2</sup>	Expiration Date <sup>2</sup>	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.
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.

**Vogle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 1.5-5 Authorizations Required for Operation<sup>1</sup> (Continued)**

Agency	Authority	Requirement	License/ Permit No. <sup>2</sup>	Expiration Date <sup>2</sup>	Activity Covered	Status
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.

<sup>1</sup> Assumes that SNC obtained the authorizations that Tables 1.5-2 and 1.5-4 identify.

**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure Attachment 2**

**NOTE:** Attached is stand-alone document 59 pages in length.

JOINT APPLICATION  
FOR  
A DEPARTMENT OF THE ARMY, CORPS OF ENGINEERS PERMIT,  
STATE OF GEORGIA MARSHLAND PROTECTION PERMIT,  
REVOCABLE LICENSE AGREEMENT  
AND REQUEST FOR  
WATER QUALITY CERTIFICATION  
AS APPLICABLE

**INSTRUCTIONS FOR SUBMITTING APPLICATION:**

Every Applicant is Responsible to Complete The Permit Application and Submit as Follows: One copy each of application, location map, drawings, copy of deed and any other supporting information to addresses 1, 2, and 3 below. If water quality certification is required, send only application, location map and drawing to address No. 4.

1. For Department of the Army Permit, mail to: Commander, U.S. Army Engineer District, Savannah ATTN: CESAS-OP-F, P.O. Box 889, Savannah, Georgia 31402-0889. Phone (912)652-5347 and/or toll free, Nationwide 1-800-448-2402.

2. For State Permit - State of Georgia (six coastal counties only) mail to: Habitat Management Program, Coastal Resources Division, Georgia Department of Natural Resources, 1 Conservation Way, Brunswick, Georgia 31523. Phone (912) 264-7218.

3. For Revocable License - State of Georgia (six coastal counties plus Effingham, Long, Wayne, Brantley and Charlton counties only) - Request must have State of Georgia's assent or a waiver authorizing the use of State owned lands. All applications for dock permits in the coastal counties, or for docks located in tidally influenced waters in the counties listed above need to be submitted to Real Estate Unit. In addition to instructions above, you must send two signed form letters regarding revocable license agreement to: Ecological Services Coastal Resources Division, Georgia Department of Natural Resources, 1 Conservation Way, Brunswick, Georgia 31523. Phone (912) 264-7218.

4. For Water Quality Certification State of Georgia, mail to: Water Protection Branch, Environmental Protection Division, Georgia Department of Natural Resources, 4220 International Parkway, Suite 101, Atlanta, Georgia 30354 (404) 675-1631.

The application must be signed by the person authorized to undertake the proposed activity. The applicant must be the owner of the property or be the lessee or have the authority to perform the activity requested. Evidence of the above may be furnished by copy of the deed or other instrument as may be appropriate. The application may be signed by a duly authorized agent if accompanied by a statement from the applicant designating the agent. See item 6, page 2.

1. Application No. \_\_\_\_\_

2. Date \_\_\_\_\_

3. For Official Use Only \_\_\_\_\_

4. Name and address of applicant.  
Southern Nuclear Operating Company, Inc.  
Attn: Environmental Project Manager  
P.O. Box 1295  
Birmingham, Alabama 35201

5. Location where the proposed activity exists or will occur.

Lat. 33° 08' 11" N Long. 81° 45' 23" W

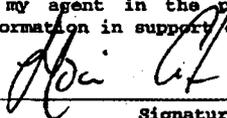
Burke	Military District	In City or Town
County		
Waynesboro	Subdivision	Lot No.
Near City or Town		
3.169 Acres	150 feet	Georgia
Lot Size	Approximate Elevation of Lot	State

Savannah River	Name of Nearest Creek, River, Sound, Bay or Hammock
Name of Waterway	

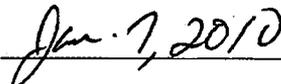
6. Name, address, and title of applicant's authorized agent for permit application coordination.

Dr. R. Darrell Smith  
Senior Environmental Scientist  
Register-Nelson, Inc.  
45 Parkland Drive  
Stockbridge, Georgia 30281

Statement of Authorization: I hereby designate and authorize the above named person to act in my behalf as my agent in the processing of this permit application and to furnish, upon request, supplemental information in support of this application.



Signature of Applicant



Date

7. Describe the proposed activity, its purpose and intended use, including a description of the type of structures, if any to be erected on fills, piles, of float-supported platforms, and the type, composition and quantity of materials to be discharged or dumped and means of conveyance. If more space is needed, use remarks section on page 4 or add a supplemental sheet. (See Part III of the Guide for additional information required for certain activities.)

Construction of a cooling water intake structure, intake canal and discharge line to support the operation of two new reactors at the Vogtle Electric Generating Plant. Please see Attachment A for additional detail.

8. Proposed use: Private \_\_\_ Public \_\_\_ Commercial X Other \_\_\_ (Explain)

9. Names and addresses of adjoining property owners whose property also adjoins the waterway.

See Attachment B

10. Date activity is proposed to commence. Upon issuance of USACE Permit

Date activity is expected to be completed. April 2013

11. Is any portion of the activity for which authorization is sought now complete \_\_\_Y XN

A. If answer is "Yes", give reasons in the remarks in the remarks section. Indicate the existing work on the drawings.

B. If the fill or work is existing, indicate date of commencement and completion.

C. If not completed, indicate percentage completed.

12. List of approvals or certifications required by other Federal, State or local agencies for any structures, construction discharges, deposits or other activities described in this application. Please show zoning approval or status of zoning for this project.

<u>Issuing Agency</u>	<u>Type Approval</u>	<u>Identification No.</u>	<u>Date/Application</u>	<u>Date/Approval</u>
Georgia EPD	Buffer Variance		Concurrent with IP	
Georgia EPD	401 Certification		Concurrent with IP	
Georgia EPD	NPDES Permit	GAR 100001	After IP issuance	
	(Construction Stormwater)			

13. Has any agency denied approval for the activity described herein or for any activity directly related to the activity described herein? \_\_\_Yes XNO (If "yes", explain).

Note: Items 14 and 15 are to be completed if you want to bulkhead, dredge or fill.

14. Description of operation: (If feasible, this information should be shown on the drawing).

Construction of a cooling water intake structure, intake canal and discharge line to support the operation of two new reactors at the Vogtle Electric Generating Plant. Please see Attachment A for additional detail.

A. Purpose of excavation or fill construct addition to existing nuclear power plant.

1. Access channel	length	depth	width
2. Boat basin	length	depth	width

3. Fill area length varies depth varies width varies total 6.40 acres

4. Other dredge length varies depth varies width varies total 3.33 acres  
(Note: If channel, give reasons for need of dimensions listed above.)

B. 1. If bulkhead, give dimensions \_\_\_\_\_

2. Type of bulkhead construction (material) \_\_\_\_\_

Backfill required: Yes \_\_\_\_\_ No \_\_\_\_\_ Cubic yards \_\_\_\_\_

Where obtained \_\_\_\_\_

C. Excavated material

1. Cubic yards 135,000

2. Type of material sand/clay

15. Type of construction equipment to be used \_\_\_\_\_

Equipment to be used will consist of normal construction machinery (e.g., track hoes, dredge barge, pan scrapers, etc.). All equipment will be suitable for minimizing disturbance to the surrounding jurisdictional areas. Additional details are included in Attachment A.

A. Does the area to be excavated include any wetland? Yes X No \_\_\_\_\_

B. Does the disposal area contain any wetland? Yes \_\_\_\_\_ No X

C. Location of disposal area 4.5-acre area along the proposed access road to the intake structure

D. Maintenance dredging, estimated amounts, frequency, and disposal sites to be utilized: none

E. Will dredged material be entrapped or encased? yes

F. Will wetlands be crossed in transporting equipment to project site? not beyond calculated impacts

G. Present rate of shoreline erosion (if known) \_\_\_\_\_

16. WATER QUALITY CERTIFICATION: In some cases, Federal law requires that a Water Quality Certification from the State of Georgia be obtained prior to issuance of a Federal license or permit. Applicability of this requirement to any specific project is determined by the permitting Federal agency. The information requested below is generally sufficient for the Georgia Environmental Protection Division to issue such a certification if required. Any item which is not applicable to a specific project should be so marked. Additional information will be requested if needed.

To be included in forthcoming Stream Buffer Variance application.

A. Please submit the following:

1. A plan showing the location and size of any facility, existing or proposed, for handling any sanitary or industrial waste waters generally on your property.

2. A plan of the existing or proposed project and your adjacent property for which permits are being requested.

3. A plan showing the location of all points where petro-chemical products (gasoline, oils, cleaners) used and stored. Any above-ground storage areas must be diked, and there should be no storm drain catch basins within the diked areas. All valving arrangements on any petro-chemical transfer lines should be shown.

4. A contingency plan delineating action to be taken by you in the event of spillage of petro-chemical products or other materials from your operation.

5. Plan and profile drawings showing limits of areas to be dredged, areas to be used for placement of spoil, locations of any dikes to be constructed showing locations of any weir(s), and typical cross sections of the dikes.

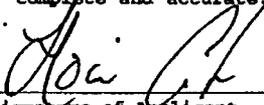
B. Please provide the following statements:

1. A statement that all activities will be performed in a manner to minimize turbidity in the stream. So stipulated

2. A statement that there will be no oils or other pollutants released from the proposed activities which will reach the stream. So stipulated

3. A statement that all work performed during construction will be done in a manner to prevent interference with any legitimate water uses. So stipulated

17. Application is hereby made for a permit or permits to authorize the activities described herein, Water Quality Certification from the Georgia Environmental Protection Division is also requested if needed. I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities.

  
\_\_\_\_\_  
Signature of Applicant

18. U.S.C. Section 1001 provides that: Whoever, in any matter within the jurisdiction of any department or agency of the United States, knowingly and willfully falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations, or makes or uses false writing or document knowing same to contain any false, fictitious or fraudulent statement or entry, shall be fined no more than \$10,000 or imprisoned not more than 5 years or both.

#### PRIVACY ACT NOTICE

The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act and Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972. These laws require permits authorizing structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Information provided will be used in evaluating the application for a permit. Information in the application is made a matter of public record through issuance of a public notice. Disclosure of the information requested is voluntary, however, the data requested are necessary in order to communicate with the applicant and to evaluate the permit application. If necessary information is not provided, the permit application cannot be processed nor can a permit be issued.

**SUPPORTING REMARKS:** See Attachments A & B

**ATTACHMENT A**

**Supporting Documentation**

**for**

**Certification and Authorization Pursuant to  
Sections 401 and 404 of the Clean Water Act and  
Section 10 of the Rivers and Harbors Act of 1899**

**Joint Application**

**Vogtle Electric Generating Plant**

**Units 3 and 4**

**Burke County, Georgia**

**Applicant: Southern Nuclear Operating Company, Inc.**

**ATTACHMENT A**  
**Plant Vogtle Units 3 and 4**  
**INDIVIDUAL PERMIT APPLICATION**

**TABLE OF CONTENTS**

<b><u>CONTENT</u></b>	<b><u>PAGE</u></b>
Introduction	1
Permittee/Agent Contact Info	2
Basic Project Purpose and Need	2
Project Setting	3
Preferred Project	4
Alternatives Analysis	5
<u>No Action Alternative</u>	5
<u>Plant Hatch Alternative</u>	6
<u>Plant Farley Alternative</u>	7
<u>Plant Barton Alternative</u>	8
Preferred Site	9
<u>Jurisdictional Wetlands/Waters Determination</u>	10
<u>Proposed Stormwater Management</u>	21
<u>Proposed Soil, Erosion, and Sediment Control Measures</u>	21
<u>Impacts</u>	22
<u>Avoidance and Minimization</u>	32
<u>Compensatory Mitigation</u>	34
<u>Protected Species</u>	34
<u>Historic Properties</u>	44

**FIGURES**

Location Map – Road Map Base
USGS Topographic Map
National Wetlands Inventory Map
Limits of USACE Jurisdiction – Existing Conditions
Limits of USACE Jurisdiction – North
Limits of USACE Jurisdiction – South
Aerial Map
Proposed Conditions Map
Soils Map

**SOP WORKSHEET**

**Application for  
Certification and Authorization Pursuant to  
Sections 401 and 404 of the Clean Water Act  
And Section 10 of the Rivers and Harbors Act of 1899  
for  
Vogtle Electric Generating Plant  
Units 3 and 4  
by Southern Nuclear Operating Company, Inc.  
Burke County, Georgia**

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**INTRODUCTION**

This document is a portion of the supporting information related to the Joint Application for certification and authorization pursuant to Sections 401 and 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The Joint Application is submitted by Southern Nuclear Operating Company, Inc. (Southern Nuclear) to the Georgia Department of Natural Resources - Environmental Protection Division (EPD) and the U.S. Army Corps of Engineers (Corps) requesting authorization to fill or dredge approximately 8.24 acres of wetlands, 1.42 acres of open water along the federal Savannah River Navigation Channel, and 610 linear feet (0.07 acre) of an ephemeral stream during construction of a cooling water intake system (including a canal, intake structure, and access road), sedimentation basin, and discharge line for the proposed Vogtle Electric Generating Plant's (VEGP) Units 3 and 4. Specific details by activity-type are presented in the **Impacts** section later in this document. Approximately 200 cubic yards of material would be dredged from the Savannah River for construction access and placed within an on-site upland disposal area.

Pursuant to the September 12, 2008, Memorandum of Understanding between the Corps and the U.S. Nuclear Regulatory Commission (NRC) dealing with the regulation of nuclear power plants, the NRC is considered to be the lead agency for purposes of implementing the National Environmental Policy Act (NEPA). As a result, the project scope and alternatives considered are as defined by the NRC. In accordance with NRC procedures, an environmental impact statement (EIS) was prepared in response to an application for an Early Site Permit (ESP) submitted to the NRC by Southern Nuclear. Subsequently, Southern Nuclear submitted its Combined Construction and Operating License Application to the NRC in March 2008. Prior to EIS preparation, in 2007 the Georgia Public Service Commission evaluated and approved Georgia Power Company's (Georgia Power) integrated resource plan, which addressed the projected demand for, current capacity for production of, and program for meeting anticipated needs for electricity in Georgia. On March 17, 2009, the Georgia Public Service Commission approved Georgia Power's request for certification to build Vogtle Units 3 and 4.

The majority of the information that follows is taken from the final EIS (August 2008) and other ongoing investigations associated with Southern Nuclear's desire to increase power production in order to provide for growing electricity needs in their service area. Southern Nuclear is engaged in the operation of several nuclear power plants. Besides operating Plant Vogtle's

Units 1 and 2, it operates the Edwin I. Hatch Nuclear Plant's Units 1 and 2 (Plant Hatch) for Georgia Power and the Joseph M. Farley Nuclear Plant's Units 1 and 2 (Plant Farley) for Alabama Power Company. The combined electric generation capability of all six units is approximately 5,700 MW(e). Should a nuclear facility be constructed at the proposed Plant Vogtle site, Southern Nuclear is expected to be the exclusive licensed operator of VEGP Units 3 and 4.

Georgia Power is engaged in the generation and transmission of electricity and the distribution and sale of such electricity within the State of Georgia, serving more than two million customers in a service area of approximately 57,000 square miles. With a rated electricity generation capability of approximately 14,000 MW(e), Georgia Power currently provides retail electric service in all but six of Georgia's 159 counties. With Georgia Power, Plant Vogtle's co-owners, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia, and the City of Dalton provide electricity to approximately 6.2 million Georgia residents. These four entities own 45.7, 30.0, 22.7, and 1.6 percent, respectively, of VEGP Units 1 and 2 and anticipate the same ownership interest percentages in VEGP Units 3 and 4.

#### **NAME, ADDRESS, PHONE NUMBER OF PROSPECTIVE PERMITTEE AND AGENT**

##### **Prospective Permittee**

Southern Nuclear Operating Company, Inc.  
Attn: Environmental Project Manager  
P.O. Box 1295  
Birmingham, Alabama 35201

##### **Agent**

Dr. R. Darrell Smith  
Register-Nelson, Inc.  
45 Parkland Drive  
Stockbridge, GA 30281  
(678) 432-2636

#### **BASIC PROJECT PURPOSE AND NEED**

The Nuclear Regulatory Commission compared Georgia Power's forecast demand for electricity within its territory to the U.S. Department of Energy - Energy Information Administration's Annual Energy Outlook 2007, which looks at the United States as a whole. The Annual Energy Outlook forecasts total electricity sales to increase by 41 percent, from 3,660 billion kilowatt-hours in 2005 to 5,168 billion kilowatt-hours in 2030. By end-user sector, electricity demand is projected to grow by 39 percent from 2005 to 2030 in the residential sector, by 63 percent in the commercial sector, and by 17 percent in the industrial sector.

The basic project purpose is to construct and operate additional nuclear generating units and associated required infrastructure to provide for growing electricity needs in the service areas of Georgia Power and Plant Vogtle's co-owners, Oglethorpe Power Corporation, the Municipal Electric Authority of Georgia and the City of Dalton.

## PROJECT SETTING

Plant Vogtle is located in the sand hills of the Upper Coastal Plain Region, 26 miles southeast of Augusta, Georgia, and 15 miles east-northeast of Waynesboro, Georgia (Figure 1). The area surrounding the site consists mostly of both naturally vegetated parcels and agricultural lands – including pasture or farmland, pine plantations, and abandoned (old) fields. The preferred project site, Plant Vogtle, is located along the Savannah River near the intersection of River Road and Hancock Landing Road in Burke County, Georgia. Vehicular access to the site is from River Road. Limited barge access is available from the Savannah River, while a railroad spur runs to the site from the Norfolk Southern Savannah-to-Augusta line. The community of Girard is located approximately 8 miles to the south. Rhodes Air Ranch, a privately owned airstrip, is located north of the site. Plant Vogtle occupies approximately 3,169 acres. The new project would be located at Savannah River mile (RM) 150.9.

The surface topography of the tract consists of gently rolling hills ranging in elevation from 80 feet above mean sea level (MSL) at the water surface of the Savannah River to nearly 300 feet above MSL in the immediate vicinity of the site. Developed portions of the property, resting on steep bluffs incised into coastal plain sediments by the river, lay at an elevation of approximately 220 feet above MSL. The alluvial floodplain of the Savannah River is situated 6-10 feet above the river surface.

The property consists predominantly of old agricultural areas which were previously disturbed during Unit 1 and 2 construction, pine plantations, and some undisturbed naturally vegetated land composed of oak/hickory hardwoods and sand hill/upland pine communities. A longleaf pine/scrub oak community is found on ridge tops as well as south and west slopes in undisturbed upland areas on the site. Common canopy species in this habitat include longleaf pine (*Pinus palustris*), turkey oak (*Quercus laevis*), and bluejack oak (*Q. incana*). The shrub layer is composed of sparkleberry (*Vaccinium arboreum*), dwarf huckleberry (*Gaylussacia dumosa*), and yellow jessamine (*Gelsemium sempervirens*). The north and east slopes in the undisturbed uplands support the more mesic oak/hickory community. The canopy in this community is composed mainly of white oak (*Q. alba*), white ash (*Fraxinus americana*), mockernut hickory (*Carya alba*), and flowering dogwood (*Comus florida*).

Directly across the Savannah River from the proposed project location is the Savannah River Site, a restricted access U.S. Department of Energy (USDoE) facility in South Carolina. River swamp, bottomland hardwood, and upland pine/hardwood communities occur on the Savannah River Site within 6 miles of the proposed project. The Savannah River Swamp encompasses about 9,400 acres and borders the Savannah River on the southwestern edge of Savannah River Site, across the river from the proposed Units 3 and 4. The Yuchi Wildlife Management Area (WMA) is immediately south of the VEGP site and is managed by the Georgia Department of Natural Resources (DNR) for public deer and turkey hunting and primitive camping. This WMA encompasses 7,800 acres and is composed of 250 acres of Savannah River bottomland; 300 acres of creek bottomland; 700 acres of mesic ravine; 6,000 acres of planted loblolly pine (*P. taeda*), slash pine (*P. ellioti*), and longleaf pine of various ages; and 550 acres of native pine and mixed pine/hardwood. Plant Vogtle also maintains a public boat landing immediately downstream of the site that provides both employees and the general public access to the

Savannah River for recreational purposes. In early 2003, Southern Nuclear's Land Department began restoration of a forested area near the boat ramp, which included planting 26,000 longleaf pine trees and 15,000 wiregrass (*Aristida stricta*) plugs. Plant Vogtle partnered with National Wild Turkey Federation-Energy for Wildlife, Georgia Power, and the Forestry for Wildlife Partnership on this restoration project. No other recreation areas occur within 6 miles of the property.

The project site has been designated as a Certified Wildlife Habitat since 1993. This designation is through the Wildlife Habitat Council, a non-profit, Washington, DC-based wildlife organization. In July 2006, Southern Nuclear submitted an application to the Wildlife Habitat Council for re-certification as a Certified Wildlife Habitat and was awarded this re-certification November 14, 2006. Georgia Power also manages wildlife habitat within some of its transmission line rights-of-way under the auspices of a Georgia DNR program called Wildlife Incentive for Non-Game and Game Species (WINGS). This program aims to assist land owners in the conversion of transmission rights-of-way into wildlife habitat areas.

Georgia Power and Southern Nuclear also signed a Safe Harbor Management Agreement with Georgia DNR in June 2007. Under the agreement, two large tracts surrounding the site will be managed to benefit red-cockaded woodpeckers. 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 their private property. Landowners entering into these agreements must establish a baseline number of individuals that would be maintained in the event they colonize the landowner's property. Surveys at the VEGP site conducted in February 2006 found no occurrence of red-cockaded woodpeckers on the property. In any case, no areas designated under the Safe Harbor agreement will be permanently impacted by Unit 3 and 4 construction.

### **PREFERRED PROJECT**

The preferred project would be located completely within the confines of the current Plant Vogtle site, with the proposed new Units 3 and 4 to be built adjacent to the existing Units 1 and 2, which are licensed by the NRC and have a combined net electric generating capacity of 2,297 MW(e) (Figure 5). Unit 1 began commercial operation in March 1987, while Unit 2 began commercial operation in March 1989. The oil-fired Plant Wilson is also located on the site. Plant Wilson is a 354-MW(e) peaking power generating facility owned by Georgia Power. Together, the two existing nuclear units, Plant Wilson, auxiliary facilities such as the training center, and transmission line rights-of-way occupy approximately 800 acres.

The remainder of the site includes approximately 1,634 acres of pine forest, 612 acres of hardwood forest, and 96 acres of open areas including mowed grass. Small ponds, streams and wetlands are located throughout the site. For the current proposed plant expansion, approximately 604 acres will be disturbed. Of this 604 acres, only 379 will be permanently impacted. The remaining 225 acres will be disturbed only during project construction.

The two additional units proposed at Plant Vogtle would be Westinghouse AP1000 reactors, with a total combined thermal power rating of 6,800 MW(t). The new units would use a closed-

cycle cooling system and require a single natural draft cooling tower for each unit. Additional infrastructure requirements at Plant Vogtle would include a new transmission line. The proposed new right-of-way for this line would connect Plant Vogtle with the Thomson substation 20 miles west of Augusta. Although the exact route has not yet been determined, the transmission line right-of-way may cross Burke, Jefferson, McDuffie, and Warren Counties. It is anticipated it would be a 150-foot-wide right-of-way approximately 60 miles long with the goal of free spanning all jurisdictional waters and wetlands, while avoiding navigable waters altogether. Using the EPRI-GTC (Electric Power Research Institute-Georgia Transmission Corporation) Transmission Line Siting Methodology, Southern Nuclear and Georgia Power identified a narrower corridor (termed the Representative Delineated Corridor [RDC]) that would be used as the basis within which the actual routing of rights-of-way alternatives would occur. The RDC represents a narrowing of the modeled right-of-way and is intended to allow for the avoidance of wetlands and stream crossings to the maximum extent practicable and to reduce the overall length and quantity of land potentially affected.

### **ALTERNATIVES ANALYSIS**

Southern Nuclear evaluated three alternative sites to Plant Vogtle for expansion: Plant Hatch, Georgia; Plant Farley, Alabama; and Plant Barton, Alabama in addition to the no action alternative. In accordance with the September 12, 2008, Memorandum of Understanding between the Corps and the NRC, the NRC is considered to be the lead agency for purposes of implementing NEPA. As a result, NRC's criteria for evaluating the environmental impacts of project alternatives have been used. These criteria employ a three-level standard of significance - SMALL, MODERATE, or LARGE - developed using Council on Environmental Quality guidelines (CEQ 1997) and set forth in the footnotes to Table B-1 of Title 10 of the Code of Federal Regulations (CFR) Part 51, Subpart A, Appendix B.

The evaluation of alternative sites is a two-step process, as set forth in NUREG-1555, Section 9.3, and stems from the NRC decision related to licensing the Seabrook Nuclear Power Plant in New Hampshire. The first step looks at a full suite of environmental issues, using reconnaissance-level information to determine if any of the alternative sites are environmentally preferable to the proposed site. If an alternative site appears environmentally preferable to the proposed site, the analysis proceeds to the second step. If not, the evaluation of alternative sites ends at the first step. The second step considers economic, technological, and institutional factors among the environmentally preferred sites to determine if any are obviously superior to the proposed site. If there is no obviously superior site, then the proposed site prevails.

### **No Action Alternative**

The no action alternative does not meet the basic project purpose to construct and operate additional electric generating units and associated required infrastructure in order to provide for growing electricity needs in the service area of Georgia Power and the other co-owners. The no action alternative would result in either additional electricity production at other facilities, the construction of new facilities elsewhere, or an inability to meet the Annual Energy Outlook

forecast total electricity sales increase by 41 percent, from 3,660 billion kilowatt-hours in 2005 to 5,168 billion kilowatt-hours in 2030.

### **Plant Hatch Alternative**

Plant Hatch is located in Appling and Toombs Counties, Georgia. The plant is located southeast of U.S. Highway 1's crossing of the Altamaha River. The Plant Hatch site encompasses approximately 2,240 acres. All of the industrial facilities are located in Appling County on a 1,340-acre parcel south of the Altamaha River. The site also includes approximately 900 acres in Toombs County on the north side of the Altamaha River. Approximately 350 acres of the plant site are composed of wetlands and transmission line rights-of-way. Approximately 1,600 acres are managed for timber production and wildlife habitat. The region in the vicinity of the site is rural and is characterized by low, rolling, sandy hills that are predominately forested. The Plant Hatch tract is not subject to the Georgia Coastal Zone Management Act because the plant is not located within one of the designated coastal zone counties. No new land would be required for the siting of new nuclear reactor units at Plant Hatch. The footprint of the new generating units would be approximately 300 acres. An additional 250 acres would be needed for temporary facilities and laydown yards, for a total of 550 acres.

There are six transmission lines in four transmission line rights-of-way that exit the Plant Hatch site. The transmission line rights-of-way pass through rolling hills that are primarily a mixture of cultivated land, grazing land, and managed timberlands. Should new nuclear reactor units be located at Plant Hatch, one new 500-kV transmission line would be needed. The new transmission line would be at least 50 miles in length and would either be installed in a new right-of-way or an expansion of an existing right-of-way. Two of the existing transmission line rights-of-way traverse designated coastal zone counties. Any expansion of these transmission line rights-of-way would require review under the procedures established under the Georgia Coastal Management Act. Because detailed information concerning the routing of the possible new transmission line right-of-way is not known at this time, a complete evaluation of potential land-use impacts cannot be made.

Structures required for the construction of the proposed project at the Plant Hatch site would be situated in abandoned fields or developed areas of the existing plant site and would avoid sensitive areas such as wetlands and mature forests. Several State-listed species of concern were identified on the Plant Hatch site or within the transmission line rights-of-way during the 1998 and 1999 threatened and endangered species surveys, although no federally-listed species were observed. Bachman's sparrows (*Aimophila aestivalis*) (listed as "rare" by Georgia DNR) were observed in the Florida and Thalmann rights-of-way. One State-listed plant species (yellow pitcherplant [*Sarracenia flava*], listed as "unusual" by Georgia DNR) was found on the Plant Hatch site, and five State-listed species were identified on other transmission line rights-of-way. These consisted of the parrot pitcherplant (*S. psittacina*) (threatened), purple honeycomb head (*Balduina atropurpurea*) (rare), cutleaf beardtongue (*Penstemon dissectus*) (rare), yellow pitcherplant (unusual), and hooded pitcherplant (*S. minor*) (unusual). In addition, the gopher tortoise (*Gopherus polyphemus*) is known to occur in undeveloped portions of Plant Hatch. Bald eagles (*Haliaeetus leucocephalus*) (State threatened) have been observed by Georgia Power biologists in the vicinity of Plant Hatch.

The Altamaha River is the major source of water for Plant Hatch. This river is relatively undisturbed and has no channelization, dredging or major reservoirs. The existing plant withdraws cooling water from the Altamaha River through a single intake structure situated on the southern shoreline. The intake structure was designed and located to have the ability to intake water under all river conditions including low flow and probable flood levels. Water is discharged back into the river via two lines 1,260 feet downstream from the intake and approximately four feet below low flow levels. Georgia DNR has classified the Altamaha River as a "High-Priority Water" of the State because of the presence of high-priority species and diverse aquatic communities within the river's watershed. The designation is designed to protect aquatic biodiversity in Georgia and is part of the State's comprehensive wildlife conservation strategy, which is detailed in "Georgia's Wildlife Action Plan."

In 1998, Southern commissioned a freshwater mussel survey of the Altamaha River throughout a 12-mile reach upstream and downstream of Plant Hatch. The survey documented viable populations of 12 different mussel species, most of which were considered by the U.S. Fish and Wildlife Service (USFWS) and Georgia DNR to be "species of concern."

### **Plant Farley Alternative**

Plant Farley is located in Houston County, Alabama. The plant is located on the west side of the Chattahoochee River about six miles north of the intersection of U.S. Highway 84 and State Highway 95. The site encompasses approximately 1,850 acres. About 500 acres are currently used for nuclear power generation and maintenance facilities, laydown areas, parking lots, and roads. The remainder of the property consists of forested areas, ponds, wetlands, and open fields. An additional approximate 500 acres of the existing plant site would be needed if new nuclear reactor units were located at Plant Farley. The land in the vicinity of the plant is rural and is forested or used as farmland. The Plant Farley tract is not subject to the Alabama Coastal Zone Program because the Program applies only in Baldwin and Mobile Counties.

The plant site is located near the boundary of the Dougherty Plain and Southern Red Hills physiographic regions of the east Gulf Coastal Plain. Two major topographic subdivisions occur at the site: (1) gently rolling uplands west of the Chattahoochee River Valley and (2) river terraces and floodplain of the Chattahoochee River. These two subdivisions contribute to a multiplicity of habitats, with diverse wildlife and plant species. Habitats at Plant Farley consist of a river bluff forest, ravine forest, floodplain forest, pine/mixed hardwood forest, pine forest, non-floodplain wetlands and mowed grassy areas. The developed portions of the property are located primarily on a plateau approximately one-half mile west of the river, with the area adjacent to the river mostly undeveloped. Alabama Power Company manages about 1,300 acres of this undeveloped land as a wildlife preserve. Farley Wildlife Management Plan strategies include managing vegetation to promote and protect diverse habitats, periodic thinning or logging of pine timber stands, mowing grassy areas, and installing nest boxes. Since 1992, the Wildlife Habitat Council has recognized Plant Farley as a certified corporate wildlife habitat for its wildlife and land management efforts. Construction of the proposed project at Plant Farley would require that a portion (up to 550 acres) of the wildlife preserve be cleared for development.

Formal surveys for threatened and endangered species on the Plant Farley site have not been conducted. Thirteen federally listed threatened and endangered terrestrial species are known to occur in the vicinity of the Plant Farley site or its transmission lines: the endangered gray bat (*Myotis grisescens*), the endangered Indiana bat (*M. sodalis*), the endangered wood stork (*Mycteria americana*), the endangered red-cockaded woodpecker (*Picoides borealis*), the threatened American alligator (*Alligator mississippiensis*), the threatened eastern indigo snake (*Drymarchon corais coupen*), the endangered flatwoods salamander (*Ambystoma cingulatum*), the threatened crystal lake nailwort (*Paronychia chartacea minima*), the endangered chaffseed (*Schwalbea americana*), the endangered fringed campion (*Silene polypetala*), the endangered gentian pinkroot (*Spigelia gentianoides*), the endangered Florida torreya (*Torreya taxifolia*), and the endangered relict trillium (*Trillium reliquum*). Land disturbance required to site the proposed new units at the Plant Farley site would take place in Houston County. Two federally listed terrestrial species are known to occur in Houston County: the eastern indigo snake and the flatwoods salamander. Suitable habitat for the eastern indigo snake exists at the Plant Farley site and this species could potentially exist on-site. Before construction activities could begin, Southern Nuclear would perform a detailed survey to ensure protection of the endangered eastern indigo snake.

Southern Nuclear currently withdraws water for Plant Farley from the lower Chattahoochee River, with which the principal aquatic resources at the site are also associated. Other important aquatic habitats include the 108-acre service and make-up water pond (on the Plant Farley site) and a few small on-site creeks.

In order to accommodate two new nuclear generating units at Plant Farley, one new 500-kV transmission line would be needed. The transmission line would be installed in a new 200-foot right-of-way, which would be approximately 10 miles long.

### **Plant Barton Alternative**

The Barton property is an undeveloped greenfield site in central Alabama that was originally proposed for a four-unit nuclear plant in the 1970s, but never developed. This site is in Chilton and Elmore Counties, Alabama, and is located on the west side of the Coosa River, between Chestnut Creek to the north and Jake Creek to the south. The property is situated on the Jordan Reservoir, a 6,800-acre impoundment on the Coosa River. The lake was created in 1928 by the Alabama Power Company to provide flood control and hydroelectric power. The Barton site encompasses approximately 2,800 acres.

The tract is mainly forested and is characterized by moderately rolling hills. The footprint of a new generating plant at the Barton site would be approximately 400 acres. An additional 150 acres would be required for temporary facilities and laydown yards. Because the site is undeveloped, additional land would be required for roads, parking lots, and a switchyard. State Road 22 passes approximately four miles north of the Barton site at its closest point. A four-mile paved road with a 100-foot right-of-way would be constructed from State Road 22 to provide vehicular access to the site. Development of the road would require approximately 50 acres. A CSX Transportation railroad line passes approximately six miles southwest of the Barton site at its closest point. A connecting rail spur, requiring approximately 120 acres, would

have to be constructed to transport materials and equipment to the site. The terrain surrounding the Barton site is also predominately wooded, with some agricultural areas and a small amount of urban development. The Barton site is not subject to the Alabama Coastal Zone Program because the Program applies only in Baldwin and Mobile Counties.

Two 500-kV transmission lines requiring a right-of-way 300 feet in width would be needed to connect new generating units at the Barton site to Alabama Power Company's transmission system. Southern assumes that the lines would connect to the substation at the Gaston Generating Plant, which is approximately 35 miles north of the Barton site. Routing the new transmission lines to the Gaston Generating Plant would require about 1,273 acres of transmission-line right-of-way. Southern Nuclear would give careful consideration to avoiding possible conflicts with any natural or man-made areas where important environmental resources are located.

A new nuclear facility at the Barton site would need to withdraw all water required for operation from the Coosa River upstream of Jordan Dam, because groundwater yields at the site are very small. The watershed of the Jordan Reservoir has water quality issues associated with high nutrient levels. Excessive nutrient levels in a waterbody can result in excessive plant growth, which can ultimately lead to a reduction in the oxygen levels necessary to adequately sustain a healthy aquatic ecosystem. Jordan Reservoir has developed this "eutrophic" characteristic, in spite of water movement through the reservoir system.

Formal surveys for threatened and endangered species on the Barton site (Autauga, Chilton, Coosa, Elmore Counties) have not been conducted. There are 13 federally listed terrestrial plant and animal species recorded in counties within 10 miles of the Barton site, as well as in Talladega County, through which transmission lines from the Barton site would presumably pass. The following federally listed terrestrial species occur in these five counties: red-cockaded woodpecker, wood stork, eastern indigo snake, Price's potato bean (*Apios priceana*), Georgia rockcress (*Arabis georgiana*), Kral's water-plantain (*Sagittaria secundifolia*), green pitcherplant (*S. oreophila*), and Alabama canebrake pitcherplant (*S. rubra alabamensis*). In addition, a query of the Alabama State Element Occurrence database detected the federally protected American alligator, least tern (*Sterna antillarum*), grey bat, Indiana bat, and Georgia aster (*Symphotrichum georgianum*) as occurring in these counties.

#### **PREFERRED SITE**

The preferred site, Plant Vogtle, could accommodate the infrastructure necessary for two new nuclear units within its uplands. It is anticipated that the addition of a future transmission line could be accommodated with no impacts to navigable waters. Impacts to other waters of the U.S. should be minimal to none, since such areas could potentially be crossed by free spans. If impacts are necessary, they would be consistent with the requirements and conditions of Nationwide Permit 12. The Savannah River would be able to provide the additional water needed for plant operation, along with supplementary subsurface aquifer withdrawals.

According to NRC criteria, since the alternative locations are not obviously superior, the proposed site prevails. For a comparison of the preferred site and the three alternative

locations, see Tables 1 and 2. These tables employ the NRC ratings of SMALL, MODERATE, and LARGE (developed using the Council on Environmental Quality guidelines and set forth in the footnotes to Table B-1 of Title 10 of the Code of Federal Regulations Part 51, Subpart A, Appendix B). These ratings are defined as:

SMALL - Environmental effects are not detectable or are so minor that they would neither destabilize nor noticeably alter any important attribute of the resource. Mitigation is generally not warranted.

MODERATE - Environmental effects are sufficient to alter noticeably, but not to destabilize important attributes of the resource.

LARGE - Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

### **Jurisdictional Wetlands/Waters Determination**

Field investigations of this site were conducted on December 17-19 and 21-22, 2006, in order to determine the limits of Corps jurisdictional wetlands and waters of the U.S. that are located within the project area. The three-parameter approach outlined in the 1987 *Corps of Engineers Wetlands Delineation Manual* was used for the determination of wetland/upland interfaces. In addition, "waters of the United States" were identified in accordance with the defining criteria set forth in 33 CFR 328, the definitions found in Paragraph E of the current Nationwide Permits, and Regulatory Guidance Letter No. 05-05. Six perennial streams, fifteen intermittent streams, three ephemeral streams, one man-made pond, and forty-five wetlands were identified on-site, as indicated on the enclosed maps (Figures 4A, 4B, 4C, and 4D). The Savannah District approved the jurisdictional determination by letters dated December 10, 2007, and May 28, 2008, assigning the project number 200701837.

Approximately 170 acres of jurisdictional wetlands and other waters of the United States were identified on the site. Principal waterbodies in the northern portion of the site include Mallard Pond and two perennial streams. Mallard Pond is a man-made, five-acre pond that was present on the property prior to the construction of Units 1 and 2. It is in a hardwood cove just north of the footprint of the proposed new powerblock for Units 3 and 4. A small unnamed perennial stream (Stream 101) flows out of Mallard Pond, entering the Savannah River at Hancock Landing, approximately 0.6 mile upstream of the intake structure for Units 1 and 2. The stream is approximately two to four feet wide and less than one foot deep, except where beavers (*Castor canadensis*) have created dams and ponds. Another intermittent stream flowing out of the northwest corner of the site joins Stream 101 approximately one-third of the way to the Savannah River.

**Table 1 - Comparison of Construction Impacts at the VEGP Site and Alternative Sites**

Category	VEGP	Plant Hatch	Plant Farley	Plant Barton
Land-Use Impacts				
The site and vicinity	SMALL	SMALL	SMALL	MODERATE
Transmission line	MODERATE	SMALL to MODERATE <sup>(a)</sup>	MODERATE	MODERATE
Air quality	SMALL	SMALL	SMALL	SMALL
Water-Related Impacts				
Water use	SMALL	SMALL	SMALL	SMALL
Water quality	SMALL	SMALL	SMALL	SMALL
Ecological Impacts				
Terrestrial ecosystems				
Site	SMALL	SMALL	SMALL to MODERATE	MODERATE
Transmission line right-of-way	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE	MODERATE
Terrestrial Threatened and Endangered Species				
Site	SMALL	SMALL	SMALL	SMALL to MODERATE
Transmission line right-of-way	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>	SMALL	SMALL to MODERATE <sup>(a)</sup>
Aquatic ecosystems				
Site	SMALL	SMALL	SMALL	SMALL
Transmission line right-of-way	SMALL	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>
Threatened and Endangered Species	SMALL	SMALL	SMALL	SMALL
Socioeconomic Impacts				
Physical impacts	SMALL	SMALL	SMALL	SMALL
Aesthetics	SMALL to MODERATE <sup>(b)</sup>	SMALL to MODERATE <sup>(b)</sup>	SMALL to MODERATE <sup>(b)</sup>	MODERATE
Demography	MODERATE <sup>(c)</sup>	MODERATE <sup>(d)</sup>	MODERATE <sup>(e)</sup>	SMALL
Impacts to the Community - Social and Economic				
Economy	MODERATE beneficial <sup>(c)</sup>	MODERATE beneficial <sup>(d)</sup>	MODERATE beneficial <sup>(e)</sup>	SMALL beneficial
Taxes	MODERATE beneficial <sup>(c)</sup>	MODERATE beneficial <sup>(d)</sup>	MODERATE beneficial <sup>(e)</sup>	MODERATE beneficial <sup>(f)</sup>
Impacts to the Community - Infrastructure and Community				
Transportation	MODERATE	MODERATE	MODERATE	MODERATE
Recreation	SMALL	SMALL	SMALL	SMALL
Housing	SMALL	MODERATE	SMALL	SMALL
Public and social services and infrastructure	SMALL	SMALL	MODERATE	SMALL
Education	SMALL	MODERATE	MODERATE	SMALL
Historic and cultural resources	MODERATE	SMALL	SMALL	SMALL
Environmental justice	SMALL	SMALL	SMALL	SMALL
Non-radiological health	SMALL	SMALL	SMALL	SMALL
Radiological health	SMALL	SMALL	SMALL	SMALL
(a) Depends on location of transmission line R.O.W.		(d) MODERATE in Appling & Toombs Cos., SMALL elsewhere		
(b) SMALL at plant site, SMALL to MODERATE along transmission right-of-way		(e) MODERATE in Houston County, SMALL elsewhere		
(c) MODERATE in Burke County, SMALL elsewhere		(f) MODERATE in Chilton & Elmore Cos., SMALL elsewhere		

**Table 2 - Comparison of Operational Impacts at the VEGP Site and Alternative Sites**

Category	VEGP	Plant Hatch	Plant Farley	Plant Barton
Land-Use Impacts				
The site and vicinity	SMALL	SMALL	SMALL	SMALL
Transmission line rights-of-way	SMALL	SMALL	SMALL	SMALL
Air quality	SMALL	SMALL	SMALL	SMALL
Water-Related Impacts				
Water use	SMALL	SMALL	SMALL	SMALL
Water quality	SMALL	SMALL	SMALL	SMALL
Ecological Impacts				
Terrestrial ecosystems	SMALL	SMALL	SMALL	SMALL
Aquatic ecosystems	SMALL	SMALL	SMALL	SMALL
Threatened and Endangered Species	SMALL	SMALL	SMALL	SMALL
Socioeconomic Impacts				
Physical impacts	SMALL	SMALL	SMALL	SMALL
Aesthetics	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>	SMALL to MODERATE <sup>(a)</sup>	MODERATE
Demography	SMALL	SMALL	SMALL	SMALL
Impacts to the Community - Social and Economic				
Economy	MODERATE beneficial <sup>(b)</sup>	SMALL beneficial	SMALL beneficial	SMALL beneficial
Taxes	LARGE beneficial <sup>(c)</sup>	LARGE beneficial <sup>(d)</sup>	LARGE beneficial <sup>(e)</sup>	MODERATE beneficial <sup>(f)</sup>
Impacts to the Community - Infrastructure and Community				
Transportation	SMALL	SMALL	SMALL	SMALL
Recreation	SMALL	SMALL	SMALL	SMALL
Housing	SMALL	SMALL	SMALL	SMALL
Public and social services and infrastructure	SMALL	SMALL	SMALL	SMALL
Education	SMALL	SMALL	SMALL	SMALL
Historic and cultural resources	SMALL	SMALL	SMALL	SMALL
Environmental justice	SMALL	SMALL	SMALL	SMALL
Non-radiological health	SMALL	SMALL	SMALL	SMALL
Radiological health	SMALL	SMALL	SMALL	SMALL
Postulated accidents				
Design-based accidents	SMALL	SMALL	SMALL	SMALL
Severe accidents	SMALL	SMALL	SMALL	SMALL
(a) Aesthetics impact at the plant site would be SMALL, but the impact would be MODERATE along new transmission line right-of-way		(c) LARGE beneficial in Burke County, SMALL elsewhere		
(b) MODERATE beneficial in Burke County, SMALL elsewhere		(d) LARGE beneficial in Appling County, SMALL elsewhere		
		(e) LARGE beneficial in Houston County, SMALL elsewhere		
		(f) MODERATE beneficial in Chilton & Elmore Cos., SMALL elsewhere		

Two small perennial streams are located in the southern portion of the site. One of these streams is located in the southwestern portion of the property and drains south through Debris Basin #2 into Daniels Branch and then into Telfair Pond. Telfair Pond drains to the east via Beaverdam Creek, which enters the Savannah River approximately two miles downstream of the existing intake structure. The other small stream is present in the southeastern portion of the site and flows south through Debris Basin #1. This unnamed perennial-tributary ultimately flows directly into Beaverdam Creek. Although Beaverdam Creek and Telfair Pond are outside the property boundary, the two described perennial streams are on the project site. Several

jurisdictional wetland areas are located within each of these two stream drainages, including wetlands associated with the two debris basins. Debris Basins #1 and #2 were originally built as stormwater retention basins during construction of Units 1 and 2. Debris Basin #1 is about 6 acres in size, while Debris Basin #2 is about 5 acres. Dominant vegetation in wetlands associated with Debris Basin #1 includes black willow (*Salix nigra*), cinnamon fern (*Osmunda cinnamomea*), sweetgum (*Liquidambar styraciflua*), giant cane (*Arundinaria gigantea*), and red maple (*Acer rubrum*). Dominant vegetation associated with the wetlands around Debris Basin #2 includes black willow, sedges (*Carex* spp.), greenbriers (*Smilax* spp.), sweetgum, and giant cane. There is also a runoff catch pond between the two basins that was formed from a depression left after the construction of Units 1 and 2. The runoff pond is about three acres in size and retains water throughout the year.

The natural or beaver enhanced wetlands associated with all of these drainages have open to closed canopies depending on water depth. In those areas with a tree canopy, dominant species include water oak (*Q. nigra*), red maple, and blackgum (*Nyssa sylvatica*). There is also a relatively dense understory of vines and shrubs composed of trumpet creeper (*Campsis radicans*), muscadine grape (*Vitis rotundifolia*), giant cane, and American holly (*Ilex opaca*). The herbaceous ground cover is dominated by cinnamon fern and royal fern (*O. regalis*). The general habitat along the Savannah River at the site is a mix of hardwood forest and bald cypress/water tupelo forest. Bald cypress (*Taxodium distichum*) and water tupelo (*Nyssa aquatica*) are the dominant canopy species in the wetter sites along the river. American sycamore (*Platanus occidentalis*), boxelder (*Acer negundo*), sugarberry (*Celtis laevigata*), and swamp chestnut oak (*Q. michauxii*) occupy the slightly higher drier ground. The understory is composed of American holly, ironwood (*Carpinus caroliniana*), water locust (*Gleditsia aquatica*), giant cane, and buttonbush (*Cephalanthus occidentalis*). Ground cover is sparse and limited to those species that can survive both inundation and dense shade. Dominant groundcover species include richweed (*Pilea pumila*), lizard's tail (*Saururus cernuus*), sensitive fern (*Onoclea sensibilis*), and Virginia dayflower (*Commelina virginica*).

Two jurisdictional wetlands would be impacted by work associated with the proposed project. Approximately 8.24 acres of wetlands (Wetlands AO and BJ) along the Savannah River would be affected during construction of the cooling water intake system and the discharge structure for the proposed VEGP Units 3 and 4. Soils in these wetlands are loamy sands more than 36 inches deep. Dominant species present in both wetlands consist of bald cypress, American sycamore, and red maple.

Locations of the wetlands, as well as streams, are identified on the attached Corps Jurisdiction Map (Figures 4A, 4B, 4C, and 4D). For convenience, the wetlands and streams are grouped by geographic region. The *A* series wetlands and *100s* streams are in the northern portion of the site. The *B* series wetlands and *200s* streams are in the eastern region along the Savannah River. The *C* series wetlands and *300s* streams are in the southeastern corner of the site. The *D* series wetlands and *400s* streams are in the southwestern corner. All jurisdictional resources are described within the Jurisdictional Waters Delineation Report which was verified by the Savannah District on December 10, 2007, and May 28, 2008.

### ***Jurisdictional Waters Descriptions - Wetlands***

Wetland AA is approximately 0.25 acres and is located in the northern portion of the property. Soils consist of sandy clay loam with a color 10YR 3/1. Dominant vegetation includes sweetgum and giant cane. Hydrology indicators include saturation in the upper 12 inches and drainage patterns.

Wetland AB is approximately 0.86 acres and is located in the northern portion of the property. Soils consist of sandy clay loam with a color 10YR 3/1. Dominant vegetation includes sweetgum and giant cane. Hydrology indicators include saturation in the upper 12 inches and drainage patterns.

Wetland AC is approximately 0.06 acres and is located in the northern portion of the property. Soils consist of sand with a color of 10YR 3/1. Dominant vegetation includes soft rush (*Juncus effusus*) and giant cane. Hydrology indicators include inundation.

Wetland AD is approximately 0.21 acres and is located in the northern portion of the property. Soils consist of sand with a color 10YR 3/1. Dominant vegetation includes giant cane, soft rush, and Christmas fern (*Polystichum acrostichoides*). Hydrology indicators include saturation in the upper 12 inches and drainage patterns.

Wetland AE is approximately 0.0047 acres and is located in the northern portion of the property. Dominant vegetation is mainly soft rush. Soils consist of sand with a color of 10YR 3/1. Hydrology indicators include drainage patterns and inundation.

Wetland AF is approximately 0.78 acres and is located in the northern portion of the property. Soils consist of sandy loam with a color of 10YR 2/1. Dominant vegetation includes sweetgum, giant cane, and American holly. Hydrology indicators include inundation.

Wetland AG is approximately 4.25 acres and is located in the northern portion of the property. Soils consist of sandy clay loam with a color of 10YR 4/1. Dominant vegetation includes soft rush, woolgrass (*Scirpus cyperoides*), dogfennel (*Eupatorium capillifolium*), giant cane, sedges, red maple, sweetgum, blackberry (*Rubus* sp.), and cattail (*Typha* sp.). Hydrology indicators include inundation.

Wetland AH is approximately 0.26 acres and is located in the northern portion of the property. Soils consist of sandy clay loam with a color of 10YR 4/2. Vegetation includes soft rush, woolgrass, red maple, and dogfennel. Hydrology indicators include inundation to a depth of 12 inches.

Wetland AI is approximately 0.45 acres and is located in the northern portion of the site. Soils consist of loam with a color of 5YR 3/1 in the upper 10 inches. The dominant vegetation includes ironwood, American holly, common greenbrier (*Smilax rotundifolia*), Christmas fern, giant cane, and sedges. Hydrology indicators include saturation in the upper 12 inches, drainage patterns, sediment deposits, and water stained leaves.

Wetland AJ is approximately 0.31 acres and is located northern portion of the property. Soils present are composed of sandy clay loam with a color of 10YR 4/2 with common mottles with color of 10YR 5/6. Dominant vegetation consists of ironwood, common greenbrier, and giant cane. Hydrology indicators include inundation to a depth of 12-inches in the soil profile.

Wetland AK is approximately 12.24 acres and is located in the northern portion of the property. Soils present are composed of sandy loam with a color of 10YR 5/1. Dominant vegetation consists of giant cane, woolgrass, soft rush, and red maple. Hydrology indicators include inundation.

Wetland AM is approximately 0.11 acres and is located in the northern portion of the property. Soils consist of sandy clay with a color of 10YR 4/1. Dominant vegetation includes bald cypress, swamp tupelo (*N. biflora*), giant cane, tulip poplar (*Liriodendron tulipifera*), and soft rush. Hydrology indicators include inundation.

Wetland AN is approximately 2.57 acres and is located in the northern portion of the property. Soils consist of sandy loam with a color of 10YR 2/1. Dominant vegetation includes swamp tupelo, sweetgum, American holly, cypress, and giant cane. Hydrology indicators include inundation.

Wetland AO is approximately 22.57 acres and is located along the Savannah River on the eastern portion of the site. The soil is composed of loamy sand more than 36 inches deep with a color of 7.5 YR 4/4. The dominant vegetation consists of bald cypress (with buttressing and root knees), American sycamore, and red maple. Hydrology indicators included sediment deposits and water marks.

Wetland AP is approximately 0.015 acres and is located in the northern portion of the property. Soils present are composed of sandy loam with a color of 10YR 5/1. Dominant vegetation consists of ironwood and giant cane. Hydrology indicators include saturation to the soil surface.

Wetland BA is approximately 1.27 acres and is located along the Savannah River on the eastern portion of the site. Soils present are composed of loamy sand more than 36 inches deep with a color 7.5 YR 4/4. The dominant vegetation consists of bald cypress (with buttressing and root knees), American sycamore, and red maple. Hydrology indicators included sediment deposits and water marks on trees.

Wetland BB is approximately 0.005 acres and is located in the eastern portion of the site near the Savannah River floodplain. Soils consist of sandy loam with a surface layer of organic material deposited under saturated conditions (O horizon). The dominant vegetation includes ironwood, tag alder (*Alnus serrulata*), giant cane, soft rush, and sedges. Hydrology indicators include saturation to the soil surface, sediment deposits, drainage patterns, and water stained leaves.

Wetland BC is approximately 0.017 acres, is located in the eastern portion of the site near the Savannah River floodplain, and is also the source of Stream 201. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay (*Persea*

*borbonia*), sweetbay (*Magnolia virginiana*), giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BD is approximately 0.038 acres, is located in the eastern portion of the site near the Savannah River floodplain, and flows into Stream 201. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BE is approximately 0.0016 acres and is located in the eastern portion of the site near the Savannah River floodplain. Soils consist of sandy loam with an O horizon. The dominant vegetation includes giant cane and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BF is approximately 0.015 acres, is located in the eastern portion of the site near the Savannah River floodplain, and is also the source of Stream 202. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BG is approximately 0.0028 acres and is located in the eastern portion of the site near the Savannah River floodplain. Soils consist of sandy loam with an O horizon. The dominant vegetation includes giant cane and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BH is approximately 0.021 acres and is located in the eastern portion of the site near the Savannah River floodplain. Soils consist of a sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BJ is approximately 25.37 acres and is located along the Savannah River on the eastern portion of the site. Soils present are composed of loamy sand more than 36 inches deep with a color of 7.5 YR 4/4. The dominant vegetation consists of bald cypress (with buttressing and root knees), American sycamore, and red maple. Hydrology indicators include sediment deposits and high water marks on trees.

Wetland BK, approximately 0.024 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 207. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BL, approximately 0.019 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 208. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay,

giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BM, approximately 0.059 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 208. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BN, approximately 0.20 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 206. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BO, approximately 0.26 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 205. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BP, approximately 0.013 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 203. Soils consist of sandy loam with an O horizon. The dominant vegetation includes giant cane and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BQ, approximately 0.19 acres in size, is located in the eastern portion of the site near the Savannah River floodplain and is also the source of Stream 204. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BR is approximately 0.084 acres and is located in the eastern portion of the site near the Savannah River floodplain. Soils consist of sandy loam with an O horizon. The dominant vegetation includes sweetgum, tag alder, redbay, sweetbay, giant cane, and Christmas fern. Hydrology indicators include saturation to the soil surface, sediment deposits, and water stained leaves.

Wetland BT is approximately 0.0030 acres and is located along the Savannah River on the eastern portion of the site. Soils present are composed of loamy sand more than 36 inches deep with a color of 7.5 YR 4/4. The dominant vegetation consists of bald cypress, American sycamore, and red maple. Hydrology indicators included sediment deposits and water marks on trees. Other wetland indicators include tree buttressing and root knees.

Wetland CA is approximately 1.03 acres and is located on the southeastern portion of the site. The soil is sandy clay with a color of 5YR 5/2. The dominant vegetation is black willow,

woolgrass, soft rush, and sedges. Hydrology indicators include inundation, water marks, drift lines, drainage patterns, and water stained leaves.

Wetland CB is approximately 18.73 acres and is located in the southeastern portion of the property. Soils consist of sandy clay with a color of 10YR 3/1. The dominant vegetation includes cinnamon fern, giant cane, loblolly pine, greenbriar, sweetgum, tulip poplar, and red maple. Hydrology indicators include saturation in the upper 12 inches, drainage patterns, and water stained leaves.

Wetland CC is approximately 0.85 acres and is located on the southeastern portion of the property. Soils consist of sandy clay with a color of 10YR 2/1. The dominant vegetation includes sweetbay, cinnamon fern, green briar, giant cane, sweetgum, black willow, and swamp tupelo. Hydrology indicators include saturation in the upper 12 inches.

Wetland CD is approximately 7.1 acres and is located in the southeastern portion of the property. Soils consist of sandy clay loam with a color of 10YR 3/2 and common mottles of 10YR 5/6. Dominant vegetation includes tulip poplar, sweetgum, red maple, and giant cane. Hydrology indicators include saturation in the upper 12 inches, oxidized root channels, and drainage patterns.

Wetland CE is approximately 2.53 acres and is located in the southeastern portion of the property. Soils consist of sandy clay varying from 10YR 3/2 to gley colors and an O horizon. Hydrology indicators include saturation in the upper 12 inches, drift lines, oxidized root channels, and water stained leaves.

Wetland CF is approximately 0.6 acres and is located in the southeastern portion of the property. Soils consist of sandy clay with a color of 10YR 3/2. The dominant vegetation includes giant cane, tag alder, black willow, swamp tupelo, and sedges. Hydrology indicators include drainage patterns, drift lines, and saturation in the upper 12 inches.

Wetland CG is approximately 3.7 acres and is located in the southeastern portion of the property. Soils consist of loamy sand with a color of 10YR 2/2 and an O horizon. The dominant vegetation includes bald cypress, greenbriar, sedges, giant cane, and swamp tupelo. Hydrology indicators include inundation, sediment deposits, drainage patterns, oxidized root channels, and water stained leaves.

Wetland CH is approximately 34.6 acres and is located in the southeastern portion of the property. Soils consist of loamy sand with a color of 10YR 2/2 and an O horizon. The dominant vegetation includes bald cypress, greenbriar, sedges, giant cane, and swamp tupelo. Hydrology indicators include inundation, sediment deposits, drainage patterns, oxidized root channels, and water stained leaves.

Wetland DA is approximately 10.86 acres and is located in the southwestern portion of the property. It originates from two sources – a road culvert and an ephemeral drainage – and is affected by beaver impoundment. Soils present are composed of sandy clay loam with a color of 5YR 2/2 and common mottles of 5YR 5/8. The dominant vegetation consists of giant cane,

soft rush, woolgrass, tulip popular, and tag alder. Primary hydrology indicators include inundation, water marks and sediment deposits. A secondary indicator of hydrology observed was water stained leaves.

Wetland DB is approximately 11.84 acres and is located in the southwestern portion of the property. Soils consist of loamy sand with a color of 10YR 2/1 and an O horizon. The dominant vegetation includes tag alder, black willow, sedges, green briar, sweetgum, and giant cane. The hydrology indicator consists of inundation.

Wetland DC is approximately 1.91 acres and is located on the southwestern portion of the site. The soil is depositional sand. Dominant vegetation includes black willow, wax myrtle (*Myrica cerifera*), soft rush, and sedges. Hydrology indicators include inundation, water marks, sediment deposits, drainage patterns, and oxidized root channels.

Wetland DD is approximately 3.67 acres and is located on the southwestern portion of the site. Soils consist of loamy sand with an O horizon and a color of 5YR 6/1. Dominant vegetation includes giant cane, soft rush, sweetgum, tulip popular, and sweetbay. Hydrology indicators include inundation up to an inch deep, water marks, sediment deposits, drainage patterns, oxidized root channels, and water stained leaves.

#### ***Jurisdictional Waters Descriptions - Streams***

Stream 101 (≈6,430 lf) is a perennial stream located in the northern portion of the property. It originates from Mallard Pond and flows into Stream 102. It is four to eight feet wide at the ordinary high water mark (OHWM). Substrate is comprised of sand and silt.

Stream 102 (≈1,200 lf) is a perennial stream located in the northern portion of the site. It originates on-site and flows into the Savannah River. It is a perennial stream five to ten feet wide at OHWM. Substrate along the channel is composed of sand.

Stream 103 (≈415 lf) is an intermittent stream located in the northern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 104 (≈75 lf) is an intermittent stream located in the northern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 105 (≈165 lf) is an intermittent stream located within the northern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 106 (≈197 lf) is an intermittent stream located in the northern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 107 (≈490 lf) is a perennial stream located in the northern portion of the property. It is four to eight feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 108 (≈465 lf) is an intermittent stream located in the northern portion of the property. It is three to six feet wide at OHWM. Substrate is comprised of sand, silt, and organic matter.

Stream 109 ( $\approx 1,200$  lf) is an intermittent stream located in the northern portion of the property. It is three to six feet wide at OHWM. Substrate is comprised of sand, silt, and organic matter.

Stream 201 ( $\approx 530$  lf) is an intermittent stream located in the eastern portion of the site. It flows into the Savannah River. It is two to four feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 202 ( $\approx 426$  lf) is an intermittent stream located in the eastern portion of the site. It flows into the Savannah River. It is two to four feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 203 ( $\approx 830$  lf) is an intermittent stream located in the eastern portion of the site. It flows into the Savannah River. It is two to four feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 204 ( $\approx 187$  lf) is an intermittent stream located in the eastern portion of the site. It is one to two feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 205 ( $\approx 282$  lf) is an intermittent stream located in the eastern portion of the site. It is one to two feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 206 ( $\approx 530$  lf) is an intermittent stream located in the eastern portion of the site. It flows into the Savannah River. It is two to four feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 207 ( $\approx 155$  lf) is an intermittent stream located in the eastern portion of the site. It is one to two feet wide at the OHWM. Substrate along the channel consists of sand.

Stream 208 ( $\approx 98$  lf) is an intermittent stream located in the eastern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 209 ( $\approx 1,250$  lf) is an intermittent stream located in the eastern portion of the property. It is two to four feet wide at OHWM. Substrate is comprised of sand and silt.

Stream 301 ( $\approx 6,950$  lf) is a perennial stream located in the southeastern portion of the property. It is six to eight feet wide at OHWM. Substrate consists of sand.

Stream 302 ( $\approx 1,850$  lf) is a perennial stream located in the southeastern portion of the property. It is ten to twelve feet wide at OHWM. Substrate consists of sand.

Ephemeral 303 ( $\approx 594$  lf) is an ephemeral stream located in the southeastern portion of the property. It is two to four feet wide at OHWM. Substrate consists of sand.

Stream 401 ( $\approx 910$  lf) is a perennial stream located in the southwestern portion of the site. It is three to six feet wide at OHWM. Substrate along the channel consists of sand.

Ephemeral 402 (~300 lf) is an ephemeral stream located in the southwestern portion of the property. It is two to four feet wide at OHWM. Substrate consists of depositional sand.

Ephemeral 403 (~562 lf) is an ephemeral stream located in the southwestern portion of the property. It is two to four feet wide at OHWM. Substrate consists of sand.

### **Proposed Stormwater Management**

Southern Nuclear is implementing a phased approach to stormwater management. As such, multiple Notices of Intent (NOIs) would be submitted to EPD for coverage under the National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges from Construction Activities for Stand Alone Construction Projects (GAR100001). Concurrence would be obtained before the start of each phase of construction, which would ensure that Best Management Practices (BMPs) are properly designed, installed, and maintained. The current plant operates existing storm water facilities that are routinely maintained and fully functional. The proposed plan would call for the implementation of additional stormwater management facilities to ensure that post-developed runoff rates do not exceed the pre-developed rates.

### **Proposed Soil, Erosion, and Sediment Control Measures**

As a requirement of the NPDES permit, Erosion, Sediment and Pollution Control Plans have been prepared and will be submitted for approval and implementation during construction. This permit is required before land disturbing activities can commence at the site. BMPs anticipated for this project are expected to include a combination of the following:

- Construction Exit,
- Sediment Barrier (silt fence, hay bales, and mulch berms),
- Check Dams,
- Temporary Sediment Basin,
- Filter Ring,
- Temporary Downdrain Structure,
- Rock Filter Dam,
- Storm Drain Inlet and Outlet Protection,
- Surface Roughing,
- Matting and Blankets
- Mulching, and
- Temporary Seeding.

According to the Georgia Erosion and Sedimentation Act of 1975, as amended, a stream buffer variance would be required for this project and would be sought from the Director of EPD.

## **Impacts**

### ***Construction Impacts to Aquatic Resources***

In order to accommodate the installation of the two new reactor units, a number of activities resulting in impacts to jurisdictional waters of the U.S., including navigable waters, are proposed. These activities include construction of a cooling water intake system and an associated access road, plus installation of an outfall structure. Table 3 provides a summary of all dredge and fill impacts. The permanent sedimentation basin will impact approximately 610 linear feet (0.07 acre) of Ephemeral Stream 403.

Southern Nuclear proposes construction of a 240-foot long by 170-foot wide intake canal, extending landward from shoreline of the Savannah River, to support cooling system water demands for Units 3 and 4. The approximate 90-foot by 125-foot cooling water intake structure, including its nine pump bays, would be located at the head of the intake canal. This structure, as well as the associated access road, would fill approximately 5.50 acres of Wetland AO and 0.55 acre of the Savannah River.

The bottom of the intake canal would be excavated to a final elevation of 70 feet above MSL (10 feet below the normal water surface of the Savannah River, which stands at 80 feet MSL) and would impact 0.99 acre of Wetland AO and 0.55 acre of the river. To achieve the 70-foot bottom elevation, the canal would be over-excavated by three feet to allow for the placement of a 3-foot deep bed of rip-rap (4,500 cubic yards). Vertical sheet piles would be driven along the sides of the canal and would extend upward to an elevation of about 98 feet above MSL. For the entire intake system, permanent impacts to jurisdictional waters would total approximately 7.59 acres, including 24,840 cubic yards of energy dissipating rip-rap and sheet piling for the construction of the cooling water intake structure (6.49 acres of wetlands and 1.10 acre of open waters of the Savannah River, plus an additional 0.90 acre of uplands). Approximately 120,100 cubic yards of material would be dredged and placed in an upland disposal area in order to construct the intake canal.

There will also be temporary construction impacts within Wetland AO associated with the cooling water intake system. These impacts will include approximately 0.26 acre of mechanical clearing/grubbing associated with the installation of silt fence and other BMPs, as well as 1.14 acres of excavation (with subsequent backfilling of 0.06 acre for a rip-rap pad) for a temporary sedimentation basin during construction. All of these impacts would be restored to pre-project elevations/contours after completion of the project.

About 400 feet downstream of the existing outfall, a new outfall pipe (decreasing in diameter from 42 to 24 inches in a waterward direction) would extend approximately 50 feet into the Savannah River from the normal shoreline (at 80 feet MSL). The centerline elevation of the pipe would be approximately three feet above the river bottom; rip-rap would be placed around the pipe's discharge point in order to resist erosion. A cofferdam would be built in the river using sheet piles before installation of the pipe. The sheet piling would then be cut to within one foot of the river bottom elevation and left in place after installation of the pipe. The outfall

structure would also temporarily impact 0.35 acres of Wetland BJ and 0.30 acres of open waters of the Savannah River.

Activities supporting construction of the new intake structure and the new discharge outfall would involve dredging an additional approximate 200 cubic yards from the river adjacent to the site for access to the shoreline. At the present time, mechanical dredging is proposed for all work within the river; however, all dredged material, whether mechanically or hydraulically dredged, would be removed from the river and deposited in a 4.5-acre upland area along the proposed access road to the intake structure. Return water from the disposal site would meet appropriate Section 401 water quality standards as specified in the Section 401 certification.

**Table 3 – Summary of Jurisdictional Impacts**

Type of Activity	Fill (in acres and yd. <sup>3</sup> )			Dredging (in acres and yd. <sup>3</sup> )		
	Wetlands	River	Streams	Wetlands	River	Uplands
<b>Intake System and Access Road (Wetland AO)</b>	5.50 + 0.26*	0.11 + 0.44 (2,140 yd. <sup>3</sup> ) rip-rap		0.99 (22,700 yd. <sup>3</sup> ) + 1.14* (13,000 yd. <sup>3</sup> )	0.55 (12,500 yd. <sup>3</sup> )	0.90 (84,900 yd. <sup>3</sup> )
<b>Outfall Structure (Wetland BJ)</b>		0.02 (1,500 yd. <sup>3</sup> ) rip-rap		0.35* (900 yd. <sup>3</sup> )	0.30* (800 yd. <sup>3</sup> )	
<b>Construction Access from River</b>					200 yd. <sup>3</sup>	
<b>Sedimentation Basin (Ephemeral Stream 403)</b>			0.07 (610 lf)			
<b>Totals</b>	5.76	0.57	0.07 (610 lf)	2.48 (36,600 yd. <sup>3</sup> )	0.85 (13,500 yd. <sup>3</sup> )	0.90 (84,900 yd. <sup>3</sup> )

\* Indicates temporary impacts

Cumulatively, a total of approximately 734 feet of the shoreline of the Savannah River would be impacted for the cooling water intake canal portion of the project. Although there will be some noise and temporary turbidity associated with the dredging activity, turbidity will be minimized by using cofferdams or by excavating in the dry. Mortality to motile riverine organisms during dredging should be minimal since they should be generally well able to escape the impact area. No dredging within known spawning areas is proposed. Although non-motile or slow moving benthic organisms will likely experience some mortality, after dredging has ceased re-colonization should eventually occur. Thus, impacts to these species should be minor.

Construction of the powerblock, cooling towers, laydown areas, and access roads to the site will occur entirely within uplands. The dewatering of the construction site would be accomplished using the same method employed for the existing VEGP Units 1 and 2. Construction of the

existing units required excavation of material comprising the Water Table aquifer (which is underlain by the Blue Bluff Marl, providing hydraulic separation from the other two aquifers). Four pumps, each with a capacity of 500 gallons/minute (gpm), were used to remove the water from the excavation site; thus, normal dewatering had a maximum capacity of 2,000 gpm. Additional capacity was employed to remove water during at least one storm event. For the new units, EPD has issued a dewatering permit allowing the use of sock drains and dewatering wells with a capacity of up to 2.9 million gallons/day (MGD).

Dewatering of the new foundation excavations during construction will occur for approximately 18 months. Although the dewatering systems will potentially depress the water table in the vicinity of the construction area, these systems will not dewater the two confined aquifers underlying the Water Table aquifer because of their hydraulic separation. Water pumped from the excavation site will be discharged into a settling basin, if necessary, before being released through a NPDES permitted outfall.

Data from observation wells monitored during construction of VEGP Units 1 and 2 revealed a variable response in the Water Table aquifer near the excavation site. The most distant well in the vicinity of the excavation for which a record exists, well #804, approximately 1,000 feet southwest of the excavation, was not substantially impacted (i.e., it experienced an approximate 2-foot decline, but subsequently recovered). Water continued to flow from Mallard Pond throughout the dewatering activity, which lasted for 7 years for these two units. The Mallard Pond discharge is currently being monitored for any signs of reduced flow. After construction had finished, the Water Table aquifer made a complete recovery within 2 years. Because the Water Table aquifer discharges into a surface-water drainage headed by Mallard Pond, there may be temporary project impacts to groundwater-influenced on-site wetlands during construction; however, a review of the change in the piezometric surface of the Water Table aquifer since 1971 by Plant Vogtle has concluded that other factors including alteration of the land surface, infiltration patterns, run-off patterns, and vegetation can also influence the piezometric surface and subsurface flow paths within the aquifer.

To summarize, the impacts of hydrological alterations (including water quality impacts) resulting from construction activities would be localized and temporary; the NPDES stormwater permits, 401 Certification, and Corps Section 10/404 permit processes would minimize impacts. Thus, NRC concluded that the impacts of hydrological alterations would be SMALL and further mitigation beyond those actions proposed in the final EIS are not warranted. Impacts to the aquatic ecosystem would also be SMALL, temporary, and largely mitigable.

#### ***Operational Impacts to Aquatic Resources***

The total size of the Savannah River watershed is approximately 10,579 square miles, 5,870 square miles of which are in Georgia, 4,530 square miles in South Carolina, and 179 square miles in North Carolina. The confluence of the Seneca and Tugaloo Rivers, which is now located within Lake Hartwell, is considered the upstream limit of the Savannah River. From Hartwell Dam, the Savannah River flows 288.9 miles to its mouth, where it enters the Atlantic Ocean at Savannah, Georgia.

## Surface Water

Because the Savannah River's operational discharge at the VEGP site during low-water periods is currently regulated by upstream dam operations, present-day operating rules adapted from the Corps for the upstream dams were factored into VEGP's water use proposal. Channel modifications were previously made to the river to allow for a 9-foot deep by 90-foot wide federal navigation channel from Savannah Harbor to the city of Augusta. By 1980, shipping along the river had essentially ceased and maintenance of the channel was discontinued by the Corps. Consequently, Hartwell, Russell, and J. Strom Thurmond Dams are no longer operated for navigation. Minimum discharges from Thurmond Dam are based on the needs of downstream water supply withdrawals without regard to navigation. Savannah River flows passing the project site are affected significantly by releases from Thurmond Dam. Although the dams located downstream of Thurmond Dam re-regulate the daily peaks and troughs of water released from Thurmond Dam, they are not capable of storing any significant volumes of water themselves. As a result, the average discharge passing the site is directly proportional to the average volume of water released from Thurmond Dam, which is itself based on Drought Contingency Plan rule curves. During periods of relative water scarcity, outflow released from Thurmond Dam is a function of the volume of water presently stored behind both Hartwell and Thurmond Dams (the two dams with significant storage capacity).

Flow data in the Savannah River are collected by the U.S. Geological Survey (USGS), in cooperation with Plant Vogtle, near the existing barge mooring area on the site. This stream gage, named Savannah River near Waynesboro, is assigned USGS gage number 021973269 (the accuracy of the USGS reported daily-discharge data is within about 10 percent of the true value). The USGS also reports discharge and reservoir storage upstream of the site, including conditions at Hartwell, Russell, and Thurmond Dams. Other USGS stream gages near the site include (1) Savannah River at Augusta (USGS gage 02197000), located at Savannah RM 187.4 and accurate to within 15 percent of the true discharge; (2) Savannah River near Jackson (period of record October 1971 to September 2002 - USGS gage 02197320), located at Savannah RM 156.8 and accurate to 10 percent of the true discharge; and (3) Savannah River at Burton's Ferry Bridge near Millhaven (USGS gage 02197500), located at Savannah RM 118.7 and accurate to within 15 percent of the true discharge.

The magnitude of surface-water withdrawals associated with operation of the proposed VEGP Units 3 and 4 would fluctuate with upstream discharges in the Savannah River. VEGP staff evaluations indicate that, at the normal withdrawal rate of 83 cfs (37,224 gpm), the proposed new units would withdraw approximately one percent of the average river discharge. At the maximum withdrawal rate of 129 cfs (57,784 gpm), the proposed VEGP Units 3 and 4 would withdraw between 1.5 and 3.4 percent of the total flow of the Savannah River as the river fluctuates between average and Drought Level 3. Compared with existing withdrawals, Units 3 and 4 would increase the average rate of water uptake from the river by an estimated four percent, with a maximum uptake of about six percent over existing operations, depending upon river flow conditions. Prior to operation of the Unit 3 and 4 Intake structure, Southern Nuclear would be required to first obtain a water withdrawal permit from the Georgia DNR and demonstrate compliance with the Clean Water Act, Section 316(b).

A water surface elevation versus discharge relationship was developed by the USGS in order to monitor discharges near the VEGP site. Using this relationship, at the maximum withdrawal rate of 129 cfs, the resulting decrease in river stage associated with operation of the proposed new VEGP units would be approximately 2 inches at Drought Level 3 and approximately 1 inch under average flow conditions.

The State of Georgia has classified the water use in the Savannah River near the VEGP site as "Fishing: propagation of fish, shellfish, game and other aquatic life." Daily average dissolved oxygen levels are required to be a minimum of 6.0 mg/l. Upstream of the VEGP site, between Thurmond (RM 221.6) and Stevens Creek Dams (RM 208.1), the Savannah River is listed as not fully supporting its designated water use due to dissolved oxygen levels; thus, it has been placed on the Georgia 303(d)/305(b) list. In contrast, near the VEGP site at Savannah RM 150.9, the river is not listed as impaired by the State of Georgia. This conclusion is supported by data provided by Southern Nuclear, which states that during 2003, dissolved oxygen levels near the site ranged between 6.1 mg/l and 11.4 mg/l, with a mean of 8.4 mg/l.

South Carolina also monitors water quality in the Savannah River near Plant Vogtle. The nearest water quality stations are both upstream and downstream of the site, at Savannah River Lock and Dam (Station SV-323 [RM 187]) and Savannah River at U.S. Highway 301 (12.5 miles southwest of Allendale: Station SV-118 [RM 119]), respectively. Data from these stations document that recreational and aquatic life uses were fully supported at both sites between January 1996 and December 2000 (the reporting period); however, there were some individual samples that exceeded the appropriate standard, including dissolved oxygen, pH, total phosphorus, total nitrogen, turbidity, fecal coliform, ammonia, cadmium, chromium, copper, lead, mercury, nickel, and zinc. Trends observed at the downstream station (SV-118) included an increase in total phosphorus concentration and a decrease in pH, total nitrogen, and fecal coliform bacteria concentrations. For total nitrogen and fecal coliforms, the decreasing trend suggests improving conditions for these two parameters.

In addition to Georgia and South Carolina, USDoE has monitored the water quality of the Savannah River for over 50 years. This federal agency monitors water quality at sampling sites located at RMs 160, 150.4, 141.5, 129.1, and 118. In 2003, data collected showed no indication of degradation or impairment.

Plant Vogtle collects on-site hydrological (i.e., flow) monitoring data in accordance with NPDES Permit GA0026786 and Industrial Stormwater Permit GAR00000. The most recent NPDES permit was issued on June 30, 1999. Discharge-monitoring locations include the following: final plant discharge, cooling tower blowdown from Units 1 and 2, wastewater retention basins for Units 1 and 2, sewage treatment plant emergency outflow, liquid radwaste systems discharge from Units 1 and 2, and nuclear service cooling tower blowdown.

Before the proposed Units 3 and 4 could begin to operate, VEGP would be required to obtain an NPDES permit for discharges from these units. In addition, Plant Vogtle would be required to demonstrate to Georgia DNR that the effluent limitations for the new units are adequate to ensure protection and propagation of a balanced, indigenous population of fish and wildlife through a Clean Water Act Section 316(a) demonstration. The thermal load discharged from

the two existing operational units does result in localized elevated water temperatures in the river. Temperature-related water quality impacts to the Savannah River resulting from the operation of the proposed units have been calculated to pose a maximum increase of less than 1.8° F; however, the size of the thermal plume from the proposed effluent discharge is small in comparison to the width of the Savannah River at the VEGP site. Therefore, the location and design of the discharge should not impede fish passage up and down the river, nor contribute to abnormally low dissolved oxygen concentrations.

The existing NPDES permit requires river temperature measurements directly associated with the current site operation, but not on a frequent basis. Thermal monitoring of the intake and final plant discharge is performed once every 5 years to support renewal of the NPDES permit. If determined to be necessary, Georgia DNR may require additional monitoring before issuance of any new NPDES permits and/or ongoing monitoring as a condition of any new NPDES permits.

Surface chemical water quality parameters currently monitored under the NPDES permit at various locations (i.e., not all are monitored at each location) are hydrazine, pH, free available chlorine, total residual chlorine, total chromium, total zinc, total suspended solids, oil and grease, and biological oxygen demand. The NPDES permit obtained for the existing units specifies chemical monitoring at a variety of locations internal to the VEGP site and at the final plant discharge location. Monitoring programs for thermal and chemical water quality will continue at VEGP for the foreseeable future.

Liquid effluent-related radiological impacts for the proposed Units 3 and 4 were estimated based upon output from the LADTAP II computer model. Relying upon the information provided by Southern Nuclear and the NRC, it was concluded that adverse health impacts on humans from radiation exposure resulting from the routine operation of the proposed new VEGP units would not violate the applicable annual dose standard found in 40 CFR 190 (13.9 mGy/year whole body dose equivalent).

Although there are no similar standards for biota, the International Commission on Radiological Protection has concluded that if humans are adequately protected, other living things are also likely to be sufficiently protected. The International Atomic Energy Agency (IAEA) and the National Council on Radiation Protection and Measurements reported that a chronic dose rate of no greater than 10 mGy/day (1000 mrad/day) received by a maximally exposed individual in a population of aquatic organisms would ensure protection of the population. IAEA also concluded that chronic dose rates of 1 mGy/day (100 mrad/day) or less do not appear to cause observable changes in terrestrial animal populations. The maximum calculated dose for any of the biota studied was 0.0047 mGy/year, which is well below the human standard.

A radiological environmental monitoring program (REMP) has been in place for the VEGP site since operations began in 1987, with preoperational sample collection activities beginning in 1981. The REMP includes monitoring of the airborne exposure pathway, direct exposure pathway, water exposure pathway, aquatic exposure pathway from the Savannah River, and the ingestion exposure pathway in a 5-mile radius of the station, with indicator locations near the plant perimeter and control locations at distances greater than 10 miles. The

preoperational REMP sampled various media in the environment – including air particulates, precipitation, crops, soil, well water, surface water, fish, and silt – as well as ambient gamma radiation in order to determine a baseline from which to observe the magnitude and fluctuation of radioactivity in the environment once the unit began operation. After operation of VEGP Unit 1 began in 1987, the monitoring program continued to assess the radiological impacts on workers, the public, and the environment. Because the current operational monitoring program is adequate to establish the radiological baseline for comparison with the expected impacts on the environment related to the construction and operation of the proposed new units at the VEGP site, no additional monitoring program has been established.

Plant Vogtle has prepared Erosion, Sedimentation and Pollution Control Plans in support of the NPDES Construction Stormwater Permit. This permit is required before land disturbing activities can commence at the site. When the new units are built and operated, monitoring of the discharge from the new units would likely be similar to the monitoring for the existing Units 1 and 2. Future monitoring of the Savannah River, intake structure withdrawals, and discharge outfall would also be performed as specified by the required permits to be issued by the Corps and the State of Georgia and obtained by Plant Vogtle prior to operation of the new units.

The cooling mechanism for Units 3 and 4 has been designed as a closed-cycle recirculating system. Such a system typically reduces water withdrawals by 96 to 98 percent over a once-through system. This is important not only as it relates to river water use, but also as it pertains to impingement and entrainment mortality of aquatic organisms. As a result of this and other minimization measures (discussed below), impingement and entrainment effects are expected to only minimally increase over current levels.

In summary, surface water utilization resulting from operation of VEGP, even at maximum consumptive use (likely a temporary condition), would not destabilize the resource. Thus, NRC concluded that impacts from surface water use would be SMALL and mitigation is not warranted.

## **Groundwater**

The groundwater resource in the vicinity of the VEGP site resides in three aquifers: the Water Table aquifer, the Tertiary aquifer, and the Cretaceous aquifer. As implied by its name, the Water Table aquifer is unconfined, relatively shallow, and subject to seasonal and inter-annual changes in response to precipitation. Groundwater levels are monitored at the VEGP site to meet the Georgia DNR requirements of the plant's groundwater use permit and the NRC groundwater monitoring program.

The Georgia DNR has the responsibility for protecting groundwater resources and maintains the Georgia Ground-Water Monitoring Network, which monitors the ambient water quality of nine aquifers. Among these is the Jacksonian system, which is close to the site and includes the Water Table aquifer, also known as the Upper Three Runs aquifer. For groundwater in the vicinity of the project site, the State of Georgia reported in 2004 on the water quality of the Jacksonian aquifer using data from eight wells drawing water from the Barnwell Group. Samples were analyzed for nitrate/nitrite and volatile organic compounds, including methyl tert-

butyl ether; however, no volatile organic compounds were identified above the reporting limit of 0.5 pg/l. The level of nitrate/nitrite was detectable in six wells and elevated in one (i.e., 7.6 mg/l), but below the primary maximum contaminant level standard (10 mg/l for nitrate-nitrogen).

In 1998, tritium was identified as a pollutant in the Water Table aquifer in the vicinity of the VEGP site. First discovered in 1988 in a public water supply well serving the DeLaigle Mobile Home Park a short distance (i.e., less than 2 miles west) from the VEGP site, it was initially believed that tritium contaminated the confined aquifer system. However, a thorough cooperative study of the region conducted by the Georgia DNR and the USGS has revealed that (1) the elevated tritium levels in the Water Table aquifer in eastern Burke County are well below the drinking water standard for tritium, (2) there is no evidence of regional tritium contamination of the confined Tertiary aquifer, (3) the primary pathway for tritium pollution of the Water Table aquifer is likely through recharge of the aquifer by atmospheric deposition of tritium released from the Savannah River Site, which is located in South Carolina and upwind of the VEGP site.

Groundwater in the vicinity of the project site is characterized by dissolved calcium-sodium bicarbonate. Total dissolved solids are less than 200 mg/l, with lower values in the Water Table aquifer. This value is below the secondary standard of 500 mg/l for total dissolved solids. Overall, the State of Georgia found the quality of site groundwater to be excellent. Plant Vogtle plans to continue monitoring groundwater levels in support of the existing units during construction of the proposed units. Southern Nuclear is committed to developing and deploying groundwater monitoring programs during construction and operation of the proposed units in coordination with the State of Georgia and the NRC.

Those persons currently using the Water Table aquifer as a groundwater resource generally pump at lower rates indicative of domestic household use and are, thus, exempt from the requirements of a groundwater-use permit. Non-agricultural water users requiring in excess of 100,000 gallons/day are required to apply for a permit in the State of Georgia. The Tertiary aquifer is the uppermost confined aquifer and includes sands, silts, and gravels that can yield substantial groundwater. The Cretaceous aquifer is composed of a sequence of aquifers and aquitards with strata also yielding substantial groundwater to wells. The production wells for the existing VEGP site withdraw groundwater from the Cretaceous aquifer, as do most high-production wells in the region. Several lower-yield wells at the VEGP site withdraw groundwater from the Tertiary aquifer. All existing wells at the VEGP site are under Georgia Water-Use Permit Number 017-0003, which allows a maximum monthly average pumping rate of 6.0 MGD and a yearly average pumping rate of 5.5 MGD.

The VEGP site maintains three wells within the Cretaceous aquifer and six wells within the Tertiary aquifer. The three wells in the Cretaceous aquifer are deep production wells with design yields of 1,000 to 2,000 gpm. These wells provide makeup water for the plant processes (e.g., 306 million gallons in 2005 for VEGP Units 1 and 2, or a rate of 0.838 MGD). The six wells in the Tertiary aquifer have design yields of 20 to 150 gpm and provide irrigation water, potable water for the recreation area and simulator training building, water supply for the nuclear operations garage, water supply for the security tactical training area, water supply for

fire protection, and a non-potable water supply for the new plant entrance security building (e.g., 2 million gallons in 2005 for VEGP Units 1 and 2, or a rate of 0.0056 MGD). Thus, in 2005 the total pumping rate was 0.843 MGD. Southern Nuclear has estimated the average pumping rate for normal operation of VEGP Units 1 and 2 as 730 gpm (1.05 MGD). The maximum pumping rate for these two units is estimated at 2,300 gpm (3.312 MGD). Both the normal and maximum operation levels are calculated for VEGP Units 1 and 2 operating simultaneously in the same mode.

Southern Nuclear projects groundwater consumptive use for the normal operation of proposed VEGP Units 3 and 4 at an average rate of 752 gpm (1.08 MGD), with a maximum operational rate of 3,140 gpm (4.52 MGD). During normal operation, approximately 305 gpm of groundwater (approximately 1,681 gpm during maximum operation) is returned as surface water to the Savannah River. Both the normal and maximum operational water-use rates are calculated for the proposed VEGP Units 3 and 4 operating simultaneously in the same mode.

Since 1974, the State of Georgia has required a groundwater-use permit for all non-agricultural groundwater users of more than 100,000 gpd. In 1997, the State of Georgia, as part of an interim strategy to manage salt water intrusion into the Floridan aquifer, instituted a moratorium on groundwater withdrawal permits for municipal, industrial, and agricultural uses in 24 Georgia counties. Burke County was among the 24 counties. The VEGP site is 62 miles or more from regions being impacted by saltwater intrusion. In 2006, Georgia issued its permitting plan for managing salt water intrusion. That plan identified Burke County as one among 19 counties that did not contribute substantially to the development or extent of salt water intrusion in coastal areas; however, in this 19-county region of Georgia, applications for water-use permits (i.e., industrial, institutional, commercial, municipal, and residential) continue to be reviewed to ensure a justified need exists and that aggressive and practical conservation and reuse principles and wastewater management are being applied. In its ESP application to the NRC, Southern Nuclear notes that new groundwater wells would be needed in the Cretaceous aquifer to supply water for operation of the proposed VEGP Units 3 and 4 and that it would request a modification of its existing water-use permit.

Wells at the VEGP site are permitted currently by the State of Georgia Environmental Protection Division to withdraw an annual average rate of 5.5 MGD (3,819 gpm), with a maximum monthly average of 6 MGD (4,167 gpm). Records for 2005 indicate that only 3.89 gpm were withdrawn from the Tertiary aquifer, while 582 gpm were withdrawn from the Cretaceous aquifer. Thus, although the majority of the groundwater resource used by the VEGP site is withdrawn from the Cretaceous aquifer, the rate of withdrawal is well below the permitted level.

Groundwater use under normal long-term demand for the operation of the proposed VEGP Units 3 and 4 is 752 gpm. This demand flow rate compares to a deep aquifer baseflow estimated to range from 119 to 218 MGD. Because at the VEGP location the deep aquifer flows toward erosional windows that permit discharge to the Savannah River, any use of deep aquifer groundwater acts to decrease discharge to the river. The normal demand of 751 gpm represents at most 0.9 percent of the base flow of the deep aquifer. The normal operating groundwater demand for both existing and proposed units would be 1,482 gpm and the maximum operating groundwater demand would be 5,440 gpm.

To summarize, groundwater withdrawals from the Cretaceous aquifer, even using a low estimate of baseflow, represent less than one percent of the total baseflow quantity available. Recharge to the Water Table aquifer during plant operation would be altered only within the localized area. As a result, NRC concluded that impacts from groundwater usage would be SMALL and mitigation is not warranted.

### ***Potential Transmission Line Impacts***

Southern Nuclear and Georgia Power plan a new 500-kV transmission line to serve the new units at the Vogtle site. Vogtle Units 3 and 4 would use the new transmission line or some combination of new and existing transmission lines. The new transmission line right-of-way would be routed northwest from the VEGP site, passing west of Fort Gordon and then north to the Thompson substation. The Thompson substation is located about 20 miles west of Augusta, Georgia. It is anticipated that the transmission line would cross Burke, Jefferson, McDuffie, and Warren Counties and would be 150 feet wide and 60 miles long. At this time, the exact route of the new transmission line is not known. To assist the NRC in their evaluation of potential impacts from construction of a new transmission line, Georgia Power conducted a study of possible routes between Vogtle Units 3 and 4 and the Thompson substation along a Representative Delineated Corridor (RDC). Land use types, buildings, known cultural resources, airports, military facilities, parks, residential areas, mines, etc. were all identified within the RDC. There are no USDA Forest Service Wilderness Areas, Wild/Scenic Rivers or Wildlife Refuges, State or National Parks within the RDC.

A hypothetical transmission line right-of-way that represents what Georgia Power believes is a feasible route within the RDC was identified as part of the transmission line study. Based on this analysis, habitats existing within the right-of-way could include approximately 148 acres of forest, 91 acres of forested wetlands, 329 acres of planted pine, 6.4 acres of open water, and 158 acres of open land. In the region surrounding the proposed transmission line right-of-way, there are 44,688 acres of forest, 41,898 acres of forested wetlands, 3,346 acres of open water and 42,656 acres of open land. Assuming the actual routing is similar to the hypothetical route, the number of acres of habitat that would be affected represents a very small portion of the total habitat.

To the extent practicable, streams and wetlands will be avoided in the actual transmission line routing. Any unavoidable activities within waters of the U.S. will be conducted in a manner consistent with the requirements and conditions of Nationwide Permit 12. Once transmission line siting begins, if additional impacts to waters of the U.S. are required, those areas will be identified and appropriate mitigation provided.

Based on the information provided by Southern Nuclear and Georgia Power, as well as the NRC's own independent review, the NRC staff concluded in their FEIS that the land-use impacts of constructing an additional transmission line to serve the VEGP site would be MODERATE.

### **Avoidance and Minimization**

A jurisdictional determination, including a wetland delineation, was conducted for the project and coordinated with the Corps' Savannah District in order to ensure that construction impacts – including equipment laydown areas and associated infrastructure such as roads and stormwater drainage – to jurisdictional portions of the property could be adequately avoided and/or minimized. New upland retention ponds would be constructed (existing debris basins would not be reused) to serve as sedimentation basins for surface-water runoff.

With the exception of the intake structure and discharge outfall, all VEGP Units 3 and 4 structures will be located in areas of the site that were previously cleared and graded during construction of Units 1 and 2. Impacts to waters of the U.S. will be limited to the construction of structures that, by their nature, must be located within such areas. When evaluating potential locations for the intake structure and discharge line, every consideration was made to limit impacts to wetlands, other waters of the U.S., cultural resources, and threatened and endangered species. Additionally, these elements were located in a manner which, as much as possible, will limit the surface area of wetlands impacted.

As described previously, the cooling mechanism for Units 3 and 4 has been designed as a closed-cycle recirculating system. Such a system typically reduces water withdrawals by 96 to 98 percent over a once-through system. This is important not only as it relates to river water use, but also as it pertains to impingement and entrainment mortality of aquatic organisms. The reduced water withdrawal rate produces a corresponding reduction in impingement and entrainment.

In addition, a one-year study of impingement and entrainment at VEGP Units 1 and 2 was completed in 2009 to support the evaluation of Units 3 and 4. The results indicated that impingement and entrainment losses at these two Units were minor. Further, the U.S. Environmental Protection Agency (EPA) has established a national standard of 0.5 feet/second for the intake through-screen velocity in order to limit fish impingement mortality. Units 3 and 4 will adhere to this standard at a minimum river water level of 78 feet MSL. As a result, impingement mortality from the two new units should be negligible.

With respect to entrainment, in addition to the recirculating cooling system described above, a weir wall would extend upward approximately 0.3 m (1 ft) from the bottom of the intake canal near its entrance. This wall will further serve to reduce entrainment mortality by restricting the portion of the water column that will be able to enter the intake canal. Based on the small percentage of water withdrawn, the design of the cooling intake canal and structure, the lesser larval densities in the straighter part of the river at the location of the VEGP site, the typically high fecundity of most species inhabiting rivers, and the high natural mortality rates of eggs and larvae, the NRC concluded that impacts to the fish of the Savannah River from entrainment due to the operation of the proposed VEGP Units 3 and 4 would be minor. As with impingement, an EPA entrainment standard exists that relates to the percentage of the flow of a source waterbody passing a site that is withdrawn by the site's intake. Units 3 and 4, even at maximum withdrawal, will use no greater than 3.4 percent of the Savannah River's mean

annual flow, which is well below the EPA standard of 5 percent. Thus, entrainment mortality should be minimal.

The new intake system has been sited and revised to reduce impacts as much as possible by reducing the canal length and placing it in an area that will minimize dredging requirements. The intake location was selected, in part, because the shorter distance from the bluff to the river minimized the area of disturbance (canal length) required to access the river. Also, the Savannah River channel at this location is of a sufficient depth to minimize the dredging required to connect the canal (once excavated) with the river channel. The intake canal/structure and associated access road will be located and designed in a manner which minimizes their footprint and limits jurisdictional impacts, while still achieving compliance with Clean Water Act Section 316(b) requirements on intake velocities.

Options for maintenance access to the intake system are limited due to the presence of a high bluff landward of the structure. The steepness of the bluff and the presence of poor foundation soils make construction of a direct access road problematic. In addition, the location of the intake system was moved upstream from the original design, partially in an effort to reduce the length of the road and avoid wetland impacts. The width of the road was also minimized from the original design. Additional consideration was given to the nearby cultural resources and avoiding impacts to those areas (see Historic Properties section below).

The new discharge pipe will be located approximately 400 feet downstream of the existing outfall pipe. This location was chosen in order to minimize the cumulative thermal impacts that would have occurred had the new outfall been placed closer to the existing outfall. The intervening distance allows the upstream outfall discharge to be diluted by river water before reaching the new outfall. After placement of the new pipe, all associated temporary wetland impacts (0.35 acre) would be restored. Additional engineering measures, such as the use of an HDPE line to limit junction boxes, are also being made to further reduce impacts. After construction, construction access areas will be stabilized and re-vegetated to preclude future erosion. Erosion and sediment controls would remain in place and would be maintained as long as necessary.

In order to limit the downstream effects of dredging and water-related construction activities, cofferdams would be constructed around these sites to limit downstream migration of river sediments. For the intake canal, in order to minimize turbidity entering the river, excavation would be done in the dry, beginning at the landward end of the cofferdam face and proceeding toward the river. Permanent sheet piles forming the northwestern and southeastern banks of the intake canal would be driven using a vibrating or diesel hammer, which would also serve as the walls of a cofferdam. Temporary sheet piling would be driven around the perimeter of the intake structure and across the northeastern and southwestern faces of the intake canal to complete the cofferdam. It is anticipated that construction work on the intake structure would occur in the summer, fall, and early winter in order to reduce the potential for unwanted flooding of the construction area and to minimize adverse impacts to those fish and other aquatic organisms that move into the floodplain with the high-water conditions that typically occur during the months of February, March, and April.

Pursuant to the Section 404(b)(1) Guidelines, the applicant made a commitment during the initial planning stages to achieve the project goals in a practicable manner and gave consideration to potential environmental impacts, costs, logistics, and existing technology during the process. As a result of these efforts, complete avoidance of all Corps jurisdictional areas was considered by the project team; however, due to the size of the project, the need to be in close proximity to the existing facility and the Savannah River, and the presence of multiple jurisdictional streams and wetlands on the available property, it is not practicable from cost and logistical perspectives to construct the fundamental aspects (i.e., powerblock, cooling towers, intake canal, and outfall structure) of the project through complete avoidance of these aquatic features.

### **Compensatory Mitigation**

On April 10, 2008, the Corps issued the Final Rule for Compensatory Mitigation for Losses of Aquatic Resources (33 CFR Parts 325 and 332). According to these regulations, mitigation credit purchase from an agency-approved mitigation bank is currently the Corps preferred manner for resolving mitigation requirements. As a result, the applicant proposes to purchase all needed mitigation credits from the Phinizy Swamp mitigation bank. According to the March 2004 SOP calculations, a total of 72.3 wetland credits will be required to offset project impacts.

### **Protected Species**

#### ***Federally Listed Species***

This section describes federally listed and proposed threatened and endangered species, as well as designated and proposed critical habitat, that may occur in the vicinity of the plant site. Endangered, threatened, and other special-status species that might be present include smooth coneflower (*Echinacea laevigata*), Canby's dropwort (*Oxypolis canbyi*), relict trillium, Georgia aster, shortnose sturgeon (*Acipenser brevirostrum*), flatwoods salamander, American alligator, wood stork, and red-cockaded woodpecker. These are federally listed species with recorded occurrences in Burke County, species listed on the USFWS website as having the potential to occur in Burke County, or species within 10 miles of the site in Aiken and Barnwell Counties, South Carolina.

Four federally listed plant and five animal species have the potential to occur in the vicinity of the site. There is no designated or proposed critical habitat for any of these species known to occur on or in the general area of the VEGP tract.

#### **Plants**

Canby's dropwort was listed as endangered by the USFWS in 1986. 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.

Canby's dropwort has been found in a variety of habitats, including ponds dominated by pond cypress (*T. nutans*), 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 inundation (2 to 12 inches). The species' water requirements are narrow, with too little or too much water being detrimental. Suitable habitat is normally on sandy loam or loamy soils underlain by a clay layer, which along with the slight gradient of the areas, results in the retention of water. 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 content, high water table, and are deep, poorly drained, and acidic. These soil types do not occur at Plant Vogtle. Soil types found at the proposed project site include soils in the Chastain-Tawcaw association; Lucy, Osier, and Bibb soils; Tawcaw-Shellbluff association; and Fuquay, Bonifay, and Troup series soils. The soil types that would be impacted during construction include Lucy, Troup, and Tawcaw-Shellbluff. Lucy and Troup soils are deep, well-drained soils occurring on uplands. The Tawcaw-Shellbluff soils occur in the Savannah River floodplain and are acidic, poorly drained, and deep. Though the Tawcaw-Shellbluff soils found on the proposed project site have characteristics similar to the soil types associated with Canby's dropwort, these areas are likely not suitable habitat because of the frequency and depth of inundation events along the Savannah River.

Canby's dropwort has not been recorded within 10 miles of the plant site. There are no known historical occurrences on the site, nor was it identified in the 2005 threatened and endangered species survey. There are two historical records in Burke County around Waynesboro; however, these populations are currently thought to be extirpated. It is unlikely that suitable habitat for the Canby's dropwort is found at the VEGP site or in areas that would be disturbed by the construction of VEGP Units 3 and 4. Because of the lack of suitable habitat, it is unlikely there would be construction-associated impacts to this species at the VEGP site.

Smooth coneflower was listed by the USFWS as endangered in 1992. There are no known occurrences of smooth coneflower in Burke County, no historical occurrences on the proposed project site, and it was not recorded in the 2005 threatened and endangered species survey. In Georgia, this species is known to occur in Stephens County. It is also found in Aiken and Barnwell Counties, South Carolina, more than 5 miles from the proposed project site.

Smooth coneflower occurs in meadows and open woodlands on alkaline or near-neutral soils. These types of soils do not occur at the proposed project site. This flower often grows in association with eastern redcedar (*Juniperus virginiana*) or button snakeroot (*Eryngium yuccifolium*). Neither of these two species is known to occur on the proposed project site and it is unlikely that suitable habitat occurs on-site. Therefore, there is no reason to suspect any impacts to this species from construction at the VEGP tract.

Relict trillium was listed as endangered by the USFWS in 1988. Distribution of this species is limited to portions of Georgia, South Carolina, and Alabama. In 1990, 14 populations of relict trillium were known to occur in Clay, Lee, Early, Talbot, Columbia, and Macon Counties,

Georgia. This trillium is also known to be present in Aiken County, South Carolina, more than 10 miles from the proposed project site.

There are no known occurrences of relict trillium in Burke County, no historical occurrences on the proposed project site, nor was relict trillium recorded in the 2005 threatened and endangered species survey. Relict trillium is found primarily in moist hardwood forests that have had little or no disturbance in the recent past. The soils on which it grows vary from rocky clays to alluvial sands, but all exhibit high levels of organic matter in the upper soil horizons. Most locations appear to be free from the influence of fire, both in the recent and distant past. Timber harvesting at the sites of known occurrence has been limited to selective cutting. Relict trillium does, however, occur on less than optimum sites, such as power and sewer line rights-of-way, and apparently can become reestablished after intense disturbance to the habitat, such as agricultural activity.

Relict trillium has the potential to occur on the proposed project site in locations of suitable habitat along the Savannah River, for example, the forested bluff previously described. This bluff was investigated during the seasonal field surveys conducted in 2005 and in 2007. The Spring 2005 and 2007 surveys took place during the flowering period for relict trillium, a plant that was targeted for special attention during the surveys, which is best for positive identification of this species. Although suitable habitat for the relict trillium appears to exist within the construction footprint, this species was not been identified by the surveys, and it is unlikely that it would occur in the future. Therefore, impacts to this species from construction at the VEGP site are unlikely to occur.

Georgia aster is a candidate for federal listing. It is a relict species of post oak savannah/prairie communities that existed in the southeast before widespread fire suppression and the extirpation of large native grazing animals. Most populations are small and, since the species' main mode of reproduction is vegetative, each isolated population probably represents just a few genotypes. Most remaining populations of this species survive adjacent to roads, railroads, utility rights-of-way, and other openings where land management mimics natural disturbance regimes. Unfortunately, plants in such settings are inherently vulnerable to accidental destruction from herbicide application, road shoulder grading, and other maintenance activities. Many populations are also threatened by development (several are within planned residential subdivisions), highway expansion/improvement, and woody succession resulting from fire suppression.

Georgia aster is not known to occur in Burke County in the vicinity of the project site. Therefore, no impacts to this species are expected from VEGP Units 3 and 4 construction activities.

### **Animals**

Shortnose sturgeon is a member of the Family Acipenseridae, a long-lived group of ancient anadromous and freshwater fishes. The species is currently represented by at least 19 distinct populations inhabiting 25 river systems ranging from New Brunswick, Canada, to northern Florida. The shortnose sturgeon was originally listed as an endangered species by the USFWS

on March 11, 1967, under the Endangered Species Preservation Act (32 FR 4001). The National Marine Fisheries Service (NMFS) assumed jurisdiction for this species in 1974. According to a 1984 synopsis of biological data by Dadswell et al., juvenile shortnose sturgeon eat available benthic crustaceans or insects. Adult shortnose sturgeon from freshwater portions of the Winyah Bay estuary in South Carolina largely consume mollusks; however, crustaceans and aquatic insects were also observed as a food source.

The age at sexual maturity for this sturgeon varies from the north to the south. Age of maturation in males possibly occurs at 2 to 3 years in Georgia, while females mature at age 6 or younger. Temperature is probably the major factor governing spawning. All sources referenced by Dadswell et al. reported shortnose sturgeon spawning to occur between 50° and 54° F. Because known spawning areas are not near the proposed VEGP site, increased thermal effluent is not expected to affect the spawning of this species.

Other factors influencing spawning include the occurrence of freshets (i.e., increased freshwater flow resulting from sudden rain or melting snow) and substrate characteristics. Spawning grounds were described as being in regions of fast flow (1.3 to 2.0 feet/second) with gravel or rubble substrate. These locations are generally well upriver of the summer foraging and nursery grounds. Although inconsistent with observations from other spawning studies, Dadswell et al. cited unpublished data which reported that in South Carolina, spawning occurred in flooded, hardwood swamps along inland portions of rivers (including the Savannah River).

Shortnose sturgeon eggs are demersal and sticky after fertilization, sinking quickly and adhering to sticks, stones, gravel and rubble on the stream bottom. Hatchlings (less than a day old) are rheotactic (i.e., moving with water currents), photonegative, benthic, and vigorously seek cover. If denied a place to hide, they exhibit vertical swim-up and drift behavior until cover is found. Older embryos (1 to 8 days old) exhibit similar behavior to hatchlings; when denied cover, they search along the bottom until cover is found. Between 9 and 16 days old, larvae leave cover and are positively rheotactic and photopositive. Three-quarters of studied larvae left bottom cover and swam in the water column.

A recent investigation was conducted to determine differences in larval shortnose sturgeon behavior resulting from latitudinal variation by comparing populations in the Connecticut River in Massachusetts and populations in the Savannah River. Specific parameters investigated included habitat preference, dispersal, diel activity, and timing for early life stages of shortnose sturgeon. Yolk sac larvae from both rivers preferred dark habitat and used rock cover. The use of cover decreased with age until Day 13, when all fish were foraging in the open, although they generally stayed near the bottom. Shortnose sturgeon larvae showed an ontogenic behavioral shift toward a preference for bright, open habitat. Both groups showed some downstream movement as yolk-sac larvae. The Savannah River shortnose sturgeon used rock cover less in the first few days after hatching than those in Massachusetts. Fish continued a low level of downstream movement for their entire larval period and as early juveniles. Laboratory studies have shown that during the first 30 days, larvae consistently swim to a mean height above the bottom of 26.4 to 46.0 inches.

Shortnose sturgeon were discovered in the lower Savannah River in the late 1970s. From 1984 to 1992, more than 100,000 sturgeon (18 percent of which were tagged) were stocked in the Savannah River by the Marine Resources Research Institute of the South Carolina DNR. Information collected during these stocking efforts and shortly thereafter indicated that stocked juveniles comprised a minimum of 35.4 percent of the juvenile population in the lower river nursery area. Based upon records of marked fish and results from double tagging studies, it was estimated that at least 37.7 percent of the adult population in the Savannah River (during the period 1997 to 2000) was composed of stocked fish. Population estimates indicate that the adult population is increasing, but juveniles are still rare. This anomaly has been attributed partly to a recruitment bottleneck in early life stages and partly due to water quality degradation within nursery habitat. Various authors have indicated the nursery habitat for juvenile shortnose sturgeon in the Savannah River is in the lower river, well downstream of the VEGP site.

Shortnose sturgeon larvae were collected in the vicinity of the Savannah River Site during ichthyoplankton surveys conducted from 1982 to 1985. Differentiating shortnose sturgeon larvae from Atlantic sturgeon larvae can be difficult based on their similar appearance; however, a total of 12 of the 43 sturgeon larvae collected were identified as shortnose sturgeon. Four of these larvae were taken from the river downstream of the VEGP site. The remaining eight were taken above the VEGP site. The shortnose sturgeon larvae were taken during March, while the Atlantic sturgeon larvae were collected in April. A 1998 investigation, made to determine the potential effect of increased Savannah River Site river water withdrawal (an additional 11,000 gpm from the river) on the shortnose sturgeon population, concluded that the existing and proposed operations at the Savannah River Site would not jeopardize the continued existence of this species within the river.

From 1984 to 1992, two researchers captured 626 adult shortnose sturgeon in the Savannah River. They found significantly more fish in the lower river than in the upper river. Telemetry data from 24 adult shortnose sturgeon implanted with radio transmitters indicated that only a portion of the population participated in the upriver spawning migration. Migrating sturgeon began moving upriver in late January to mid-March, traveling at a rate of up to 31 miles/day. Other authors also performed telemetry studies to determine seasonal movement and spatial distribution of adult and juvenile shortnose sturgeon. They reported upriver spawning migrations from mid-February to mid-March, when temperatures ranged from 50 to 54° F. Migration rates were as high as 21 miles/day.

The area near the VEGP site has not been identified as a known or suspected spawning location. Probable spawning sites were identified by monitoring the movement of adult shortnose sturgeon within the river. Certain authors have reported a probable spawning location between RM 111 and 142. Others reported that two areas, one downstream of the VEGP site and one upstream, had repeatedly served as destinations for migrating adult fish and were occupied for several days during the spawning season. Thus they were identified as probable spawning sites.

A description of the environment at these two locations indicated that the substrate in the river bend portions of these areas was distinctly different from the other sections of the river. The

sharp river bends were characterized by "...submerged timber, with scoured sand, clay, and gravel as substrate." The outside banks were hard packed clay, which was scoured by the swift currents, preventing any sediment accumulation. Fish located in the spawning areas were always situated in the main channel. Hall et al. reported that the maximum water depths in the river bends of these two areas were 20 to 30 feet and current velocities ranged from 1.7 to 3.4 feet/second at the surface. Bottom velocities during the spawning season averaged 2.7 feet/second. These authors theorized that the sharp bends in certain sections of the Savannah River create the necessary velocity and turbulence for spawning. Substrate in these areas provided suitable attachment points for the highly adhesive eggs. Previous reports have indicated that spawning is usually associated with areas where the predominant substrate is composed of gravel, rubble, and cobble. Independent visual observations of the bend areas in the suspected spawning grounds of the Savannah River confirmed the presence of such materials. Other researchers also reported that the probable spawning areas contain sharp bends with strong currents, submerged timber, and a substrate of gravel, clay, and sand.

It is unlikely that spawning activity occurs in the vicinity of the VEGP site because the substrate, the depth, and the sinuosity of the river are unlike those characteristics observed in the identified spawning areas. Construction work on the intake structure will not occur during February-April in order to avoid impacts to shortnose sturgeon during migration. Based upon a Biological Assessment prepared by the NRC, by letter dated August 11, 2008, NMFS documented its conclusion that the project as proposed "is not likely to adversely affect shortnose sturgeon."

The red-cockaded woodpecker was listed by the USFWS as endangered in 1970. Historically, this woodpecker's range extended from north Florida to New Jersey and Maryland, as far west as Texas and Oklahoma, and inland to Missouri, Kentucky, and Tennessee; however, the species has now been extirpated in New Jersey, Maryland, Tennessee, Missouri, and Kentucky. Currently, it is estimated that the existing about 6,000 family groups of red-cockaded woodpeckers, or 15,000 birds, from Florida to Virginia and west to southeast Oklahoma and eastern Texas, represent about one percent of the bird's original range. Critical habitat has not been established for this bird. In 1998, there were an estimated 665 family groups of red-cockaded woodpeckers in Georgia.

This species is endemic to open, mature, old growth pine ecosystems in the southeastern United States. Red-cockaded woodpeckers require open pine woodlands and savannahs with large, old pine trees for nesting and roosting habitat for family groups (clusters). Large, old pines are required as cavity trees because the birds excavate cavities entirely within inactive heartwood; the higher incidence of heartwood decay in older trees greatly facilitates excavation. Cavity trees must be in open stands with little or no hardwood mid-story 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 mid-story, few or no overstory hardwoods, and abundant native bunchgrass and forb groundcovers.

These 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. A typical territory for an active group ranges from approximately 125 to 200 acres, but can be as large as 600 acres. The size of a particular territory is related to both habitat and population density. Dispersal is undertaken primarily by young birds. Mate loss and an apparent avoidance of inbreeding sometimes cause adults to disperse, although adults may also occasionally move to neighboring territories for unknown reasons. In a North Carolina study, females dispersed a maximum of 19.5 miles and males a maximum of 13.1 miles.

Surveys of the VEGP property conducted in 2005 and 2006 (the Safe Harbor Program baseline survey) found no occurrence of red-cockaded woodpeckers on-site, nor are there any known historical occurrences on the tract. In fact, there are no recorded occurrences of this woodpecker anywhere in Burke County, Georgia, and no active colonies are known within 10 miles of the site in South Carolina; however, red-cockaded woodpeckers are listed as having the potential to occur within Burke County, Georgia, and in both Aiken and Barnwell Counties in South Carolina. In 2003, a total of 177 red-cockaded woodpeckers in 45 family groups were recorded on the Savannah River Site, with the closest active colony being approximately 10 miles from Plant Vogtle. Although suitable habitat for the red-cockaded woodpecker exists on VEGP property, this habitat is not in the vicinity of the construction area footprint. 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 this species would be affected during construction activities.

The wood stork, a federally-listed endangered species, possesses breeding populations which currently occur or have recently occurred only in Alabama, Florida, Georgia, and South Carolina. There were 13 known active colonies of wood storks in Georgia during the 2002 breeding season, with an estimated 1227 nesting pairs. No critical habitat has been designated for this bird.

Wood storks are a highly colonial species, usually nesting and feeding in flocks. They inhabit freshwater and brackish wetlands, normally nesting in bald cypress or red mangrove (*Rhizophora mangle*) swamps. At freshwater sites, in addition to bald cypress, nests are often constructed in swamp tupelo. Wood storks in Georgia and South Carolina lay eggs from March to late May, with fledging occurring in July and August.

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. A study from a wood stork colony in east-central Georgia found the diet to be composed mostly of fish, including sunfishes (*Lepomis* spp.), bowfin (*Amia calva*), redbfin pickerel (*Esox americanus americanus*), and lake chubsuckers (*Erimyzon* spp.).

Wood storks in east-central Georgia forage in a wide variety of 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 usually either still or very slowly moving, with a depth

normally between 2 and 16 inches. It has been suggested storks may have difficulty feeding in water more than 20 inches deep.

Differences among seasonal 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. Because nesting storks generally use foraging sites that are located within about 31 miles of the colony, most successful colonies 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 with relatively long and short annual hydroperiods, be available for foraging.

The closest known wood stork colonies to the VEGP site are located in Jenkins and Screven Counties, Georgia. The Birdsville colony is located at Big Dukes Pond, a 1,400-acre bald cypress swamp, 7.8 miles northwest of Millen, in Jenkins County, Georgia. The proposed project site is approximately 28 miles from the Birdsville colony. The Chew Mill Pond colony in Jenkins County is approximately 3.7 miles 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. The Jacobsons Landing colony in Screven County is approximately 27 miles southeast of the VEGP tract. In 1996, it contained an estimated 40 wood stork nests. These colonies are all within 37 to 43 miles of the project site, the maximum radius that wood storks can travel during daily feeding flights. Wood storks have been recorded foraging throughout Burke County and within 2 miles of the project site in the Savannah River Swamp on the Savannah River Site in South Carolina.

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. Data from 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 have already finished breeding for the year.

No wood storks were identified in the threatened and endangered species surveys completed on-site in 2005, and there are no known historical records of wood storks occurring at Plant Vogtle. The closest known colony is more than 25 miles away. Although forage areas may be 37 to 43 miles from the colony, 85 percent are within 12 miles. Suitable foraging habitat includes wetlands and open waters with low flow rates, depths less than 20 inches, and reduced quantities of both submerged and emergent macrophytes. These habitats exist at Plant Vogtle, and wood storks have been seen within 2 miles of the site in the Savannah River Swamp. Foraging at Plant Vogtle appears possible from June to September in wetland areas along stream drainages, man-made ponds, drainage ditches, and the wetlands along the Savannah

River. During construction of the cooling water intake and discharge structure, suitable foraging habitat may be affected. Because this species is highly mobile, however, any on-site impacts associated with construction on the VEGP site would be minimal.

The flatwoods salamander was listed by the USFWS as threatened in 1999. The historical range of this amphibian included the parts of Alabama, Florida, Georgia, and South Carolina that are in the lower Coastal Plain of the southeastern United States. Survey work completed since 1990 indicates that 51 populations of flatwoods salamanders are known from across the historical range. Most of these occur in Florida (36 populations or 71 percent). Eleven populations have been found in Georgia, four in South Carolina, and none have been found in Alabama. The last breeding record for Burke County was in the 1940s. Critical habitat was proposed in February 2007 in Miller and Baker Counties, Georgia (72 FR 5856). These counties are over 180 miles southeast of Plant Vogtle.

Adults and sub-adults are fossorial (dig and live underground), occur in open mesic pine forests and are closely associated with pine/wiregrass habitats maintained by frequent fire that are dominated by longleaf or slash pine. During the breeding period, which coincides with heavy rains from October to December, these salamanders move to isolated, shallow, small, acidic, tannin-stained depressions (forested with emergent vegetation) that dry completely on an acyclic basis (ephemeral ponds).

There are no recorded occurrences of this species within 10 miles of the proposed project site, no known historical occurrences on the site, and no individuals were identified in the 2005 threatened and endangered species survey. Suitable habitat for the flatwoods salamander may occur on the project tract, but suitable habitat is not found within the construction area footprint for the proposed Units 3 and 4. Flatwoods salamanders are not likely to be encountered during construction at the VEGP site, so adverse impacts are unlikely.

American alligators were classified by the USFWS as endangered throughout their range, including Georgia, in 1967. By 1987, following several reclassification actions in other states, it was reclassified as "threatened based on similarity of appearance" to the American crocodile in the remainder of its range, including Georgia. The alligator is no longer biologically imperiled in Georgia. Its populations are considered disjunct, limited to suitable habitat, and stable. The reclassification helps prevent excessive take of the alligator and protects the American crocodile.

Alligator habitat consists of swamps, marshes, ponds, lakes, and slow-moving streams and rivers. This reptile appears to be relatively common in the general vicinity of the site. During surveys of the project area made by Third Rock Consultants, LLC (TRC) in the summer of 2005, an alligator was observed in Mallard Pond, for example. Alligators in the Savannah River floodplain may be temporarily displaced during construction, but there is ample wetland habitat in the region. Thus, alligators may be minimally affected by construction at the VEGP site; however, impacts on this species would be considered negligible.

To summarize, NRC concluded that impacts to both terrestrial and aquatic federally listed threatened and endangered species from construction activities on the VEGP site would be

SMALL. Based upon a Biological Assessment prepared by the NRC, by letter dated August 11, 2008, NMFS documented its conclusion that the project as proposed "is not likely to adversely affect shortnose sturgeon." In their September 19, 2008, letter, the USFWS stated that "species under the jurisdiction of the Service have been adequately addressed for limited site preparation activities at the Vogtle site." Thus, mitigation beyond those actions proposed in the final EIS is not warranted.

### **Threatened and Endangered Species Monitoring**

The VEGP Units 1 and 2 Environmental Protection Plan, Appendix B to the Plant Vogtle operating license for a nuclear power facility (NPF) 68 and NPF 81, Section 4.1, entitled "Unusual or Important Environmental Events," requires NRC notification of any unusual environmental events, including excessive bird mortality, on-site plant or animal disease outbreaks, or mortality or unusual occurrence of any species protected by the Endangered Species Act. To date no reports to the NRC have been made. Surveys were conducted on the site for red-cockaded woodpeckers in February 2006 in support of a Safe Harbor Agreement; however, the red-cockaded woodpecker has never been documented on-site. The types of habitat that would be disturbed during construction consist mainly of previously disturbed areas, planted pines, hardwoods, wetlands along the Savannah River, and open fields. Red-cockaded woodpeckers are found primarily in large stands of old longleaf pine. Because such habitats would not be impacted during construction, the red-cockaded woodpecker is not likely to be found in areas where construction will take place.

### **State Listed Species**

A rare-plant survey was conducted by Georgia DNR biologists on April 13, 2007, along the river bluffs at the proposed new water intake structure and the adjacent upland sandhill habitat. During this survey, no federally- or State-listed species were observed. During the spring (April 12 to 21), summer (August 22 to 31), and fall (October 2 to November 2) of 2005, TRC also conducted surveys of the property for State-listed species classified as threatened and endangered. Bay star-vine (*Schisandra glabra*), State-listed as threatened in Georgia, was the only State-listed species found at the site. With the exception of bay star-vine, there are no known State-listed plant species occurrences within 2 miles of the site. Bay star-vine is found twining through understory trees in rich forested areas, especially bottomlands and slopes. Older vines may occur on overstory tree trunks or sprawling along the ground, especially near mountain laurel (*Kalmia latifolia*) thickets. The bay star-vine was found at several locations along the wooded bluff bordering the Savannah River, including in the area of the proposed cooling water intake structure, as well as in Wetland CC. Wetland CC will not be impacted by the proposed project.

In summary, the impact on State-listed species from construction of Units 3 and 4 at the VEGP site is expected to be negligible. Southern Nuclear has committed to work with the Georgia DNR to ensure that any species of concern are protected during construction.

### **Historic Properties**

Because the NRC is considered to be the lead agency for purposes of implementing NEPA, they have already begun consultations with the Georgia State Historic Preservation Office (SHPO) regarding known on-site cultural resources. Cultural resource identification efforts previously conducted indicated the presence of 17 archaeological sites. Two are eligible for listing in the National Register of Historic Places (NRHP). Two other sites are potentially eligible (9BK419 and 9BK420). The two eligible sites (9BK416 and 9BK423) are located adjacent to the proposed facilities.

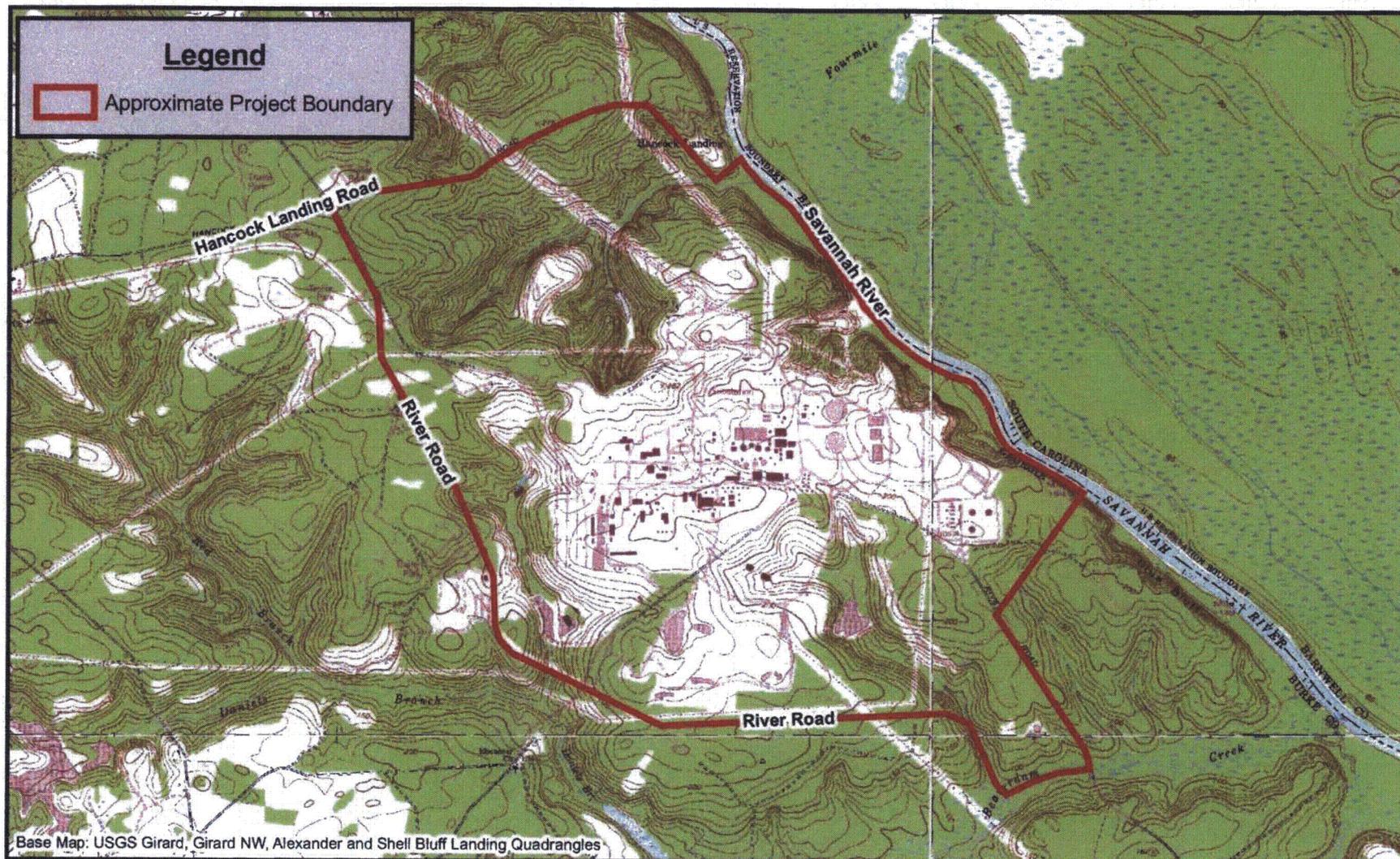
In addition to the NRC, Southern Nuclear has also been in consultation with the Georgia SHPO concerning protective actions to be taken for 9BK423 and agreement has been reached. Because 9BK416 would be impacted by construction of utilities associated with the water intake structure, New South Associates (NSA) conducted a Phase 1 archaeological survey in the proposed construction area. The results of this survey support the original findings that site 9BK416 is a multi-component prehistoric site that is eligible to be listed in the NRHP. Site 9BK416 has the potential to yield significant information on prehistory for the area. It would not be possible to avoid disturbing site 9BK416 when the water pipeline is constructed. Thus, the NRC concluded that the potential impacts on historic and cultural resources would be MODERATE.

As a result, the Georgia SHPO requested that additional work to establish the character and integrity of subsurface archaeological deposits. Additional investigations within the waterline corridor are ongoing. Three 2-m by 2-m test units were excavated in February 2008, within the proposed intake water line corridor. Based on the results of the excavation, the Georgia SHPO determined that the proposed project will affect, but not adversely affect, site 9BK416. Southern Nuclear and the Georgia SHPO will enter into a Memorandum of Understanding (MOU) to preserve the balance of site 9BK416 from disturbance and to conduct further investigations as directed by Georgia SHPO. The NRC has concurred with this course of action. There will be no activity in the areas where sites 9BK419 and 9BK420 are located; therefore, there will be no effect on these resources.

During construction, Southern Nuclear would implement procedures that identify the actions that should be taken if archaeological or historical materials are encountered. Procedures that would be in place prior to construction would identify measures that need to be taken if historic or cultural resources are discovered during construction. Archaeological surveys of the new transmission line right-of-way that would be needed were not conducted; however, an analysis of potential impacts in historic and cultural resources was conducted for possible transmission line rights-of-way. The full extent of impacts cannot be determined until a specific route is defined. Once this process is completed, the appropriate cultural resource studies would be undertaken to ensure that resources are identified and addressed before construction. In addition, consultation with the State of Georgia would establish requirements to follow should archaeological, historical, or other cultural resources be uncovered during construction. Construction workers would be given cultural resource training so they would be aware of the types of artifacts that might be encountered. If archaeological materials are discovered during construction, work would stop while an assessment is conducted.



Figure 2



Base Map: USGS Girard, Girard NW, Alexander and Shell Bluff Landing Quadrangles

Prepared  
October 26, 2009  
By:

**REGISTER NELSON**  
Environmental Consultants

45 Parkland Dr. Stockbridge, GA 30281  
Office: (678) 432-2636 Fax: (678) 432-2464

**USGS Topographic Map**

Vogtle Nuclear Power Plant  
Burke County, Georgia  
for  
Southern Nuclear Operating Company, Inc.

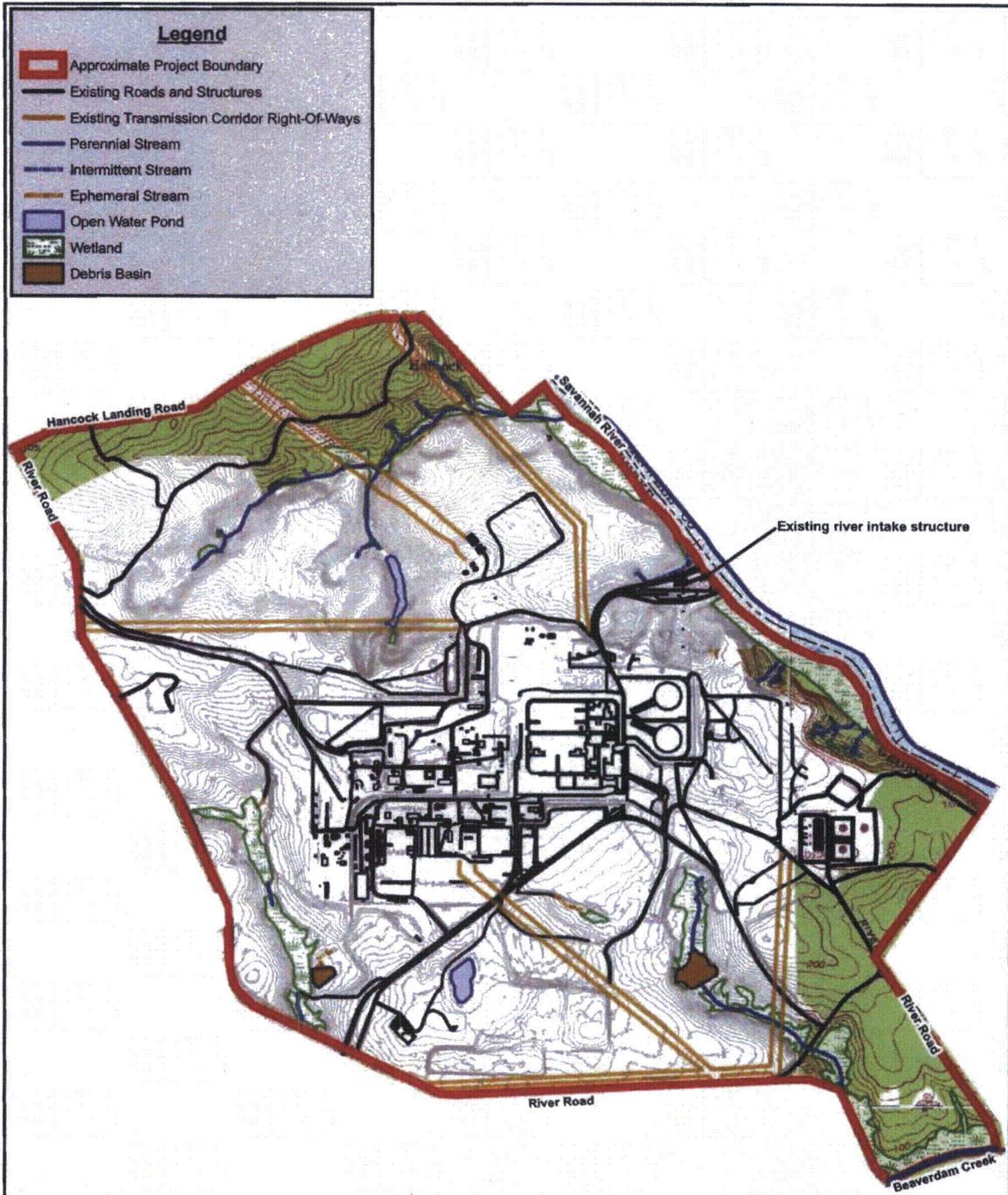
2,900  
Feet



X:\Eco-sciences\Plant Vogtle\GIS\maps\USGS.mxd



Figure 4A



Base Map: Shaw Group/USGS (Shell Bluff and Girard NW quadrangles)

Prepared  
October 26, 2009  
By:  
**REGISTER NELSON**  
Environmental Consultants  
45 Parkland Dr. Stockbridge, GA 30281  
Office: (678) 432-2636 Fax: (678) 432-2464

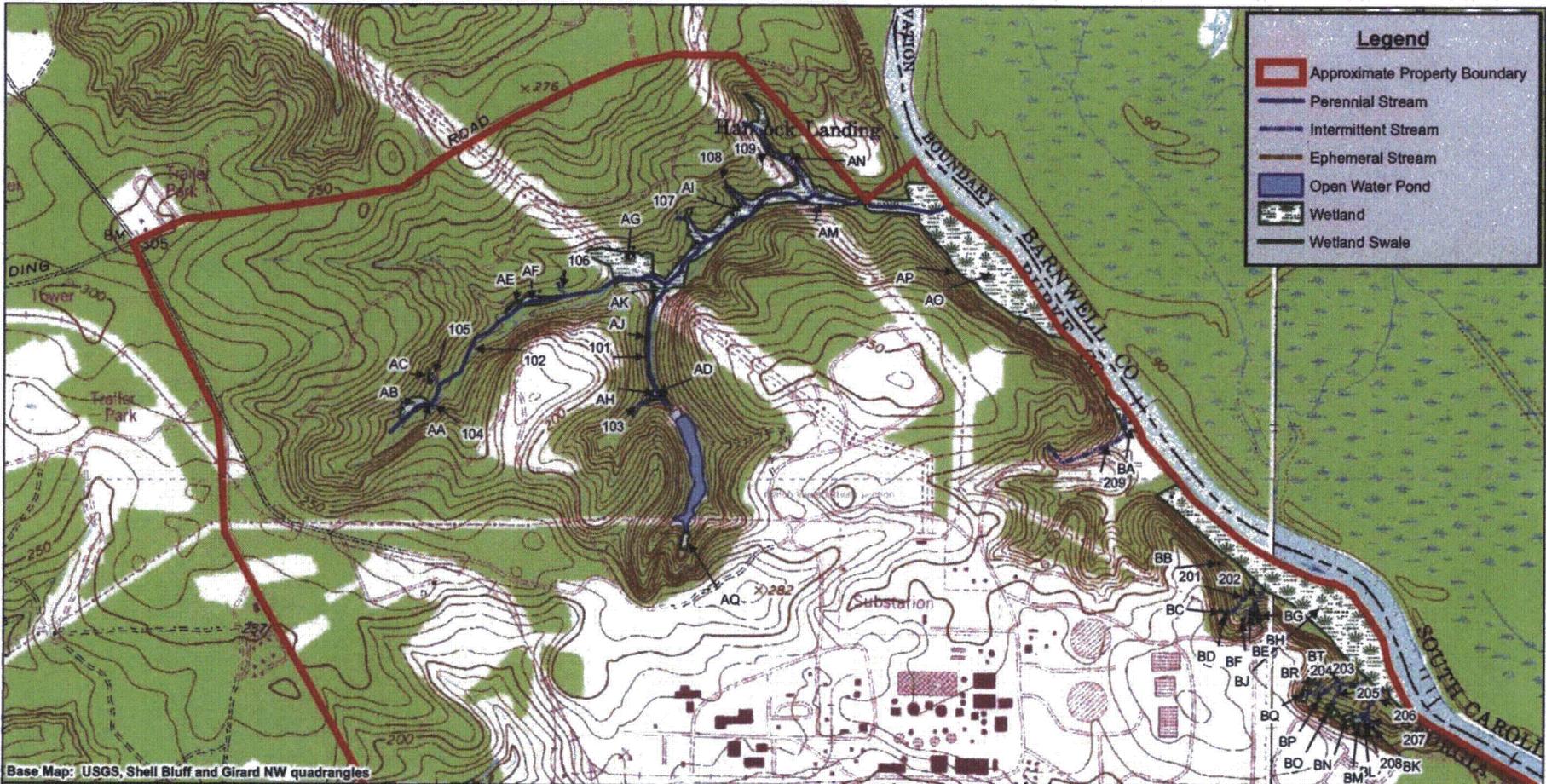
**Limits of USACE Jurisdiction  
Existing Conditions**

Vogle Nuclear Power Plant  
Burke County, Georgia  
for  
Southern Nuclear Operating Company, Inc.

1,700  
Feet

X:\Eco-science\Plant\_Vogle\GIS\maps\USGS.mxd

Figure 4B



Base Map: USGS, Shell Bluff and Girard NW quadrangles

Prepared:  
October 26, 2009  
By:

**REGISTER NELSON**  
Environmental Consultants

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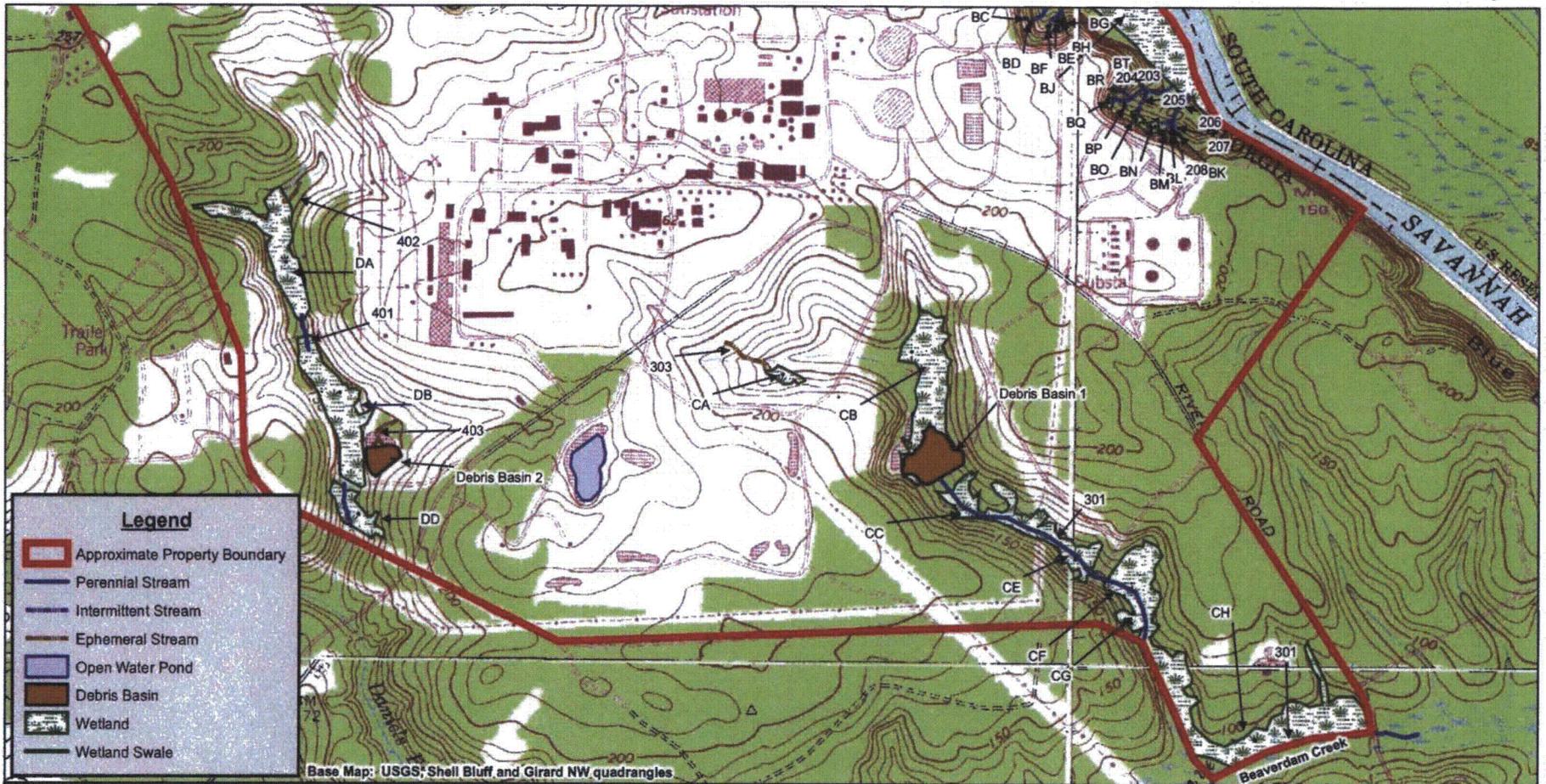
**Limits of USACE Jurisdiction- North**

Vogtle Nuclear Power Plant  
Burke County, Georgia  
for  
Southern Nuclear Operating Company, Inc.

1,100  
Feet



Figure 4C



Base Map: USGS, Shell Bluff and Girard NW quadrangles

Prepared:  
October 26, 2009  
By:

**REGISTER NELSON**  
Environmental Consultants  
45 Parkland Dr. Stockbridge, GA 30281  
Office: (678) 432-2636 Fax: (678) 432-2464

**Limits of USACE Jurisdiction- South**

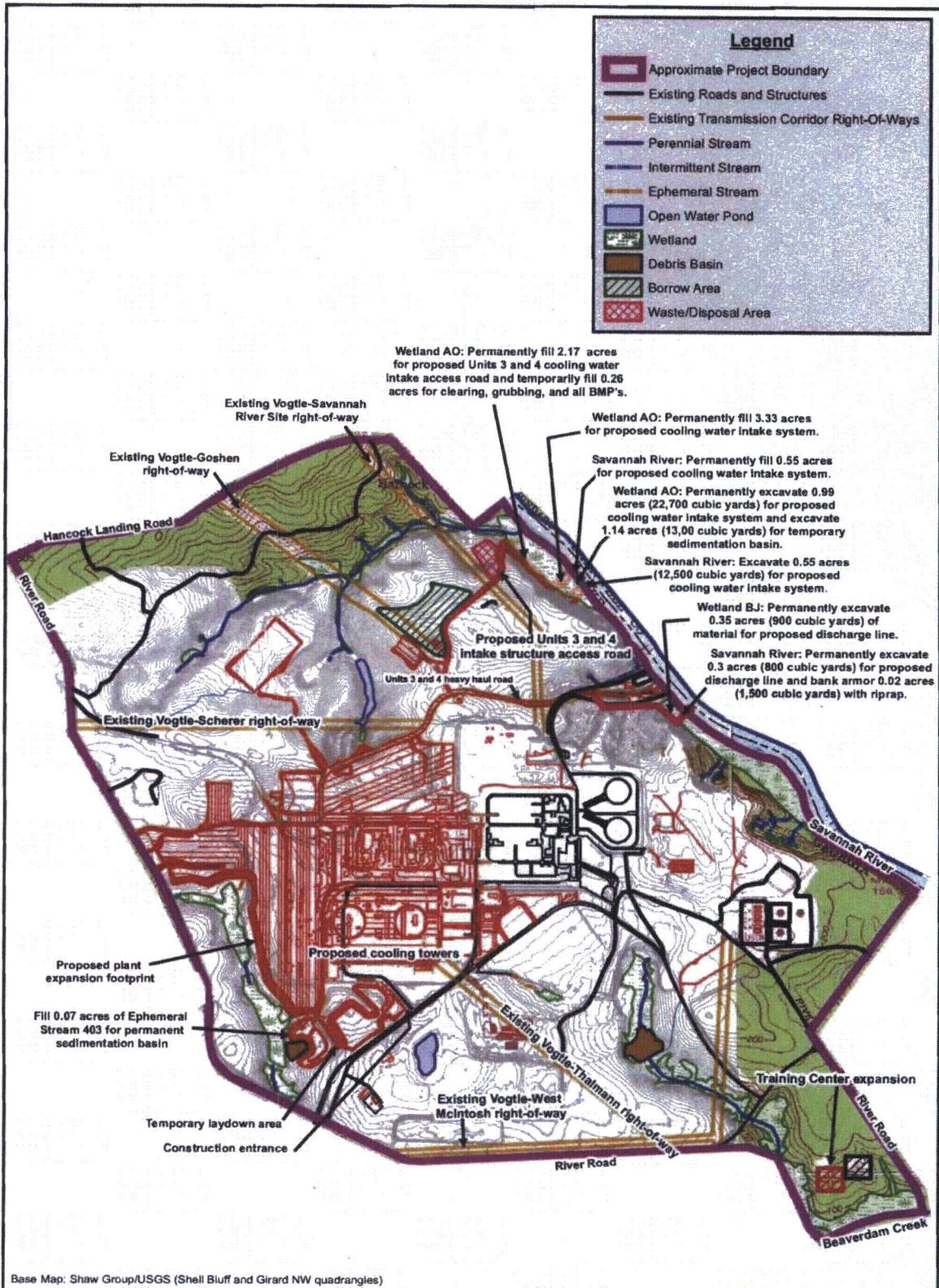
Vogtle Nuclear Power Plant  
Burke County, Georgia  
for  
Southern Nuclear Operating Company, Inc.

1,100  
Feet



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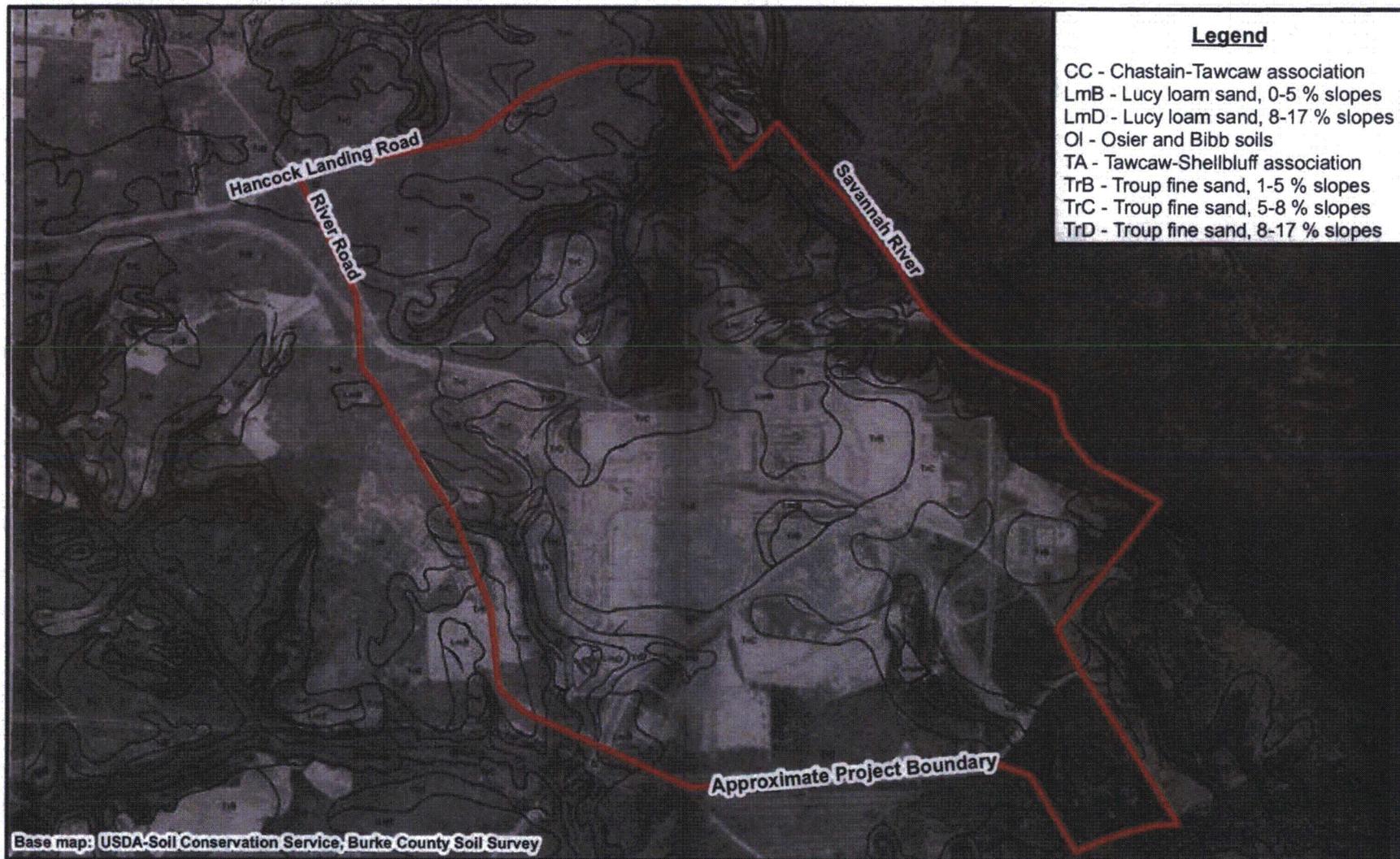
Figure 5



Base Map: Shaw Group/USGS (Shell Bluff and Girard NW quadrangles)

<p>Prepared January 6, 2010 By:</p> <p><b>REGISTER NELSON</b> Environmental Consultants</p> <p>45 Parkland Dr. Stockbridge, GA 30281 Office: (678) 432-2636 Fax: (678) 432-2464</p>	<p><b>Proposed Conditions</b></p> <p>Vogtle Nuclear Power Plant Burke County, Georgia for Southern Nuclear Operating Company, Inc.</p>	<p>1,600 Feet</p> <p>W N E S</p> <p>X:\Eco-science\Plant Vogtle\GIS\Map\Proposed Conditions.mxd</p>
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Figure 6



Base map: USDA-Soil Conservation Service, Burke County Soil Survey

Prepared  
October 26, 2009  
By:

**REGISTER NELSON**  
Environmental Consultants

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Soils Map

Vogtle Nuclear Power Plant  
Burke County, Georgia  
for  
Southern Nuclear Operating Company, Inc.



Not to Scale

X:\Eco-Sciences\Plant Vogtle\GIS\Soils Map.mxd

**WETLANDS AND OPEN WATERS  
MITIGATION WORKSHEET**

**PROJECT NAME:** Vogtle Electric Generating Plant  
**COUNTY:** Burke  
**PREPARED:** 6-Jan-10

**ADVERSE IMPACT FACTORS**

Factor	Options							
	Fill	Dredge	Impound	Drain	Flood	Clear	Shade	
Dominant Effect	2	1.8	1.6	1.4	1.2	1	0.5	
Duration of Effects	7+ years 2	5-7 years 1.5	3-5 years 1	1-3 years 0.5	< 1 year 0.1			
Existing Condition	Class 1 2	Class 2 1.5	Class 3 1	Class 4 0.5	Class 5 0.1			
Lost Kind	Kind A 2	Kind B 1.5	Kind C 1	Kind D 0.5	Kind E 0.1			
Preventability	High 2	Moderate 1	Low 0.5	None 0				
Rarity Ranking	Rare 2	Uncommon 0.5	Common 0.1					

† These factors are determined on a case-by-case basis.

**REQUIRED MITIGATION CREDITS WORKSHEET**

Factor	Cooling Intake (fill) - Wetland AO	Cooling Intake (temp fill) - Wetland AO	Cooling Intake (dredge) - Wetland AO	Cooling Intake (temp dredge) - Wetland AO	Cooling Intake (fill) - Savannah River	Outfall Structure (fill) - Savannah River	Outfall Structure (dredge) - Wetland BJ	Sedimentation Basin Ephemeral Stream 403
Dominant Effect	2.00	2.00	1.80	1.80	2.00	2.00	1.80	2.00
Duration of Effect	2.00	0.50	2.00	0.50	2.00	2.00	0.10	2.00
Existing Condition	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Lost Kind	2.00	2.00	2.00	2.00	0.50	0.50	2.00	2.00
Preventability	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Rarity Ranking	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Sum of r Factors	8.60	7.10	8.40	6.90	7.10	7.10	6.50	8.60
Impacted Area	5.50	0.26	0.99	1.14	0.55	0.02	0.35	0.07
R X AA =	47.30	1.85	8.32	7.87	3.91	0.14	2.28	0.60

**Total Required Credits =  $\sum (R \times AA) =$**

72.3

**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure Attachment 3**

**NOTE:** Attached is stand-alone document one page in length.

TITLE <b>ISSUED FOR REVIEW          NOT FOR CONSTRUCTION</b>		SHEET NO. 1 OF 1	
PROJECT NO. <b>SVO-7200-XG-001</b>		DATE 1/10/10	
DRAWING NO. <b>PLAN</b>		SCALE <b>AS SHOWN</b>	
CLIENT <b>VOGTE ELECTRIC GENERATING PLANT          RIVER WATER INTAKE STRUCTURE          BACKFILL</b>		CONTRACT NO. <b>SVO-7200-XG-001, D04</b>	
DESIGNER <b>SAUNDERS &amp; ASSOCIATES, INC.</b>		CHECKED BY <b>[Signature]</b>	
DRAWN BY <b>[Signature]</b>		APPROVED BY <b>[Signature]</b>	

THIS DRAWING SUPERSEDES SVO-7500-XG-001  
 SAFETY CLASSIFICATION: E  
 CONFIDENTIAL  
 THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF SAUNDERS & ASSOCIATES, INC. AND IS TO BE KEPT UNDER LOCK AND KEY. IT IS TO BE RETURNED TO SAUNDERS & ASSOCIATES, INC. UPON COMPLETION OF THE PROJECT. NO PART OF THIS DOCUMENT IS TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM.

**FOR REVIEW ONLY  
 NOT FOR CONSTRUCTION**

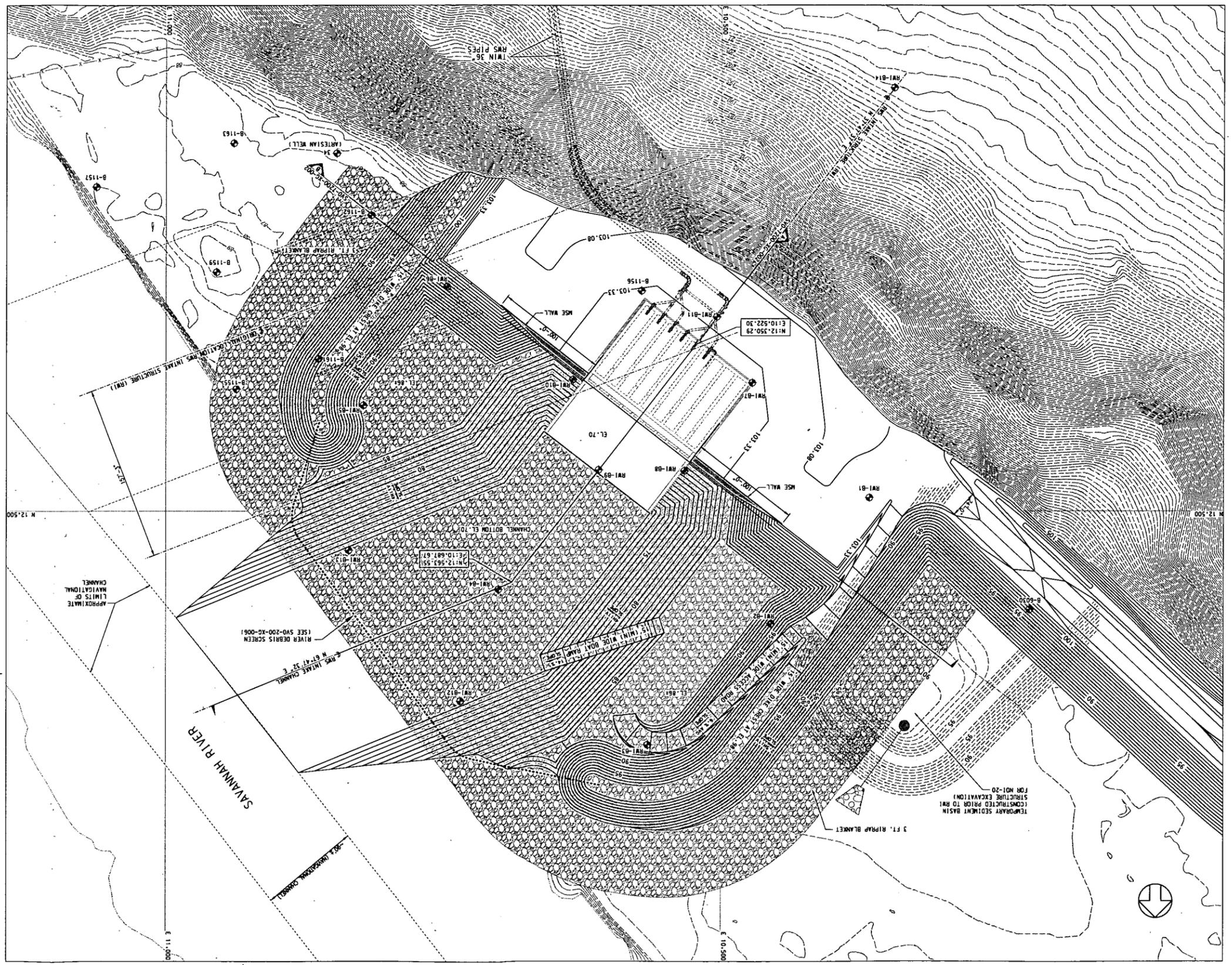
PRELIMINARY REVIEW PACKAGE DRAWINGS ARE NOT FOR CONSTRUCTION OR FABRICATION. BILL OF MATERIALS, SHOP DRAWINGS, ETC., ARE TO BE OBTAINED FROM THE CONTRACTOR. CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY INFORMATION FROM THE LOCAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE LOCAL AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY INFORMATION FROM THE LOCAL AGENCIES.

SCALE: 1" = 30'  
 0 30 60 90

**NOTES:**  
 1. THE GRID SYSTEM SHOWN IS AN APPROXIMATE PLANT GRID SYSTEM. PLANT GRID CONTROL IS BEING UPDATED AND CONTROL INFORMATION WILL BE PROVIDED TO START OF FIELD WORK.  
 2. THE MSE WALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH SPECIFICATION SVO-8001-20-001, "MSE RETAINING WALL".

**REFERENCE DRAWINGS:**  
 SVO-7200-XE-001 RIVER WATER INTAKE STRUCTURE EXCAVATION PLAN  
 SVO-7200-XG-002 RIVER WATER INTAKE STRUCTURE BACKFILL SECTIONS  
 SVO-7200-XG-003 RIVER WATER INTAKE STRUCTURE GRADING PLAN  
 SVO-7200-XG-006 RIVER WATER INTAKE STRUCTURE RIVER DEBRIS SCREEN PLAN  
 SVO-0000-XS-005 RIVER WATER INTAKE STRUCTURE ROAD PLAN AND PROFILE S1A 33+00.00 TO S1A 43+50.00  
 RIVER WATER INTAKE STRUCTURE RIVER DEBRIS SCREEN PLAN  
 RIVER WATER INTAKE STRUCTURE ELECTRICAL DUCT BANKS

**LEGEND:**  
 --- EXISTING GRADE CONTOUR  
 ● BORING LOCATION AND ID  
 --- 100' PROPOSED BACKFILL GRADE  
 [Symbol] RIPRAP



A  
 B  
 C  
 D  
 E  
 F  
 G  
 H

**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure Attachment 4**

**NOTE:** Attached is stand-alone document four pages in length.

Southern Nuclear  
Operating Company, Inc.  
40 Inverness Center Parkway  
Birmingham, Alabama 35242



**JAN 04 2010**

ND-09-1452

Ms. Elizabeth Shirk  
Historical Preservation Division  
Georgia Department of Natural Resources  
34 Peachtree Street, NW  
Suite 1600  
Atlanta, GA 30303

**SUBJECT: Vogtle Electric Generating Plant - Memorandum of Understanding  
For the Construction Activities at Archaeological Site 9BK416  
(HP-060428-001)**

Dear Ms. Shirk:

In August 2006, Southern Nuclear Operating Company (SNC) filed an Early Site Permit (ESP) application with the Nuclear Regulatory Commission (NRC) for two proposed new nuclear units at the existing Vogtle Electric generating Plant (VEGP) site on the Savannah River near Waynesboro, Georgia. Included as Part 3 of this application was an Environmental Report prepared in accordance with NRC rules to support development of an Environmental Impact Statement (EIS) for the project by NRC under the requirements of the National Environmental Policy Act (NEPA). The EIS requires consultation with the State Historic Preservation Office (SHPO) to confirm if the proposed action has potential to impact cultural resources regulated by Section 102 of the Historic Preservation Act or other relevant regulations pertaining to protection and management of cultural resources.

In 2005, SNC began informal discussions and engaged New South Associates to perform a cultural resources survey of the areas of the site that could be potentially impacted by construction and/or operation of the new units. This Phase 1 survey identified ten potential archaeological sites with two sites considered potentially eligible for inclusion in the National Register of Historic Places including Site 9BK416, a large multicomponent prehistoric site at the top of the bluff adjacent to the proposed Intake Structure for Vogtle Units 3 and 4. Subsequent to this survey, SNC re-designed the intake system to route the piping directly up the bluff from the intake structure, in lieu of following the intake access road right-of-way. SNC informed SHPO of the change in early 2007. At the direction of the SHPO, SNC had New South Associates conduct additional work resulting in the following reports:

Georgia Department of Natural Resources,  
Historic Preservation Division  
ND-09-1452  
Page 2 of 3

- Addendum Report: Intensive Archaeological Survey of the Proposed Expansion Areas at the Vogtle Electric Generating Plant, Burke County, Georgia – November 2006
- Addendum Report: Phase I. Archaeological Survey of the Water Line Corridor for the Proposed Intake Structure at Plant Vogtle, Burke County, Georgia – July 2007
- Phase II Testing at Archaeological Site 9BK416 Within Proposed Water Line and Intake Structure Vogtle Electric Generating Plant, Burke County, Georgia - May 2008

Consultations with SHPO were active and ongoing from 2006 – 2008. On March 18, 2008 a meeting with SNC, New South and SHPO was held to discuss the findings from the Phase II testing and receive further guidance from SHPO. During this meeting, SHPO determined that the relocation of the proposed water line corridor was acceptable and indicated that the proposed project will affect, but not adversely affect site 9BK416. SHPO requested that a Memorandum of Understanding (MOU) be developed to confirm the finding and document a commitment from SNC to preserve the balance of site 9BK416 from additional disturbance and conduct additional investigations to further characterize the site, as directed by the SHPO.

Please find enclosed the MOU for your review and signature. Please provide your concurrence or any comments you may have to support finalizing this important document. Your expedited review is appreciated.

If you have questions or require additional information, please contact Dale Fulton at (205) 992-7536.

Sincerely,



T. C. Moorer  
Manager – Environmental Affairs, Chemistry, and Radiological Services  
Southern Nuclear Operating Company

TCM/DLF:dmw

Enclosure

Georgia Department of Natural Resources,  
Historic Preservation Division  
ND-09-1452  
Page 3 of 3

cc: Southern Nuclear Operating Company (with Enclosures)  
Mr. D. M. Lloyd, Vogtle Deployment Director  
Ms. M. Caston, Vice President & General Counsel – External Affairs  
Mr. C. R. Pierce, Licensing Manager  
Mr. J. N. Stringfellow, Licensing Supervisor  
Mr. J. T. Davis, Project Engineer  
Document Services RTYPE: AR01.1053  
File: AR.01.01.06

Georgia Power Company (with Enclosures)  
Mr. C. H. Huling, Vice President – Environmental Affairs  
Mr. R. D. Just, Environmental Issues Manager

Nuclear Regulatory Commission (with Enclosures)  
Ms. M. A. Sutton, Environmental Project Manager

MEMORANDUM OF UNDERSTANDING BETWEEN  
SOUTHERN NUCLEAR OPERATING COMPANY AND  
GEORGIA DEPARTMENT OF NATURAL RESOURCES,  
HISTORIC PRESERVATION DIVISION

FOR CONSTRUCTION ACTIVITIES IN SITE 9BK416 AS PART OF VOGTLE  
UNITS 3 AND 4 (HP-060428-001)

Southern Nuclear Operating Company (SNC) and Georgia Department of Natural Resources, Historic Preservation Division (HPD) have consulted and determined that the construction activities for the proposed Vogtle Units 3 and 4 will impact site 9BK416. Site 9BK416 was determined eligible for inclusion in the National Register of Historic Places (NRHP) in 2006. Based on these consultations and supporting field surveys HPD determined the proposed project will impact site 9BK416, but not adversely impact the site.

This Memorandum of Understanding (MOU) between SNC and HPD is for the preservation of the remaining balance of site 9BK416 from physical disturbance and performance of additional archaeological surveys as directed by HPD. The proposed project will disturb approximately 2.5 acres of the estimated 29 total acres of site 9BK416. This disturbance constitutes approximately 8.5 percent of the total estimated site and results from the installation of the river water intake piping, an electrical duct bank and associated right-of-way clearings.

We the undersigned concur that the balance of site 9BK416 should be preserved and understand that additional historical and archaeological surveys may be warranted at a later date, under the direction of HPD.

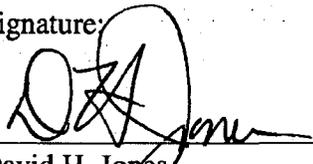
Signature:

Date:

\_\_\_\_\_  
W. Ray Luce, HPD  
Director and Deputy SHPO

Signature:

Date:

  
\_\_\_\_\_  
David H. Jones  
Site Vice President, Vogtle 3 and 4

\_\_\_\_\_  
12/18/2009

**Southern Nuclear Operating Company**

**ND-10-0023**

**Enclosure Attachment 5**

**NOTE:** Attached is stand-alone document two pages in length.

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 3.2-2 Revised Plant Groundwater Estimates and Plant Effluent Streams  
for Two Units**

Stream Description	Normal Case <sup>a</sup> (gpm)		Maximum Case <sup>a,b</sup> (gpm)		Comments
	ESP	COLA	ESP	COLA	
<b>Groundwater (Well) Streams:</b>					
<b>Plant Well Water Demand</b>	752	752	3140	2797	
Well Water for Service Water System Makeup	537	537	2353	1600	
• Service Water System Consumptive Use	403	403	1177	1100 <sup>g</sup>	
- Service Water System Evaporation	402	402	1176	1099 <sup>g</sup>	
- Service Water System Drift	1	1	1	1 <sup>g</sup>	
• Service Water System Blowdown	134	134	1176	500	
Well Water for Power Plant Make-up/ Use	215	215	787	1197	
• Demineralized Water System Feed	150	150	600	1080	
- Plant System Make-up/ Processes	109	109	519	999 <sup>g</sup>	
- Misc. Well Water Users	41	41	81	81 <sup>g</sup>	
• Potable Water Feed	42	42	140	70	
• Fire Water System	10	10	12	12 <sup>g</sup>	
• Misc. Well Water Users	13	13	35	35 <sup>g</sup>	

**Vogtle Electric Generating Plant, Units 3 & 4  
COL Application  
Part 3 – Environmental Report**

**Table 3.2-2 Revised Plant Groundwater Estimates and Plant Effluent Streams  
for Two Units (Continued)**

Stream Description	Normal Case <sup>a</sup> (gpm)		Maximum Case <sup>a,b</sup> (gpm)		Comments
	ESP	COLA	ESP	COLA	
<b>Plant Effluent Streams</b>					
Plant Effluent Discharge to River	9,608	10,008	30,761	31,695	
• Blowdown Sump Discharge	9,605	10,005	30,561	31,495	c
- Wastewater Retention Basin Discharge	171	171	505	435	c
- Miscellaneous Low Volume Waste	129	129	365	365 <sup>g</sup>	
- Treated Sanitary Waste	42	42	140	70	c
- Circulating Water / Turbine Plant Cooling Water System Blowdown	9,300	9,700	28,880	30,560 <sup>g</sup>	d
- Service Water System Blowdown	134	134	1176	500	d
- Start-up Pond Discharge	0	0	0	0 <sup>g</sup>	e
• Treated Liquid Radwaste	3	3	200	200 <sup>g</sup>	f

**NOTES:**

- <sup>a</sup> The flow rate values are for two AP1000 units.
- <sup>b</sup> These flows are not necessarily concurrent.
- <sup>c</sup> Per SNC the sanitary waste from Units 3 and 4 will be routed to the existing Unit 1 and 2 sewage treatment plant and will be discharged via the existing Unit 1 and 2 outfall. (No change in value, change in discharge point). Because of this the 70 gpm is not included in the "Blowdown Sump Discharge" figure but is included in the "Final Effluent Discharge to the River."
- <sup>d</sup> For the normal case, the cooling towers are assumed operating at four cycles of concentration. For the service water cooling tower (maximum case), both unit towers are assumed operating at two cycles of concentration. For the main condenser / turbine auxiliary cooling water tower (maximum case), both towers are assumed operating at two cycles of concentration. Flows are determined by weather conditions water chemistry, river conditions (circulating water / turbine plant cooling water system only) and operator discretion.
- <sup>e</sup> Start-up flushes and start-up pond discharge would occur only during the initial plant start-up phase and potentially after unit outages when system flushes are required.
- <sup>f</sup> The short-term liquid waste discharge flow rate may be up to 200 gpm. However, given the waste liquid activity level, the discharge rate must be controlled to be compatible with the available dilution (cooling tower blowdown) flow.
- <sup>g</sup> These values were inadvertently omitted from Rev 0 and do not constitute a change from Rev 0.