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SOUTHERN COMPANY
Energy to Serve Your World℠

DEC 11 2006

Docket No.: 52-011

AR-06-2684

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

Southern Nuclear Operating Company
Vogtle Early Site Permit Application
Environmental Site Audit Information Needs

Ladies and Gentlemen:

On October 17-19, 2006, the U.S. Nuclear Regulatory Commission (NRC) performed an onsite audit of the Environmental Report (ER) that was submitted with the Early Site Permit (ESP) Application for the Vogtle site. Approximately one week prior to the audit, the NRC provided Southern Nuclear Operating Company (SNC) with a list of questions to discuss during the audit. SNC dispositioned many of these questions during the audit, and the NRC added some additional questions to the list.

The NRC requested that many of the questions receive formal answers by the second week in December to support the development of their Environmental Impact Statement (EIS). The enclosure to this letter provides the SNC response to all but 35 questions. SNC will continue developing the responses to these remaining questions with the expectation that these answers will be provided to the NRC in the near future. It is SNC's understanding that the NRC will restructure and reissue these open questions as formal Requests for Additional Information (RAIs).

If you have any questions, please contact T. C. Moorer at 205-992-5807 or J. T. Davis at 205-992-7692.

Respectfully submitted,

SOUTHERN NUCLEAR OPERATING COMPANY

Joseph A. (Buzz) Miller

Sworn to and subscripted before me this 11th *day of* December, *2006*

Gloria H. Bree
Notary Public

JAM/BJS/dmw

Enclosure: Response to NRC Information Needs from October 2006 Environmental Site Audit for Vogtle ESP Application

cc: Southern Nuclear Operating Company
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Mr. J. T. Gasser, Executive Vice President, Nuclear Operations (w/o enclosure)
Mr. D. E. Grissette, Vice President, Plant Vogtle (w/o enclosure)
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Ms. S. M. Coffin, AP1000 Manager of New Reactors (w/o enclosure)
Mr. C. J. Araguas, Project Manager of New Reactors
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Georgia Power Company
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Oglethorpe Power Corporation
Mr. M. W. Price, Chief Operating Officer (w/o enclosure)

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Southern Nuclear Operating Company

AR-06-2684

Enclosure

Response to NRC Information Needs

from

October 2006 Environmental Site Audit

for

Vogtle ESP Application

NOTE: This enclosure makes reference to attachments which follow the enclosure. The referenced attachments are identified below. The enclosure alone, without referenced attachments or this coversheet, consists of 73 pages.

Attachment A-1 (2 pages)
Attachment A-2 (3 pages)
Attachment A-3 (3 pages)
Attachment A-4 (6 pages)
Attachment A-5 (6 pages)
Attachment A-6 (8 pages)
Attachment A-7 (12 pages)
Attachment A-8 (7 pages)

Attachment B-1 (9 pages)
Attachment B-2 (3 pages)
Attachment B-3 (2 pages)

Attachment C-1 (8 pages)
Attachment C-2 (2 pages)
Attachment C-3 (14 pages)
Attachment C-4 (71 pages)

#	Information Need	Discipline Name	Reviewer Name
1	Provide more detailed information on location, purpose, withdrawal rate for known surface water intakes within 50 mi of the VEGP site, not just those intakes within the Savannah River Basin (potential impacts of severe accidents are not limited to the Savannah River Basin). The information should include bearing and distance from the site. Tables 2.3.2.2 and 2.3.2.3 and Figures 2.3.2-3 and 2.3.2.4 provide relevant, but incomplete information.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
2	Complete bibliographic information should be included in the reference lists for NRC documents referenced in the text. (Through out ER)	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
3	Why does the ER reference more than one version of the AP1000 Design Control Document? (e.g. Section 2.7 references Revision 14; Section 3.0 references Revision 15)	Accidents	Van Ramsdell
Response: Reference to Revision 14 is incorrect and will be corrected in the next revision of the ESP.; No further action needed.			
4	Please provide input to and output from the PAVAN code.	Accidents	Van Ramsdell
Response: Input files and Executive Summary of methodology were provided during the audit. Copies will be provided separately by December 31, 2006.			
5	Section 2.7.7 does not provide a basis for the statements related to predicted noise levels. How were the noise levels estimated? Please provide references?	Accidents	Van Ramsdell

#	Information Need	Discipline Name	Reviewer Name
Response: Noise levels at full power conditions were predicted for seven locations along the property line using ambient measurements and a model developed by Argonne Labs. Predictions were also made using Edison Electric Institute's Electric Power Plant Environmental Noise Guide and reported in the Operating License Stage Environmental Report for the Unit 1 & 2 FES. ***References:*** Georgia Power Company, 1985, Applicants Operating License Stage Environmental Report, Vogtle Electric Generating Plant Unit 1 and Unit 2, March, 29 Edison Electric Institute, Electric Power Plant Environmental Noise Guide			
6	The last line of Section 5.3.3.1 states that 1999 meteorological data were used in the SACTI code runs because they were the most complete. Was 1999 a representative year meteorologically? If not, why not and what is the impact of the departure on the results of the SACTI analysis.	Accidents	Van Ramsdell
Response: 1999 is a representative year meteorologically. There is generally not great variation in meteorogical data from year to year at the Vogtle site. A complete data set is an important discriminator when selecting meteorological data. SNC provided five years of met data. Of those five years, two years of data were considered complete – 1998 and 1999. The year 1999 was selected for the representative year from the two complete years of data since, in the judgment of the analyst, it would provide slightly more conservative results for the severe accident analysis. The year 1999 was not judged to be more conservative for SACTI, but the data sets were consistent for the two analyses. There was no sensitivity study on the year of met data for the SACTI runs.			
7	Section 5.3.3.1.3 cites a salt deposition value in NUREG-1555 as a basis for determining significance. This is an improper use of NUREG-1555. NUREG-1555 is a review plan, not a technical basis document. Use of NUREG-1555 in this manner decreases the validity of the environmental review.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
8	Page 5.6-7 Section 5.6.3.4 refers to "A 1974 study on radio noise..." Please provide a reference for the statement and include the reference in the reference list.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
9	Page 7.1-1... Last paragraph... What EAB is considered here? It isn't likely to be the EAB for the current site, which is the EAB described in Chapter 3.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
10	Please explain how the noise levels predicted for the cooling towers (Table 2.7-26) are combined with ambient noise levels to arrive at the conclusion in Section 2.7.7.	Accidents	Van Ramsdell
Response: The noise levels estimates made by Georgia Power Company were made using Edison Electric Institute's Electric Power Plant Environmental Noise Guide. The significant sound-producing plant components were identified, and the effects of directional sources, distance, and other attenuation factors were considered. Table 2.7-26 is Table 5.6-1 from GPC 1985. ***Reference:*** Georgia Power Company, 1985, Applicants Operating License Stage Environmental Report, Vogtle Electric Generating Plant Unit 1 and Unit 2, March, 29			
11	The EAB defined in Table 3.0-1 near the bottom of page 3.0-2 is not the EAB described or used for X/Q calculation in Section 2.7.5.1, or for the X/Q presented in Table 3.0-1 near the center of page 3.0-2.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
12	Section 3.6.3.1 states that there will be no sources of gaseous emissions for the new plants other than from the diesel generators and auxiliary boilers. Will there be activities using paint,solvents, or other volatile substances?	Accidents	Van Ramsdell

#	Information Need	Discipline Name	Reviewer Name
Response: The current Vogtle Unit 1 and 2 site is subject to a full Title V permit issued by the Georgia Environmental Protection Division (EPD). The proposed new units will be subject to the same requirements either as part of the Vogtle 1 and 2 Title V permit or a separate Title V permit. In either case, emissions from painting, use of solvents, or other volatile substances fall well below the threshold (deminimus) activities under the permit requirements. Best management practices will be used to minimize emissions of volatile substances.			
13	Please clarify the last sentence in Section 3.7.1. How do the 12 and 30 ft numbers in this sentence relate to the 45 ft phase-to-ground clearance listed in Section 3.7.2 on page 3.7-2?	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
14	Page 4.4-3, last line of Section 4.4.1.1.3. Does this sentence mean that the " "minor road repairs and improvements" said to be necessary in the last paragraph on page 4.4-2 will not be made? Or that damage to public roads, etc. listed in the first paragraph of pate 4.4-3 will not be made as promised. The words "... and will not require mitigation." are unacceptable in places where mitigation measures are discussed or promised!	Accidents	Van Ramsdell
Response: SNC does not consider minor repair and/or improvements of roadways to be mitigation. Burke County and the Georgia Highway Department coordinate these type activities as part of their ongoing road maintenance program.			
15	Same comment line of page 4.4-3; last line of Section 4.4.1 on page 4.4-5; last line on page 5.1-3;	Accidents	Van Ramsdell
Response: Correct wording should be that "mitigation beyond that discussed above will not be warranted." This correction will be reflected in the next revision to the ESP application.			
16	The statistics in Section 4.7.2 seem to indicate that VEGP is a more dangerous place to work than the US or Georgia in general. Why is that? The nuclear industry is generally regarded as having a good safety record.	Accidents	Van Ramsdell
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
17	On page 4.4-19 and again on page 5.8-15, you estimate the number of school-aged (under 18 years old) children in a manner that is incorrect. The methodology creates an estimated percentage of under 18 people based on the general GA population which includes children, retired people, and possibly other demographic groups that do not have children. Please provide a more appropriate estimate of the number of school-aged children.	Socioeconomics and Environmental Justice	Katie Cort

#	Information Need	Discipline Name	Reviewer Name

Response: During the NRC site audit at SNC, NRC requested that SNC use a different methodology for estimating the number of school-aged children that would migrate into the VEGP socioeconomic region for construction of the new units. NRC requested that SNC use the same methodology used by TVA in their environmental report to renew the licenses for their Browns Ferry Nuclear Plant Units 1, 2, and 3 (TVA 2003, Section E.3.4, page E-110).

The TVA document analyzed the refurbishment of Unit 1 based on recent TVA experiences on other large construction projects. In its analysis, TVA made the following assumptions:

a. 830 refurbishment workers would relocate to the area
b. 65 to 85 percent of them would bring families (or a maximum of 706 workers would bring families (830 X 0.85 = 706))
c. "the estimated number of dependents would be 1,244, consisting of 622 spouses and 622 children". 1,244 dependents is approximately 1.762 times the number of workers bringing families (706 X 1.762 = 1,244)
d. the estimated number of school-aged children was estimated to be 460, which is approximately 74 percent of the total number of children.

Therefore, applying the same methodology to the VEGP construction project, SNC estimates the following:

a. 2,700 construction workers would relocate to the area
b. 65 to 85 percent of them would bring families (or a maximum of 2,295 workers would bring families (2,700 X 0.85 = 2,295)
c. the estimated number of dependents would be 4,044, consisting of 2,022 spouses and 2,022 children. 4,044 dependents is approximately 1.762 times the number of workers bringing families (2,295 X 1.762 = 4,044)
d. the estimated number of school-aged children is estimated to be 1,496, which is approximately 74 percent of the total number of children.

The original analysis estimated that 1,900 school-aged children would accompany the construction workforce.
This confirmatory analysis was performed at the NRC's request. No revision to the evaluation in the ESP application is planned.

Reference:
Tennessee Valley Authority (TVA). 2003 Applicant's Environmental Report. Operating License Renewal Stage. Browns Ferry Nuclear Plant, Units 1, 2, and 3. December.

#	Information Need	Discipline Name	Reviewer Name
18	Provide a complete listing of the county-by-county residence for Vogtle employees.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action is necessary.			
19	Population data in different parts of the analysis come from different sources (SECPOP, US Census, State of Georgia). Provide a short discussion of the different data sources and explain how the use of multiple sources does not compromise the conclusions you derive from them.	Socioeconomics and Environmental Justice	Katie Cort
Response: See response to Question 20 below.			
20	On page 2.5-2 you say future populations were calculated from SECPOP data, extrapolated by applying the change in population between 1980 and 2000 in SECPOP. On page 2.5-3 you say future populations were calculated from State of Georgia Data, extrapolated by using ". . . the most recent census data and the actual birth and death data for 1990 through 2003." Reconcile this conflict and explain why you can use an extrapolation from a recent 20-year change in population to more than eighty years in the future. (See page 2.5-2.) Provide a complete list of the underlying assumptions behind your population projections, any possible bias each assumption could introduce to the analysis, and the potential magnitude of that bias.	Socioeconomics and Environmental Justice	Katie Cort

#	Information Need	Discipline Name	Reviewer Name
Response: NUREG-1555 directs the analyst to include a table with population data and projections by sector, not by political jurisdiction. Population data presented in sector format is most useful to analysts performing accident analyses, not those performing socioeconomic analyses. In general, socioeconomic impacts are not experienced by sectors, but are experienced by political jurisdiction (i.e. town, county, state, etc.). Though not required by NUREG-1555, SNC added a table with population data and projections provided by the State of Georgia to aid in the analyses of socioeconomic impacts. \ There is a difference in methodologies used for the projections in the two tables in Section 2.5. In the sector population table, the (20-year) annualized growth rate is calculated from 1980 to 2000 for each sector. The growth rate is used to project decennial populations for each sector to 2090. In the political jurisdiction table, the projection data is provided by the State of Georgia, which used the cohort-component model to project decennial populations to 2015. When the growth rates are compared side-by-side, the growth rates provided by the state are larger than the 20-year annualized rates (1.0 % vs. 0.7%, in 2010) in Burke County and smaller than the 20-year rates in Richmond (-0.3% vs. 0.48%, in 2010) and Columbia (2.7% vs. 4.1%, in 2010) Counties. Such differences may overstate or understate accident impacts, depending on the county. However, over the 50-mile radius, these differences will offset one another to a degree. Additionally, for accident analyses, a sensitivity analysis is performed wherein population projections were increased 30 percent. This increase would also serve to narrow the margin between the two growth rates. While differences are noted, each method is considered a valid approach. With respect to projections to 2090, most demographers and economists agree that, beyond 20 years, the uncertainty (or degree of error) of any projection method is large and projections become increasingly speculative. In effect, the validity of any methodology used for dates beyond 20 or so years from the present could be seriously debated. However, in effort to provide some rough estimate of projected populations to 2090 (assuming units go on-line about 2020 and a sixty-year operating life, or to 2080), these methods (SECPOP) were selected.		
21	Provide the raw Arcview data and the "calculation package" used to determine minority and low-income population sizes.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action is necessary.			
22	The ESP characterization of affected Native American communities on page 2.5-25 does not include South Carolina populations. Provide this analysis.	Socioeconomics and Environmental Justice	Katie Cort
Response: The location and distribution of South Carolina Native American populations are provided in Attachment A-1. This information will be added to the ESP at the next revision.			

#	Information Need	Discipline Name	Reviewer Name
23	Page 4.4-13, states (and page 5.8-11 reiterates): "Use of the WMA/boat landing is seasonal and it will be unlikely that hunters and fishermen will be on River Road at the same time as the construction shifts. . ." Provide citations for the assumption that sports and recreational users of the boat landing will not be on the roads at the same time as construction or operations-related vehicles.	Socioeconomics and Environmental Justice	Katie Cort
Response: Based on interviews with plant personnel and individuals with personal knowledge of local hunters/fishermen habits, deer/turkey hunters are in place before daylight, and leave mid-day or after dark. Fishermen are more likely to use River Road at same time as commuters; however since they are also recreational users, they will likely start later in the day than commuter traffic. Both will use the roads more on weekends than weekdays. Also, there are additional roads to Yucci Wildlife Management Area and the boat landing other than those to VEGP.			
24	On page 2.5-20 the ESP says: "All three school districts have *some* capacity for additional students. . . " [Emphasis added] Please provide concrete values for this statement. What is the capacity of each affected school? What was the student population at each school last year? What are the projected population and capacity factor for each school during the construction phase of the Vogtle project?	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
25	Page 4.4-7 states "The creation of such a large pool of jobs [5,800] would inject *millions of dollars* into the regional economy." Provide an actual value for your estimate.	Socioeconomics and Environmental Justice	Katie Cort
Response: Please see Attachment A-2.			
26	Page 4.4-8 states "While the exact amount of income taxes the project will generate for Georgia cannot be known, it could be *fairly large* over a 7-year pre-construction and construction period. . ." Provide a quantity for your estimation of the tax revenues that will be collected.	Socioeconomics and Environmental Justice	Katie Cort
Response: Please see Attachment A-3. This analysis is provided for confirmatory purposes; no revision to the ESP is planned.			
27	Clarify your statements on page 4.4-16, within two sentences, that the in-migration of workers in Burke County is "significant" and "MODERATE."	Socioeconomics and Environmental Justice	Katie Cort

#	Information Need	Discipline Name	Reviewer Name
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
28	Page 5.8-6 of the report states: "Therefore, SNC used generic assumptions. SNC based costs on reasonable assumptions supported by several independent studies . . ." Provide a comprehensive list of those studies and the generic and reasonable assumptions used in this report. For each assumption, discuss the consequences of that bias in terms of its direction and magnitude on the results of the analysis.	Socioeconomics and Environmental Justice	Katie Cort

Response: The following simplifying assumptions were used to generate the tax revenue analysis. Supporting information is provided in Attachment A-4.:

- Cost range [for a single unit] was based on GPC analyses-generated estimates and generic estimates in MIT 2003.
- Joint ownership was disregarded.
- Tax benefits to other Georgia counties from GPC ownership in the new units was disregarded, and all tax benefits were assumed to accrue to Burke County.
- The Allowance for Funds Used During Construction (AFUDC) was estimated assuming a 5-year schedule from ground breaking to on-line, but the AFUDC was not based on an actual construction schedule / percent complete.
- Millage rate was held constant for the approximate 40-year analysis period at the current rate.
- 40 years of operation for each unit was assumed to estimate depreciation and rate base returns Rates of return based on market costs of capital will be received for property placed in the rate base.
- Rates of return on property not subject to rate regulation is assumed to be comparable to rates of return for property that is subject to rate regulation.
- Value of property placed in the rate basis is approximately equal to the amount added to the rate base as a result of the project.
- The value of nontaxable property on the project was estimated to be 19% of the total value, but this was based on fossil-fueled plants. The portion of nuclear units not subject to the ad valorem tax is not known.
- Tax payments to Alabama were calculated as a ratio of payments to Georgia and were not based on the Alabama tax structure.

#	Information Need	Discipline Name	Reviewer Name
29	List all of your underlying assumptions with regard to the working conditions at the Vogtle site. How many days a week will the construction workforce work? How many hours a day? Will the work be done with labor agreements with local unions or through nonunion companies? Provide references and/or anecdotal evidence in support of each assumption. On page 4.4-11, the ESP states; ". . . SNC has assumed that there will be four construction shifts and each shift will include 25 percent of the total construction workforce. . ." Provide evidence this manpower strategy has been successfully employed on a project of this magnitude.	Socioeconomics and Environmental Justice	Katie Cort
Response: The information contained in Chapter 4 of the ER provides a description of the strategy planned for the construction of new units at Vogtle and provides a brief discussion of the workforce structure and work schedule. The construction of the new units will be managed by a contractor. Decisions regarding the detailed work schedule have not been made and will likely not be made for some time to come. Southern Company has a long history of constructing and operating power plants in the southeast including three nuclear facilities. SNC has relied extensively on previous experience with the construction of the existing Vogtle units in evaluating the socioeconomic impacts of this new construction project. SNC and their contractors will comply fully with applicable laws and regulations and will manage working conditions in a way to maximize efficiency, ensure a quality work product, and ensure fair and equitable treatment of the construction workforce.			
30	Page 5.8-11 discusses the impact of outages, but there is no description of what is meant when an outage occurs. Explain your number of outages per year, how it was derived, and what takes place at an outage.	Socioeconomics and Environmental Justice	Katie Cort
Response: There are currently two units located at the Vogtle site. Each unit undergoes a scheduled refueling outage every 18 months. As such, there are two years with one outage and one year with two outages for every three year period. Typical outage length is 20 - 25 days. The proposed Vogtle Unit 3 and Unit 4 are currently estimated to undergo scheduled refueling outages approximately every 18 - 24 months. Outage length should be in the 18 - 24 day range. Although an outage schedule for all four Vogtle units has not yet been designed, it is reasonable to assume that outages will be carefully planned in advance to optimize the process and minimize the impact on Southern Company system reliability and SNC manpower resources. The typical outage consists of the required fuel reload activities, scheduled equipment maintenance, and frequently special projects such as major equipment replacements and refurbishment, chemical cleanings, etc. The onsite work force increases significantly as contractors come onsite to support outage activities. Plant shifts are modified to ensure outage coverage and coverage for the operating units and overtime is common. Outages are carefully managed to minimize downtime.			

#	Information Need	Discipline Name	Reviewer Name
31	On page 2.5-1, you assume the construction workforce will locate in the 50-mile region in approximately the "same proportion as the existing workforce." There is not enough detail presented to support your assumption. Table 4.4.2-1, footnote #1 suggests this assumption may be coming from a report; however the report is not cited. Revise your assumptions for worker housing to reflect a defensible distribution of workers. List your assumptions, any potential bias that each assumption may impose, and the potential magnitude of that bias. Provide citations.	Socioeconomics and Environmental Justice	Katie Cort
Response: Information in Table 4.4.2-1 is based on similar sized projects and knowledge of the local skilled craft labor force. This information is based on the following: 1. A manpower curve and project schedule for a two-unit (1500 MW each unit) project. 2. A derivation of the number of local skilled craft labor force (1,000) based on the following: a. The known skilled craft workforce currently with jobs working in the area. b. The assumption that the ESP project could draw 20 to 25 percent of the known skilled craft workforce in the area c c. The assumption that field non-manual workers would come from outside of the area 3. It is expected that approximately 70 to 80 percent of the entire construction workforce would be employed for two years or more. SNC conservatively assumed that construction workers expecting to stay 2 or more years would consider the area their permanent residence and move their families there. SNC determined that the distribution of a permanent construction workforce would be best represented by the distribution of an operations workforce. The majority of the current operations workforce employed at VEGP lives in one of the three counties of interest (Burke, Richmond, and Columbia).		
32	On page 2.5-1 you state "the residential distribution of the new units' construction and operational workforces would resemble the residential distribution of VEGP's current workforce." You also state that since 80% current workforce lives in only three counties, that those three counties are sufficient for your socioeconomic analysis. Provide an analysis for all construction and operational workers and all of the counties within the 50 mile radius around the Vogtle site.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
33	Almost half the study area is in South Carolina, yet all of the socioeconomic and environmental health effects are limited to only three counties in Georgia. Explain county-by-county why that simplifying assumption can be made.	Socioeconomics and Environmental Justice	Katie Cort

#	Information Need	Discipline Name	Reviewer Name
Response: Please see Attachment A-5			
34	The ER claims 1,000 of the 4,400 construction workers will come from local labor sources. Provide citations for the reports and studies from which this assertion was derived. Farther in the analysis, you claim that, to be conservative, you assume all of the 660 workers needed for operating the new Vogtle units after construction will immigrate from outside the area. Explain why some proportion of the 660 operations workers cannot come from the local labor pool. Provide anecdotal evidence or other support for such an assertion.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
35	Page 4.4-6 uses a multiplier to estimate the number of new jobs that will be created by the influx of 3,400 new construction workers for the life of the construction project. The value assigned to the construction labor multiplier appears to be too high for it to be correct. Specific issues and questions that arise related to the use of the multiplier include the following: Is it appropriate for this multiplier to be applied directly to the labor component of the economy? What were the baseline and specific changes to that baseline that went into the RIMS II analysis? Please provide the letter you cited from the BEA representative that gave you the RIMS II multiplier value and the contact's instructions on how to it. When construction is complete, the area will experience a loss of about 2,300 jobs (based on the maximum construction employment, net of the new operations work force). In terms of multiplier effects, can you adequately capture and discuss the net loss in employment from this change? Construction employment is not constant. It will begin with a small work force and then expand to its maximum size, then decline to a low level again (similar to a bell curve with the peak at 4,400), not a constant plateau at 4,400 from beginning to end. This would suggest that the ER overstates the full employment effect by as much as 100% (assuming a normal distribution on the bell curve). Can you adjust your analysis based upon this distribution?	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
36	Chapter 4 claims "the assessed value of plant during construction is discussed as likely being greater than $0 and less than "actual cost."" Provide an estimated value, using the estimated overnight capital costs used in Table 10.4-2.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
37	Provide the list of local "government officials, the staff of social welfare agencies, and local businesses" that were contacted concerning environmental justice issues? Provide copies of all interview notes, as well.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
38	Provide the GIS layer data that includes population data as well as minority and low-income block groups.	Socioeconomics and Environmental Justice	Katie Cort
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
39	Provide estimates of the potentially disproportionate health and environmental effects among populations of interest. Quantify each health and environmental effect identified. Discuss and quantify the applicant's planned mitigation strategies for these anticipated effects, using monetary measures whenever possible. Quantify and discuss the possible exposure doses to affected populations of interest. (This especially applies to all four subsections of chapter 7)	Socioeconomics and Environmental Justice	Katie Cort
Response: SNC plans to provide the response to this question by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
40	The ER identifies a serious public services problem that may arise due to the in-migration of workers: "Fire protection infrastructure, already inadequate could not be able to meet the needs of [Burke] county. . ." Chapter 4 identifies under staffing of the fire department and the county police, road congestion problems, and overcrowding of its schools. Chapters 4 and 10 let local tax increases fund the new personnel and equipment necessary to address these problems. However, there is a lag between the collection of the new taxes and the actual use of the new assets. Furthermore, mitigation strategies need to be actions to be taken by the applicant, not outside entities. What forms of mitigation does the applicant plan to mitigate social problems created by the construction and/or operation of the Vogtle units 3 and 4? Provide cost estimates of the before- and after-mitigation levels for all social problems that require mitigation.	Socioeconomics and Environmental Justice	Katie Cort
Response: SNC has not proposed a mitigation measure for the impact described. NEPA does not require mitigation for every impact. The increased tax revenues identified in the ER that will result from the proposed action will offset impacts on county services and should be considered by NRC in conjunction with any such impacts. While the conservative assumption underlying the analysis is that the entire construction workforce will arrive en masse, that scenario is not realistic. (why did we assume it for the purpose of the analysis). The increases in population that will result from the construction of the new units will ramp up gradually over several years. It is reasonable to conclude that the impacted counties will respond to these increases in population as they would other population growth, regardless of cause. The counties' response can be financed through tax revenues generated through the construction and operation of the units. Mitigation measures by SNC, therefore, should not be required. As part of the planning process, SNC will keep local officials apprised of the expected arrival of workers far enough in advance to allow them to respond appropriately. SNC will include such notification measures as mitigation measures in the next revision to the ESP application.		
41	Provide a table that displays all of the benefit categories attributable to the proposed site and all alternative sites and the expected magnitude of those benefits in monetary terms whenever possible.	Socioeconomics and Environmental Justice	Katie Cort
Response: SNC plans to provide the response to this question by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
42	Expand the analysis on page 10.1.2 which discusses the unavoidable and adverse impacts of operation (currently in eleven lines). Include a discussion of each impact, mitigation strategies to reduce their impact, and cost estimates for before- and after-mitigation levels for each impact.	Socioeconomics and Environmental Justice	Katie Cort
Response: Please see Attachment A-6.			
43	Provide a discussion of the procedures and practices that the applicant will undertake to minimize the size of the commitment, the cost of those efforts, and some quantification of those commitments that remain after all mitigation attempts have been made.	Socioeconomics and Environmental Justice	Katie Cort

#	Information Need	Discipline Name	Reviewer Name

Response:
Groundwater
SNC estimates that the new units will use 752 gallons per minute (gpm) of groundwater (during off-normal operations the new units could draw 3,140 gpm for a short period of time). Using this estimate and historic data from existing site wells and Units 1 and 2, SNC estimates that drawdown at the site boundary could range from less than 2 feet to less than 13 feet (note that groundwater analyses are still being prepared and will be provided in response to an RAI). Some AP1000 water systems are recycled to minimize consumption. No other activities near the VEGP site require large amounts of groundwater. SNC concludes that impacts to groundwater will be small and short-term (i.e., withdrawals and drawdown would cease when operations ceased) and therefore does not require additional mitigation.

Surface Water
SNC will use surface water drawn from the Savannah River turbine plant cooling. The Best Available Technology for power plant cooling systems is cooling towers. SNC plans to construct natural draft cooling towers for the new units. Consumptive losses from the cooling towers are estimated to be 1.55 percent of the river flow under worst case conditions. This water loss would lower the river level at VEGP less than 1 inch. No large water withdrawals exist between VEGP (at River Mile 151) and approximately River Mile 25. SNC concludes that impacts to the water quantity from consumptive water losses will be small and will not require mitigation beyond cooling towers.

A small thermal plume will be discharged into the river just downstream of the existing plume. The new plume will affect less that 800 ft^3 of the river. Small amounts of regulated chemicals will be discharged with the plume. The chemicals will disperse quickly and concentrations outside the Georgia-approved mixing zone will be at ambient river concentrations. SNC concludes that impacts to the water quality from discharges will be small and will not require mitigation beyond cooling towers.

The intake canal/ intake structure will be designed to Best Available Technology and recessed from the river flow which will reduce the approach velocity significantly. This will minimize impingement and entrainment losses of aquatic organisms.

By constructing cooling towers and an intake using Best Available Technology, SNC has mitigated impacts to the Savannah River and its aquatic organisms. The estimated cost of cooling towers and associated infrastructure is $175,000,000. All impacts will be small and short-term, ending with the cessation of operations. No additional mitigation is warranted.

#	Information Need	Discipline Name	Reviewer Name

Land Use
Two new units will require a commitment of approximately 300 acres of land for the duration of plant operations. The land will be unsuitable habitat for many terrestrial plant and animal species that are found in the natural habitats in the area. However, there is sufficient undeveloped land adjacent to the VEGP site, and such that any impacts from the loss of 300 acres will be small and mitigation will not be necessary.
The AP1000 is designed to minimize waste generation, thus minimizing the disposal space required. For example, the liquid radioactive waste system is designed to minimize the generation of solid wastes. In this way, SNC minimizes not only the amount of land needed to dispose of wastes but also the costs incurred through waste disposal.
In addition, SNC has practices in place to further minimize solid waste generation. Vogtle currently has active waste minimization programs for solid waste (including paper, cardboard, used oil, and scrap metal recycle), hazardous and mixed waste, low-level radwaste, and a Pollution Prevention Program. These programs have been in place for a number of years and have produced significant results. Similar programs would be put in place for the new units.

Radiation Releases to Air and Surface Water
Nuclear plants are designed to ensure very low radiation exposure to employees and the public and that only very low concentrations of radiation are released to the environment. The plant systems are designed to prevent or minimize leakage, equipment failures, corrosion, and other factors that would stress system components and increase the likelihood of system failures. For example, radiation equipment and piping are shielded to minimize radiation exposure by plant personnel. Direct connections between inside and outside the containment are minimized. Exhaust air ductwork is designed to minimize the spread of any airborne contamination. Air exhausted to the outside passes through filters to minimize particulate releases. The design of the AP1000 minimizes the potential for large fission product releases in the event of a severe accident: for example, water would drain on the outside of the containment to increase heat transfer, improved containment isolation reduces the probability of containment bypass, steam generator tube rupture core melt frequency is reduced with multiple levels of redundant and diverse defensive systems. It is not possible to determine the costs of these design features at this time
SNC concludes that the design of the reactor and auxiliary systems will limit the potential for releases to the environment and exposure to workers and the public and that further mitigation is not warranted.

Construction Material
The AP1000 utilizes building configurations and structural designs that minimize building volumes and quantities of materials such as concrete, wiring, steel, etc.

#	Information Need	Discipline Name	Reviewer Name
44	Establish a $2005 US standard for all dollar values in the report.	Socioeconomics and Environmental Justice	Katie Cort
Response: The data used by SNC to conduct the economic analysis includes data from many sources and many years. It would be extremely difficult, if possible at all, to express all of this data in terms of Standard Dollars for 2005 or for any reference year. SNC believes that the purpose of this data does not warrant this action.			
45	The section on unavoidable adverse environmental impacts discusses social issues without specificity and never identifies any particular environmental concern. Clarify this discussion to include specific environmental adverse impacts for construction and operations, including an assessment of the before- and after-mitigation value of those impacts? Include the EJ effects of both construction and operations for each alternative site. Provide a table that displays all of the adverse environmental impacts of construction and operations (including human health effects); a description of each impact; all mitigation strategies to be undertaken by the applicant for that impact, the cost of mitigation, and the expected value of the unavoidable portion of that impact.	Socioeconomics and Environmental Justice	Katie Cort
Response: Please see Attachment A-7.			
46	Provide a discussion of the unavoidable and adverse effects of construction and operation at alternative sites (including human health effects), including the pre- and post-mitigation levels of those impact categories. Provide a table that displays all of the adverse environmental impacts of construction and operations at alternative sites; a description of each impact; all mitigation strategies to be undertaken by the applicant for that impact, the cost of mitigation, and the expected value of the unavoidable portion of that impact.	Socioeconomics and Environmental Justice	Katie Cort
Response: SNC is currently working on this information. It will be sent to the NRC by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
47	Provide a copy of the documentation for your assessment of the real estate markets in the affected area. In particular, explain your statement on page 5.8-12 that states: "the average income of the new workforce will be expected to be higher than the median or average income in the county, therefore, the new workforce could exhaust the high-end housing market . . ." What is the correlation between wages and home value (corrected for boom economy immigration) in the Savannah River basin?	Socioeconomics and Environmental Justice	Katie Cort

Response: The 2000 real estate inventory, by price, in Burke, Richmond, and Columbia Counties is provided in Attachment A-8 (USCB 2000). In Burke County, the largest housing inventories fall within the $40,000 to $79,999 price ranges and the median housing price is $59,800. In Richmond County, the largest housing inventories fall within the $40,000 to $174,999 price ranges and the median housing price is $76,800. In Columbia County, the largest housing inventories fall within the $60,000 to $249,999 price ranges and the median housing price is $118,000. The inventory of higher-priced housing ($100,000 or more) is the lowest in Burke County at 0.1 percent of total housing. Richmond County has 15.4 percent and Columbia County has 21.6 percent. The average wage in the Augusta-Richmond County, GA-SC metropolitan statistical area in 2005 was $33,560 (BLS 2005). The average annual salary of an SNC operations worker at the VEGP site will be $75,400 (Woodruff and Pittman 2005).

Based on the housing inventories and wage information presented here and the fact that workers with larger disposable incomes tend to purchase more expensive housing, it would be reasonable to assume that this workforce would purchase housing in the upper price ranges (over $100,000) of the housing markets.

References: U.S. Department of Labor Bureau of Labor Statistics (BLS). 2005. "May 2005 Metropolitan Area Occupational Employment and Wage Estimates. Augusta-Richmond County, GA-SC." Available online at http://stats.bls.gov/bls/blswage.htm. Accessed October 16, 2006.U.S. Census Bureau (USCB). 2000. "QT-H14. Value, Mortgage Status, and Selected Conditions: 2000." Data Set: Census 2000 Summary File 3 (SF 3) – Sample Data. Available online at http://factfinder.census.gov. Accessed November 16, 2006.Woodruff, J. and Pittman, J. 2005. "Staffing and Cost Study for a New Unit at Plant Vogtle." August 12. ATTENTION -- Business Confidential.

48	Provide a table that displays all of the benefit categories (including human health benefits) attributable to the proposed site (including health benefits) for the proposed site and all alternative sites; a description of each benefit; and the expected value of the benefit.	Socioeconomics and Environmental Justice	Katie Cort

Response: SNC is currently working on a response to this question. It be sent to the NRC by January 31, 2007.

#	Information Need	Discipline Name	Reviewer Name
49	Wetlands meet the definition of "important habitats" in NUREG-1555. Impacts to wetlands associated with building the new units at Vogtle will be quantified as part of the NEPA review process.	Terrestrial Ecology	Amanda Stegen
Response: In order to evaluate the impacts of construction on wetland habitat, the final location of the intake and discharge structures, barge slip, and other construction activities with potential to impact wetlands must be known. This information has only recently become available. SNC will conduct wetlands delineation in early December 2006 and will use the information to evaluate the impacts of construction on wetlands. Thus, SNC plans to provide the response to this question by January 31, 2007.			
50	Please identify and provide a figure with all wetlands that may be impacted during the pre-construction and construction activities including the wetlands found on the floodplain adjacent to the Savannah River.	Terrestrial Ecology	Amanda Stegen
Response: As described in the response to Question 49, information on the final location of key structures only recently became available. SNC will conduct wetlands delineation in early December 2006 and will utilize the information to evaluate the impacts of construction activities on wetlands. SNC plans to provide the response to this question by January 31, 2007.			
51	How were the wetlands determined - aerial photos, wetlands delineation. If delineated, was the 1987 Wetlands Delineation Manual used? If not, what method was used?	Terrestrial Ecology	Amanda Stegen
Response: A survey of wetland areas on the Vogtle site was conducted in support of the original Unit 1 and 2 Licensing in the early 1980's. This work was also used in the Wildlife Habitat Council program development. It consists primarily of maps developed from topos, aerial photos, and site walkdowns of wetland areas. The wetlands were mapped and the aerial extent was defined. No formal delineation was conducted and the 1987 Wetland Delineation Manual was used for reference only. SNC will conduct wetlands delineation in early December 2006. SNC plans to provide the response to this question by January 31, 2007.			
52	Identify the specific activities associated with wetlands impacts - including both preconstruction and construction activities (example - building the access/haul roads, new water intake structure) Specifically, provide information on the activity, the potential impact, number of acres to be impacted, type of wetland impacted (jurisdictional/non jurisdictional), and any planned mitigation associated with the wetlands. We have provided Table X-1 to facilitate compiling this information.	Terrestrial Ecology	Amanda Stegen

#	Information Need	Discipline Name	Reviewer Name
Response: SNC now has adequate information available about the final design, location, and process for the construction activities that have potential to impact wetlands. SNC will conduct wetlands delineation in early December 2006 and the resulting information will be utilized to determine the impact to wetland areas associated with the Unit 3 and 4 construction. SNC plans to provide the response to this question by January 31, 2007.			
53	It is understood that the specifics associated with the construction of the new 500 kV transmission line and the borrow areas is still in the planning phase. Provide as much information as possible on wetlands, sensitive areas, and Carolina Bays that may be impacted with the construction of the new 500 kV transmission line as well as the borrow areas.	Terrestrial Ecology	Amanda Stegen
Response: SNC is working with Georgia Power Company (GPC) to develop a macro-corridor for new 500 KV line and an assessment of the environmental impacts associated with construction and operation of this line. The assessment will build on the county level assessment provided in the ER for this line. Information should be available by January 31, 2007. SNC plans to provide the response to this question by January 31, 2007.			
54	In regards to wetlands, has SNC provided maps or delineations to the ACOE for jurisdictional determinations, and if not, how much interaction regarding wetlands has SNC had with the Corps?	Terrestrial Ecology	Amanda Stegen
Response: Information about the final design and location of structures and construction activities has only recently become available. SNC has engaged the U.S. Army Corps of Engineers (USACE) – Savannah District and has met with them on two occasions to discuss wetland issues. SNC will conduct wetlands delineation in early December 2006 and this information will be provided to the USACE for the purpose of obtaining jurisdictional determinations. These determinations will be utilized in evaluating the environmental impact of construction activities on wetlands. SNC plans to provide the response to this question by January 31, 2007.			
55	What is the proposed schedule for obtaining the required permits from Georgia DNR and COE? What is the status of the 401, 404 and Section 10 applications? These permits include the 401, 404 and Section 10 permits.	Terrestrial Ecology	Amanda Stegen

#	Information Need	Discipline Name	Reviewer Name
Response: SNC has engaged the Georgia Department of Natural Resources – Environmental Protection Division (EPD) regarding state issued permits and the US Army Corps of Engineers (USACE) regarding federal permits. A number of meetings have been held and Georgia EPD personnel were present at the site audit. There are four permits that are the focus of current efforts; the Section 10/Section 404 permits for the intake structure, discharge structure, and barge slip and the NPDES Stormwater permit for construction activities. The first three permits are issues by the USACE, but require Section 401 water Quality Certifications from Georgia EPD. The stormwater permit is issued by Georgia EPD. In addition to these permits, SNC is evaluating the need for coverage under a Title V air permit for construction activities, including control of dust and storage and use of volatile substances such as gasoline and diesel fuel. The ER discusses permits in Chapter 6. The current schedule for permit applications is under development. Applications for the four permits discussed above will be submitted as follows: Intake Structure Section 10 and Section 404 permit - Fall 2007 Discharge Structure Section 10 and Section 404 permit - Fall 2007 Barge Slip Section 10 and Section 404 permit - Fall 2007 NPDES Stormwater permit for construction activities - Summer 2007 **Dependent on schedule of pre-construction activities and outcome of LWA rulemaking SNC has already had discussions with the relevant agency personnel about these permits and will continue dialogue as additional schedule information becomes available.		
56	Provide acreage associated with the man-made ponds.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
57	What species are associated with Debris Basins 1 and 2 and associated wetland areas?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
58	What species are associated with the large basin between Debris Basin 1 and 2?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
59	There is currently insufficient detail to determine if there will be any dredge and fill activities associated with the preconstruction/construction activities including building access roads to and from riverfront structures, the new cooling water intake structure, the new discharge structure; modification of existing barge slip; and installation of proposed 500 kV transmission line. Provide information regarding the preconstruction/construction activities that may have dredge and fill component. What are the quantities of material to be dredged/ used for fill? And have these sediments been characterized? Table X-1 has been provided to facilitate compiling this data.	Terrestrial Ecology	Amanda Stegen
Response: As part of site preparation activities and prior to any construction activities, any wetlands associated with the intake/discharge structure and barge facility or within the upland construction site will be delineated to determine wetland impacts and all appropriate state and federal permits would be obtained. SNC will conduct wetland delineation in early December 2006 and utilize this information in determining the impacts of construction activities on wetlands. SNC plans to provide the response to this question by January 31, 2007. .			
60	pg 2.4-4, 4th para. The first sentence states that "No streams or wetlands are located within the proposed footprint (see Figure 2.1-1)." The legend for Figure 2.1-1 does not include wetlands. Provide a map with wetlands in legend and on figure.	Terrestrial Ecology	Amanda Stegen
Response: There are no streams or wetland areas in the proposed footprint. The power block, cooling towers, and switchyard are located in upland areas and construction in these areas will not impact wetlands. SNC will begin wetland delineation in early December 2006 beyond the proposed footprint and the subsequent report will clearly define and delineate wetland areas and SNC will utilize that information to determine wetland impacts.			
61	What survey methods were used for the 2005 threatened and endangered surveys? Were separate plant, reptile, amphibian and bird surveys conducted? If not, how were these organisms surveyed? What methods were used to complete these surveys (e.g.; did trained biologists conduct the surveys, number of people on each survey, type of survey?).	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC. No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
62	Specifically what sections of the VEGP Site and transmission line corridors were surveyed for threatened and endangered species? Please provide a map(s) with this information.	Terrestrial Ecology	Amanda Stegen
Response: SNC is developing this information in December 2006, but it will not be available with this response. SNC plans to provide the response to this question by January 31, 2007.			
63	Were the all the areas that will be impacted during pre-construction/construction activities surveyed for threatened and endangered species? If not, what areas that will be impacted were NOT surveyed? Please identify what activities are associated with areas that have been surveyed/haven't been surveyed. Table X-1 is provided to facilitate compiling this information.	Terrestrial Ecology	Amanda Stegen
Response: All areas that will be impacted during pre-construction/construction activities were surveyed for threatened and endangered species. Regarding areas that have been surveyed, SNC is developing this information in December 2006, but it will not be available with this response. SNC plans to provide the response to this question by January 31, 2007.			
64	If areas that will be impacted were not surveyed, please provide justification for not completing any surveys/monitoring.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed			
65	Are there historical records of "important" species using the site? If so, when and where?	Terrestrial Ecology	Amanda Stegen
Response: There are no historical records of "important species" utilizing the Vogtle site.			
66	Provide information on any historic programs that documented wildlife onsite or in the transmission line corridors.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
67	pg 5.6-1, 4th para, last sentence, Transmission System Impacts provide additional details (procedures/training qualifications) concerning reporting unusual occurrences (or mortality) of federally threatened or endangered (T&E) species to the GPC Environmental Affairs Department within 24 hours of discovery. Do the maintenance crews actively look for T&E species or are the reports just by chance? Do they have T and E training?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
68	Has suitable habitat for T&E species been identified in the transmission corridors or onsite? If not, have any efforts been made to identify suitable habitat?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
69	pg 2.4-4, 2nd para The last sentence states that "SNC biologists at VEGP are familiar with special-status species in eastern Georgia." Does this imply that there is on-going program to document special-status species if they are encountered on site? Do the SNC biologists work with state and federal biologists to document/protect species that may occur onsite or in the transmission corridors? Please describe the SNC terrestrial threatened and endangered species program.	Terrestrial Ecology	Amanda Stegen
Response: SNC utilizes biologists from the Georgia Power Company (GPC) Environmental Lab to provide support for the current Plant Vogtle needs and for support of the ESP process. A consultant (Third Rock) was used to develop the Threatened and Endangered (T & E) Species report for the Vogtle ESP. They worked closely with GPC biologists during all phases of the work and the GPC biologists provided review of the T & E species report and the ESP ER sections dealing with T & E species. GPC maintains an outstanding working relationship with state and federal biologists and participate in the Georgia Heritage program. SNC also maintains a focus on T & E species issues through the Wildlife Habitat Council (WHC) certification program. Vogtle is a Certified Wildlife Habitat site. The WHC program includes an outreach program to local schools and employees actively participate in wildlife education projects. Any activity conducted at Vogtle with potential for environmental impact is reviewed by environmental personnel and experts are brought in when needed. T & E species is one of the many items that are considered during these reviews. The GPC biologists met with NRC, PNNL, and Georgia Department of Natural Resources (DNR) personnel during the site audit and provided copies of many of the guidelines and procedures used on transmission line siting and other environmental assessment work. The GPC biologists will be working with the SNC consultant during the upcoming wetlands delineation work.		

#	Information Need	Discipline Name	Reviewer Name
70	The longleaf, loblolly and slash pine forests that occur on the VEGP Site are described as being "diverse ages" (pg 2.4.1). Provide a map that shows the distribution of the forest age classes on the VEGP site in relation to the areas that will be impacted by pre-construction and construction activities.	Terrestrial Ecology	Amanda Stegen
Response: SNC plans to provide the response to this question by January 31, 2007.			
71	Provide information on the construction/pre construction activities associated with removal of forested/hardwood areas. Specifically provide the activity, type of impact, acres impacted, type of forest, and planned mitigation. Table X-1 has been provided to facilitate compiling this information.	Terrestrial Ecology	Amanda Stegen
Response: SNC plans to provide the response to this question by January 31, 2007.			
72	Page 2.4.-4 mentions the "bottomland hardwoods" near the new intake structure. Please describe these hardwoods including acreage.	Terrestrial Ecology	Amanda Stegen
Response: The hardwoods in question are described on page 2.4-2: "Canopy species in the lower, wetter areas along the Savannah River are primarily bald cypress and tupelo gum, while sycamore, box elder, sugarberry, and swamp chestnut oak occupy the slightly higher ground in the bottomland hardwoods. American holly, ironwood, water locust, cane, and buttonbush form the understory. Ground cover is sparse and limited to those species that can survive inundation and dense shade; these include richweed, lizard tail, sensitive fern, and Virginia dayflower." The layout plan is for 12 acres to be impacted.			
73	Provide the data sources (e.g., on-going investigations by licensee, existing GIS database, federal/state/local records, etc.) used to describe the existing environmental conditions, the site habitats and communities, and the wildlife populations. These general descriptions are found in section 2.0 and 2.4.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
74	Provide documentation regarding any fieldwork that was conducted as part of the review including extent/duration of the field work, and whether or not any federal or state agencies participated in the field work or data analysis/review.	Terrestrial Ecology	Amanda Stegen

#	Information Need	Discipline Name	Reviewer Name
Response: The threatened and endangered species surveys were conducted during spring, summer, and fall of 2005; each survey lasted 10 days, and began on April 12, August 22, and October 24. Additional details regarding these surveys are documented in the Threatened and Endangered Species Survey Final Report, copies of which were distributed to the Georgia Department of Natural Resources Natural Heritage Program. Personnel from federal or state agencies did not participate in the field work, but the Threatened and Endangered Species Survey Final Report was distributed to the Georgia Department of Natural Resources Natural Heritage Program.			
75	Provide information on the existing species composition, spatial and temporal distribution, abundance of terrestrial natural resources onsite and in the transmission line corridors.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
76	Has the species composition, spatial and temporal distribution, abundance of terrestrial natural resources changed since the 1985 FES for operation was written? In so, please explain how these communities have changed. If the communities have not changed, please explain how "no change" has been verified.	Terrestrial Ecology	Amanda Stegen
Response: Vegetation communities continuously change over time, and SNC actively manages the natural habitats at VEGP for wildlife enhancement. Major emphasis has been placed on reestablishing native longleaf pine at VEGP. Prescribed burning, timber thinning, and other methods are used for habitat management at VEGP; details are documented in Wildlife Habitat Council 2003 Recertification Application for Vogtle Electric Generating Plant. The VEGP site has been designated as a Certified Wildlife Habitat by the Wildlife Habitat Council. However, no studies have quantified the change over time, and so no information is available. A copy of the WHC certification application was provided during the site audit.			
77	Are the dominant species present native or non-native?	Terrestrial Ecology	Amanda Stegen
Response: Dominant species are native; see Section 2.4.1 of the ESP Application Environmental Report and the Threatened and Endangered Species Survey Final Report for species.			
78	Are there any issues concerning invasive plant species?	Terrestrial Ecology	Amanda Stegen
Response: No invasive species have been noted in the terrestrial or aquatic environments at Vogtle.			
79	Are there any species present that serve as biological indicators?	Terrestrial Ecology	Amanda Stegen

#	Information Need	Discipline Name	Reviewer Name
Response: The question presumably uses the term "biological indicators" as does NUREG-1555: "Species that may serve as biological indicators to monitor the effects of the facilities on the terrestrial environment". In this regard, SNC is not aware of any species at VEGP that serve as biological indicators. However, the natural community as a whole could be thought of as a biological indicator.			
80	pg 2.4-4, 5th para continued Are there any species present that are critical to the function and structure of the local terrestrial ecosystem?	Terrestrial Ecology	Amanda Stegen
Response: SNC is not aware of any species critical to the function and structure of the local terrestrial ecosystem.			
81	What activities are included in the 500 acre footprint?	Terrestrial Ecology	Amanda Stegen
Response: The area of the footprint and associated uses are shown on Figure 3.1-3 "ESP Site Utilization Plan." In addition, SNC is conducting additional onsite work in December 2006 to map the habitat types and presence of species onsite which will be provided by January 31, 2007.			
82	Provide a complete map with locations for all the planned activities/buildings including any new debris basins, the solid waste storage areas, fabrication and shop areas (pg 3.9-3). Provide information on the acreage breakdown associated with each pre-construction activity. For example, provide the number of acres associated with expanding the barge slip, building the new intake, etc. Table X-1 is provided to facilitate compiling this information.	Terrestrial Ecology	Amanda Stegen
Response: The majority of this information is available in Figure 3.1-3. SNC is developing detailed construction information that will include the requested information. SNC plans to provide the response to this question by January 31, 2007. .			
83	What upgrades will be required on "the rail line that runs from its connection with Norfolk and Southern line to the termination at VEGP" (pg 3.9-3)?	Terrestrial Ecology	Amanda Stegen
Response: No upgrades are anticipated at this time.			

#	Information Need	Discipline Name	Reviewer Name
84	It is difficult to discern what activities are covered under the current license and thus out of scope of our review and which pre construction activities are associated with the ESP application. For example, are the transmission line re-routes part of the pre-construction activities or are these covered under the current license for Units 1 and 2? Please clarify which activities are covered under the current license and which activities are associated with the ESP application.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved (See 3.9-1 and 4.1-1) through audit interaction between SNC and the NRC; No further action needed.			
85	Are any upgrades/changes to the existing corridors needed to support additional power that will be generated by Units 3 and 4?	Terrestrial Ecology	Amanda Stegen
Response: There are no upgrades/ changes to the offsite portions of the existing SNC transmission lines. Changes will be made onsite to relocate lines and expand the switchyards. These changes are discussed in the ER.			
86	Does SNC cooperate with the Georgia Natural Heritage Program or other state/federal agencies in conducting transmission corridor rare plant survey program on a periodic basis?	Terrestrial Ecology	Amanda Stegen
Response: Transmission corridor rare plant surveys are not conducted on a periodic basis. However, Georgia Power provides the locations of any rare plants and animals discovered on the transmission corridors to the Georgia Natural Heritage Program. In turn, the Georgia Natural Heritage Program periodically provides updates of their rare species GIS data base to Georgia Power so that Georgia Power can avoid negative impacts during corridor maintenance activities. Georgia has a state transmission line siting program (Georgia Code Title 22) that provides guidance.			
87	Provide information regarding the location/description of any sensitive/protected areas in the transmission corridors.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
88	Provide the transmission line maintenance procedures.	Terrestrial Ecology	Amanda Stegen
Response: GPC Transmission Maintenance Procedures were provided at the Site Audit.			

#	Information Need	Discipline Name	Reviewer Name
89	Provide the GPC procedures for implementing Georgia Code Title 22, Section 22-3-161 (pg 4.1-3).	Terrestrial Ecology	Amanda Stegen
Response: A copy was provided initially at Site Audit in draft form. A final copy is included as Attachment C-4.			
90	Provide the GPC Avian Protection Plan.	Terrestrial Ecology	Amanda Stegen
Response: A copy of the Avian Protection Plan was provided during the Site Audit.			
91	Provide the VEGP Environmental Protection Plan.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
92	Provide documentation on how SNC will comply with the Migratory Bird Treaty Act during pre-construction and construction activities?	Terrestrial Ecology	Amanda Stegen
Response: This information is contained in the Avian Protection Plan provided during the site audit.			
93	Pg 4.3-1 - how many acres of forested area will be impacted by construction? There are conflicting total acres on this page (500, 250, 249 acres). How many acres of hardwood forest will be impacted - this page states that "25 acres" will be impacted and page 4.1.-1 states that 50 acres of hardwood will be impacted. Please clarify.	Terrestrial Ecology	Amanda Stegen
Response: The reference to 249 acres in the first paragraph of page 4.3-1 is in error. Otherwise, that paragraph is correct (250 acres pine forest + 25 acres hardwood forest + 125 acres developed areas = 500 total acres). The sentence on page 4.1-1 stating "...less than 50 acres of...hardwoods" should have stated "25 acres". This typo will be corrected in the next revision of the ESP application.			
94	What are the impacts to the shoreline associated with the new intake and barge slip as well as increased water withdrawals?	Terrestrial Ecology	Amanda Stegen
Response: SNC has begun detailed evaluation of the impacts of construction. Results are expected in early January 2007. In addition, wetland delineation will be conducted in early December 2006. SNC plans to provide the response to this question by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
95	Are there any ecological or biological studies of the site or its environs that are recent or currently in progress (either by licensee or others)?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
96	pg 2.4-4, 5th para What is the status of the primary game species (e.g., relative health of deer herd, number of deer harvested)?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
97	The fourth sentence states that "No 'travel corridors' for game species cross the VEGP site." Provide documentation/reference for this conclusion. Was actual field reconnaissance conducted?	Terrestrial Ecology	Amanda Stegen
Response: NUREG 1555 states that data should be obtained for "locations of travel corridors for "important" terrestrial species and alternate routes for those corridors that could potentially be blocked by use of the site". Deer and small mammals use "game trails" at VEGP; such game trails are ubiquitous in forested areas of Georgia. The statement on page 2.4-4 that "travel corridors" do not exist at VEGP refers to the absence of seasonal routes of large migratory mammals such as caribou, elk, etc. and to seasonal flyways of migratory birds. The absence of large migratory mammals such as caribou and elk is obvious. Migratory birds do pass through the vicinity of VEGP and throughout the entire southeastern U.S., but VEGP is not located on a major flyway. Numerous references exist describing avian migration flyways in North America, see http://www.birdnature.com/flyways.html for an example.			
98	pg 4.3-2, 3rd para, last sentence. It is not clear if the "few avian collisions with existing structures at VEGP" is based on a formal cooling tower bird collision survey. Please clarify.	Terrestrial Ecology	Amanda Stegen
Response: No formal cooling tower bird collision surveys have been conducted at VEGP. The relatively few bird collision events have been investigated and determined to be of no significance.			

#	Information Need	Discipline Name	Reviewer Name
99	6.5-2 Construction, Pre-Operational, and Operational Monitoring In Section 5.3.3.2.5 Avian Collisions, the following statement is made: "Because collisions with existing VEGP cooling towers are rare, it is likely that bird collision with the new towers will be minimal." NUREG-1555, Section 6.5.1, states that "Monitoring programs should cover elements of the ecosystem for which a causal relationship between station construction and/or operation and adverse change is established or strongly suspected." Provide documentation on the cooling tower monitoring that was conducted to confirm that no changes in composition, abundance, or distribution of avian species are occurring as a result of operating the two additional units at VEGP. If no monitoring was conducted, provide documentation on how SNC reached the conclusion that collisions with the existing towers are rare.	Terrestrial Ecology	Amanda Stegen
Response: See response to comment # 98; no formal monitoring has been conducted. Collisions with the existing towers have been infrequent and the bird carcasses were examined to confirm the cause of mortality. The towers are surrounded by a wide expanse of open, gravel-covered area in which carcasses are relatively easily seen.			
100	Chapter 1010.1 Unavoidable Adverse Environmental Impacts and 10.2 Irreversible and Irretrievable Commitments of Resources Provide a summary regarding the modification to wetlands or wetlands filled as part of the planned construction activities in the bottomland hardwood forest along the Savannah River or along the proposed 500 kV transmission corridor across approximately 60 linear miles of eastern Georgia.	Terrestrial Ecology	Amanda Stegen
Response: SNC will conduct wetland delineation in early December 2006. SNC plans to provide the response to this question by January 31, 2007.			
101	Provide information on the cumulative impacts on terrestrial resources.	Terrestrial Ecology	Amanda Stegen
Response: The approximately 500 acres of potentially affected habitat at the site represents a small portion of the available undeveloped land in the vicinity, and since the construction and support areas do not contain any old growth timber, unique or sensitive plants, or unique or sensitive plant communities and are largely planted slash pines and open areas, cumulative impacts to terrestrial resources will be small.			
102	pg 6.0-1, Chapter 6, Environmental Measurements and Monitoring Programs Provide a figure showing the monitoring locations.	Terrestrial Ecology	Amanda Stegen

#	Information Need	Discipline Name	Reviewer Name
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
103	pg 6.5.1, 6.5 Ecological Monitoring, 6.5.1 Existing Ecological Monitoring Explain how the criterion of pre-application monitoring for at least one annual cycle has been met.	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
104	pg 4.3-2, 4th paraNUREG-1555, Section 2.4.1, page 2.4.1-6, states that "Information should be based on an analysis of at least one full year of data, to reflect seasonal variations in terrestrial populations." Was any effort made to either review historical data or collect new data for wildlife at the site?	Terrestrial Ecology	Amanda Stegen
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
105	All of the input, output, and on-site meteorological (1998 - 2002 or more) files used for the PAVAN, XOQDOQ, and SACTI models.	Meteorology	Jeremy Rishel
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
106	Please provide a map showing the areas that will be directly or indirectly impacted by construction of the new plant and the locations of archaeological sites documented by New South.	Cultural and Historical Resources	Darby Stapp
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed. Figure 3.1-3 locates areas that will be directly or indirectly impacted by construction of the new plant. Figure 8 in the New South report locates previously identified and new cultural resource survey sites in relation to the areas affected by new unit construction.			

#	Information Need	Discipline Name	Reviewer Name
107	Determinations of Eligibility. In order for NRC to move forward with its determination of impact, SNOC needs to obtain concurrence from the Georgia SHPO on both the "recommended eligible for listing on the National Register" and "recommended not eligible for listing on the National Register" archaeological sites. Presently, we understand that New South has submitted site forms for the sites with these recommendations to the Georgia Archaeological Site files. No action will be taken, however, until SNOC requests the Georgia SHPO to review the site forms and agree or not agree. Once this is done, NRC will know for certain which sites are eligible for listing (i.e., "historic properties") and therefore which sites need to be addressed in the analysis. It is important that this concurrence be obtained before the site audit.	Cultural and Historical Resources	Darby Stapp
Response: SNC has received response from SHPO and a copy was provided during the Site Audit.			
108	Determination of Adverse Effect. SNOC needs to seek concurrence from SHPO on SNOC's determination that the water intake structure and associated infrastructure will have no impact on archaeological sites 9BK416 and 9BK423. It is important that this concurrence be obtained before the draft EIS is submitted.	Cultural and Historical Resources	Darby Stapp
Response: SNC has received letter from SHPO. A copy of the letter was provided at the Site Audit.			

#	Information Need	Discipline Name	Reviewer Name
109	In order for NRC to make its level of impact determination, several things need to be clarified: a. In comparing Figure 2.5.3-1 with Figure 3.1-3, it appears that the water intake structure and associate road will impact both sites. Please explain why SNOC does not believe it will. b. We understand that no shovel testing was conducted on the river terrace where the water intake structure will be located. Please explain why no testing was done and why SNOC does not believe that there is any potential for archaeological sites in this area. c. Please explain any protective/mitigation measures that will be put in place during construction and operation. d. Please copies of the procedures that will be in place relative to cultural and historic resource protection.	Cultural and Historical Resources	Darby Stapp
Response: SNC will agree with conditions requested by SHPO. A copy will be provided to NRC for the docket upon transmittal. Additional shovel testing was done at the request of NRC in the floodplain area where the intake will be located. No positive tests were reported. The New South Addendum report is now complete and a copy will provided by separate transmittal letter to the NRC for the docket.			
110	Please provide the revised New South report.	Cultural and Historical Resources	Darby Stapp
Response: The New South Addendum Report is complete. SNC will provide by letter for the docket by January 31, 2007.			
111	Please provide any responses from the SHPO office, tribes, or interested parties.	Cultural and Historical Resources	Darby Stapp
Response: A copy of the letter from the SHPO was provided during the Site Audit.			
112	Section 2.3 Water Provide maximum, average maximum, average, average-minimum, and minimum monthly temperature of the Savannah River.	Hydrology	Chris Cook
Response: This information is contained in the SSAR portion of the ESP submittal. Please see SSAR 2.4.7.			

#	Information Need	Discipline Name	Reviewer Name
113	Provide a description (figure and coordinates) of all wetlands, and their respective seasonal characteristics, on the site. Describe how these wetlands will be affected during construction and operation of the facility.	Hydrology	Chris Cook
Response: SNC will conduct wetland delineation in early December 2006 and provide the response by January 31, 2007.			
114	Provide estimated erosion characteristics and sediment transport rates, including bed and suspended load fractions, for the Savannah River near the site.	Hydrology	Chris Cook
Response: This information is provided in Attachment B-1.			
115	Provide any water velocity data collected near the location of the proposed intake and outfall structures.	Hydrology	Chris Cook
Response: This information is contained in SSAR 2.4.11 of the ESP submittal. Water velocity data has been collected at USGS Station No. 021973269 Savannah River near Waynesboro and are presented in the SSAR Table 2.4.11-6. Other than these data, water velocity measurements have not been acquired at the locations proposed for the intake or outfall structures. Note that the SRP for ER 2.3.1 does show this requirement for fresh water streams. Bathymetric surveys were conducted at these locations. This data could be used to estimate the longitudinal velocity distributions at these locations for a given river stage.			
116	Provide the stage-discharge rating curves for the Savannah River gauges nearest the site.	Hydrology	Chris Cook
Response: The Stage-discharging rating curve is provided in the SSAR, Figure 2.4.11-7. The rating curve was developed using measured data at the USGS Station no. 021973269 Savannah River near Waynesboro for 1986, 1987, 1988 and 2005.			
117	Section 2.3.1 Hydrology, Describe the process used to develop the reasonably conservative Vogtle site conceptual model and nearby area. Also, describe any alternate conceptual models that were considered. Provide data (e.g., precipitation, surface water runoff, stream flow, groundwater levels, historical groundwater resource depletion [pumping) used to formulate the water budget for key hydrologic elements of the Vogtle site and the nearby area, (e.g., Mallard/Mathes pond, water table aquifer, Tertiary aquifer, Cretaceous aquifer). Include data and descriptions on the recharge rates, soil moisture characteristics and moisture content in the vadose zone.	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: This question along with questions 118, 144, 145, 146, 147, 148 and 163 will be addressed comprehensively in a single response. This response will require more time to complete and will be submitted by January 31, 2007.			
118	Provide any information regarding what the anticipated impacts of excavation beneath the ESP facility site will have on the water levels within the pond. Also, provide any existing monthly water elevation and water quality data. Based upon the piezometric contour maps for the water table aquifer, much of this aquifer apparently recharges Mallard/Mathes Pond.	Hydrology	Chris Cook
Response: SNC has provided two (2) hard copies of LIDAR maps of the site including the Mallard pond area which may be used to determine the pond surface elevation and the relationship to site terrain and drainage. No elevation or water quality data exists for Mallard Pond. SNC concurs that based on the piezometric contour maps, there is recharge to the pond from the Water Table Aquifer. Significant recharge also occurs from surface runoff in the pond drainage area. SNC is investigating availability of dewatering data from the construction of Units 1 and 2. This information, if available, will be included by January 31, 2007 in response with Question 117.			
119	Section 2.3.1.2.3 Observation Well Data, Provide a table listing the observation and water well statistics (for example, well name, legal location, well depth, screened interval, and formation or water-bearing unit of the screened interval). Provide geologic logs and construction diagrams of the observation wells and discuss the procedures for installing these wells.	Hydrology	Chris Cook
Response: Please see Appendix 2.4-A of the SSAR. This reference provides all needed information. Although this data is not available in a single table, it is available collectively in Tables 2.3.1-18, 19, and 20. SSAR Appendix 2.4A – Observation Well Installation and Development Report (Report Table 5.1 and Appendices E and F) contains the geologic logs, construction information, and other pertinent installation documentation.			
120	Provide data that support why Wells OW-1006 and OW-1007 were at their highest elevations in June and lowest elevations in December (Table 2.3.1-18). Trends at other wells show relatively low elevations in July and high elevations in Feb/March. Well 808, with its respective high/low elevation for September and May, also seems to be an exception.	Hydrology	Chris Cook
Response: This response is provided as Attachment B-2.			

#	Information Need	Discipline Name	Reviewer Name
121	Section 2.3.1.2.4 Water Table Aquifer, Provide the data presented in Table 2.3.1-20. In the case of well OW-1001A, the depth interval tested for hydraulic conductivity appears to be above the water table, and hence not suitable for testing saturated zone hydraulic conductivity.	Hydrology	Chris Cook

Response: The data used to obtain the hydraulic conductivity values summarized in ER Table 2.3.1-20 is included in SSAR Appendix 2.5A – Geotechnical Investigation and Laboratory Testing Data Report (Report Appendix D). Hydraulic conductivity values were determined by in situ hydraulic testing using the slug test method. In the case of observation well OW-1001A, SSAR Appendix 2.5A, report Appendix D discusses the installation, development, and testing of OW-1001A. This well was installed as a replacement well for OW-1001, which was either impacted by grout during installation or installed in a confining unit. OW-1001A was installed, developed, and tested October 11-14, 2005. The screened interval for this well extends from 136.13 to 146.13 ft msl. The static water level in the well prior to testing was 3.2 ft above the bottom of the well sump at an elevation of 136.33 ft msl and only slightly above the bottom of the screen. Subsequent monthly water level measurements, summarized in ER Table 2.3.1-18, have varied from 135.91 to 135.99 ft msl, which fall below the screened interval. This data suggests that the screened interval for the well extends above the water table and that this well is not suitable for characterizing saturated hydraulic conductivity using the slug test method.

In the next revision of the ESP application, the hydraulic conductivity value for OW-1001A reported in Table 2.3.1-20 will be deleted, the Geometric Mean will be recalculated, and a footnote will be added to this table to explain that the value in SSAR Appendix 2.5A for this well is not considered reliable because of the thin saturated zone present within the screened interval during testing.

#	Information Need	Discipline Name	Reviewer Name
122	This section describes the basis for a groundwater travel time of 400 years from the center of the Power block to Mallard Pond. This travel time is based on Barnwell Formation data; geometric mean hydraulic conductivity of 0.41 ft/day, horizontal gradient of 0.012 ft/ft, effective porosity of 0.32, and distance of 2200 ft. If the north-south cross section reported in Figure 2.4.12-2A of the Vogtle Early Site Permit Application - Part 2 - SSAR is applicable to the groundwater path between Power block and pond, the water table aquifer between them is a combination of Utley Limestone and Barnwell Formation. Assuming a release from the vicinity of the Power block could move through the backfill underlying construction to the Utley Limestone, the travel time to Mallard Pond may be much shorter than the 400 years described. If one only examines the influence of the hydraulic conductivity cited for the Utley Limestone (range 340 to 4.2 ft/day), the travel times are 0.5 year and 40 years respectively. Describe the conceptual model supporting the groundwater travel time estimate more fully, and include a map showing where across the site the basal Utley Limestone of the water table aquifer is known to be absent, where it is present and its thickness. Include data on the Utley Limestone necessary to make a travel time calculation, e.g., effective porosity. Note that deMarsily (1986) suggests a much lower porosity for limestone than employed for the Barnwell Formation. Provide a table and map showing the 'geotechnical and hydrogeological borings' used to describe each of the geohydrologic units described in the conceptual model of the Vogtle site, (e.g., Barnwell Formation, Utley Limestone, Tertiary aquifer, Cretaceous aquifer).	Hydrology	Chris Cook

Response: The Utley Limestone is not continuous beneath the ESP site and cannot be described as what is commonly considered a limestone. At the ESP site the limestone is generally described as a "silty clayey sand with varying amounts of carbonate material and silicified zones" (ER Section 2.6). Pumping tests conducted in the Utley Limestone for Units 1 and 2 and described in the UFSAR indicated that the transmissivity of the Utley Limestone is relatively low and varies considerably from place to place. It was concluded it would not be an effective drain for dewatering the excavation for Units 1 and 2, which implies that it would also not be effective as a preferential pathway for radionuclide transport.

#	Information Need	Discipline Name	Reviewer Name
123	Section 2.3.1.2.4 Lisbon Formation (Blue Bluff Marl) Confining Unit, Provide data to support porosity values in this section. The deMarsily (1986) citation does not support the assumption of an effective porosity of 80% of total porosity for the Lisbon Formation confining unit. Rather, the cited table suggests a total porosity of ~0.44 which corresponds to an effective porosity of ~0.13. These values will impact time of travel calculations.	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name

Response: Total porosity values for the Lisbon Formation (Blue Bluff Marl) confining unit are summarized in ER Table 2.3.1-22. These values are included in the SSAR Appendix 2.5A – Geotechnical Investigation and Laboratory Testing Data Report (report Appendix E). Total porosity values were determined by laboratory testing of soil samples obtained from the Lisbon Formation (Blue Bluff Marl). Table 1 (Attachment B-3) of this response presents the total porosity values along with grain size distribution test data. Total porosity values range from 0.25 to 0.59 and have a median value of 0.44. Grain size distribution data indicate that most of the Lisbon Formation (Blue Bluff Marl) samples can be classified as silty sand (SM) or clayey sand (SC).

The effective porosity of the Lisbon Formation (Blue Bluff Marl) was estimated using Figure 2.17 of de Marsily (1986). This figure plots total and effective porosity as a function of grain size. To estimate the effective porosity for the Lisbon Formation (Blue Bluff Marl), the ratio of effective to total porosity determined from Figure 2.17 was applied to the site-specific total porosity value for the Vogtle Electric Generating Plant (VEGP) site. Using the median D50 value of 0.24 mm as a representative grain size (cited in Table 1 of this response), a ratio of effective to total porosity of about 0.8 was determined from de Marsily's Figure 2.17. Multiplying the median total porosity of 0.44 by this ratio yields an effective porosity of 0.35.

The effective porosity was also estimated as the difference between the total porosity and the residual water content, as given by Equation 4.4 of Yu et al. (1993). The residual water content for the SM or SC soils comprising the Lisbon Formation (Blue Bluff Marl), obtained from Carsel and Parrish (1988) using equivalent USDA-SCS soil textural classifications, ranges from 0.07 to 0.10. The effective porosity would then range from 0.34 to 0.37. This result indicates that the 0.35 value for effective porosity reported in the ESP application should be representative of the Lisbon Formation (Blue Bluff Marl).

Clarifying text will be added in the next revision of the ESP application. ER Table 2.3.1-22 will also be updated to include the additional information described in this response and the new references [(Carsel and Parrish 1988) and (Yu et al. 1993)] will be added.

References;

Carsel, R. F., and R. S. Parrish, Developing Joint Probability Distributions of Soil Water Retention Characteristics, Water Resources Research, 24:755-769, 1988.
de Marsily, G., Quantitative Hydrogeology, Groundwater Hydrology for Engineers, Academic Press Inc.; London, p. 36, 1986.
Yu, C., C. Loureiro*, J.-J. Cheng, L. G. Jones, Y. Y. Wang, Y. P. Chia, and E. Faillace, Data Collection Handbook to Support Modeling Impacts of Radioactive Material in Soil, Argonne National Laboratory, Argonne, Illinois, April 1993.

#	Information Need	Discipline Name	Reviewer Name
124	Section 2.3.2.1.1 Local and Onsite Water Use and Section 5.2.4 Future Water Use, Provide current and projected water use at the SRS site. SRS is a major water consumer within 6 miles of the site.	Hydrology	Chris Cook
Response: Current SRS water use was provided during the audit in a copy of the Savannah River Site (SRS) Annual Environmental Operating Report. SNC was unable to find any source of information other than the report above that would provide SRS projected water use in the future. As a federal agency, NRC may be able to obtain projections from DOE.			
125	Describe any recent activity toward developing a current/updated comprehensive water resources management plan (e.g., an updated Rutherford 2000) that includes a revised drought management plan with the ESP facility in place. Describe how these developments could or could not impact SNC's ability to acquire the water rights necessary for the ESP facility.	Hydrology	Chris Cook
Response: SNC has not been involved in and is not aware of any activity to develop drought management information with the proposed new Vogtle units in place. Georgia EPD has a process in place requiring counties to develop water resources management plans (this process resulted in the original Rutherford 2000 report). The plan is updated on five year intervals, but the 2005 update is not available at this time. It is reasonable to think that water use associated with the proposed new Vogtle units would be factored into the next update cycle (2010). Based on discussions with Georgia EPD, SNC does not anticipate that this county planning process will have major impact in acquiring the necessary permits for Unit 3 and 4 water needs. The amount of water needed for the Vogtle expansion is relatively small and current permits have significant margin in them such that the impact from a planning perspective should be insignificant.		
126	Section 2.3.1.1.3.4 Historic Flooding, Since PMF is a statistical event that is not reasonably expected to occur, what is the surrounding environmental concern surrounding its discussion?	Hydrology	Chris Cook
Response: The Probable Mean Flood (PMF) is included in the ER for reference purposes only and has no significance from an environmental perspective.			
127	Section 2.3.2 Water Use, Provide maps and cross sections showing those portions of ground water aquifer systems that could be affected by plant withdrawals (i.e., water table aquifer, Tertiary aquifer).	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
128	Provide 2005 and any 2006 data for Tables 2.3.2-4 and 2.3.2-6.	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
129	Provide quantitative and qualitative descriptions of navigational, recreational, in stream and other non-consumptive present and known future water uses (see page 2.3.2-3, especially as it relates to the information requested for a 6 mile radius).	Hydrology	Chris Cook
Response: The U.S. Army Corps of Engineers draft Water Control Plan for the Savannah River contains significant information regarding non-consumptive water uses such as recreation, navigation, ecology, etc. see http://www.sas.usace.army.mil. The document is currently under revision.			
130	Provide the specifics (e.g., depth, aquifer, and known degree of hydraulic connection with the water table and Tertiary aquifer) on which wells reported tritium (page 2.3.3-5). Provide the tritium data obtained from those wells from 1991 through 2002 (or current, if available).	Hydrology	Chris Cook
Response: A number of studies have been conducted in the area of Plant Vogtle to evaluate the effects of tritium contamination known to exist at the Savannah River Site (SRS). None of these studies have identified tritium contamination in the Tertiary aquifer on the Georgia side of the Savannah River. SNC review of GA DNR tritium studies revealed the initial report of tritium in Tertiary aquifer wells may be incorrect. New information, contained in subsequent reports, indicates that the monitoring wells in question were actually in the water table aquifer. The studies generally conclude that the tritium does not produce significant environmental concern downstream. References:			
131	Section 2.3.3 Water Quality, Provide the mean, range, temporal and spatial variations of surface water quality characteristics such as water temperature, TSS, TDS, DO, BOC, COD, etc. Is this type of data available for surface waters and ground water at the site?	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
132	"Ground water from the water table aquifer contains 20 to 170 ppm TDS; ground water from the deeper confined aquifer contains 110 to 194 ppm" page 2.3.3-3. Which wells are these values derived from and what has been the variation over time?	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
133	Section 2.6 Geology, Page 2.6-2. Indicate how many borings were "drilled as part of the ESP subsurface investigation program encountered the top of the Blue Bluff member..."	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
134	Section 2.8. Related Federal Project Activities, Provide recent information on the ongoing USACE studies regarding decommissioning of the Savannah Bluff's Lock and dam. Describe the consultations which have been conducted between SNC and USACE regarding decommissioning.	Hydrology	Chris Cook
Response: A copy of the referenced study is available on the US Army Corps of Engineers – Savannah District website http://www.sas.usace.army.mil. SNC is participating as a member of the public along with the Corps in determining the impacts of removing this dam. At present, a decision has been made to leave the dam in place and refurbish it over the next 5 years.			
135	Section 3.3 Plant Water Use, Provide average plant water use by month.	Hydrology	Chris Cook
Response: Bi-annual Reports for Groundwater Use for the most recent one-year period (July 05 – June 06) are provided in Attachment C-1.			
136	Section 3.3.1. Water Use, For the water use diagram, provide the data and narrative description for water consumption during periods of minimum water availability, and average operation by month and by plant operating status.	Hydrology	Chris Cook
Response: The water use described in the water use diagram does not vary based on water availability. In the event of a protracted severe drought, SNC would examine water use needs and make reductions in normal flow provided the safe operation of the plant was not impacted.			
137	Table 3.3-1. Provide the atmospheric conditions applied when generating data shown in this table. Are the maximum case values bounding?	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: For surface water, the Average values presented in the table represent average annual uses during a normal year. The maximum values represent extreme conditions and are considered bounding. For groundwater, the average values represent average use during a normal year and the maximum values represent operation at the installed pumping capacity with and assumption of extreme operating conditions for equipment. For the discharge values, the average values represent normal cooling tower operation at 4 cycles of concentration. The maximum values represent cooling tower operation at two cycles of concentration.			
138	Section 3.3.2 Water Treatment, Provide operating cycles for each water treatment system for normal modes of plant operation (i.e., full power operation, shutdown/refueling, and startup).	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
139	Provide a tabulation of chemicals to be added by quantity and frequency of addition.	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
140	Provide a list of all chemicals (identification and quantities) to be used or considered.	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
141	Section 3.4.1.3.2 Water Treatment, What is the environmental concern associated with the icing discussion in this section?	Hydrology	Chris Cook
Response: There is no environmental concern with icing at Vogtle since icing will not occur but includes for completeness only..			
142	Section 3.4.2.1 River Intake Structure, Provide the basis for stating that the minimum river level is 78 ft MSL. Describe consultations SNC has had with USACE regarding minimum water surface elevations at the site. Has a commitment from USACE been provided to maintain a minimum water surface elevation?	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: SNC has worked closely with the Savannah District Corps of Engineers over the life of the plant and in recent years has participated in development of the revisions to the Corps Water Control Plan and Drought Plan for the Savannah River. The 78 ft MSL "minimum" river level is a level that is based on the period of record data maintained for the Savannah Basin. It is discussed in Corps reports and is characterized as the minimum level observed for the period of record. The Corps Water Control Plan is the plan by which the federal reservoirs are operated and is a guidance document. There is no commitment stated or implied by the Corps to maintain this minimum level beyond what is considered "good engineering practice". SNC does not depend on this level to support any safety related plant functions and does not view it as a commitment.			
143	Section 3.4.2.2 Final Plant Discharge, Provide details regarding how the ESP facility will comply with 40 CFR 423 and EPA's associated discharge regulations.	Hydrology	Chris Cook
Response: The proposed new units at Vogtle will utilize natural draft recirculating cooling towers to provide closed cycle cooling for plant components including the main condenser (which represents the main heat load). This technology is recognized by EPA as Best Technology Available (BTA) relative to compliance with 40 CFR 423 limits. Since heat is the only pollutant of significance, installation of BTA should more than satisfy EPA Part 423 requirements. SNC has already begun discussion with the Georgia EPD relative to the proposed new units at Vogtle. Vogtle has an outstanding compliance record and no major concerns are anticipated with the permitting of the new units. Chapters 5 and 6 of the ER provide information regarding the impact of operation on the environment and thermal monitoring. Chapter 10 provides discussion of the cumulative impacts of four unit operation.			
144	Section 4.2.2 Water Use Impacts, Provide inputs to the calculation package and the calculation package to assess the impacts of construction on the potentiometric surface at the property boundary.	Hydrology	Chris Cook
Response: This information will be included in a future response by January 31, 2007.			
145	Section 5.2.2 Hydrologic Alterations and Plant Water Supply, Provide the calculation package for the drawdown model.	Hydrology	Chris Cook
Response: This information will be included in a future response by January 31, 2007.			
146	Provide any impacts of drawdown to Mathes Pond.	Hydrology	Chris Cook
Response: This information will be included in a future response by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
147	Provide any impacts of drawdown to the closest offsite wells completed in the water table aquifer and the Tertiary aquifer as well as the Cretaceous aquifer.	Hydrology	Chris Cook
Response: This information will be included in a future response by January 31, 2007.			
148	Provide information on potential impacts resulting from site excavation to Mallard Pond.	Hydrology	Chris Cook
Response: This information will be included in a future response by January 31, 2007.			
149	Section 5.2.2.2 Water Related Impacts – Groundwater, Describe SNC's consultations with the appropriate state agencies to withdraw water for the ESP facility at rates up to VEGP's withdrawal limit. Also, discuss any restrictions that may be placed on the withdrawals. Finally, discuss any issues the state agencies raised with the stated potential to exceed withdrawal limits for short periods of time.	Hydrology	Chris Cook
Response: SNC has initiated discussions with Georgia EPD regarding water withdrawal to support the proposed new units at Vogtle. The existing Vogtle Permit for Groundwater Use has significant margin in it and EPD has indicated that this should provide support for permitting the water use for the new units. As discussed in Chapter 5 of the ER, the impact from normal use of groundwater for four unit operation is considered small. Based on initial discussion with EPD, SNC does not anticipate problems with obtaining modifications of the Groundwater Use permit to support the new units nor do we see any restrictions being placed on water withdrawal. The discussion in Chapter 5 regarding potential to exceed withdrawal limits for short period of time applies to extreme circumstances such as a major fire event or something similar that might require use of all pumps for a short period of time. Such an event is highly unlikely. SNC contacted EPD and discussed this question with the Groundwater Division personnel. GPD indicated that they were not concerned with the ability to permit additional groundwater withdrawal for Vogtle in the amounts associated with the proposed new units.		
150	Well MU-2A was chosen as the well from which to simulate drawdown resulting from the cumulative projected water usage. Was the drawdown calculation made using a model calibrated to MU-2A data? If so, describe the data and model calibration. If not, describe more fully the circumstances mentioned in footnote 1 on Table 6.3-2; "MU-2A has proved difficult to monitor."	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name

Response: This response was also presented by discussion between SNC, NRC and TtNUS during the VEGP site audit. There are three site wells installed into the Cretaceous aquifer at VEGP, Wells TW-1, MU-2A, and MU-1. Well MU-2A was chosen for the model because it is the closest well to off-site wells. Even though the off-site wells are in the Tertiary aquifer, Well MU-2A was used to estimate potential drawdown at the property boundary nearest the off-site well.

Because the updated FSAR (FSAR for current units [SNC 2005]) stated that the aquifer tests conducted in the Cretaceous indicated varying results, the data reported in the UFSAR generated from all of the tests performed in the Cretaceous aquifer were either averaged by the writer or the datum used was a stated mean value in the FSAR. To determine potential offsite impacts of groundwater drawdown, cumulative well yield was used to calculate drawdown as though it had been pumped from a single onsite well. The well MU-2A location was used, due to its close proximity to the VEGP property boundary (5,700 feet) and because the well has been one of the site's primary production wells.

Data used as input to an analytical distance-drawdown model was taken from VEGP's updated Final Safety Analysis Report. A Transmissivity value of 158,000 gpd/ft was used. The Storativity value (3.1×10^{-4}) is an average of the values listed in Table 2.4.12-8 of the FSAR calculated for the deeper production wells. Total groundwater use reported to the Georgia Department of Natural Resources by VEGP from 2001 through 2004 averaged 730 gpm. (SNC 2000a,b, 2001a,b, 2002a,b,c, 2003a,b, 2004a,b in Chapter 3 of the environmental report) This value is considered the total groundwater use for the existing units. A maximum construction pumping rate of 420 gpm was used (FSAR 2005). The total groundwater use rate for the proposed units is 752 gpm (ESP ER Table 3.3-1).Therefore, the pumping rate used in the analysis for most of the construction phase is 1,150 gpm (730 + 420 = 1,150 gpm). There will be a period, after completion of the first unit but before completion of the second unit, when the pumping rate will include the 730 gpm for the existing units, a construction rate for Unit 4, and an operational rate for Unit 3. For this construction/operational overlap period, the groundwater pumping rate will include the existing rate of 730 gpm, one-half the construction rate or 210 gpm, and one-half the proposed operational rate or 376 gpm. The total for this period will be 1,316 gpm. The pumping rate during the normal operation of all four units will be 1,482 gpm (730 gpm + 752 gpm).

#	Information Need	Discipline Name	Reviewer Name
A non-leaky aquifer scenario was used using the Theis equation to simulate site conditions. The equation assumes that the aquifer is homogeneous, isotopic, with negligible recharge and gradient, and that boundary impacts do not occur. The equation was run for each pumping rate scenario described above. The first simulation assessed the initial pumping rate for Units 1 and 2 plus construction water usage; the second included pumping for Units 1 and 2, the initial startup of one unit, plus construction; and the third assumed the total use for all four units. The drawdown values calculated are very conservative because the pumping times for each of the simulations was initiated as being the start of Unit 1 operations and not adjusted to accommodate when actual changes in pumping rates would occur. Therefore, the drawdowns at the property boundary modeled here are the result of a much longer pumping period for each scenario than will actually occur. The result is a larger drawdown value than would actually be observed, resulting in a very conservative analysis. Off-normal operations (Table 2.9-1) for the existing units would require approximately 2,300 gpm of groundwater for both units and off-normal operations for both the proposed units would use approximately 3,140 gpm. Off-normal usage for all four units would be 5,540 gpm. However, off-normal operations would likely affect only one unit, therefore SNC believes that groundwater needs for any off-normal operations plus normal operations of the other units can be accomplished within the existing groundwater permit issued by the State of Georgia. Since off-normal operations would be short lived, this scenario has not been modeled. SNC believes that a scenario where all four operating units would be under off-normal operations would be extremely unlikely. Therefore, this scenario has not been modeled although it would greatly exceed the maximum groundwater pumping rates [6 million gallons per day monthly average (MGD) [4,167 gpm] and average 5.5 MGD annually (3,819 gpm)] established under SNC's existing permit. In regard to the question about the Footnote 1 on Table 6.3-2; "MU-2A has proved difficult to monitor", the following information is provided. During the NRC site audit, a question was asked regarding the reason for the footnote. SNC stated that Well MU-2A was in good condition. The reason for the change in monitoring from Well MU-2A to another well, was that due to the down-well hoses, etc. the well proved difficult to introduce a water level probe into the casing in order to gather water level data. The GEPD allowed for a substitution for this reason. However, data retrieved from the well is still considered good data.		

#	Information Need	Discipline Name	Reviewer Name
151	The transmissivity value of158,000 gpd/ft and the storativity value of 3.1x10-4 used in the simulation of drawdown at MU-2A need to be supported with the complete data sets from which they are drawn. Page 2.4.12-12 of the Vogtle Early Site Permit Application - Part 2 - SSAR describes the transmissivity range as 110,400 to 130,900 gpd/ft and the storativity as 1.07x10-4 based on earlier data (i.e., Unit 1 and 2 studies. Page 2.4.12-13 of the Vogtle Early Site Permit Application - Part 2 - SSAR describes the transmissivity average as 158,000 gpd/ft and a storativity range of 3.3x10-4 to 2.1x10-4 based on more recent data that included data from test well TW-1. The complete data sets are needed for both hydraulic conductivity and storativity. Based on the data presented, the average hydraulic conductivity lies outside the cited range.	Hydrology	Chris Cook
Response: The transmissivity data were from TW-1 and were taken from the analysis beginning on p. 2.4.12-21 of the FSAR for the existing units. Storage data was averaged from Table 2.4.12-8 of the FSAR.			
152	The simulated drawdown for both the two existing units and all four units are provided, however, the hydraulic head of the Cretaceous aquifer should be provided to complete the argument that the forecasted drawdown is not of consequence.	Hydrology	Chris Cook
Response: This information is contained in the Bi-Annual Groundwater Use Report provided in Attachment C-1.			
153	Section 5.2.3.1 Chemical Impacts, Provide the data and/or calculations to support the claim that no effect is expected from the Units 3 and 4 discharge plume on DO concentrations in the Savannah River near the site. Provide a figure and coordinates showing what sections of the Savannah River near the site are on the South Carolina and Georgia State 303(d) Lists.	Hydrology	Chris Cook
Response: There are no sections of the Savannah River proximate to the Vogtle site included on the Georgia or South Carolina 303 (d) List. The Savannah Harbor is currently on the 303 (d) List for Dissolved Oxygen (DO). As discussed with Georgia EPD at the Site Audit, this will be considered in future Vogtle NPDES permits but will not likely result in any significant impact. EPA recently published the DO TMDL for the Savannah Harbor. In the document, EPA indicates that thermal loads would only have an impact on the TMDL if the water was at the saturation point for oxygen. Since the Savannah River is well below the saturation point for oxygen, any thermal load associated with Vogtle would have no effect.			

#	Information Need	Discipline Name	Reviewer Name
154	Section 5.2.3.2 Thermal Impacts, Provide a map and the coordinates of Shell Bluff Landing.	Hydrology	Chris Cook
Response: USGS Quadrangle Map Shell Bluff Landing, GA. – SC. 33081-B7-TF-024 contains Shell Bluff and the surrounding area. Plant Vogtle is also shown on this map. The coordinates of Shell Bluff Landing and a copy of the referenced map may be found at: http://www.topozone.com/map.asp?lat=33.22664&lon=-81.82307&datum=nad27&layer=DRG			
155	Section 5.2.3.8 Bottom Scour, Expand on and quantify the statement "only minor scouring of the river bottom is expected."	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
156	Section 5.3.2 Discharge Systems, Expand on the statement "During infrequent periods more scouring could be expected."	Hydrology	Chris Cook
Response: An expanded discussion of this statement is contained in the Bottom Scour subsection of the "Temperature Distribution as a Result of Blowdown Discharge" section of Toblin, 2006. The "infrequent periods" refer to the infrequent operation at 2-cycles of concentration, when discharge velocities will exceed those of the normal 4-cycle operation.			
157	Provide data input, data output, graphics and schematization conditions used in the CORMIX model. Include the CORMIX data package.	Hydrology	Chris Cook
Response: The CORMIX input and output files for the proposed units are contained in the "PROPOSED" folder of the "Blowdown Thermal Analysis Calculation Package." The analogous files for the existing units are contained in the "EXISTING" folder. The schematization is described in detail in the Bathymetry sub-section of the "Temperature Distribution as a Result of Blowdown Discharge" section of Toblin, 2006. Revised Bathymetry Maps illustrating the intake and discharge locations are provided as Attachment C-3.			
158	Section 6.1 Thermal Monitoring, Provide descriptions of the monitoring equipment to be used. Also, identify the type and frequency of temperature measurements to be taken and the duration of each monitoring program (page 6.1-2).	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: In 2005, Southern Nuclear and Georgia Power agreed to provide funding support for a study of Water Quality Impacts on 15 reaches of the Savannah River. A Datasonde instrument was installed near the Vogtle intake during the summer of 2006 to continuously monitor ambient river conditions. The data will be used to evaluate the condition of the river and will be available to those who participate. Since the study only began this summer, no useable data has yet been generated..			
159	Provide more information regarding why "it is unlikely that routine thermal monitoring will be a requirement of the new or amended permit" and why the pre-application and post operational monitoring activities (as specified in the ESRP) are not discussed.	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
160	Section 6.2.2 Existing Radiological Environmental Monitoring Program Contents, How would releases of radiological contaminants from DOE's Savannah River Site (SRS) be distinguished from releases from Vogtle Units 1, 2, 3, or 4? Is monitoring of the Vogtle site designed to distinguish Vogtle releases from SRS releases? Would Vogtle staff rely entirely on SRS reports / data / interpretations? Are agreements in place with DOE regarding radiological releases to the environment from these two adjacent facilities? Are the existing monitoring programs at the two sites cooperative programs? Or, has it been assumed that any and all incremental change in the environment from the pre-operational state in the 1980's is associated with operation of Vogtle Units 1 and 2? Is it now assumed that any and all incremental change from the current state will be associated with operation of Vogtle Units 3 and 4?	Hydrology	Chris Cook
Response: SNC recently committed to a tritium monitoring program as part of an Nuclear Energy Institute (NEI) agreement with NRC to address concerns over tritium in groundwater at U.S. nuclear plants. That program is in the design stage at this time. A discussion of the SNC program for monitoring tritium will be provided in a response by January 31, 2007. There are no agreements in place with Savannah River Site regarding tritium. SNC would not rely on Savannah River Site data alone to make decisions regarding tritium at Vogtle. The new tritium monitoring program will provide some ability to distinguish tritium releases and pinpoint the source. There has been no assumption based on incremental changes in the environment..		
161	Section 6.3 Hydrological Monitoring, Provide the datasets that support this section.	Hydrology	Chris Cook

#	Information Need	Discipline Name	Reviewer Name
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
162	Section 6.3.1 and Table 6.3-1 Existing Hydrological Monitoring, What process was followed to define the frequency and adequacy of monitoring as reflected in Table 6.3-1? How does the process used and the conclusions reached regarding sampling frequency relate to the conceptual site model, especially as the conceptual site model attempts to describe seasonal aspects of the environment?	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
163	Section 6.3.2 Construction and Pre-Operational Monitoring, This section summarizes the construction and pre-operational monitoring that will occur, and concludes that no significant impacts to groundwater are anticipated during construction. The reasonably conservative conceptual site model employed to reach this conclusion and others should be verified, to the extent possible, during the construction and pre-operational period. Were data from the construction and pre-operational period for Units 1 and 2 used to calibrate the model used here to conclude the construction of Units 3 and 4 would not impact the aquifers? What process will be used during the construction and pre-operational period to conclude that changes in the aquifers are anticipated and not unanticipated? What are the anticipated hydraulic head levels in the water table, Tertiary, and Cretaceous aquifers during the dewatering phase of construction? What delta from the anticipated levels will signal unanticipated performance of the adopted conceptual site model? Would an unanticipated level lead to review / revision of the conceptual site model, and be reflected in revised estimates of future impact?	Hydrology	Chris Cook
Response: Information for this question will be provided in a response to be provided by January 31, 2007.			
164	Section 6.7.1 Pre-Application Monitoring, Describe the process that was followed to arrive at the conclusion "No thermal pre-application monitoring will be required." Provide SNC's consultations with the appropriate state and federal agencies that support this statement.	Hydrology	Chris Cook
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
165	10 CFR 51.52 states a condition that rad wastes are to be in solid form and packaged or the applicant has to do an impact analysis. ER page 5.11.3 states that all rad wastes will be solidified, but ER Section 3.5.3 indicates some liquid wastes may be shipped offsite. Please clarify this apparent discrepancy. Also, explain why SNC intends to ship liquid wastes.	Transportation	Philip Daling
Response: In a conference call held on November 29, 2006. SNC stated that it does not intend to ship liquid radioactive wastes offsite. Section 3.5.3 provides estimates for wet wastes (resins, activated carbon, and liquid chemical waste) that would be shipped offsite to a LLW disposal facility. Prior to shipment, it is anticipated that these wastes will undergo dewatering, concentration, or solidification using mobile processing systems to obtain a solid waste form suitable for disposal. A small volume of liquid mixed waste (estimated at less than three 55-gal drums or approximately 17 cubic ft per year) would be stored on containment pallets in the waste accumulation room of the radwaste building. Processing of mixed waste is not included in the AP1000's solid waste management system (see Figure 11.4-1 of the AP1000 DCD). This liquid mixed waste would be shipped offsite for processing in accordance with RCRA requirements applicable to the hazardous constituents. Solidification of liquid mixed wastes prior to shipment would likely be inconsistent with RCRA requirements and detrimental to the ultimate processing of this waste to comply with the RCRA Land Disposal Restriction treatment standards. Section 5.11.1 indicates that all radioactive waste (i.e., all low-level radioactive wastes) would be packaged and in a solid form to meet 10 CFR 51.52(a).		
166	Did SNC estimate the heat load in a spent fuel shipping cask and compare the result to 10 CFR 51.52 Table S-4 conditions (i.e., 225,000 Btu/hr (~66 kW))?	Transportation	Philip Daling
Response: In a conference call was held on November 29, 2006 SNC stated that the heat load was not determined for a spent fuel shipping cask. The industry will follow a recent DOE publication ("Civilian Radioactive Waste Management System – Preliminary Transportation, Aging, and Disposal Canister System Performance Specification, Revision A DOE/RW-0585, Document ID Number WMO-TADCS-0000001, dated November 2006) for guidance on spent fuel management. Based on this document, the maximum allowable heat load for shipping is 25 KW for the 125 ton loaded shipping container. This is significantly less than the value specified in table S-4 of 10 CFR 51.52.		
167	Did SNC estimate the non-radiological impacts of accidents and compare the results to Table S-4 condition (i.e., non-radiological accidents result in one fatal injury per 100 reactor years, 1 non-fatal injury in 10 reactor years, and $475 in property damage per year)?	Transportation	Phil Daling

#	Information Need	Discipline Name	Reviewer Name
Response: In a conference call on November 29, 2006, SNC stated that it did not estimate non-radiological impacts. As discussed in Section 7.4.1, accident risks are a combination of accident frequency and consequence. Accident frequencies for transportation of fuel from future reactors are expected to be lower than those used in the analysis in WASH-1238, which forms the basis for Table S-4. This reduction is due to improvements in highway safety and security and decreases in traffic accident, injury and fatality rates. Consequently, the non-radiological impacts of accidents would be expected to be within the limits listed in Table S-4.In NUREG-1437, Volume 1, Addendum 1, NRC estimated the non-radiological impacts of truck accidents. Section 2.3.2 of that document identifies the following average accident rates for the period from 1990 to 1995: Large truck accidents at 233 per 100 million truck miles. Injuries at 21 per 100 million truck miles Fatalities at 0.42 per 100 million truck miles. Using the TRAGIS code, SNC estimated a transportation distance for the VEGP-Yucca Mountain route of 2,556 miles one-way or 5,112 miles roundtrip per shipment. SNC assumed that an average of 39 spent fuel shipments per year would be required. Using the accident rates above, the spent fuel shipments from VEGP to a repository would result in approximately 0.42 injuries per 10 reactor years and 0.084 fatalities per 100 reactor years. Both are less than their respective Table S-4 conditions.			
168	Figure 2.1-1 shows a small onsite pond and a stream leading from it to Telfair Pond. However, no description of this stream or pond was found, unless it was considered one of the several detention ponds mentioned briefly in Section 2.4.2.1. More description of the stream and pond is needed	Aquatic Ecology	Rebekah Krieg
Response: Georgia Power has never conducted surveys of aquatic biota in this pond (Retention Basin No. 2) or the stream leading to it. This basin was built during the Vogtle Unit 1 and 2 construction to prevent sediment from moving into Telfair Pond and Beaverdam Creek.			
169	Sampling occurred in the Beaverdam Creek over a two year period in 1977-1978. Did sampling take place in Telfair pond or in the stream or small pond above Telfair Pond? If so, what were the results? If not, why was it considered not important to sample?	Aquatic Ecology	Rebekah Krieg
Response: The 1977-1978 studies of fish and benthic organisms involved sampling at 8 stations in the streams, including two in Daniels Branch upstream of Telfair Pond. These 1977-1978 studies were discussed in fairly general terms, because they are nearly 30 years old. Because of the study's age, discussion of sampling results at a particular sampling station would not likely be representative.			
170	The statement is made in 2.4.2.1 that "Little is known about the aquatic biota of this stream" (the unnamed stream that drains Mallard Pond. Is more known about the aquatic biota besides the statement that "probably supports limited communities of aquatic macro invertebrates and fish". Is there any information on the aquatic biota of Mallard Pond?	Aquatic Ecology	Rebekah Krieg

#	Information Need	Discipline Name	Reviewer Name
Response: Almost nothing is known about the aquatic communities of Mallard Pond and the stream that drains it. Anecdotal information suggests that construction workers fished the pond in the early 1980s when Plant Vogtle was being built. One can see yearling largemouth bass and sunfish in the shallows. The pond has not been utilized for many years even for fishing.			
171	Have any more recent surveys been conducted of the Beaverdam creek since 1977 and 1978? If so, provide the results.	Aquatic Ecology	Rebekah Krieg
Response: There have been no additional surveys since 1977-1978.			
172	Would any construction related activities impact the small pond and stream inside the site property line that drain into Telfair pond? Would there be impacts to Telfair pond as a result of impacts to the small pond and stream?	Aquatic Ecology	Rebekah Krieg
Response: No, not if best construction management practices are employed. The construction of the power block and cooling towers occurs in an upland area. Drainage from this construction activity is routed to a retention pond installed to protect Beaverdam Creek and Telfair Pond from sediment associated with construction run-off.			
173	Is it Beaverdam creek? Or Beaver Dam creek? Both names are used in the ER.	Aquatic Ecology	Rebekah Krieg
Response: The correct name is "Beaverdam Creek" according to USGS topo maps and most documents.			
174	A more detailed characterization of the retention ponds is needed.	Aquatic Ecology	Rebekah Krieg
Response: The aquatic biota of the retention basins/ponds has not been surveyed. These basins were built to intercept sediment, thereby protecting down-gradient wetlands and streams. SNC will conduct wetland delineation in early December 2006 and these areas will be examined and classified. The information will be documented in a response to be provided by January 31, 2007.			
175	Section 2.4.2.2.1 refers to "changes in the flow characteristics of the Savannah River associated with the construction of dikes, upriver dams and removal of meanders...." A description of such changes that are directly related to that portion of the Savannah River that flows by the Vogtle site is needed unless this information is easily obtainable from the referenced document (Arnett 2001)	Aquatic Ecology	Rebekah Krieg

#	Information Need	Discipline Name	Reviewer Name
Response: Since the 1950's the USACE has added three major locks and dams to the Savannah River and made significant modifications to the navigation channel, including a number of cut-offs, on the Lower Savannah (below Clarks Hill Dam). One of these cut-offs, known as Cox Point is located at RM 153.2, approximately 2.3 miles upstream of the Vogtle site. Hale and Jackson (2003) provide a very detailed description of how dredging for navigation has altered the hydrogeology and geomorphology of the Savannah River over the past century. This reference in addition to Arnette 2001 should provide a sufficient description of the requested information. Please see the response to question # 114 (Attachment B-1) for further information and references.			
176	Section 2.4.2.2.2 (Resident Fish of the Middle Savannah River) refers to a study between 1980 and 1995 of fish collected by the Academy of Natural Sciences. However, the reference cited (Halverson 1997) is from a SRS Ecology Environmental Information Document prepared by Westinghouse Savannah River Company. Is this the correct reference?	Aquatic Ecology	Rebekah Krieg
Response: This is the correct reference. Halverson (1997) summarizes the Academy studies. The original studies from the Philadelphia Academy or from Westinghouse Savannah River Company were not available. Note that Halverson (1997) actually says 59 (rather than 61) species had been collected. The larger number was used because the table accompanying this discussion shows 61 fish species. Also WSRC has updated Halverson et al (1997) with Wike et al (2006) which can be requested from WSRC or DOE-SR.			
177	Section 2.4.2.2 (Sturgeons) discusses the substrate of the Savannah River in the vicinity of the VEGP as being characterized as "shifting sand". A copy of GPC 1972 might clear this up, but we are interested in the basis for this statement. What type of substrate sampling was performed on the bottom of the Savannah River to make this conclusion. Where were the samples taken and when were they made?	Aquatlic Ecology	Rebekah Krieg
Response: See page 2.7-107 of the Vogtle Operating License Stage Environmental Report Units 1 and 2 (OLER). This brief description of substrate is actually in the OLER discussion of benthic organisms: "Bottom fauna over most of the river bed are very sparse…because the river bottom consists mainly of shifting sand. "The author(s) appear to have based this on the material observed in bottom samples, which were taken with a Peterson dredge. Samples were taken upstream and downstream of the Vogtle site, and in the immediate vicinity of the Vogtle site. In early December 2006, SNC took additional samples to confirm the bottom substrate materials and properties. This information is presented in Attachment C-3.			

#	Information Need	Discipline Name	Reviewer Name
178	Section 2.4.2.2 (Sturgeons) mentions a four year Department of Energy study of ichthyoplankton abundance and entrainment. No reference is provided. Is this the 1983-1985 Comprehensive Cooling Water study (DuPont 1987)?	Aquatic Ecology	Rebekah Krieg
Response: The information is from Volume VI of the CCWS (Du Pont 1987). Note that the number 12 (sturgeon larvae) is a typographical error and should be 13.			
179	Section 2.4.2.2 (Sturgeons) cites a reference, "Lamprecht, 1991", is this the same reference as "Hall, Smith and Lamprecht 1991"?	Aquatic Ecology	Rebekah Krieg
Response: Yes. This citation should be "Hall, Smith, and Lamprecht 1991."			
180	Characterize any noise impacts to the fauna of the Savannah River from construction activities such as pile driving?	Aquatic Ecology	Rebekah Krieg
Response: The impact of noise on aquatic organisms is not yet well-understood. Most of the research on fish has been on marine species on the West Coast. Hastings and Hopper (2005) summarized studies on the effects of noise on fish and this information is taken from that report. Most studies have focused on pile driving and blasts. Construction at the intake and barge canal may involve pile driving or similar activities with similar noise impacts. SNC does not anticipate blasting will be necessary. Fast, high acoustic exposures such as from blasting can cause physical damage and mortality. Limited studies and observations show mortality related to pile driving. Results from sounds other than those created by pile driving indicate that some sounds damage some fish species inner ear sensory structures, and some sounds may destroy the swim bladder. No studies have focused on the impacts of inner ear damage or hearing loss to the survival of the fish so the ultimate impact on individual fish is not known. Hearing loss could make fish more vulnerable to predation, and, depending on the species, hinder feeding. It appears that the degree of damage from pile driving is not related to the distance of the fish from the sound, but to the received sound level and the duration. Sound pressures do not appear to decrease monotonically with distance. The body of data available is inadequate for developing more than preliminary scientifically supportable criteria that will protect fish from exposure to pile driving sound and so mitigation measures are not currently available. It is likely that some fish in the Savannah River will be adversely affected by the noise of construction at the barge slip and intake structure. The primary impact will be to drive fish from the construction areas, however, the impacts will be short-term, and will not adversely affect any populations in the Savannah River. Hastings, M.C. and A.N. Popper. 2005. Effects of Sound on Fish. Funding provided by the California Department of Transportation. Jones and Stokes. Sacramento, CA.		

#	Information Need	Discipline Name	Reviewer Name
181	Provide any available GIS layer information for the following areas:- (1) site description including location of disturbed areas, new plant structures, temporary laydown areas, - (2) near site description including closest cities, water bodies, current transmission lines, gas lines etc. -(3) radiological sampling sites- (4)other sampling sites- (5) vegetation maps for the Vogtle site - (6) approximate location of the proposed transmission lines	General	Rebekah Krieg
Response: Specific information will be provided in a response at a later time.			
182	Please have section authors available during the audit.	Human health/radiological	Michael Smith
Response: The section authors were available for the site audit.			
183	Did different staff do the biota and public dose assessments? If so, please have each available during the audit.	Human health/radiological	Michael Smith
Response: The requested support staff was available for the site audit.			
184	I would like an opportunity to view/cross check original data. This is a general request for which I provide the following example: TLD (dosimeter) monitoring reports that feed into offsite and construction worker dose calculations. The direct radiation to construction workers (ER Section 4.5.3.1) is estimated as 51 mrem/yr, but no reference or supporting data is provided. It would be helpful to have a listing of quarterly TLD measurements used, along with locations mapped.	Human health/radiological	Michael Smith
Response: This data is available at The GPC Environmental Lab. A sample of TLD data from the Radiological Environmental Monitoring Program (REMP) at Plant Vogtle was provided during the site audit. Additional data can be provided, if desired.			
185	I would like to view the following reports: - offsite dose calculation manual - several years of the environmental monitoring report (operating report) - several years of the annual radioactive effluent release report, including the years referenced in the ER (2001 & 2003).	Human health/radiological	Michael Smith
Response: Copies of these documents were available during Site Audit.			

#	Information Need	Discipline Name	Reviewer Name
186	I would like to view input & output files for LADTAP and GASPAR model runs. I would like to receive copies of input/output so that I can run them independently (receive during audit or have them submitted as part of the application?)	Human health/radiological	Michael Smith
Response: As discussed at the VEGP site audit, LADTAP/GASPAR runs were not performed for the ESP ER. Instead, as stated in Section 5.4, the equations and parameters in the VEGP ODCM and the estimated releases from the AP1000 provided in the AP1000 documentation were used to calculate the doses to offsite receptors from the new units.			
187	Comments on ER Section 5.4 - Radiological Impacts of Normal Operation, and ER Section 6.2 - Radiological Monitoring, and Related Supporting Sections of the ER and SSAR Radiation exposures and doses due to liquid and gaseous effluents are based on models, assumptions, and site-specific data described in two documents. The are:· Southern Nuclear Operating Company, Offsite Dose Calculation Manual for Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Ver. 22, June 25, 2004. (ODCM)· Southern Nuclear Operating Company, Vogtle Electric Generating Plant - Unit 1 and 2, Annual Radioactive Effluent Release Report for January 1, 2003 to December 31, 2003. (Effluent Release Report)However, the information and model parameters are not described in ER Section 5.4, with the above documents not included in the application. The documents will be obtained ([1]) and reviewed to determine whether the modeling approach and assumptions used for operating plants are acceptable in the context of an ESP application. Based on this review, RAIs will be submitted to the applicant, as needed.	Human health/radiological	IHPB/NRC
Response: Copies of these documents were available during the Site Audit.			
188	Sections 3.5 and 5.4 of the ER refer extensively to the AP1000 Design Control Document (Rev. 15, November 2005). The AP1000 DCD will be reviewed to determine whether the information, assumptions, and data are properly used in the context of the ESP application. Based on this review, RAIs will be submitted to the applicant, as needed.	Human health/radiological	IHPB/NRC
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
189	Sections 3.0 and 5.4 of the ER do not demonstrate compliance with liquid and gaseous effluent concentration limits of Part 20, Appendix B, Table 2, Columns 1 and 2. The ESP application will be reviewed and based on the results of this review, RAIs will be submitted to the applicant, as needed.	Human health/radiological	IHPB/NRC
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
190	Section 5.4 of the ER excludes potential exposure pathways (for liquid and gaseous effluents), with no basis provided for their omissions. For example, the ER excludes boating, shoreline activity, crop and pasture irrigation, and cow and goat milk production. Given that the ER relies on information presented in the ODCM and effluent release report, these documents will be reviewed and based on the results of this review, RAIs will be submitted to the applicant, as needed.	Human health/radiological	IHPB/NRC
Response: All exposure pathways were chosen to be consistent with the ODCM.			
191	Other items identified include internal inconsistencies in referencing information and parameters used in calculating doses to the maximally exposed individual. For example, such inconsistencies include: basis for the dilution factor within ER Section 5.4, as applied to liquid effluents basis for atmospheric dispersion factors between SSAR Section 2.3.5 and ER Section 2.7.6 versus that cited in ER Section 5.4 (ODCM for existing plants) designations of wind sectors and distances for the maximally exposed individual and nearest site boundary for gaseous effluents between ER Sections 5.4 and 2.7.6 and SSAR Section 2.3.5 location of the maximally exposed individual for liquid effluents within ER Section 5.4 basis of total population within the 50-mile radius used in assessing collective doses between ER Sections 2.5.1 and 5.4 operational radiological monitoring program of onsite ground water wells stated to be used for potable water in light of the information presented in ER Sections 2.3.3, 6.2.3, and 6.3.3 and SSAR Section 2.4.12	Human health/radiological	IHPB/NRC

#	Information Need	Discipline Name	Reviewer Name
Response: The total population used to calculate background dose in Section 5.4 has been corrected to match the year 2000 population total presented in Table 2.5.1-1. Table 5.4-10 has been revised as follows: Table 5.4-10 Collective Total Body Doses within 50 Miles (millirem per year) AP1000 (two units) Existing Units Noble gases 2.6E-08 2.44E-11, Iodines and particulates 0.24 1.81E-06, Tritium and C-14 0.11 0.006, Total 0.13 0.006, Natural background (expressed as person-rem per year) 2.43E+05 2.43 E+05, Note: Natural background dose is based on a dose rate of 360 mrem/person/yr (NCRP 1987) and a population of 674,102 (Table 2.5.1-1).			
192	Sections 4.5.2.2 and 4.5.2.3 of the ER reference gaseous releases for 2003 and liquid releases for 2001 as being typical releases for the existing units. No data for releases for other years is provided to justify the use of the release data for the years chosen. It is unclear why the data for typical gaseous and liquid releases were chosen from two different years.	Human health/radiological	IHPB/NRC
Response: The reference in Section 4.5.2.3 to 2001 liquid effluent releases is a typographical error. As can be seen in the reference citation, the correct year is 2003. Release data from 2003 was chosen because it was the latest available full year of data. This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
193	Section 4.5.3.1 of the ER discusses the use of TLD data to establish the estimated direct radiation dose to construction workers. This section should provide additional information on the applicant's basis for selecting 50 mrem/year as the average accumulated exposure from VEGP. Additional information should include the year that this data was measured (and why 50 mrem/year is a representative value to use for the average direct dose value), the number and location of the TLDs used to obtain this dose data, and if the TLD values were corrected for a 100 percent power level.	Human health/radiological	IHPB/NRC
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
194	Section 4.5.3.1 of the ER also discusses the dose contribution from the ISFSI. Additional information is needed about when the ISFSI will be put into use and what percent loading of the ISFSI the applicant assumed to arrive at the ISFSI contribution of 15 mrem/year to the Unit 3 construction workforce. How the licensee arrived at the estimated direct radiation dose to construction workers of 52 mrem/year is also not clear.	Human health/radiological	IHPB/NRC

#	Information Need	Discipline Name	Reviewer Name
Response: SNC has evaluated the contribution from the ISFSI to the construction work force. The occupational projected dose for workers on Units 3 and 4 is as follows: The projected dose to Unit 3 Construction Workers is 15 mrem based on the six casks placed in 2014. Due to the distance from the ISFSI, Dose to Unit 4 Construction Workers is considered negligible. There will be twelve casks in storage at the time Unit 4 goes online in 2016. Assuming casks that hold 32 assemblies are used, VEGP 1&2 will need to load six casks every 18 months. For the ESP, the following cask loading schedule is projected: 2014 – first cask placed in service April 1, 2014 with six casks in service by July 1, 2015 – six additional casks will be placed in service by July 1, 2016 . This is the current schedule contemplated for Vogtle dry storage start-up. The average accumulated exposure from VEGP Protected Area internal and general area TLDs over a 365 day period is 50 mrem. The average Environmental Plant Site Boundary TLD exposure over a 365 day period is 13 mrem. Dose from the internal and general area TLDs minus the Environmental Plant Site Boundary TLDs, is the method used to determine dose above background. Based on this approach, 50 mrem per year – 13 mrem per year = 37 mrem per year (for normal 1&2 operations). The total construction worker dose is obtained by adding: 15 mrem ISFSI dose + 37 mrem site exposure dose = 52mrem annual direct radiation dose to construction worker. In the event Vogtle needs to pursue a more aggressive schedule, the earliest spent fuel loading would occur no sooner that April 1, 2012. The annual direct radiation dose to a Unit 3 construction worker would increase proportionally.			
195	In Section 4.5.4.2 of the ER, the applicant applies a multiplication factor of ten (10) to the measured annual effluent dose to account for the fact that the workers are located closer to the effluent release point than the maximum exposed member of the public. The applicant did not provide a description of how they derived this multiplication factor.	Human health/radiological	IHPB/NRC
Response: The basis for application of the factor of 10 was an estimate.			
196	Table 4.5-1 in the ER should have a column showing the TEDE annual dose (sum of whole body and critical organ annual doses).	Human health/radiological	IHPB/NRC
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			
197	Section 4.5 of the ER should include a site map indicating the location of the internal and general area TLDs used to estimate the direct radiation dose to the construction workforce.	Human health/radiological	IHPB/NRC
Response: This item was clarified/resolved through audit interaction between SNC and the NRC; No further action needed.			

#	Information Need	Discipline Name	Reviewer Name
198	Are there any wetland areas on the Vogtle site?	Land Use/Alternatives	Paul Hendrickson
Response: This question is deferred to the Ecology Section. Wetlands will be delineated in early December 2006 and information will be provided in a response to be provided by January 31, 2007.			
199	No wetland impacts are identified in Table 10-1 (p. 10.1-5). Should there be such impacts for the plant or for the new transmission line?	Land Use/Alternatives	Paul Hendrickson
Response: This question is deferred to the Ecology Section and will be addressed in a response to be provided by January 31, 2007.			
200	Wetland impacts are not mentioned in Section 10.5 covering cumulative impacts. Are there likely to be cumulative wetland impacts?	Land Use/Alternatives	Paul Hendrickson
Response: This question is deferred to Ecology. Wetland impacts will be assessed through the wetland delineation process in a response to be provided by January 31, 2007.. No significant cumulative impacts to wetlands are anticipated.			
201	Will borrow pits be utilized? If so, where will they be located?	Land Use/Alternatives	Paul Hendrickson
Response: Borrow pits will be utilized and are identified in drawings in the Threatened and Endangered Species and Cultural Resources sections of the ER.			
202	Will upgrades to the rail corridor be needed?	Use/Alternatives	Hendrickson
Response: No upgrades to the rail corridor are anticipated.			
203	Will dredging of the barge slip be needed? If so, where will the spoils go?	Land Use/Alternatives	Paul Hendrickson
Response: The construction methodology for the intake, barge slip, and discharge are currently being evaluated and the response will be provided under an RAI. The need for dredging and disposal of dredge spoil will be addressed in this response.			

#	Information Need	Discipline Name	Reviewer Name
204	Would refueling and maintenance outages be staggered after construction of the new units?	Land Use/Alternatives	Paul Hendrickson
Response: While it is anticipated that the new units will be staffed and operated independently from the existing units, efforts will be made to minimize concurrent outages. Outages will be staggered, as necessary, to avoid overlap when possible.			
205	How does the process for siting a new transmission line in Georgia work? Who would need to approve the siting? Will Southern be the owner of the new transmission line?	Land Use/Alternatives	Paul Hendrickson
Response: The transmission siting process in Georgia is governed by a state law (Title 22) and associated regulations. A copy of the Georgia Power guideline for transmission siting was provided at the Site Audit. The GPC Siting guide and other supporting information are provided as Attachment C-5.			
206	Has salt drift from the existing cooling tower plumes been an issue?	Land Use/Alternatives	Paul Hendrickson
Response: Salt drift from the existing units does not present any significant environmental concern. No significant cumulative effects are anticipated after the new units are added.			
207	Section 10.5.1 (page 10.5-1) states that no large construction projects (other than the proposed Vogtle plants) are planned in the vicinity. Does this include the Savannah River Site?	Land Use/Alternatives	Paul Hendrickson
Response: *DOE – Savannah River provided the following construction estimates for anticipated SRS construction projects.*			
Project	*Anticipated time of construction*	*Construction workforce*	
Salt Waste Processing Facility	*2007 –2011*	*Peak of 650 in 2008 – 2010*	
Mixed Oxide Fuel Facility	*2007 – 2015*	*Peak of 1,000 in 2010; avg about 600*	
Plutonium Vitrification Facility	*2008 -- 2012*	*Peak of 300 in 2011 – 2012*	
Complex 2030 Consolidated Plutonium Complex	*2014 – 2020*	*800 – 1,100*	
208	Are agricultural activities allowed under transmission lines?	Land Use/Alternatives	Paul Hendrickson

#	Information Need	Discipline Name	Reviewer Name
Response: Yes. Georgia Power provides easements for agricultural activities under transmission lines.			
209	Did SNC estimate the heat load in a spent fuel shipping cask and compare the result to 10 CFR 51.52 Table S-4 conditions (i.e., 225,000 Btu/hr (~66 kW))?	Transportation	Philip Daling
Response: In a conference call was held on November 29, 2006, this issue was addressed.			
210	Did SNC estimate the non-radiological impacts of accidents and compare the results to Table S-4 condition (i.e., non-radiological accidents result in one fatal injury per 100 reactor years, 1 non-fatal injury in 10 reactor years, and $475 in property damage per year)?	Transportation	Phil Daling
Response: In a conference call was held on November 29, 2006, this issue was addressed.			
211	What is source for 325 mrem/person/yr natural background dose used in ER Table 5.4-10?	Human health/radiological	Michael Smith
Response: The source of background radiation in Table 5.4-10 has been revised. The number used in the revised table is 360 mrem (NCRP 1987). See response to question # 191 for revised table. NCRP (National Council of Radiation Protection and Measurements). 1987. Ionizing Radiation Exposure of the Populations of the United States. Bethesda, MD.			
212	Table 3.0-1 states that CWS Cooling Tower Offsite Noise Levels are less than 20 dB above background. What approach was used to determine this value? Provide any associated references. Also, this table refers to ER Section 5.8.1.1 that is not related to noise calculation.	Nonradiological Health	Michael Smith
Response: Table 3.0-1 has been corrected in Rev. 1 of the environmental report. The correct noise levels range from 20 to ≤ 40 dBA, taken from Table 2.7-26. Table 2.7-26 is derived from work done to estimate noise levels at particular locations around the site boundary for the initial units. The NRC Staff used an Argonne National Lab model to confirm noise impact were small (Ref. VEGP Unit 1 & 2 FES Section 5.12). No noise measurements have been done at VEGP since before Units 1 and 2 came on-line. VEGP has a requirement in the Unit 1 and 2 Environmental Protection Plan (EPP) to investigate any noise complaints and report them in the Annual Environmental Operating Report for each year. No complaints have been received since the units became operational.			

#	Information Need	Discipline Name	Reviewer Name
213	Better description of the new barge facility, including area impacted and possible methods of construction.	Aquatic Ecology	Rebekah Krieg
Response: The construction methodology for the intake, barge slip, and discharge are currently being evaluated and the response will be provided by January 31, 2007.			

#	Information Need	Discipline Name	Reviewer Name
214	Need chart of 20 year expected peak loads, consumption, price of oil projections, coal, gas and nuclear.	Need for Power	Mike Dusaniwskyj

Response: **Fuel Cost Projection**

The cost of producing electricity is a function of the costs of fuel, operations and maintenance, and capital. In Energy Information Administration (EIA) projections for the year 2030, fuel costs would account for about two-thirds of the generating costs for new natural-gas-fired plants, less than one-third for new coal-fired units, and less than one-tenth for new nuclear power plants (EIA 2006, at page 82). As shown in Figure 1, coal- and nuclear-fuel costs have remained relatively steady for the past 10 years but natural gas and petroleum costs have risen significantly. Projections of fuel costs, therefore, bear significantly on the analysis of the cost of producing electricity using the various fuel options. EIA projections show petroleum and natural gas prices dropping but then rising again towards the end of the projection period. Table 1 shows values for selected years shown in Figure 1.

Regional fuel prices can vary from the national composite prices that Figure 1 shows. For the Southeast Electric Reliability Council (SERC) region, in which VEGP Units 3 and 4 would be located, EIA-reported differences do not alter the relative cost comparisons. For example, Table 1 projects a national composite price for coal in 2030 of $1.51 per million Btu. For SERC, EIA projects a price for coal in 2030 of $1.70 per million Btu. Similar comparisons for natural gas (6.26 vs. 5.01) and petroleum (7.61 vs. 8.51) (EIA 2006c, table 68, page 376) show that nuclear will remain the least expensive fuel and petroleum the most expensive. Furthermore, the difference between nuclear and natural gas fuel costs will be comparable to what the difference is today.

References

(EIA 2006a) Energy Information Administration, U. S. Department of Energy, Annual Energy Outlook 2006 With Projections to 2030, Washington, D. C.,DOE/EIA-0383(2006), February. Available online at http://www.eia.doe.gov/oiaf/aeo/index.html. Accessed December 1, 2006.

(EIA 2006b) Energy Information Administration, U. S. Department of Energy, Annual Energy Outlook 2006 With Projections to 2030, Washington, D. C.,DOE/EIA-0383(2006), February. Graphic Data for Figure 65. Available online at http://www.eia.doe.gov/oiaf/aeo/excel/figure65_data.xls. Accessed December 1, 2006.

(EIA 2006c) Energy Information Administration, U. S. Department of Energy, Supplemental Tables to the Annual Energy Outlook 2006; Part III Electric Generation and Renewable Resource Data. Available online at http://www.eia.doe.gov/oiaf/aeo/supplement/pdf/sup_elec.pdf. Accessed December 1, 2006.

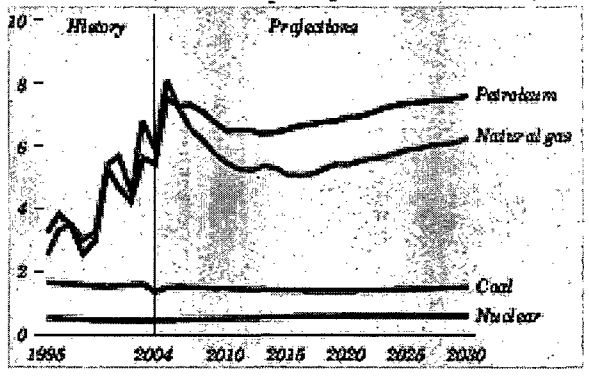
#	Information Need	Discipline Name	Reviewer Name

Table 1. Fuel prices to electricity generators, 1995-2030 (2004 dollars per million Btu).

Fuel	2004	2010	2015	2020	2025	2030
Petroleum	5.43	6.5	6.52	6.91	7.37	7.61
Natural gas	5.92	5.46	5.08	5.4	5.87	6.26
Coal	1.36	1.48	1.4	1.39	1.44	1.51
Nuclear	0.45	0.52	0.57	0.6	0.61	0.6

Source: **EIA 2006b**.

Figure 1. Fuel prices to electricity generators, 1995-2030 (2004 dollars per million Btu).



Source: Reprinted from **EIA 2006a, Figure 65**.

215	Provide the 2000 survey report that was conducted by Georgia Power on the transmission lines. This report specifically addressed sensitive areas and T and E species occurrences within 0.5 miles of the lines. We would like to be able to reference this report.	Terrestrial Ecology	Amanda Stegen
Response: This report was provided during the site audit.			
216	Provide the Georgia Power transmission line maintenance procedures. The information we were provided is specific for the current Vogtle lines, but may not include procedures that may need to be followed on the new line. The more general Georgia power procedures have more detail on how sensitive areas are handled. We want to be able to reference the overall document.	Terrestrial Ecology	Amanda Stegen
Response: These procedures were provided during the Site Audit.			

#	Information Need	Discipline Name	Reviewer Name
217	Although no red-cockaded woodpeckers (RCWs) have been found at VEGP, the area north of the proposed borrow areas contains longleaf pine more than 100 years old and is suitable habitat for this federally-listed species. Provide a copy of the safe harbor agreement application that has been submitted for RCWs.	Terrestrial Ecology	Amanda Stegen
Response: A copy of the Safe harbor agreement was provided during the Site Audit.			
218	Provide information on suitable habitat for T and E species, both onsite and in the transmission line corridors. This should include suitable habitat for all T and E species that may occur onsite and in the transmission line corridors. For example, GA DNR told us that although no plants have been discovered thus far, the bluff above the bottomland hardwood swamp at VEGP that will be impacted by construction of the intake is suitable habitat for the federally-listed relict trillium (Trillium reliquum).	Terrestrial Ecology	Amanda Stegen
Response: This issue will be investigated during the wetland delineation work in early December 2006 and will be documented in the response to be provided by January 31, 2007.			
219	We were told that there was a Wildlife Habitat Enhancement Management Plan that was referenced in section 2.4. This management plan contains information on timber management, hunting etc. I have not been able to find this reference anywhere in the document. Perhaps it is right in front of me and I am just continuing to miss it. We need a copy of this reference, and if it isn't in the document, we need to have it provided to us.	Terrestrial Ecology	Amanda Stegen
Response: A copy of the Wildlife Management Plan was provided during the Site Audit.			
220	It was mentioned that prior to a timber harvest, GPC biologists survey the area to ensure no T and E species are present. This sounded like it was a common practice - though not a procedure. Is there any formal documentation on what types of activities prompt this survey? Is there any formal documentation on what the survey entails?	Terrestrial Ecology	Amanda Stegen
Response: Timber management activities are coordinated through the Georgia Power Company Land Department. They keep good records and document each timber management event. SNC will ensure they are available for discussion on this subject, if desired.			

#	Information Need	Discipline Name	Reviewer Name
221	Is there plans to conduct T and E surveys in areas that will be impacted by construction and have not been surveyed (such as the borrow area etc)? If there is not a plan in place to conduct these surveys, please provide justification.	Terrestrial Ecology	Amanda Stegen
Response: All areas that may be potentially impacted by construction have been surveyed for Threatened and Endangered species and Cultural Resources.			
222	Have there been any bird impact events - such as avian collisions with cooling towers?	Terrestrial Ecology	Amanda Stegen
Response: There have been no significant avian collision events during the current operation of VEGP.			
223	Has SNC identified any air permits that need to be secured for plant construction or operation (e.g., Title V)? If so, what emission sources need to be permitted?	Meteorology	Jeremy Rishel
Response: SNC has determined that the first permit necessary for construction will be the construction stormwater permit covering non-pint source discharges associated with construction. New or modified Title V permit may be required to manage construction emissions such as volatiles and dust. This information is discussed in Chapter 6 of the ER.			
224	Did SNC reevaluate the validity of assumptions made in the ODCM for application to proposed units 3 and 4 (e.g., updated meteorology, updated population distribution, effects from construction and demolition)? Need description of SNC process used to determine whether an update to the ODCM is required. For example, is there a regular schedule or are there other events that would initiate a reevaluation of assumptions in the ODCM?	Radiological, Non-Radiological Waste, Noise, OSHA	Mike Smith
Response: No, SNC did not reevaluate the validity of the assumptions in the Vogtle OCDM. The current OCDM is the best information available to estimate the impacts of offiste doses associated with Units 3 and 4. It is understood that a separate ODCM may be developed for the AP-1000 design. The Vogtle procedure for implementation of the ODCM provides guidance on when changes are required and how changes will be implemented. A copy of the ODCM Procedure for Vogtle was provided at the Site Audit.			

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Information Needs Question Response

Table X-1 Information Need

Activity	Pre-construction/Construction	Total # acres impacted	Number of forested acres	Type of forest impacted	Number of wetland acres impacted	Type of wetland impacted (jurisdictional/not jurisdictional)	Type of impact on wetlands	Any dredge and fill associated with activity? Quantities?	T&E survey of area impacted?	Mitigation measure

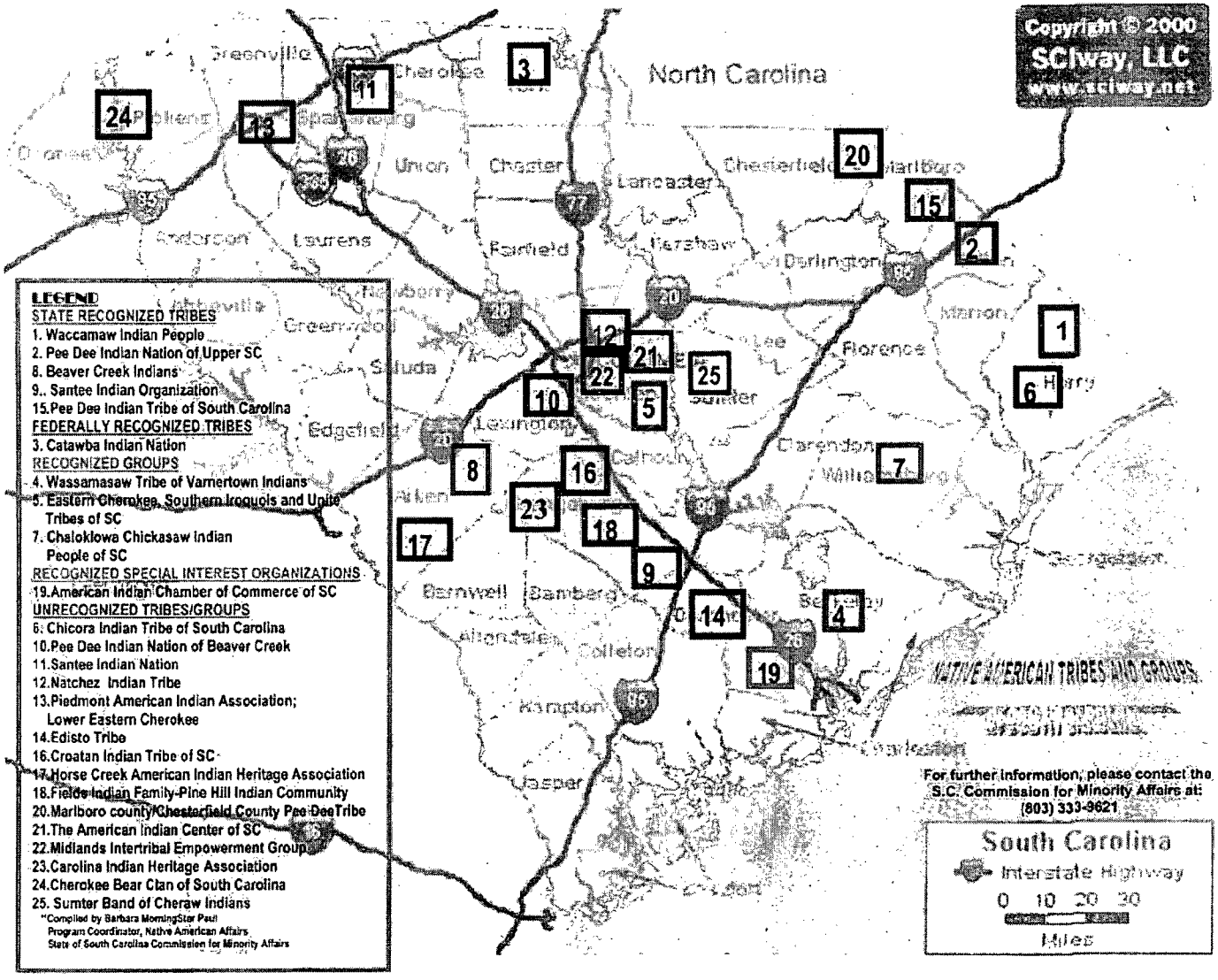
Note: There are no land use or alternative needs available at this time.

AR-06-2684

Enclosure

Attachment A-1 #22

AR-06-2684
Enclosure
Attachment A-1 #22



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Enclosure

Attachment A-2 #25

25. Page 4.4-7 states "The creation of such a large pool of jobs [5,800] would inject millions of dollars into the regional economy . . ." Provide an actual value for your estimate.

Response:

The main table lists the number of construction workers on site, by month, during construction. SNC obtained construction worker wage data for the Augusta-Richmond County, GA-SC MSA from the Department of the Interior's Bureau of Labor Statistics. The average annual wage for all construction and extraction occupations in this MSA in 2005 was $32,180 (BLS 2005). The range of wages for all construction and extraction occupations in this MSA in 2005 was $17,620 to $46,400. The average annual wage for a construction laborer (a subset of the above) in this MSA in 2005 was $22,080. To be conservative, SNC used the average annual wage of a construction laborer, $22,080, in its analysis. In the attached table, the average annual wage of a construction laborer was divided by 12 to calculate an average monthly wage. The monthly wage was multiplied by the number of workers each month and then summed to calculate total dollars earned by the construction workforce.

A sensitivity analysis (smaller table) was performed to further assess the impacts of the construction worker wages on the region. Because of uncertainty surrounding the amount of wages that would be spent in the region, SNC provided a table depicting the dollar impact on the region by percent of the wages spent within the region.

This analysis is provided for clarification and no revision to the ESP application is planned.

Reference

U.S. Department of Labor Bureau of Labor Statistics. 2005. "May 2005 Metropolitan Area Occupational Employment and Wage Estimates. Augusta-Richmond County, GA-SC." Available online at http://stats.bls.gov/bls/blswage.htm. Accessed October 16, 2006.

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Attachment A-2 #25

Estimated Construction Work Force Wages

Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce
Limited Work Authorized Activities				10	3500	$1,840	$6,440,000	38	4350	$1,840	$8,004,000
-18	80	$1,840	$147,200	11	3600	$1,840	$6,624,000	39	4275	$1,840	$7,866,000
-17	160	$1,840	$294,400	12	3700	$1,840	$6,808,000	40	4250	$1,840	$7,820,000
-16	230	$1,840	$423,200	Construciton on Second Unit				41	4225	$1,840	$7,774,000
-15	300	$1,840	$552,000	13	3800	$1,840	$6,992,000	42	4200	$1,840	$7,728,000
-14	380	$1,840	$699,200	14	3850	$1,840	$7,084,000	43	4175	$1,840	$7,682,000
-13	460	$1,840	$846,400	15	3900	$1,840	$7,176,000	44	4150	$1,840	$7,636,000
-12	530	$1,840	$975,200	16	3950	$1,840	$7,268,000	45	4125	$1,840	$7,590,000
-11	610	$1,840	$1,122,400	17	4000	$1,840	$7,360,000	46	4100	$1,840	$7,544,000
-10	700	$1,840	$1,288,000	18	4050	$1,840	$7,452,000	47	4075	$1,840	$7,498,000
-9	820	$1,840	$1,508,800	19	4100	$1,840	$7,544,000	48	4050	$1,840	$7,452,000
-8	960	$1,840	$1,766,400	20	4150	$1,840	$7,636,000	49	4025	$1,840	$7,406,000
-7	1130	$1,840	$2,079,200	21	4175	$1,840	$7,682,000	50	4000	$1,840	$7,360,000
-6	1310	$1,840	$2,410,400	22	4200	$1,840	$7,728,000	51	3975	$1,840	$7,314,000
-5	1480	$1,840	$2,723,200	23	4250	$1,840	$7,820,000	52	3950	$1,840	$7,268,000
-4	1660	$1,840	$3,054,400	24	4275	$1,840	$7,866,000	53	3925	$1,840	$7,222,000
-3	1830	$1,840	$3,367,200	25	4300	$1,840	$7,912,000	54	3900	$1,840	$7,176,000
-2	2000	$1,840	$3,680,000	26	4350	$1,840	$8,004,000	55	3875	$1,840	$7,130,000
-1	2175	$1,840	$4,002,000	27	4375	$1,840	$8,050,000	56	3850	$1,840	$7,084,000
Construction on First Unit				28	4400	$1,840	$8,096,000	57	3825	$1,840	$7,038,000
1	2350	$1,840	$4,324,000	29	4400	$1,840	$8,096,000	58	3800	$1,840	$6,992,000
2	2525	$1,840	$4,646,000	30	4400	$1,840	$8,096,000	59	3700	$1,840	$6,808,000
3	2700	$1,840	$4,968,000	31	4400	$1,840	$8,096,000	60	3600	$1,840	$6,624,000
4	2870	$1,840	$5,280,800	32	4400	$1,840	$8,096,000	61	3500	$1,840	$6,440,000
5	3045	$1,840	$5,602,800	33	4400	$1,840	$8,096,000	62	3000	$1,840	$5,520,000
6	3180	$1,840	$5,851,200	34	4400	$1,840	$8,096,000	63	2500	$1,840	$4,600,000
7	3250	$1,840	$5,980,000	35	4400	$1,840	$8,096,000	64	2000	$1,840	$3,680,000
8	3300	$1,840	$6,072,000	36	4400	$1,840	$8,096,000	65	1000	$1,840	$1,840,000
9	3365	$1,840	$6,191,600	37	4350	$1,840	$8,004,000	66	500	$1,840	$920,000
		Subtotal =	$79,856,000			Subtotal =	$214,314,000			Subtotal =	$193,016,000

Total $ earned by construction workforce =	**$487,186,000**

Sensitivity Analysis

% of Total Construction Workforce Wages that could be Spent in Region	$
10	$48,718,600
20	$97,437,200
30	$146,155,800
40	$194,874,400
50	$243,593,000
60	$292,311,600
70	$341,030,200
80	$389,748,800
90	$438,467,400
100	$487,186,000

a. U.S. Department of Labor Bureau of Labor Statistics. 2005. "May 2005 Metropolitan Area Occupational Employment and Wage Estimates. Augusta-Richmond County, GA-SC." Available online at http://stats.bls.gov/bls/blswage.htm. Accessed October 16, 2006.

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Attachment A-3 #26

26. Page 4.4-8 states "While the exact amount of income taxes the project will generate for Georgia cannot be known, it could be fairly large over a 7-year pre-construction and construction period. . ." Provide a quantity for your estimation of the tax revenues that will be collected.

Response:

As stated in Section 2.5.2.3 of the VEGP ESP ER, "Georgia has personal and corporate income taxes. Construction workers will pay taxes on their wages and salaries to Georgia if (1) their residence is in Georgia, (2) they are nonresidents working in Georgia and filing a federal return which will include income from sources in Georgia that exceeds five percent of income from all sources, or (3) they have income that is subject to Georgia tax that is not subject to federal income tax."

A large portion of construction workers would be considered residents of Georgia while they work at VEGP. For non-residents, SNC is not able to accurately assess whether or not a construction worker's VEGP wages would be more than 5 percent of his/her income from all sources, however, it is most likely that this would be the case for a majority of the workers. Therefore, to account for these uncertainties, SNC performed a sensitivity analysis of tax impacts from construction worker wages. The analysis includes estimates ranging from 20 percent to 100 percent of the workers paying taxes in Georgia.

To estimate income tax impacts to the State of Georgia, SNC selected the tax bracket that contains the average annual wage of a construction laborer (see response to comment #25) for the Augusta-Richmond County, GA-SC MSA (as provided by the Bureau of Labor Statistics, 2005): $22,080. (See attached table) In Georgia, this annual wage or salary falls into the 6 percent tax bracket, the highest. (Note - wages between $1 and $7,000 (the first 5 brackets) are taxed at lower rates on a graduated scale. Therefore, the actual tax rate is actually slightly less than 6 percent of the annual salary. However, the difference is minimal and, for the sake of simplification, the worker's entire salary has been multiplied by 6 percent.)

On the VEGP construction project, it is likely that the average construction worker wage will be higher than $22,080 per year because a large portion of the workforce would be considered skilled labor. Therefore, this estimate is actually likely to understate the tax impacts to the region. In either case, the impacts would be large and positive.

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Estimated Construction Work Force Wages

Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce	Month	Workforce Strength	Avg. Monthly Wage[a] ($)	$ Earned by Construction Workforce
Limited Work Authorized Activities				10	3500	$1,840	$6,440,000	38	4350	$1,840	$8,004,000
-18	80	$1,840	$147,200	11	3600	$1,840	$6,624,000	39	4275	$1,840	$7,866,000
-17	160	$1,840	$294,400	12	3700	$1,840	$6,808,000	40	4250	$1,840	$7,820,000
-16	230	$1,840	$423,200	Construciton on Second Unit				41	4225	$1,840	$7,774,000
-15	300	$1,840	$552,000	13	3800	$1,840	$6,992,000	42	4200	$1,840	$7,728,000
-14	380	$1,840	$699,200	14	3850	$1,840	$7,084,000	43	4175	$1,840	$7,682,000
-13	460	$1,840	$846,400	15	3900	$1,840	$7,176,000	44	4150	$1,840	$7,636,000
-12	530	$1,840	$975,200	16	3950	$1,840	$7,268,000	45	4125	$1,840	$7,590,000
-11	610	$1,840	$1,122,400	17	4000	$1,840	$7,360,000	46	4100	$1,840	$7,544,000
-10	700	$1,840	$1,288,000	18	4050	$1,840	$7,452,000	47	4075	$1,840	$7,498,000
-9	820	$1,840	$1,508,800	19	4100	$1,840	$7,544,000	48	4050	$1,840	$7,452,000
-8	960	$1,840	$1,766,400	20	4150	$1,840	$7,636,000	49	4025	$1,840	$7,406,000
-7	1130	$1,840	$2,079,200	21	4175	$1,840	$7,682,000	50	4000	$1,840	$7,360,000
-6	1310	$1,840	$2,410,400	22	4200	$1,840	$7,728,000	51	3975	$1,840	$7,314,000
-5	1480	$1,840	$2,723,200	23	4250	$1,840	$7,820,000	52	3950	$1,840	$7,268,000
-4	1660	$1,840	$3,054,400	24	4275	$1,840	$7,866,000	53	3925	$1,840	$7,222,000
-3	1830	$1,840	$3,367,200	25	4300	$1,840	$7,912,000	54	3900	$1,840	$7,176,000
-2	2000	$1,840	$3,680,000	26	4350	$1,840	$8,004,000	55	3875	$1,840	$7,130,000
-1	2175	$1,840	$4,002,000	27	4375	$1,840	$8,050,000	56	3850	$1,840	$7,084,000
Construction on First Unit				28	4400	$1,840	$8,096,000	57	3825	$1,840	$7,038,000
1	2350	$1,840	$4,324,000	29	4400	$1,840	$8,096,000	58	3800	$1,840	$6,992,000
2	2525	$1,840	$4,646,000	30	4400	$1,840	$8,096,000	59	3700	$1,840	$6,808,000
3	2700	$1,840	$4,968,000	31	4400	$1,840	$8,096,000	60	3600	$1,840	$6,624,000
4	2870	$1,840	$5,280,800	32	4400	$1,840	$8,096,000	61	3500	$1,840	$6,440,000
5	3045	$1,840	$5,602,800	33	4400	$1,840	$8,096,000	62	3000	$1,840	$5,520,000
6	3180	$1,840	$5,851,200	34	4400	$1,840	$8,096,000	63	2500	$1,840	$4,600,000
7	3250	$1,840	$5,980,000	35	4400	$1,840	$8,096,000	64	2000	$1,840	$3,680,000
8	3300	$1,840	$6,072,000	36	4400	$1,840	$8,096,000	65	1000	$1,840	$1,840,000
9	3365	$1,840	$6,191,600	37	4350	$1,840	$8,004,000	66	500	$1,840	$920,000
		Subtotal =	$79,856,000			Subtotal =	$214,314,000			Subtotal =	$193,016,000

Total $ earned by construction workforce =	**$487,186,000**
Total tax impact at GA's 6 percent tax rate =	**$29,231,160**

Sensitivity Analysis

Construction Wage Tax Impacts by % of Workforce	$
20	$5,846,232
30	$8,769,348
40	$11,692,464
50	$14,615,580
60	$17,538,696
70	$20,461,812
80	$23,384,928
90	$26,308,044
100	$29,231,160

a. U.S. Department of Labor Bureau of Labor Statistics. 2005. "May 2005 Metropolitan Area Occupational Employment and Wage Estimates. Augusta-Richmond County, GA-SC." Available online at http://stats.bls.gov/bls/blswage.htm. Accessed October 16, 2006.

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Attachment A-4 #28

TROUTMAN SANDERS LLP

MEMORANDUM

TO: File

FROM: T. Jerry Jackson

RE: First Response to Environmental Report Re: Tax Benefits

DATE: November 16, 2006

The Environmental Report can be found on the NRC website under "new reactors". In it, on page 5.8-6 the following appears:

> "Therefore, SNC used generic assumptions. SNC based costs on reasonable assumptions supported by several independent studies . . ."

The following comments are in response to the NRC request for information concerning the assumptions made in the tax revenue analysis contained in the Environmental Report:

1. **Cost Range**. The range of costs used as the basis for the tax estimates came from confidential information filed by GPC with the Georgia Public Service Commission and from estimates of costs to build a nuclear power plant in an MIT study done in 1993 and referenced in the Environment Report.

Note: the following discussion and footnote might be helpful regarding comments to assumptions 2. and 3.:

> ***Because this is a preliminary estimate, the approach used for estimating tax impacts will disregard the joint ownership arrangement and assumes that the two new units will***

be subject to ad valorem tax in Burke County as though owned by a single entity filing on a non unit basis .[1]

1. This assumption treats all four joint owners in the same manner for ad valorem tax purposes which differs from reality in Georgia. Because Georgia Power is taxed on a unit basis, its ad valorem tax payments to Burke County will be calculated somewhat differently than those of the other joint owners. Georgia Power's interest in the new units, in addition to increasing Burke County's ad valorem tax, could increase the tax benefits to other Georgia Counties with properties owned by Georgia Power.

2. **Joint Ownership Was Disregarded**. The assumption here was that the nuclear plants would be owned by a single entity instead of the existing joint ownership arrangement involving Georgia Power owning 45.7%, OPC owning 30%, MEAG owning 22.7% and Dalton Utilities owning 1.6%. This assumption is necessary for assumption 3 in that it makes the estimation process easier if only one entity is considered. In reality the tax impact would not be the same for each of the four (4) entities for a number of reasons. However, SNC does not have access to all information necessary to estimate the tax impacts to the other owners. Calculating the tax benefits individually by each of the four owners is beyond the scope of this preliminary estimate. By assuming a single entity proxy ownership structure we avoided dealing with the multi-county tax impact described above that would arise from a unit value tax approach such as is appropriate for Georgia Power. In other words, for purposes of approximating the tax impact, the assumption was made that both new units and associated infrastructure would be owned by a single entity like MEAG or OPC (and not Georgia Power) so that the plant value could be attributed to Burke County alone. Even though there is some negative bias in that MEAG /OPC may be tax exempt for a portion of the tax, overall this assumption results in a bias which overstates the tax to Burke County (see assumption 3).

3. **Tax Benefits To Other Georgia Counties From GPC Ownership In The New Units Was Disregarded, And All Tax Benefits Were Assumed To Accrue To Burke County.** This is more of a consequence of assumption 2 than an independent assumption. The bias of this consequence is that it overstates the benefits to Burke County and understates the benefits to other counties which would arise if Georgia Power's unitary filing were taken into account. The order of magnitude of the bias is difficult to estimate because of the complexity of estimating the impact of a utility filing on a unit basis.

4. **The Allowance For Funds Used During Construction ("AFUDC") Is Estimated Assuming a Five Year Schedule From Groundbreaking To On-Line And Not On An Actual Construction Schedule.** This assumption is a generic assumption. It assumes a five year build-out which appears to be a reasonable assumption which has no intrinsic bias but has no validity at this time. The Environmental Report, however, also assumed that the AFUDC will not significantly affect the tax benefit proposition. This is unlikely: although it is difficult to say what tax benefits will come from AFUDC, it is more likely that the work in progress will be subject to some level of taxation. While it is unclear how much tax benefits would accrue to Burke County during construction, it will be more than zero, but much less than the completed units will generate. Therefore, assuming this as zero results in a bias which understates the benefits to Burke County.

5. **Millage Rate Held Constant For The Forty Year Analysis**. The rate used in the analysis was the rate currently in effect in Burke County. The amount of the millage rate directly relates to the amount of tax revenues generated and therefore the millage rate is largely a function of Burke County's budget needs. It seems just as likely that the millage rate might be increased as it might be decreased over this period and therefore the bias is not able to be determined.

6. **Forty Years Of Operation For Each Unit Was Assumed To Estimate Depreciation And Rate Base Returns**. The rate base return determines the income stream and the income stream is used to estimate value. The rate base return is based on the amount of value placed in the rate base to which the rate is applied in each of the 40 years. The amount of property in the rate base declines over time with depreciation, and with it, income. The Environmental Report assumed straight line depreciation over forty years which GPC considers to be the most likely rate of depreciation for property placed in rate base. For GPC, this assumption has no specific bias. For MEAG, OPC, and Dalton Utilities, there is no rate base and therefore this depreciation rate may not be as significant. Because they are not in the rate base, the 2 ½% depreciation per year is not as relevant to their interests. Since GPC is not privy to

such information, there is not sufficient information available to determine whether the bias is up or down.

7. **Rates Of Return Based On Market Costs Of Capital Will Be Received For Property Placed In The Rate Base. Rates Of Return On Property Not Subject To Rate Regulation Is Assumed To Be Comparable To Rates Of Return For Property That Is.** This is a simplifying assumption that is also generic in the sense that one would expect the regulatory authorities to provide rates of return which represent fair return on investment and this, in turn, would lead to the assumption that whatever value is placed in the rate base is a close approximation to the fair market value used for tax purposes. The last part of the assumption relates to the three joint owners whose property is not in rate base. The bias here tends slightly toward understating the tax revenue to Burke County.

8. **The Total Cost of the Project Is Approximately Equal To The Amount Added To The Rate Base As A Result Of The Project.** The point here is that we are assuming that the total cost of construction will be included in the rate base which, because of market rates of return, leads to the conclusion that the value of the units is approximately equal to the cost. GPC believes this is a reasonable assumption and the bias tends slightly toward overstating tax revenues since any cost that does not go into rate base could negatively affect values.

9. **The Value Of Non-taxable Property On The Project Was Estimated To Be 19% Of The Total Value, But This Was Based on Fossil Fuel Plants.** The 19% estimate is probably on the high side even for coal--fired generating plants (it was derived from information from coal-fired generating plants). In the case of nuclear units, we do not know what percentage of the investment might be exempt from property tax but it could be considerably less than for coal-fired plants. Without further research, we do not know what exempt property might be used in constructing a nuclear plant. Thus, this assumption is likely significantly biased toward understating the tax value of this plant in Burke County.

10. **Tax Payments To Alabama.** Tax payments to Alabama were estimate solely on ratio of Georgia to Alabama ad valorem tax rates. No information on Alabama's basis for their tax rates was considered.

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Attachment A-5 #33

33. Almost half the study area is in South Carolina, yet all of the socioeconomic and environmental health effects are limited to only three counties in Georgia. Explain county-by-county why that simplifying assumption can be made.

Response:

It would be easier to answer this question by resource area, rather than by county.

A. Construction

1. Land Use

Land Use impacts are primarily on-site. The new plant footprint is wholly contained within the existing VEGP site. Within the vicinity of the VEGP site, no land use changes are expected with the exception of the possible conversion of some property to mobile home sites and the reopening of a recreational vehicle park and a convenience store nearby. The majority, if not all of these impacts, would be experienced in Burke County. Similar land use impacts are not expected across the river in South Carolina for two reasons: (1) The land immediately across the river is owned by the federal government for a nuclear defense facility with limited public access. (2) The nearest river crossings are the Highway 301 bridge, approximately 20 miles south of the VEGP site and the Sand Bar Ferry (Highway 278) bridge in South Augusta. With respect to transmission line construction, the counties that would be most likely impacted would be Burke, Jefferson, Warren, and McDuffie Counties.

2. Water

Water-related impacts include hydrological alterations, water use impacts, and water quality impacts. Due to the nature of the construction activities, the county with the greatest potential to be impacted by construction activities at the VEGP site would be Burke. The AEC estimated (in its 1973 FES) that approximately 4 acres of the Savannah River would be affected by sedimentation from construction of original units. Assuming a similar level of disturbance for new units, there is virtually no chance that construction impacts would extend beyond Burke County, or even the immediate vicinity of the Vogtle site. SNC's adherence to state and federal water regulations, use of best management practices, and use of good construction engineering practices serve to mitigate any potential impacts to water resources in Burke County.

3. Ecology

Ecological resources include terrestrial and aquatic ecosystems. Due to the nature of the construction activities, the counties with the greatest potential to be impacted by construction activities at the VEGP site and along the proposed transmission corridor are Burke, Jefferson, Warren, and McDuffie. SNC's adherence to state and federal regulations, use of

best management practices, and use of good construction engineering practices serve to mitigate any potential impacts to ecological resources in Burke, Jefferson, Warren, and McDuffie Counties. The Savannah River is an effective barrier for migration of terrestrial animals avoiding construction activities, and there is adequate undeveloped land in the immediate vicinity of VEGP to support any misplaced animals.

4. Socioeconomics

   a. Physical Impacts -- All construction activities will occur within the construction site boundary on the VEGP site, which is surrounded by forests. The use of local public roadways will be necessary to transport construction materials and equipment. However, the roads with the greatest concentration of VEGP-related construction traffic would be in Burke County. Most impacts would be felt in Burke County. Impacts to air quality and noise would not extend beyond the VEGP site boundary. The land directly across the Savannah River is river swamp and not inhabited.

   b. Social and Economic -- After reviewing the residential distribution of the current VEGP *operations* workforce, SNC determined that the majority (79%) of the employees live in Burke, Richmond, and Columbia Counties. Because the majority of the *construction* workforce is expected to be on the job site for at least 2 years, for this analysis, SNC considered them to be "permanent" residents and follow the same residential distribution as the current *operations* workforce. The county with the next highest percentage of current *operations* workforce (beyond the three mentioned above) is Screven County, with 6.7 percent. All other counties are home to less than 6.7 percent of the current *operations* workforce. Because 6.7 percent (and less) of the incoming *construction* workforce would be a relatively small number of people, there would be little or no impact on those counties. Few VEGP employees live in South Carolina, perhaps because there is no convenient access to VEGP or Burke County from South Carolina.

5. Radiation Exposure and Non-Radiological Health

   Radiation exposure during construction would be from the nuclear units currently operating on the VEGP site. Since construction workers would be the only additional people to be exposed to those impacts and those impacts would occur because the workers would be in close proximity to the units, the workers are the only ones with the potential to be impacted (and only while they are on site). Therefore, potential impacts would be confined to Burke County. Non-radiological health impacts would be restricted to the VEGP site and the construction workforce.

B. Operations

1. Land Use

The only impacts to land use from operations will be the impacts of solids deposition from cooling tower drift. Impacts will be restricted to an area of approximately 1,600 feet around the towers, most in a north-northeast direction. The towers will be approximately 2,000 feet from the nearest site boundary to the west and approximately 6,000 feet to the north-northeast site boundary, so any effects will be localized on VEGP property. This impact would be experienced in Burke County only. Land use impacts caused by the inmigration of the operations workforce could cause impacts due to the conversion of land to residential housing (in Burke, Richmond, and Columbia Counties). See Socioeconomics for a discussion of the residential distribution of the new operations workforce. With respect to transmission line operation and maintenance, the counties that would be most likely impacted would be Burke, Jefferson, Warren, and McDuffie Counties, the counties hosting the line.

2. Water

Water-related impacts include hydrological alterations, water use impacts, and water quality impacts. Due to the nature of the operations activities, the county with the greatest potential to be impacted by operations activities at the VEGP site would be Burke. SNC's modeling of the thermal plume demonstrated that the area of the Savannah River affected by operation of the new units would be less than 800 ft^3 immediately downstream of the discharge line. SNC's adherence to state and federal water regulations and use of best management practices serve to mitigate any potential impacts to water resources in Burke County.

3. Ecology

Ecological resources include terrestrial and aquatic ecosystems. Due to the nature of the operations activities, the counties with the greatest potential to be impacted by operations activities at the VEGP site and along the proposed transmission corridor are Burke, Jefferson, Warren, and McDuffie. SNC's adherence to state and federal regulations and use of best management practices serve to mitigate any potential impacts to ecological resources in Burke, Jefferson, Warren, and McDuffie Counties. The Savannah River is an effective barrier for migration of terrestrial animals avoiding operations activities and there is adequate undeveloped land in the immediate vicinity of VEGP to support any misplaced animals.

4. Socioeconomics

   a. Physical Impacts – Most operations-related physical impacts would be experienced within the borders of Burke County, the majority of which will occur on the VEGP site, which is surrounded by forests. The only visual intrusions that would be seen offsite

would be the cooling towers and their plumes. The longest cooling tower plume is likely to extend to a distance of 5 to 6 miles from the site and would occur no more than 4 percent of the time.

Offsite, the use of local public roadways will be necessary to move the operations workforce to and from the site. The roads with the greatest concentration of VEGP-related operations traffic would be in Burke County.

b. Social and Economic -- After reviewing the residential distribution of the current VEGP operations workforce, SNC determined that the majority (79%) of the employees live in Burke, Richmond, and Columbia Counties. The operations workforce for Units 3 and 4 are expected to settle in the same distribution. Social and economic impacts would be felt in those counties.

The county with the next highest percentage of current operations workforce (beyond the three mentioned above) is Screven County, with 6.7 percent. All other counties are home to less than 6.7 percent of the current operations workforce. Because 6.7 percent (and less) of the incoming operations workforce would be a relatively small number of people, there would be little or no impact on those counties. Few VEGP employees live in South Carolina, perhaps because there is no convenient access to VEGP or Burke County from South Carolina.

5. Radiation Exposure and Non-radiological Health

Radiation exposure during operations can be caused by operation of the nuclear units, on-site storage of waste and fuel, transportation of waste and fuel, and ultimate disposal of waste. Radiation impacts are assessed for a 50-mile radius from the site. Therefore, all counties within the 50-mile radius have to potential to be impacted. However, SNC's strict adherence to federal laws and regulations prevents radioactive releases from reaching levels that would be harmful to humans and/or the environment.

Non-radiological health impacts would be restricted to Burke County and along the transmission corridors in Jefferson, Warren, and McDuffie Counties. SNC's strict adherence to local, state, and federal laws and regulations prevents non-radiological health impacts from reaching levels that would cause harm to humans or the environment.

6. Waste Impacts

Operations waste categories include radioactive, non-radioactive, and mixed. Waste impacts can be caused by the creation, storage, transportation, and ultimate disposal of waste. Therefore, the counties with the greatest potential to be impacted would be Burke County, the counties through which the waste would be transported (currently

unknown), and the counties hosting the ultimate disposal sites (currently unknown). However, SNC's strict adherence to local, state, and federal laws and regulations prevents waste impacts from reaching levels that would cause harm to humans or the environment.

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Attachment A-6 #42

42	Expand the analysis on page 10.1.2 which discusses the unavoidable and adverse impacts of operation (currently in eleven lines). Include a discussion of each impact, mitigation strategies to reduce their impact, and cost estimates for before- and after-mitigation levels for each impact.

10.1.2 Unavoidable Adverse Environmental Impacts of Operations

Operational impacts of new units at the VEGP site are discussed in detail in Chapter 5 of the ESP Environmental Report (ER).

Table 5.10-1 briefly describes those impacts and identifies measures and controls that will be implemented to reduce or eliminate adverse impacts. The expected impacts and the mitigation measures that are available to reduce these impacts are summarized in Table 10.1-2 (attached). Unavoidable adverse impacts from construction of two new units at the VEGP site include evaporative water loss from the Savannah River, additional groundwater withdrawal, air emissions, radioactive and non-radioactive waste to be treated and disposed of, radioactive emissions into the Savannah River and the air, increases in local traffic, and the addition of two natural draft cooling towers to the landscape.

The level of unavoidable adverse impacts from operation of the new units will be small when applicable mitigation measures are considered.

Response:

The following sections discuss mitigation measures that could be implemented to reduce unavoidable adverse impacts.

Land Use

Operating the new units will produce radioactive and non-radioactive wastes that are required to be disposed in permitted disposal facilities or permitted landfills. No landfills or radioactive waste disposal facilities will be constructed solely for the use of the new units or SNC activities. SNC currently practices recycling and waste minimization to reduce the volume of materials that must be disposed. SNC will continue good waste management practices and thus mitigate potential impacts. SNC pays fees to the operators of the disposal facilities and landfills so no costs related to the waste disposal will be incurred by taxpayers. SNC estimates that approximately 2000 ft^3 of radioactive wastes will be disposed of annually for 40 years, for a total volume of 80,000 ft^3. Additional disposal space will be required for decommissioning. This will be a long term

impact.

Hydrological and Water Use

As with the existing units, some plant systems will use groundwater. VEGP is currently permitted to withdraw an annual average 5.5 MGD and actually withdraws approximately 1.44 MGD from the Tertiary and Cretaceous aquifers, combined. The new units are anticipated to require an additional 1.08 MGD, approaching half the current permit's limits. While the withdrawals will be within the permit limits imposed by the Georgia EPD, this groundwater will not be available for other uses. Most of the groundwater wells in the area are for domestic or small agricultural uses and do not withdraw large volumes of water so no water use conflicts are expected. Mitigation could include encouraging plant staff to conserve water, but because most of the water is for plant systems, mitigation will do little to reduce total volumes extracted. SNC does not believe that the adverse impact of increased groundwater use will affect other local groundwater users and therefore additional mitigation is not warranted. This will be a short term impact.

Evaporative water losses from the Savannah River will increase. SNC estimates that maximum surface water losses from two new units will be less than 2 percent of the 7Q10. This loss will not be noticeable in the Savannah River, but, as with groundwater, the water will not be available for other users. Downstream of VEGP, the Savannah River is used for some industrial purposes, but the majority of the consumptive losses are to South Carolina and Georgia municipal water supplies. SNC knows of no ways to decrease the consumptive use of Savannah River water or of any mitigation strategies. This will be a short term impact.

Atmospheric and Meteorological

Air emissions would occur from the emergency diesel generators and the auxiliary boilers when these are in use. Because the generators and auxiliary boiler are operated intermittently and for short periods of time, the equipment is permitted for duration of use, rather than contaminants introduced to the air. All equipment is regularly maintained to ensure that emissions are as low as possible. Additional mitigation measures are not warranted. This will be a short term impact.

Radiological

Nuclear power plants emit small amounts of radionuclides to the air and surface water during normal operations. The releases are monitored to ensure that they remain below limits imposed by regulations. The regulatory limit is 25 mrem a year to the maximally exposed individual. SNC estimates that the hypothetical maximally exposed individual

would receive a total body dose of approximately 0.21 mrem per year from VEGP with four operating nuclear reactors. Radiation exposure is unavoidable, because the earth is constantly bombarded with cosmic radiation and because the earth itself emits radiation. The National Council on Radiation Protection estimates that a person living in the United States receives a dose of approximately 27 mrem per year (100 times the dose from VEGP) from cosmic radiation and an additional 200 mrem per year from indoor radon (1000 times the dose from VEGP). SNC monitors the radioactivity in local farm products and water regularly, and provides the results to Georgia EPD and interested members of the public. The small amounts of radioactivity released by VEGP do not warrant further mitigation. The impacts will be short term.

Socioeconomic

Local traffic during shift change will approximately double with the addition of two new units at VEGP. The capacity of River Road as established by the Georgia Department of Transportation is 3,200 cars per hours. Using conservative assumptions regarding size of shifts, SNC estimated that with two additional units, the number of cars on the road during the busiest shift change would be approximately 1,800 vehicles, less than the road capacity. During the month-long outages that will occur one or two times per year, SNC estimates that approximately 2,800 cars per hour could be on River Road if outage and operations shifts changed at once. This is below the capacity of River Road. SNC could mitigate for increased traffic by encouraging carpooling, staggering work shifts, or by purchasing land along Rt 56 for a remote parking lot and bussing workers to the site.

Two new units at VEGP would require two new cooling towers that would be visible from offsite. The plumes would be more noticeable as well. People in the area are accustomed to seeing the towers and plumes and have not voiced concerns, so SNC does not anticipate that the additional towers will generate complaints from local residents. The Augusta area has numerous manufacturing facilities, many with stacks and plumes. From vantage points in the area, the VEGP towers are no more prominent than other towers, and often less so. Landscaping could be used to hide the base of the towers from observers close to the plant. Mitigation is not warranted for views of the towers on the horizon.

Because all identifiable unavoidable adverse impacts will be small, no disproportionate adverse unavoidable impacts to environmental justice populations will occur.

Table 10.1-2 Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Land Use	Operating the new units will generate radioactive and non-radioactive wastes that are required to be disposed in permitted disposal facilities or permitted landfills	Practice waste minimization to minimize the volume of wastes.	Some land will be dedicated to permitted landfills or licensed disposal facilities and will not be available for other uses.
Hydrological and Water Use	Operations will result in discharge of small amounts of chemicals to the Savannah River	All discharges will comply with Georgia NPDES permit and applicable water quality standards. Revise the existing VEGP Storm Water Pollution Prevention Plan or prepare and implement a new one to avoid/minimize releases of contaminated storm water. Revise the existing VEGP Spill Prevention Countermeasures and Control Plan or prepare and implement a new one to avoid/minimize contamination from spills.	Small unavoidable adverse impacts
	Water for some systems will be provided by groundwater	Maximum normal groundwater use will be within existing permit limits	Water withdrawn from groundwater will not be available for other uses. In the unlikely event of off-normal pumping by more than one unit, the groundwater withdrawal limits could be exceeded and the aquifer drawdown could be accelerated
	Maintenance activities at the site and along the transmission line could result in small petroleum spills	Revise the existing VEGP Spill Prevention Countermeasures and Control Plan or prepare and implement a new one to avoid/minimize contamination from spills. Adhere to the GPC SPCC plan when working on transmission lines	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Maximum surface water consumptive use will be less that 2 percent of 7Q10.	No mitigation required.	Water lost through evaporation will not be available for other uses
	Operations will result in a small thermal plume discharged to the Savannah River	The differences between plume temperature and ambient water temperature will be maintained within limits set in the NPDES permit	Small unavoidable adverse impacts
Aquatic Ecology	Operations will result in discharge of small amounts of chemicals to the Savannah River	The NPDES permit limits are set to ensure that discharges do not significantly affect aquatic populations or water quality.	Small unavoidable adverse impacts
	Routine maintenance activities could result in petroleum spills near water	Revise the existing VEGP Spill Prevention Control and Countermeasures Plan or prepare and implement a new one to avoid/minimize contamination from spills.	Small unavoidable adverse impacts
	Impingement, entrainment and thermal discharges	Cooling towers	Small unavoidable impacts
Terrestrial Ecology	Some birds will collide with the cooling towers or the transmission line	This is not a problem with the existing cooling towers and is not expected to be a problem with the new towers. Bird collisions with transmission lines are so rare that none have been reported to GPC. No mitigation is necessary	Small unavoidable adverse impacts
	Salt drift will be distributed in a 3,300 foot radius around each tower.	The rate of deposition will be less than that expected to cause leaf damage. No mitigation is necessary.	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Episodic loud noises at the site or along transmission line could frighten animals.	None necessary	Small unavoidable adverse impacts
Socioeconomic	The plants emit low noise	Noise levels would normally not be above background at the site boundary. No mitigation is necessary.	Small unavoidable adverse impacts
	Episodic loud noises could annoy nearby residents	Handle incidents on a case-by-case basis.	
	New transmission line has potential to induce electric shock in people standing near the line	Build transmission line to NESC code to minimize noise and electric shock	Small unavoidable adverse impacts
	Additional cooling towers and plumes would impact existing viewscape.	Consider landscaping to hide towers from boaters on the river	Small unavoidable adverse impacts
	Two additional units will double the traffic on local roads during shift change. More frequent outages at VEGP will increase traffic even further.	Consider staggering outage shifts to reduce plant-associated traffic on local roads during shift changes	Small unavoidable adverse impacts
	Emissions from diesel generators and the auxiliary boilers	No mitigation needed. Emission would be within limits established in certificates of operation	Small unavoidable adverse impacts
	Population in the region may increase by 2,600 people	No mitigation required. The increased tax revenues from construction will support upgrades to additional infrastructure. Housing availability is adequate in the region.	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Radiological	Potential doses to members of the public from releases to air and surface water.	All releases will be well below regulatory limits. No mitigation required.	Small unavoidable adverse impacts
Atmospheric and Meteorological	Median plume from cooling towers will be about 0.5 miles long with a maximum plume length of 6.2 miles expected 3.5 percent of the time	No mitigation required	Small unavoidable adverse impacts
	Diesels and the auxiliary boiler would contribute to air emissions	Comply with permit limits and regulations for installing and operating air emission sources.	Small unavoidable adverse impacts
Environmental Justice	No disproportionately high or adverse impacts on minority or low-income populations resulting from operation of the proposed new units have been identified.	None required.	Small unavoidable adverse impacts

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Attachment A-7 #45

45	The section on unavoidable adverse environmental impacts discusses social issues without specificity and never identifies any particular environmental concern. Clarify this discussion to include specific environmental adverse impacts for construction and operations, including an assessment of the before- and after-mitigation value of those impacts? Include the EJ effects of both construction and operations for each alternative site. Provide a table that displays all of the adverse environmental impacts of construction and operations (including human health effects); a description of each impact; all mitigation strategies to be undertaken by the applicant for that impact, the cost of mitigation, and the expected value of the unavoidable portion of that impact.

Response:

SNC drafted this response based on additional guidance from NRC the week of December 4, 2006.

The text of ER Section 10.1 summarizes the unavoidable adverse impacts of construction and operation of the new units. Tables 10.1-1 for construction and 10.1-2 for operations provide greater detail about the impacts, potential mitigation and the unavoidable adverse impacts after mitigation has been considered.

The costs of mitigation are not easy to determine at this time. Many would be built into the project design (e.g., scheduling to ensure that construction of the barge and intake are completed in the shortest possible time; using construction best management practices to limit erosion, fugitive dust, runoff, spills and air emissions; providing first aid stations at the construction site, etc.). Others would rely on a communication plan of early/frequent communication between SNC and the affected communities, and thus the costs would be minimal.

Tables 10.1-1 and 10.1-2 are provided below. They have been slightly modified from the environmental report to expand on mitigation options.

Table 10.1-1 Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Land Use	Approximately 500 acres of land will be cleared during construction, with the potential for erosion. Land will not be available for other uses.	Comply with requirements of applicable federal, state and local construction permits/approvals and local ordinances.	310 acres of land occupied on a long-term basis by nuclear plant and associated infrastructure.
		Clear only areas necessary for installation of the power plant/infrastructure.	
		Restrict construction activities to the construction footprint.	
		Use adequate erosion controls and stabilization measures, such as those provided in the Georgia Stormwater Manual.	
		Restrict activities to actual construction site and access ways.	
		Locate soil stockpiles near the construction site.	
		Revegetate all affected temporary-use areas after completion of construction	
	Construction of transmission corridor across approximately 60 linear miles of eastern Georgia	Minimize potential impacts through compliance with permitting requirements and best management practices, including sediment basins.	Land use on some land will change from woodland or agriculture to open scrub or grassland.
		Restrict sites of access to corridor for construction equipment.	
		Limit maintenance access roads	
		Revegetate, with attention to wildlife structure or food plots.	

Table 10.1-1 (cont.) Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Potential to disturb buried historic, archaeological, or paleontological resources	Conduct sub-surface testing prior to start of any onsite work to identify buried historic, cultural, or paeleontological resources. Follow established VEGP procedures to stop work and contact appropriate regulatory agencies if potential unanticipated historic, cultural, or paleontological resources are discovered.	Potential for destruction of unanticipated historic, cultural, or paleontological resources
	Construction debris will be disposed in on-site of off-site landfills	Use waste minimization to reduce volume of debris	Some land will be dedicated to disposal of construction debris and not available for other uses
Hydrologic and Water Use/	Construction has potential to erode sediments into water resources and will dewater the shallow aquifer	Adhere to applicable regulations, permits, and plans. Use best Management practices as found in the Georgia Stormwater Manual Install drainage controls to direct dewatering runoff.	Dewatering of shallow aquifer to surface water during construction.
	Construction will require approximately 460 gpm of groundwater	Practice water conservation as practical No other measures or controls will be necessary because withdrawals will be less than allowed by current permits	Use of groundwater as source for all water used for construction.
	Construction along river banks or stream banks (in the case of the transmission line) could introduce sediments into the river or stream	Adhere to best management practices. Install drainage controls Revegetate as soon as possible after clearing.	Small unavoidable adverse impacts

Table 10.1-1 (cont.) Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Use of heavy equipment introduces the possibility of petroleum spills that could enter surface water	Use good maintenance practices to maintain equipment, and prevent spills and leaks. Invoke VEGP's existing SPCC plan for construction activities.	Small unavoidable adverse impacts
Aquatic Ecology	Construction at river's edge will cause the loss of some organisms, and temporary degradation of habitat Transmission line construction across streams will cause the loss of some organisms and temporary degradation of habitat	Install coffer dams or similar engineering protective measures around the construction site Use best management practices to minimize erosion and sedimentation Install storm water drainage system at large construction sites and stabilize disturbed soils	Small unavoidable adverse impacts, including effects of construction noise on fish, for which there is no known mitigation
Terrestrial Ecology	Habitat loss will kill or displace animals Clearing and grading will kill or displace animals Construction noises could startle or scare animals	Plant footprint is sited on previously disturbed area that is poor natural habitat. Site new corridor to avoid critical or sensitive habitats/species as much as possible per Georgia regulations and GPC practices. Limit vegetation removal and construction activities to construction site or corridor and access roads	Small unavoidable impacts
	Birds may collide with tall construction equipment	No measures or controls will be necessary because impacts will be small.	Small unavoidable impacts

Table 10.1-1 (cont.) Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Socio-economics	Construction workers, employees at the existing units, and local residents will be exposed to elevated levels of dust, noise and exhaust emissions from vehicles	Train and appropriately protect VEGP employees and construction workers to reduce the risk of potential exposure to noise, dust and exhaust emissions. Make public announcements or prior notification of atypically loud construction activities. Use dust control measures (such as watering, stabilizing disturbed areas, covering trucks). Ensure construction equipment is maintained Manage concerns from adjacent residents or visitors on a case-by-case basis.	Small unavoidable impacts
	Construction workers, employees at the existing units, outage employees, and local residents will be exposed to elevated levels of traffic	Post signs near construction entrances and exits to make the public aware of potentially high construction traffic areas. Add turn lanes at construction entrance Consider buses, vans, carpools, or staggered shifts	Level of service on River Road will be reduced during shift change
	Construction workers could be injured	Provide on-site services for emergency first aid, and arrange with local hospital emergency room to accept trauma victims, and conduct regular health and safety monitoring. Provide appropriate job-training to construction workers.	Small unavoidable impacts

Table 10.1-1 (cont.) Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Initially sufficient housing to support the influx of construction workforce may be unavailable in Burke County	Discuss construction plans and anticipated influx of workers with community leaders. Builders and developers will meet the demand for additional housing, and because the project has a long lead time, and the construction workforce will build gradually, it is likely that if the community anticipates the increase in population, adequate housing will always be available.	Potential short-term housing shortage in Burke County.
	Initially there may be insufficient classroom space for the influx of construction workers families.	Discuss construction plans and anticipated influx of workers with community leaders. Increased tax revenues as a result of the large construction project will fund additional school resources. Because the project has a long lead time, and the construction workforce will build gradually, it is likely that if the community anticipates the increase in population, adequate classroom space will always be available.	In the short-term there could be school crowding and inadequate fire protection in Burke County
	Inadequate fire protection infrastructure in Burke County will be further reduced	Discuss construction plans and anticipated influx of workers with community leaders. Burke County could fund additional fire protection equipment and train additional staff using the tax resources already paid by VEGP. Increased tax revenues after construction begins could be used to purchase additional equipment and hire/train additional staff, if necessary.	In the short term there could be insufficient fire protection in some areas of Burke County
Radiological	Construction workers will be exposed to small doses of radiation from the existing units	None required. All doses will be well within regulatory limits.	Small radiation exposure to construction workers.

Table 10.1-1 (cont.) Construction-Related Unavoidable Adverse Environmental Impacts

Category	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Atmospheric and Meteorological	Construction will cause increased air emissions from traffic and construction equipment, and fugitive dust	Use dust control measures (such as watering, stabilizing disturbed areas, covering trucks) Ensure that construction equipment is well maintained.	Small unavoidable adverse impacts
Environmental Justice	Except for increased traffic on River Road, no disproportionately high or adverse impacts to minority or low-income populations were identified.	Consider buses, vans, carpools, or staggered shifts	Small unavoidable adverse impacts

Table 10.1-2 Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
Land Use	Operating the new units will generate radioactive and non-radioactive wastes that are required to be disposed in permitted disposal facilities or permitted landfills	Practice waste minimization to minimize the volume of wastes.	Some land will be dedicated to permitted landfills or licensed disposal facilities and will not be available for other uses.
Hydrological and Water Use	Operations will result in discharge of small amounts of chemicals to the Savannah River	All discharges will comply with Georgia NPDES permit and applicable water quality standards. Revise the existing VEGP Storm Water Pollution Prevention Plan or prepare and implement a new one to avoid/minimize releases of contaminated storm water. Revise the existing VEGP Spill Prevention Countermeasures and Control Plan or prepare and implement a new one to avoid/minimize contamination from spills.	Small unavoidable adverse impacts
	Water for some systems will be provided by groundwater	Maximum normal groundwater use will be within existing permit limits	Water withdrawn from groundwater will not be available for other uses. In the unlikely event of off-normal pumping by more than one unit, the groundwater withdrawal limits could be exceeded and the aquifer drawdown could be accelerated
	Maintenance activities at the site and along the transmission line could result in small petroleum spills	Revise the existing VEGP Spill Prevention Countermeasures and Control Plan or prepare and implement a new one to avoid/minimize contamination from spills. Adhere to the GPC SPCC plan when working on transmission lines	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Maximum surface water consumptive use will be less that 2 percent of 7Q10.	No mitigation required.	Water lost through evaporation will not be available for other uses
	Operations will result in a small thermal plume discharged to the Savannah River	The differences between plume temperature and ambient water temperature will be maintained within limits set in the NPDES permit	Small unavoidable adverse impacts
Aquatic Ecology	Operations will result in discharge of small amounts of chemicals to the Savannah River	The NPDES permit limits are set to ensure that discharges do not significantly affect aquatic populations or water quality.	Small unavoidable adverse impacts
	Routine maintenance activities could result in petroleum spills near water	Revise the existing VEGP Spill Prevention Control and Countermeasures Plan or prepare and implement a new one to avoid/minimize contamination from spills.	Small unavoidable adverse impacts
	Impingement, entrainment and thermal discharges	Cooling towers	Small unavoidable impacts
Terrestrial Ecology	Some birds will collide with the cooling towers or the transmission line	This is not a problem with the existing cooling towers and is not expected to be a problem with the new towers. Bird collisions with transmission lines are so rare that none have been reported to GPC. No mitigation is necessary	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Salt drift will be distributed in a 3,300 foot radius around each tower.	The rate of deposition will be less than that expected to cause leaf damage. No mitigation is necessary.	Small unavoidable adverse impacts
	Episodic loud noises at the site or along transmission line could frighten animals.	None necessary	Small unavoidable adverse impacts
Socioeconomic	The plants emit low noise	Noise levels would normally not be above background at the site boundary. No mitigation is necessary.	Small unavoidable adverse impacts
	Episodic loud noises could annoy nearby residents	Handle incidents on a case-by-case basis.	
	New transmission line has potential to induce electric shock in people standing near the line	Build transmission line to NESC code to minimize noise and electric shock	Small unavoidable adverse impacts
	Additional cooling towers and plumes would impact existing viewscape.	Consider landscaping to hide towers from boaters on the river	Small unavoidable adverse impacts
	Two additional units will double the traffic on local roads during shift change. More frequent outages at VEGP will increase traffic even further.	Consider staggering outage shifts to reduce plant-associated traffic on local roads during shift changes	Small unavoidable adverse impacts
	Emissions from diesel generators and the auxiliary boilers	No mitigation needed. Emission would be within limits established in certificates of operation	Small unavoidable adverse impacts

Table 10.1-2 (cont.) Operations-Related Unavoidable Adverse Environmental Impacts

Category/ Vogtle ESP ER Section	Adverse Impact	Mitigation Measure	Unavoidable Adverse Environmental Impacts
	Population in the region may increase by 2,600 people	No mitigation required. The increased tax revenues from construction will support upgrades to additional infrastructure. Housing availability is adequate in the region.	Small unavoidable adverse impacts
Radiological	Potential doses to members of the public from releases to air and surface water.	All releases will be well below regulatory limits. No mitigation required.	Small unavoidable adverse impacts
Atmospheric and Meteorological	Median plume from cooling towers will be about 0.5 miles long with a maximum plume length of 6.2 miles expected 3.5 percent of the time	No mitigation required	Small unavoidable adverse impacts
	Diesels and the auxiliary boiler would contribute to air emissions	Comply with permit limits and regulations for installing and operating air emission sources.	Small unavoidable adverse impacts
Environmental Justice	No disproportionately high or adverse impacts on minority or low-income populations resulting from operation of the proposed new units have been identified.	None required.	Small unavoidable adverse impacts

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Attachment A-8 #47

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U.S. Census Bureau
American FactFinder

QT-H14. Value, Mortgage Status, and Selected Conditions: 2000
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Burke County, Georgia**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf3.htm.

Subject	Number	Percent
Specified owner-occupied housing units	3,072	100.0
VALUE		
Less than $10,000	73	2.4
$10,000 to $14,999	77	2.5
$15,000 to $19,999	70	2.3
$20,000 to $24,999	123	4.0
$25,000 to $29,999	154	5.0
$30,000 to $34,999	143	4.7
$35,000 to $39,999	130	4.2
$40,000 to $49,999	395	12.9
$50,000 to $59,999	378	12.3
$60,000 to $69,999	320	10.4
$70,000 to $79,999	360	11.7
$80,000 to $89,999	150	4.9
$90,000 to $99,999	168	5.5
$100,000 to $124,999	173	5.6
$125,000 to $149,999	145	4.7
$150,000 to $174,999	99	3.2
$175,000 to $199,999	40	1.3
$200,000 to $249,999	30	1.0
$250,000 to $299,999	26	0.8
$300,000 to $399,999	0	0.0
$400,000 to $499,999	18	0.6
$500,000 to $749,999	0	0.0
$750,000 to $999,999	0	0.0
$1,000,000 or more	0	0.0
Median (dollars)	59,800	(X)
MORTGAGE STATUS		
With a mortgage, contract to purchase, or similar debt	1,952	63.5
With a second mortgage or home equity loan, but not both	319	16.3

Subject	Number	Percent
Second mortgage only	154	48.3
Home equity loan only	165	51.7
Both second mortgage and home equity loan	0	0.0
No second mortgage or home equity loan	1,633	83.7
Without a mortgage	1,120	36.5
TENURE BY SELECTED CONDITIONS		
Owner-occupied housing units	6,030	100.0
With one selected condition	1,732	28.7
With two selected conditions	126	2.1
With three selected conditions	7	0.1
With four selected conditions	0	0.0
No selected conditions	4,165	69.1
Renter-occupied housing units	1,904	100.0
With one selected condition	595	31.3
With two selected conditions	50	2.6
With three selected conditions	43	2.3
With four selected conditions	0	0.0
No selected conditions	1,216	63.9

(X) Not applicable.
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices H7, H74, H76, H80, and HCT28.

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Attachment A-8 #47

U.S. Census Bureau
American FactFinder

QT-H14. Value, Mortgage Status, and Selected Conditions: 2000
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Richmond County, Georgia**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf3.htm.

Subject	Number	Percent
Specified owner-occupied housing units	**36,702**	**100.0**
VALUE		
Less than $10,000	134	0.4
$10,000 to $14,999	252	0.7
$15,000 to $19,999	250	0.7
$20,000 to $24,999	375	1.0
$25,000 to $29,999	613	1.7
$30,000 to $34,999	750	2.0
$35,000 to $39,999	854	2.3
$40,000 to $49,999	2,944	8.0
$50,000 to $59,999	4,048	11.0
$60,000 to $69,999	5,210	14.2
$70,000 to $79,999	4,270	11.6
$80,000 to $89,999	4,372	11.9
$90,000 to $99,999	3,219	8.8
$100,000 to $124,999	3,686	10.0
$125,000 to $149,999	2,188	6.0
$150,000 to $174,999	1,218	3.3
$175,000 to $199,999	475	1.3
$200,000 to $249,999	627	1.7
$250,000 to $299,999	383	1.0
$300,000 to $399,999	403	1.1
$400,000 to $499,999	205	0.6
$500,000 to $749,999	159	0.4
$750,000 to $999,999	42	0.1
$1,000,000 or more	25	0.1
Median (dollars)	76,800	(X)
MORTGAGE STATUS		
With a mortgage, contract to purchase, or similar debt	26,334	71.8
With a second mortgage or home equity loan, but not both	5,793	21.8

Subject	Number	Percent
Second mortgage only	3,366	58.7
Home equity loan only	2,367	41.3
Both second mortgage and home equity loan	88	0.3
No second mortgage or home equity loan	20,513	77.9
Without a mortgage	10,368	28.2
TENURE BY SELECTED CONDITIONS		
Owner-occupied housing units	42,819	100.0
With one selected condition	10,219	23.9
With two selected conditions	361	0.8
With three selected conditions	22	0.1
With four selected conditions	0	0.0
No selected conditions	32,217	75.2
Renter-occupied housing units	31,101	100.0
With one selected condition	11,795	37.9
With two selected conditions	1,105	3.6
With three selected conditions	41	0.1
With four selected conditions	0	0.0
No selected conditions	18,160	58.4

(X) Not applicable.
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices H7, H74, H76, H80, and HCT28.

U.S. Census Bureau
American FactFinder

QT-H14. Value, Mortgage Status, and Selected Conditions: 2000
Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data
Geographic Area: **Columbia County, Georgia**

NOTE: Data based on a sample except in P3, P4, H3, and H4. For information on confidentiality protection, sampling error, nonsampling error, definitions, and count corrections see http://factfinder.census.gov/home/en/datanotes/expsf3.htm.

Subject	Number	Percent
Specified owner-occupied housing units	**21,453**	**100.0**
VALUE		
Less than $10,000	17	0.1
$10,000 to $14,999	50	0.2
$15,000 to $19,999	18	0.1
$20,000 to $24,999	17	0.1
$25,000 to $29,999	44	0.2
$30,000 to $34,999	80	0.4
$35,000 to $39,999	94	0.4
$40,000 to $49,999	190	0.9
$50,000 to $59,999	459	2.1
$60,000 to $69,999	1,168	5.4
$70,000 to $79,999	1,689	7.9
$80,000 to $89,999	2,250	10.5
$90,000 to $99,999	2,125	9.9
$100,000 to $124,999	3,509	16.4
$125,000 to $149,999	2,711	12.6
$150,000 to $174,999	2,402	11.2
$175,000 to $199,999	1,508	7.0
$200,000 to $249,999	1,405	6.5
$250,000 to $299,999	730	3.4
$300,000 to $399,999	555	2.6
$400,000 to $499,999	247	1.2
$500,000 to $749,999	122	0.6
$750,000 to $999,999	31	0.1
$1,000,000 or more	32	0.1
Median (dollars)	118,000	(X)
MORTGAGE STATUS		
With a mortgage, contract to purchase, or similar debt	17,902	83.4
With a second mortgage or home equity loan, but not both	3,643	20.3

Columbia County, Georgia - QT-H14. Value, Mortgage Status, and Selected Conditions: 2000

Subject	Number	Percent
Second mortgage only	1,656	45.5
Home equity loan only	1,987	54.5
Both second mortgage and home equity loan	59	0.3
No second mortgage or home equity loan	14,200	79.3
Without a mortgage	3,551	16.6
TENURE BY SELECTED CONDITIONS		
Owner-occupied housing units	**25,544**	**100.0**
With one selected condition	4,713	18.5
With two selected conditions	128	0.5
With three selected conditions	9	0.0
With four selected conditions	0	0.0
No selected conditions	20,694	81.0
Renter-occupied housing units	**5,576**	**100.0**
With one selected condition	1,834	32.9
With two selected conditions	110	2.0
With three selected conditions	12	0.2
With four selected conditions	10	0.2
No selected conditions	3,610	64.7

(X) Not applicable.
Source: U.S. Census Bureau, Census 2000 Summary File 3, Matrices H7, H74, H76, H80, and HCT28.

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Attachment B-1 #114

ER Section 2.3 Water

NRC Question 114

Provide estimated erosion characteristics and sediment transport rates, including bed and suspended load fractions, for the Savannah River near the site.

Response

Responses to NRC Question 114 are provided in the following two sections.

1. Estimated Erosion Characteristics

Bank erosion caused by wave action has been measured in the reservoirs upstream of the ESP (Hoke, 2000), but no references to measurements of bank erosion along the middle reaches of the Savannah River were found in the literature.

Erosion characteristics of the Savannah River near the site were discussed in a general manner in Section 2.4.9 of the SAR, where it was concluded that bank erosion along the study reach has not been a significant factor:

Historical development of the river plan-form, which is the shape on map of river bank-line, near the VEGP site is well-represented in the USGS 7.5-minute series (topographic) maps. Oxbow lakes, meander cutoffs, abandoned meanders, low-lying swamps, and forested wetlands provide considerable evidence of historical channel plan-form development. Although meander river plan-form is present upstream and downstream of the site, the Savannah River near the site has a relatively straight and stable reach extending approximately from River Mile 143 to River Mile 152. A comparison of river bank-lines between 1965 and 1989, obtained from USGS topographic maps (USGS 1989a; USGS 1989b; USGS 1989d) and topographic maps used for VEGP Units 1 and 2 shows a nearly unchanged river plan-form within the reach during this period.

Hale and Jackson (2003) describe how dredging for navigation has altered the hydrology and geomorphology of the Savannah River over the past century. They present a table of forty cut-offs constructed on the lower Savannah River between 1889 and 1962 that had the cumulative effect of reducing stream length by a total of 26.5 miles. Each of these cut-offs will have had some impact on local channel conditions and sediment transport due to change in bed slope.

According to their table, the 4350-foot Cox Point Cut-off at River Mile 153.2 (about 2.3 miles upstream of the Vogtle site) was completed in 1959. The cutoff is visible on the Shell Bluff Landing 1:24,000-scale USGS topographic map.

Based on the alignment of the channel shown on the map, which is based on aerial photography from 1965 with photorevisons from 1989, the stability of the Savannah River channel section at the Vogtle site does not appear to have been adversely impacted by the cut-off, which would be the expected outcome for the relatively short length of the cut-off and the mild gradient of the reach.

In general, channel straightening of the type affected by the Cox Point cutoff will cause a local reduction in water level and an increase in velocity, so that the small creeks which are tributary to the reach may experience increased gradients causing scour and

head cutting (U.S.D.O.T., 1977). No evidence of such impacts is noticeable at the scale of the available mapping, however.

2. Sediment Transport Rates

A search of the literature shows that there have been a number of studies of sediment transport on the Savannah River within the piedmont physiographic region, resulting from requirements to establish Total Maximum Daily Loads for the E.P.A. (i.e. EPA 1999, Keyes and Radcliffe, 2002, Freshley, 2003). There have also been a number of studies of sedimentation in Savannah Harbor (Goodrich, Way, and Liu, 2003; Semmes et al 2003, and Phillips and Slattery, 2006). Sedimentation rates resulting from these studies, where available, are not directly applicable at the study site within the coastal plain physiographic region because of the different bed slopes and stream power typical of each physiographic region.

There have been very few studies of sedimentation on the Savannah River near the site because sedimentation has not been considered a critical environmental issue in the coastal plain below the Corps's three-dam reservoir project, where the Vogtle site is located. According to the Savannah District of the U.S. Army Corps of Engineers (USACE 1996):

> The problem of sediment in the Savannah River Basin has been greatly reduced since the early 1900's by the conversion of much former cropland to silviculture and pasture. Cotton farming, considered a highly erosive land use, has greatly declined during this century in central Georgia and western South Carolina. The combination of agricultural decline, transition of cropland to timber and pasture, and widespread implementation of soil conservation practices have resulted in lessened stream sediment loads. Deposits of silt in the reservoirs and channel retrogression below the dams are not major problems.

Duncan and EuDaly (2003) discuss the possibility that the reduced variation in discharge downstream of the dams since closure has lead to accumulations of silt with an adverse impact on fish habitats in the shoals, but they present no measurements or quantitative estimates of sedimentation rates.

<u>Suspended load transport rates</u>

Table 1 summarizes the availability of water quality data for the U.S.G.S gages on the Savannah River. There is no information of measured bed load measurements and of the 23 gage stations listed to have water quality data, only two have data on suspended load transport rates, and only the gage at Clyo is in the coastal plain reach (USGS 2006).

Table 1 - Water quality data availability for USGS gages on the Savannah River

USGS Site Number	Site Name	From	To	Count	suspended sediment data available
2187303	SAVANNAH RIVER AT GA 181 NEAR MONTEVIDEO, GA.	1/10/2002	12/11/2002	22	turbidity only
2187500	SAVANNAH RIVER NEAR IVA,S.C.	5/24/1957	11/14/1985	138	suspended solids, residue
2189000	SAVANNAH RIVER NEAR CALHOUN FALLS, S. C.	3/29/1956	7/10/1974	63	turbidity only
21964839	SAVANNAH RIVER NEAR MARTINEZ, GA	7/24/1990	2/16/1994	44	none
2196560	SAVANNAH RIVER (AUGUSTA INTAKE) NR AUGUSTA, GA.	10/12/1970	10/12/1970	1	none
2196650	SAVANNAH R NR BEECH ISLAND, S. C.	12/10/1971	7/12/1972	5	none
2196670	SAVANNAH RIVER JEFFERSON DAVIS BR, AT AUGUSTA, GA.	1/14/2002	12/16/2002	20	residue
2196671	SAVANNAH RIVER (US 1) AT AUGUSTA, GA.	1/28/1997	8/13/1998	18	turbidity, residue
2196993	SAVANNAH RIVER ABOVE LOCK AND DAM AT AUGUSTA, GA.	1/14/2002	12/16/2002	20	turbidity, residue
2197000	SAVANNAH RIVER AT AUGUSTA, GA	7/24/1990	7/20/1998	62	turbidity, residue
					turbidity
2197065	SAVANNAH RIVER BELOW SPIRIT CREEK, NEAR AUGUSTA,GA	7/23/1990	8/9/2005	243	turbidity, residue
2197320	SAVANNAH R. NR JACKSON, SC	10/3/1972	6/27/1974	23	turbidity
2197375	SAVANNAH RIVER AT STONY BLUFF LANDING, GA.	11/3/1937	12/17/2002	83	turbidity, residue
2197500	SAVANNAH R AT BURTONS FERRY BR NR MILLHAVEN, GA	10/19/1993	2/15/1994	5	turbidity
2198500	SAVANNAH RIVER NEAR CLYO, GA	5/1/1938	7/8/2003	771	suspended solids, residue
2198920	SAVANNAH RIVER AT GA 25, AT PORT WENTWORTH, GA	5/2/1958	8/10/2005	101	turbidity, residue
2198975	SAVANNAH RIVER AT SAVANNAH, GA	1/16/2002	12/2/2004	63	turbidity, residue
219897991	SAVANNAH RIVER AT FORT JACKSON, NEAR SAVANNAH, GA	1/17/2002	12/2/2004	63	turbidity, residue
219897992	SAVANNAH RIVER AT SOUTH CHANNEL,NEAR SAVANNAH, GA	1/17/2002	12/2/2004	63	turbidity
219897996	SAVANNAH RIVER AT FIELDS CUT, NEAR SAVANNAH, GA	1/17/2002	12/2/2004	63	turbidity, residue
219897998	SAVANNAH RIVER NEAR FORT PULASKI, GA	1/17/2002	12/2/2004	63	turbidity, residue
2198980	SAVANNAH RIVER AT FORT PULASKI, GA	3/7/1960	3/8/1960	3	residue

While water quality data for the Savannah River at Clyo, GA (2198500) includes entries from 1938 to the present, only 97 records of measurements of suspended sediment load between 1974 and 1983 are reported (as time-weighted daily mean values).

These data points are listed in Table 2 and are plotted in Figure 1 against the average daily discharge recorded for those days. There is only a slight correlation between average daily discharge in cfs and suspended sediment load in tons per day, so the suspended load data time series can not be extended with much reliability.

There are gages on the Savannah River nearer to the site than Clyo, for which turbidity measurements are available, offering the possibility of estimating suspended sediment loads from a correlation with turbidity measurements, but no statistically significant relation was discerned between turbidity measurements and average daily suspended sediment discharge for these data sets.

Table 2 Suspended Sediment loads and average daily flows for the Savannah River at Clyo, GA

Date	Average daily flow, cfs	Suspended sediment discharge, tons per day	Date	Average daily flow, cfs	Suspended sediment discharge, tons per day
1/17/1974	19800	1970	3/8/1978	11600	469
2/14/1974	26300	2120	4/5/1978	10300	609
3/21/1974	10100	1270	5/3/1978	9670	342
4/26/1974	13300	1450	6/7/1978	10300	72
5/22/1974	9190	1350	7/6/1978	7220	660
8/1/1974	7810	522	8/9/1978	7870	170
8/30/1974	9040	731	9/7/1978	8850	337
9/26/1974	7620	518	10/4/1978	6880	15
10/23/1974	7480	850	11/2/1978	6690	54
11/22/1974	8300	627	12/6/1978	7460	200
12/18/1974	8700	353	1/4/1979	7710	166
1/17/1975	14600	3150	2/7/1979	8370	386
2/21/1975	23500	771	4/4/1979	16800	544
3/13/1975	23200	643	5/2/1979	35200	762
4/17/1975	38700	847	6/7/1979	18800	1260
5/8/1975	14500	1170	7/19/1979	7840	462
6/19/1975	11400	948	8/23/1979	7760	251
7/17/1975	12800	1170	9/6/1979	11400	400
8/13/1975	9700	627	10/4/1979	11600	345
9/11/1975	9020	497	11/9/1979	9040	243
10/16/1975	9940	485	12/14/1979	16600	538
11/12/1975	16200	797	1/10/1980	8640	140
12/18/1975	15400	994	2/6/1980	24700	603
1/14/1976	15900	926	3/6/1980	12400	439
2/12/1976	18600	492	4/2/1980	51600	1570
3/17/1976	13000	1120	5/7/1980	12000	758
4/14/1976	22200	754	6/11/1980	17500	950
5/12/1976	8070	367	7/2/1980	9030	24
6/9/1976	21200	592	8/6/1980	6480	273
7/14/1976	18000	544	9/4/1980	6120	234
8/11/1976	8400	530	10/8/1980	7950	372
9/14/1976	8230	152	11/21/1980	8770	309
10/6/1976	8900	301	12/9/1980	7820	233
11/4/1976	9200	400	1/8/1981	7870	214
12/2/1976	15900	1350	2/4/1981	7850	148
1/12/1977	19100	363	4/16/1981	7380	278
2/10/1977	11700	57	5/5/1981	6350	223
3/9/1977	14700	591	6/3/1981	7510	734
4/7/1977	24300	643	7/9/1981	6180	67
5/5/1977	11400	745	8/26/1981	6870	149
6/2/1977	7820	484	9/3/1981	6450	313
7/13/1977	7320	332	11/4/1981	5430	147
8/10/1977	8090	440	1/6/1982	15200	1070
9/14/1977	7590	326	3/3/1982	18500	549
10/20/1977	7050	266	5/13/1982	6660	215
11/17/1977	13700	769	7/13/1982	6680	332
12/7/1977	15700	899	9/2/1982	6250	284
1/11/1978	11100	366	2/8/1983	19300	1060
2/8/1978	28600	318			

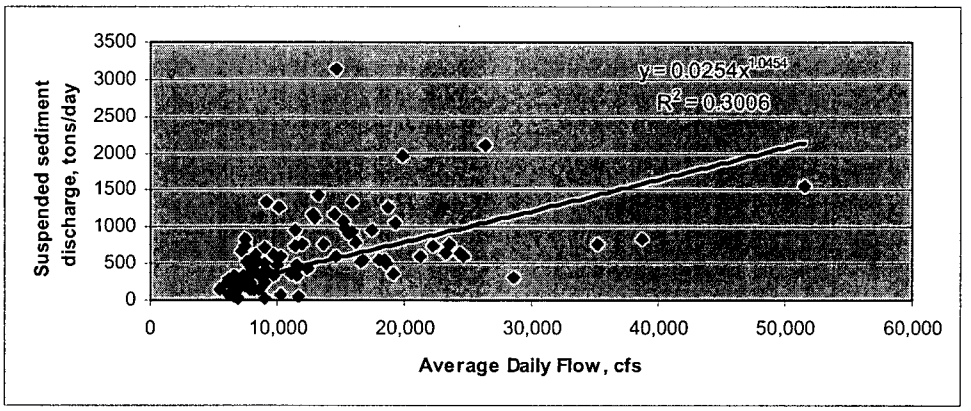

Figure 1 – Average daily suspended sediment load for Savannah River at Clyo, GA (USGS Gage No. 2198500)

The 97 reported measurements of daily suspended sediment loads were sorted to permit the calculation of monthly statistics, as summarized in Table 3, and plotted in Figure 2. The data shows some seasonality, but as the relation between discharge and suspended load is not strong, the seasonality is not pronounced.

Table 3 Calculation of monthly statistics for suspended sediment load at Clyo, GA

January samples	tons/day	February samples	tons/day	March samples	tons/day	April samples	tons/day	May samples	tons/day	June samples	tons/day
1/17/1974	1970	2/14/1974	2120	3/21/1974	1270	4/26/1974	1450	5/22/1974	1350	6/19/1975	948
1/17/1975	3150	2/21/1975	771	3/13/1975	643	4/17/1975	847	5/8/1975	1170	6/9/1976	592
1/14/1976	926	2/12/1976	492	3/17/1976	1120	4/14/1976	754	5/12/1976	367	6/2/1977	484
1/12/1977	363	2/10/1977	57	3/9/1977	591	4/7/1977	643	5/5/1977	745	6/7/1978	72
1/11/1978	366	2/8/1978	318	3/8/1978	469	4/5/1978	609	5/3/1978	342	6/7/1979	1260
1/4/1979	166	2/7/1979	386	3/6/1980	439	4/4/1979	544	5/2/1979	762	6/11/1980	950
1/10/1980	140	2/6/1980	603	3/3/1982	549	4/2/1980	1570	5/7/1980	758	6/3/1981	734
1/8/1981	214	2/4/1981	148			4/16/1981	278	5/5/1981	223		
1/6/1982	1070	2/8/1983	1060					5/13/1982	215		
Samp size	9		9		7		8		9		7
Avg	929.4		661.7		725.9		836.9		659.1		720.0
Std Dev	1024.1		627.8		330.7		448.5		409.2		384.9
C.I., 95%, α = .05	**669.0**		**410.2**		**245.0**		**310.8**		**267.3**		**285.1**
C.I., 50%, α = .50	**230.2**		**141.2**		**84.3**		**107.0**		**92.0**		**98.1**

July samples	tons/day	August samples	tons/day	September samples	tons/day	October samples	tons/day	November samples	tons/day	December samples	tons/day
7/17/1975	1170	8/1/1974	522	9/26/1974	518	10/23/1974	850	11/22/1974	627	12/18/1974	353
7/14/1976	544	8/30/1974	731	9/11/1975	497	10/16/1975	485	11/12/1975	797	12/18/1975	994
7/13/1977	332	8/13/1975	627	9/14/1976	152	10/6/1976	301	11/4/1976	400	12/2/1976	1350
7/6/1978	660	8/11/1976	530	9/14/1977	326	10/20/1977	266	11/17/1977	769	12/7/1977	899
7/19/1979	462	8/10/1977	440	9/7/1978	337	10/4/1978	15	11/2/1978	54	12/6/1978	200
7/2/1980	24	8/9/1978	170	9/6/1979	400	10/4/1979	345	11/9/1979	243	12/14/1979	538
7/9/1981	67	8/23/1979	251	9/4/1980	234	10/8/1980	372	11/21/1980	309	12/9/1980	233
7/13/1982	332	8/6/1980	273	9/3/1981	313			11/4/1981	147		
		8/26/1981	149	9/2/1982	284						
Samp size	8		9		9		7		8		7
Avg	448.9		410.3		340.1		376.3		418.3		652.4
Std Dev	364.0		208.5		117.6		253.5		282.7		437.3
C.I., 95%, α = .05	**252.2**		**136.2**		**76.8**		**187.8**		**195.9**		**324.0**
C.I., 50%, α = .50	**86.8**		**46.9**		**26.4**		**64.6**		**67.4**		**111.5**

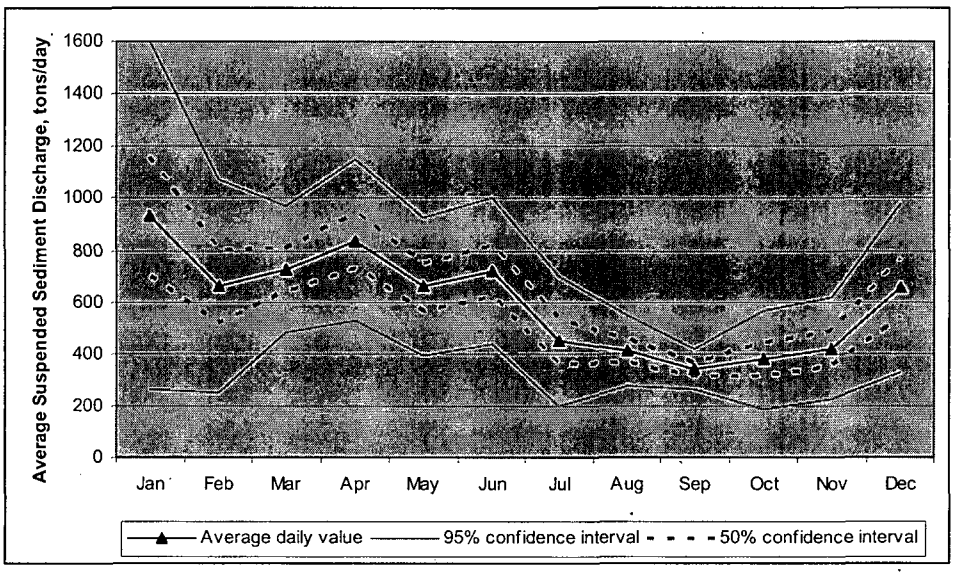

Figure 2 – Average monthly suspended sediment discharge measured on the Savannah River at Clyo, GA (USGS Gage No. 2198500)

Based on the assumption that the suspended sediment load at Clyo is not significantly different from the load at the Vogtle site, ninety miles upstream, the monthly average suspended load at the site will range between 200 and 1600 tons per day with a 95% probability.

Bed Load Sediment Transport Rates

No bed load sediment transport measurements have been reported for any reach of the Savannah River and can not be easily estimated as a fraction of the suspended load because the portion of sediment that moves as bed load varies widely between rivers and on the same river over time (Keyes & Radcliffe, 2002).

However, to get an order of magnitude estimate, the globally averaged ratio of suspended load to bed load sediment flux for rivers of 9:1 reported by Syvitski et al (2003) can be used. For the range of suspended load of 320 to 880 tons per year calculated from the data at Clyo, GA, this would indicate a range for bed load transport of between about 35 and 100 tons per day.

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Action

Clarifying text, tables, and figures will be added in the next revision of the ESP application as appropriate, and the Section 2.3 References will be updated as required.

AR-06-2684

Enclosure

Attachment B-2 #120

ER Section 2.3.1, Hydrology

NRC Question 120

Provide data that support why Wells OW-1006 and OW-1007 were at their highest elevations in June and lowest elevations in December (Table 2.3.1-18). Trends at other wells show relatively low elevations in July and high elevations in Feb/March. Well 808, with its respective high/low elevation for September and May, also seems to be an exception.

Response

ER Table 2.3.1-18 summarizes monthly groundwater levels for the Water Table aquifer for the period extending from June 2005 through June 2006, which includes 13 months of data. ER Figure 2.3.1-15 plots the hydrographs for each well. The minimum, maximum, range, and mean groundwater level for each observation well have been determined and are summarized in Table 1 of this response. The observations wells have been further sorted in order of descending groundwater level based on mean values.

As is evident from ER Figure 2.3.1-15 and statistics presented in Table 1, water levels measured in observation wells exhibit little variability over time and do not show any significant seasonal influences over the 13 month period. The well exhibiting the most variability (808) has a range of only 1.02 ft. The range for all wells averages 0.62 ft.

Because the variability is relatively small, attaching physical significance to the timing of the maximum and minimum values for the set wells is difficult. The lithology of the screened intervals for these wells and their hydraulic conductivity values are relatively consistent, as is indicated in SSAR Appendix 2.5A – Geotechnical Investigation and Laboratory Testing Data Report (report Appendix D). The trends likely reflect the transient response of the Water Table aquifer to temporal and spatial variability in groundwater recharge. The fact that observation wells OW-1006 and OW-1007 are both located on topographically-steeper terrain suggests that their temporal response to seasonal recharge would be different than for wells located in upland areas. Several additional years of monitoring would be required to verify this hypothesis. Regardless of the underlying physical mechanisms, the seasonal range in Water Table aquifer groundwater levels is small (averaging 0.62 ft), and observations to date indicate that groundwater flow directions and gradients do not exhibit any significant variation with season.

References

None.

Table 1. Monthly Groundwater Level Elevations in the Water Table Aquifer

Well	Groundwater Level Elevations (ft msl)																
	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Min	Max	Range	Mean
OW-1013	164.95	165.00	165.29	165.47	165.48	165.42	165.21	165.29	165.46	165.31	165.23	165.11	164.96	164.95	165.48	0.53	165.24
804	163.73	163.62	163.92	164.10	164.21	164.23	164.05	164.08	164.23	164.30	164.11	163.99	163.88	163.62	164.30	0.68	164.03
OW-1010	163.06	163.26	163.59	163.77	163.81	163.78	163.62	163.60	163.63	163.57	163.44	163.29	163.09	163.06	163.81	0.75	163.50
OW-1009	162.38	162.40	162.71	162.90	163.01	163.03	162.87	162.93	163.01	163.01	162.89	162.79	162.65	162.38	163.03	0.65	162.81
OW-1012	161.83	161.93	162.07	162.06	161.98	161.80	161.71	161.82	161.86	161.80	161.68	161.53	161.37	161.37	162.07	0.70	161.80
803A	159.98	159.91	160.15	160.32	160.39	160.48	160.39	160.37	160.48	160.45	160.30	160.20	160.12	159.91	160.48	0.57	160.27
OW-1015	159.63	159.58	159.78	159.90	159.96	159.96	159.82	159.81	159.79	159.89	159.75	159.66	159.58	159.58	159.96	0.38	159.78
808	158.88	159.14	159.42	159.55	159.49	159.37	159.15	159.04	159.19	159.15	158.99	158.53	158.80	158.53	159.55	1.02	159.13
805A	158.53	158.57	158.84	158.98	159.09	159.09	159.05	158.94	158.92	158.98	158.82	158.82	158.63	158.53	159.09	0.56	158.87
LT-12	158.21	157.90	158.07	158.22	158.31	158.28	158.21	158.53	158.66	158.48	158.54	158.48	158.23	157.90	158.66	0.76	158.32
802A	157.88	157.86	158.07	158.23	158.29	158.34	158.28	158.28	158.39	158.23	158.17	158.09	157.99	157.86	158.39	0.53	158.16
LT-13	156.10	155.92	156.13	156.30	156.32	156.37	156.23	156.36	156.66	156.35	156.32	156.32	156.23	155.92	156.66	0.74	156.28
OW-1003	155.94	155.89	156.06	156.29	156.24	156.36	156.26	156.34	156.37	156.43	156.32	157.24	156.16	155.89	156.43	0.54	156.22
806B	155.62	155.65	155.78	155.90	155.96	155.98	155.88	155.97	155.98	156.03	155.85	155.78	155.73	155.62	156.03	0.41	155.85
LT-1B	154.92	154.82	155.01	155.16	155.18	155.22	155.06	155.18	155.52	155.28	155.18	155.15	154.95	154.82	155.52	0.70	155.13
142	154.37	154.38	154.49	154.64	154.75	154.69	154.60	154.71	154.78	154.71	154.63	154.55	154.48	154.37	154.78	0.41	154.60
LT-7A	154.39	154.15	154.33	154.46	154.48	154.46	154.31	154.57	154.83	154.59	154.57	154.50	154.41	154.15	154.83	0.68	154.47
809	152.78	152.70	152.75	152.89	152.98	152.97	152.98	153.10	153.22	153.18	153.05	153.02	153.00	152.70	153.22	0.52	152.98
OW-1007	151.82	151.72	151.78	151.63	151.45	151.15	151.05	151.41	151.49	151.45	151.22	151.11	150.99	150.99	151.82	0.83	151.41
179	147.42	148.40	148.42	148.72	148.69	148.75	148.52	148.61	148.64	148.72	148.66	148.76	148.78	148.40	148.78	0.38	148.64
OW-1006	147.66	147.48	147.57	147.60	147.49	147.20	147.18	147.41	147.40	147.37	147.35	147.12	147.05	147.05	147.66	0.61	147.38
OW-1005	132.95	132.73	132.88	133.01	132.67	132.65	132.53	132.74	133.04	133.12	133.14	133.20	133.12	132.53	133.20	0.67	132.91

Notes: Monthly groundwater level elevations obtained from ER Table 2.3.1-18.
Yellow-shaded cells denote minimum values.
Blue-shaded cells denote maximum values.
May 2006 measurement for OW-1003 appears anomalous based on ER Figure 2.3.1-15; value is excluded in calculation of statistics.
June 2005 measurement for 179 appears anomalous based on ER Figure 2.3.1-15; value is excluded in calculation of statistics.

AR-06-2684

Enclosure

Attachment B-3 #123

Attachment B-3

Table 1. Total Porosity and Grain Size Distribution Test Data for the Lisbon Formation (Blue Bluff Marl)

Borehole	Sample No.	Elevation (ft msl)	% Gravel	% Sand	% Fines	Description	USCS Classification	D50 (mm)	Porosity
B-1002	UD-1 Upper	130.0	49.4%	21.7%	28.9%	Silty gravel with sand	GM	3.49	0.59
B-1002	UD-2	118.5	22.9%	41.2%	35.9%	Clayey sand with gravel	SC	0.26	0.56
B-1002	UD-3	108.5	12.8%	53.4%	33.8%	Clayey sand	SC	0.21	0.36
B-1002	UD-4	98.5	53.7%	21.8%	24.5%	Clayey/silty gravel with sand	GC-GM	7.52	0.25
B-1002	UD-5	88.5	26.3%	49.4%	24.3%	Silty sand with gravel	SM	0.87	0.45
B-1003	17	135.2	16.5%	50.1%	33.4%	Silty sand with gravel	SM	0.43	ND
B-1003	UD-1	130.2	1.6%	57.8%	40.6%	Silty sand	SM	0.14	0.46
B-1003	22	118.5	1.2%	67.1%	31.7%	Silty sand with shells	SM	0.27	0.52
B-1003	27	101.5	11.7%	45.8%	42.5%	Silty sand	SM	0.12	0.42
B-1003	31	81.5	7.3%	58.5%	34.2%	Silty sand with shells	SM	0.15	0.39
B-1004	UD-1 Upper	105.8	1.0%	52.7%	46.3%	Silty sand	SM	0.10	0.56
B-1004	UD-2	96.3	0.7%	57.6%	41.7%	Silty sand	SM	0.15	0.45
B-1004	UD-3 Upper	86.3	38.0%	29.8%	32.2%	Clayey gravel with sand	GC	0.49	0.43
B-1004	UD-4 Upper	72.8	20.9%	37.4%	41.7%	Silty sand with gravel	SM	0.12	0.38
B-1004	UD-5	61.3	34.9%	41.3%	23.8%	Silty sand with gravel	SM	0.85	0.44
B-1004	UD-6	51.3	5.2%	60.3%	34.5%	Clayey sand	SC	0.18	0.39
B-1006	32	132.5	0.0%	35.9%	64.1%	Sandy elastic silt	MH	ND	ND
							Median	0.24	0.44

Notes: Data obtained from SSAR Appendix 2.5A – Geotechnical Investigation and Laboratory Testing Data Report (report Appendix E).
ND – not determined.

AR-06-2684

Enclosure

Attachment C-1 #135

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

SOUTHERN COMPANY
Energy to Serve Your World™

File: E.03.34
Log: EV-06-0053

January 11, 2006

Vogtle Electric Generating Plant
Ground Water Use Permit No. 017-0003
Semi-Annual Report

Mr. Bill Frechette
Georgia Environmental Protection Division
Water Withdrawal Permitting Program
Groundwater Permitting Unit
4220 International Parkway, Suite 101
Atlanta, GA 30354

Dear Mr. Frechette:

In accordance with standard condition #3 of the Vogtle Electric Generating Plant Ground Water Use Permit (No. 017-0003) and Rule 391-3-2-.08, enclosed is the semi-annual Ground Water Use Report for the second half of 2005, and the annual measured value for specific conductance.

If you have any questions, please contact Jessica Joyner at (205) 992-7693.

Sincerely,

Mike Godfrey
Environmental Affairs Manager

JMG/JAJ:ahl

Vogtle Electric Generating Plant – Permit No. 017-0003

Annual Specific Conductance

Obtained from:	Make-up well #1
Obtained on:	12/09/05
Value (µmhos/cm):	173.4
Temperature:	25°C

Obtained from:	Recreation Center well
Obtained on:	12/09/05
Value (µmhos/cm):	236
Temperature:	25°C

Georgia Environmental Protection
Department of Natural Resources

[redacted]

Groundwater Use Report

This form shall be submitted to the Division twice each year, within the reporting period specified on the Groundwater Withdrawal Permit under Standard Condition No. 3.

(Print or type ALL information)

Permittee Information

Contact Person: Mike Godfrey | Phone: (205) 992-6387 | Email: JGODFREY@southernco.com

Company / Permittee: Southern Nuclear operating Company / Vogtle electric Generating Plant

Address: P.O. Box 1295 , Birmingham , Alabama 35201
(No. and Street) (City) (State) (Zip)

GW Withdrawal Permit No.: 017 - 0003 | For six (6) month period from July 2005 thru December 2005

County where well(s) is located: Burke County , GA

This report is on the Cretaceous Sand aquifer(s) used by well(s) numbered MU-1, MU-2A, TW-1, SW-5, SB, Rec, CW-3, & TW-4

Month/Year	Amount of water pumped from aquifer(s) each MONTH (in gallons)		Method used to determine pumpage
	System Total from ALL wells	Monthly Average (Total/Days in Month)	
July/2005	24146700 gal	778900 gal	☒ Flow meter
August/2005	24861100 gal	802000 gal	☐ Other (specify below)
September/2005	28310800 gal	943700 gal	
October/2005	30421000 gal	981300 gal	
November/2005	23340100 gal	778000 gal	
December/2005	26566000 gal	857000 gal	Average hours pumped per day 7.2
Six Month - Grand Total	157645700 gal		

Static water level (SWL)*** 46.05 ft.	Elevation 154.48 ft.	Well no. MU-1	Date measured 12-08-05
Pumping water level (PWL)*** 49.20 ft.	Elevation 151.33 ft.	Well no. MU-1	Date measured 12-08-05

(Use additional sheet if necessary)

Number of hrs shutdown for SWL measurement 0.25. Number of continuous hrs pumped for PWL measurement 2.08.

Method of measurement: ☐ Air line ☒ Probe ☐ Tape ☐ Other (specify) _____

Measurement from: ☒ Top of casing ☐ Ground ☐ Other (specify) _____

***** Obtain and submit appropriate sets of water level measurements as indicated below:**

From 1-5 wells – a set from ONLY 1 WELL	Take readings from the highest yield well(s) using the same well(s) each time. For additional wells, follow this format.
From 6-10 wells – a set from ONLY 2 WELL	
From 11-15 wells – a set from ONLY 3 WELL	
From 16-20 wells – a set from ONLY 4 WELL	

And such other pertinent information submitted by the applicant or required by the Division.

I certify that the above information is true to the best of my knowledge.

Signed

Clifton L. Buck , Chemistry Manager
Title

1/6/06
Date

Return Report To:
[redacted]

October 2002

[redacted]

Georgia Environmental Protection Department of Natural Resources

Groundwater Use Report

This form shall be submitted to the Division twice each year, within the reporting period specified on the Groundwater Withdrawal Permit under Standard Condition No. 3.

(Print or type ALL information)

Permittee Information

Contact Person: Mike Godfrey | Phone: (205) 992-6387 | Email: JGODFREY@southernco.com

Company / Permittee: Southern Nuclear operating Company / Vogtle electric Generating Plant

Address: P.O. Box 1295 , Birmingham , Alabama 35201
(No. and Street) (City) (State) (Zip)

GW Withdrawal Permit No.: 017 - 0003 | For six (6) month period from July 2005 thru December 2005

County where well(s) is located: Burke County , GA

This report is on the Cretaceous Sand aquifer(s) used by well(s) numbered MU-1, MU-2A, TW-1, SW-5, SB, Rec, CW-3, & TW-4

Month/Year	Amount of water pumped from aquifer(s) each MONTH (in gallons)		Method used to determine pumpage
	System Total from ALL wells	Monthly Average (Total/Days in Month)	
N/A	N/A gal	N/A gal	☐ Flow meter
N/A	N/A gal	N/A gal	☐ Other (specify below)
N/A	N/A gal	N/A gal	
N/A	N/A gal	N/A gal	
N/A	N/A gal	N/A gal	
N/A	N/A gal	N/A gal	Average hours pumped per day N/A
Six Month - Grand Total	gal		

Static water level (SWL)***	24.55	ft.	Elevation 143.647	ft.	Well no.	Rec	Date measured 12-08-05
Pumping water level (PWL)***	46.50	ft.	Elevation 121.697	ft.	Well no.	Rec	Date measured 12-08-05

(Use additional sheet if necessary)

Number of hrs shutdown for SWL measurement 2.17. Number of continuous hrs pumped for PWL measurement 0.67.

Method of measurement: ☐ Air line ☒ Probe ☐ Tape ☐ Other (specify) _____

Measurement from: ☒ Top of casing ☐ Ground ☐ Other (specify) _____

***** Obtain and submit appropriate sets of water level measurements as indicated below:**

From 1-5 wells – a set from ONLY 1 WELL	Take readings from the highest yield well(s) using the same well(s) each time. For additional wells, follow this format.
From 6-10 wells – a set from ONLY 2 WELL	
From 11-15 wells – a set from ONLY 3 WELL	
From 16-20 wells – a set from ONLY 4 WELL	

And such other pertinent information submitted by the applicant or required by the Division.

I certify that the above information is true to the best of my knowledge.

Signed

Clifton L. Buck , Chemistry Manager
Title

Date 1/6/06

Return Report To: [redacted]

October 2002

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

SOUTHERN COMPANY
Energy to Serve Your World™
File: E.03.34
Log: EV-06-1477

July 7, 2006

Vogtle Electric Generating Plant
Ground Water Use Permit No. 017-0003
Semi-Annual Report

Mr. Bill Frechette
Georgia Environmental Protection Division
Water Withdrawal Permitting Program
Groundwater Permitting Unit
4220 International Parkway, Suite 101
Atlanta, GA 30354

Dear Mr. Frechette:

In accordance with standard condition #3 of the Vogtle Electric Generating Plant Ground Water Use Permit (No. 017-0003) and Rule 391-3-2-.08, enclosed is the semi-annual Ground Water Use Report for the first half of 2006.

If you have any questions, please contact Jessica Joyner at (205) 992-7693.

Sincerely,

J. M. Godfrey
Environmental Affairs Manager

JMG/JAJ:ahl

Enclosure

Georgia Environmental Protection
Department of Natural Resources

[redacted]

Groundwater Use Report

This form shall be submitted to the Division twice each year, within the reporting period specified on the Groundwater Withdrawal Permit under Standard Condition No. 3.

(Print or type ALL information)

Permittee Information

Contact Person: Mike Godfrey | Phone: (205) 992-6387 | Email: JGODFREY@southernco.com

Company / Permittee: Southern Nuclear Operating Company / Vogtle Electric Generating Plant

Address: P.O. Box 1295, Birmingham, Alabama 35201
(No. and Street) (City) (State) (Zip)

GW Withdrawal Permit No.: 017 - 0003 | For six (6) month period from January 2006 thru June 2006

County where well(s) is located: Burke County, GA

This report is on the Cretaceous Sand aquifer(s) used by well(s) numbered MU-1, MU-2A, TW-1, SW-5, SB, Rec, CW-3, & IW-4, SEC.

Month/Year	Amount of water pumped from aquifer(s) each MONTH (in gallons)				Method used to determine pumpage
	System Total from ALL wells		Monthly Average (Total/Days in Month)		
January/2006	20309900	gal	655100	gal	☒ Flow meter
February/2006	24932900	gal	890500	gal	☐ Other (specify below)
March/2006	27213400	gal	877900	gal	
April/2006	30291800	gal	1009700	gal	
May/2006	23786400	gal	767300	gal	
June/2006	27432400	gal	914400	gal	Average hours pumped per day 7.1
Six Month - Grand Total	153966400	gal			

Static water level (SWL)*** 46.23	ft.	Elevation 154.30	ft.	Well no. MU-1	Date measured 06-07-06
Pumping water level (PWL)*** 52.03	ft.	Elevation 148.50	ft.	Well no. MU-1	Date measured 06-07-06

(Use additional sheet if necessary)

Number of hrs shutdown for SWL measurement 0.50. Number of continuous hrs pumped for PWL measurement 0.50.

Method of measurement: ☐ Air line ☒ Probe ☐ Tape ☐ Other (specify) _____

Measurement from: ☒ Top of casing ☐ Ground ☐ Other (specify) _____

***** Obtain and submit appropriate sets of water level measurements as indicated below:**

From 1-5 wells – a set from ONLY 1 WELL	Take readings from the highest yield well(s) using the same well(s) each time. For additional wells, follow this format.
From 6-10 wells – a set from ONLY 2 WELL	
From 11-15 wells – a set from ONLY 3 WELL	
From 16-20 wells – a set from ONLY 4 WELL	

And such other pertinent information submitted by the applicant or required by the Division.

I certify that the above information is true to the best of my knowledge.

Signed

Clifton L. Buck, Chemistry Manager
Title

7-6-06
Date

Return Report To:
[redacted]

sid October 2002

Georgia Environmental Protection
Department of Natural Resources

[redacted]

Groundwater Use Report

This form shall be submitted to the Division twice each year, within the reporting period specified on the Groundwater Withdrawal Permit under Standard Condition No. 3.

(Print or type ALL information)

Permittee Information

Contact Person: Mike Godfrey	Phone: (205) 992-6387	Email: JGODFREY@southernco.com

Company / Permittee: Southern Nuclear Operating Company / Vogtle Electric Generating Plant

Address: P.O. Box 1295, Birmingham, Alabama 35201
(No. and Street) (City) (State) (Zip)

GW Withdrawal Permit No.: 017 - 0003 | For six (6) month period from January 2006 thru June 2006

County where well(s) is located: Burke County , GA

This report is on the Cretaceous Sand aquifer(s) used by well(s) numbered MU-1, MU-2A, TW-1, SW-5, SB, Rec, CW-3, & IW-4, SFC

Month/Year	Amount of water pumped from aquifer(s) each MONTH (in gallons)		Method used to determine pumpage
	System Total from ALL wells	Monthly Average (Total/Days in Month)	
January/2006	N/A gal	N/A gal	☐ Flow meter
February/2006	N/A gal	N/A gal	☐ Other (specify below)
March/2006	N/A gal	N/A gal	
April/2006	N/A gal	N/A gal	
May/2006	N/A gal	N/A gal	
June/2006	N/A gal	N/A gal	Average hours pumped per day ____
Six Month - Grand Total	N/A gal		

Static water level (SWL)*** 24.68 ft.	Elevation 143.517 ft.	Well no. Rec	Date measured 06-07-06
Pumping water level (PWL)*** 44.30 ft.	Elevation 123.897 ft.	Well no. Rec	Date measured 06-07-06

(Use additional sheet if necessary)

Number of hrs shutdown for SWL measurement 0.50. Number of continuous hrs pumped for PWL measurement 0.50.

Method of measurement: ☐ Air line ☒ Probe ☐ Tape ☐ Other (specify) ____

Measurement from: ☒ Top of casing ☐ Ground ☐ Other (specify) ____

***** Obtain and submit appropriate sets of water level measurements as indicated below:**

From 1-5 wells – a set from ONLY 1 WELL	Take readings from the highest yield well(s) using the same well(s) each time. For additional wells, follow this format.
From 6-10 wells – a set from ONLY 2 WELL	
From 11-15 wells – a set from ONLY 3 WELL	
From 16-20 wells – a set from ONLY 4 WELL	

And such other pertinent information submitted by the applicant or required by the Division.

I certify that the above information is true to the best of my knowledge.

Signed

Clifton L. Buck , Chemistry Manager
Title

7/6/06
Date

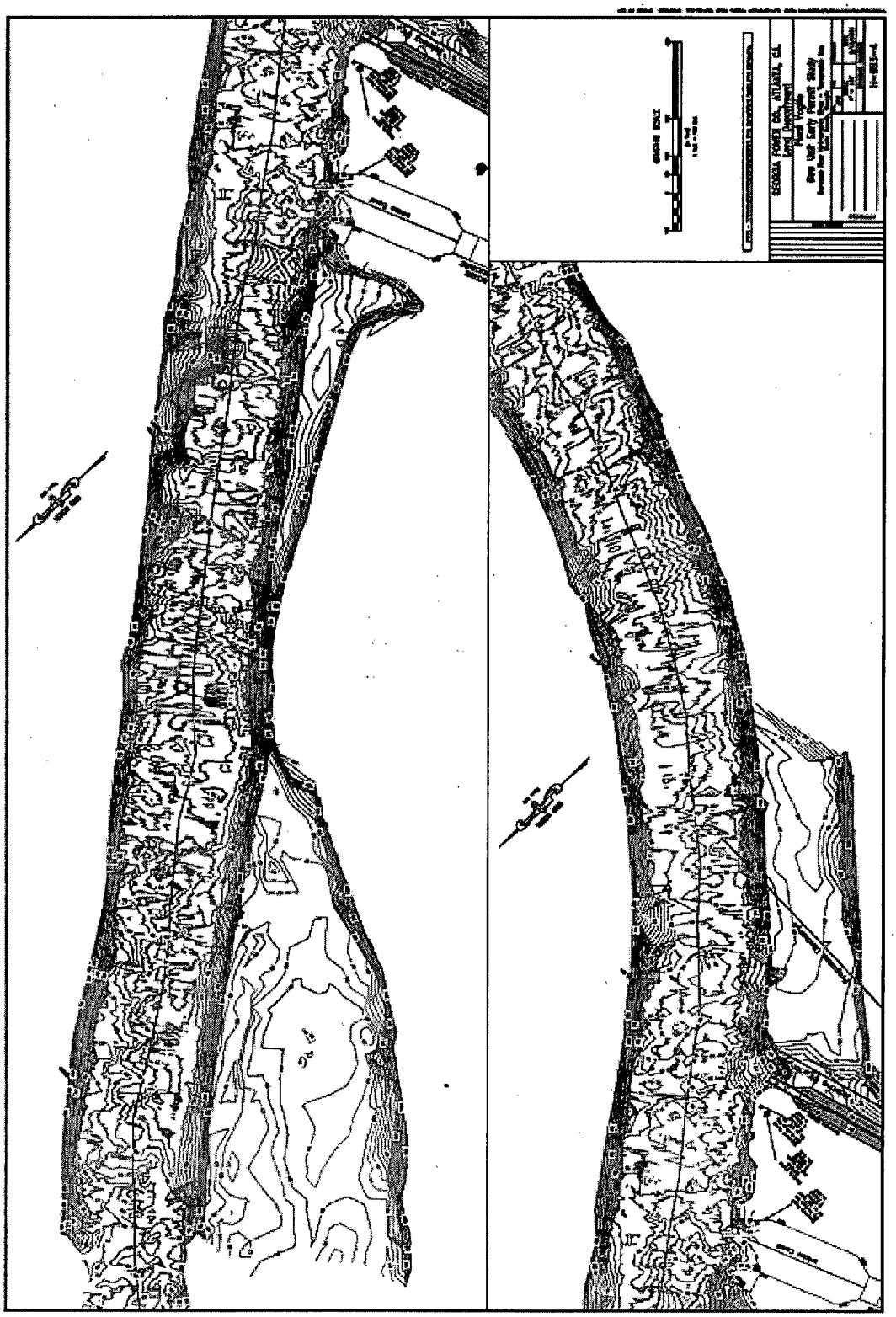
Return Report To:
[redacted]

sld October 2002

AR-06-2684

Enclosure

Attachment C-2 #157


GEORGIA POWER CO., ATLANTA, GA.
Land Department
Plant Vogtle
Bore Hole Survey Permit Study
GRAPHIC SCALE

AR-06-2684

Enclosure

Attachment C-3 #177

Intracompany Correspondence

SOUTHERN COMPANY
Energy to Serve Your World

Date: December 6, 2006

To: Mr. Mike Nichols

From: Mr. Bobby Williams

Subject: Plant Vogtle

Enclosed are the test results for the Plant Vogtle soil samples delivered to the Southern Company Central Laboratory on December 1, 2006. Tests performed include, Soil Particle Size Analysis (ASTM D-422).

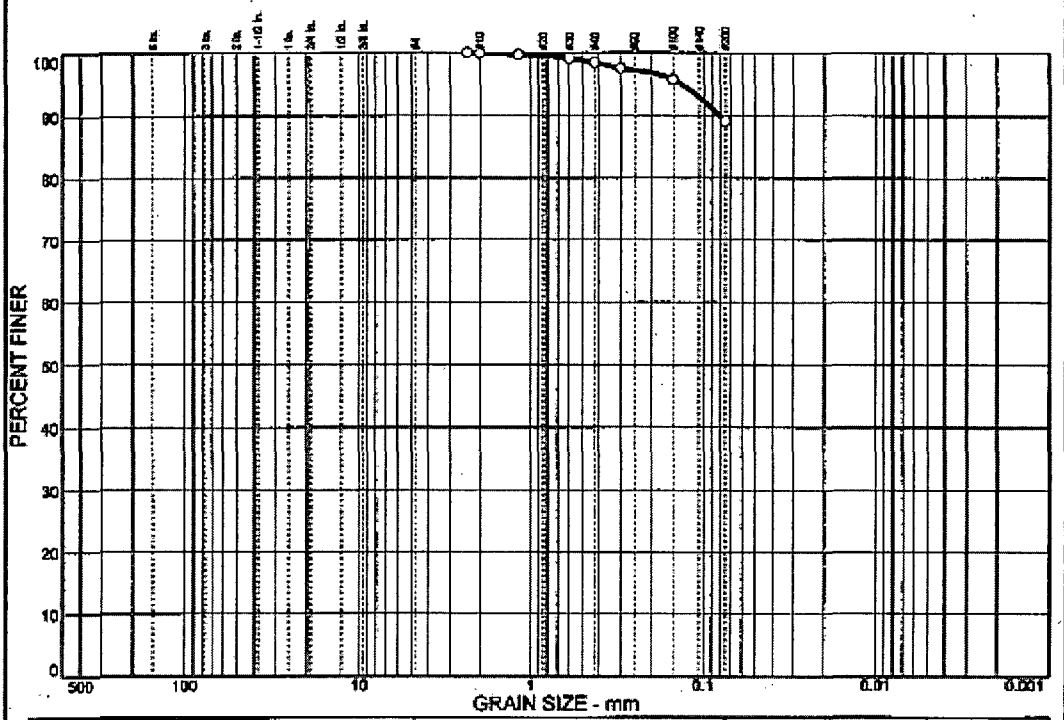
We appreciate the opportunity to assist you on this project. If there are any questions, or if we can be of any further assistance, please call me at 8-255-6508 or Sam Moore at 8-255-6061.

Sincerely,

Bobby Williams, PE
Geostructural Services

cc: Mr. Tom C. Moorer

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.0	10.8	89.2	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#8	100.0		
#10	99.9		
#16	99.7		
#30	99.2		
#40	98.5		
#50	97.6		
#100	95.8		
#200	89.2		

* (no specification provided)

Soil Description

Brown Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= ML AASHTO=

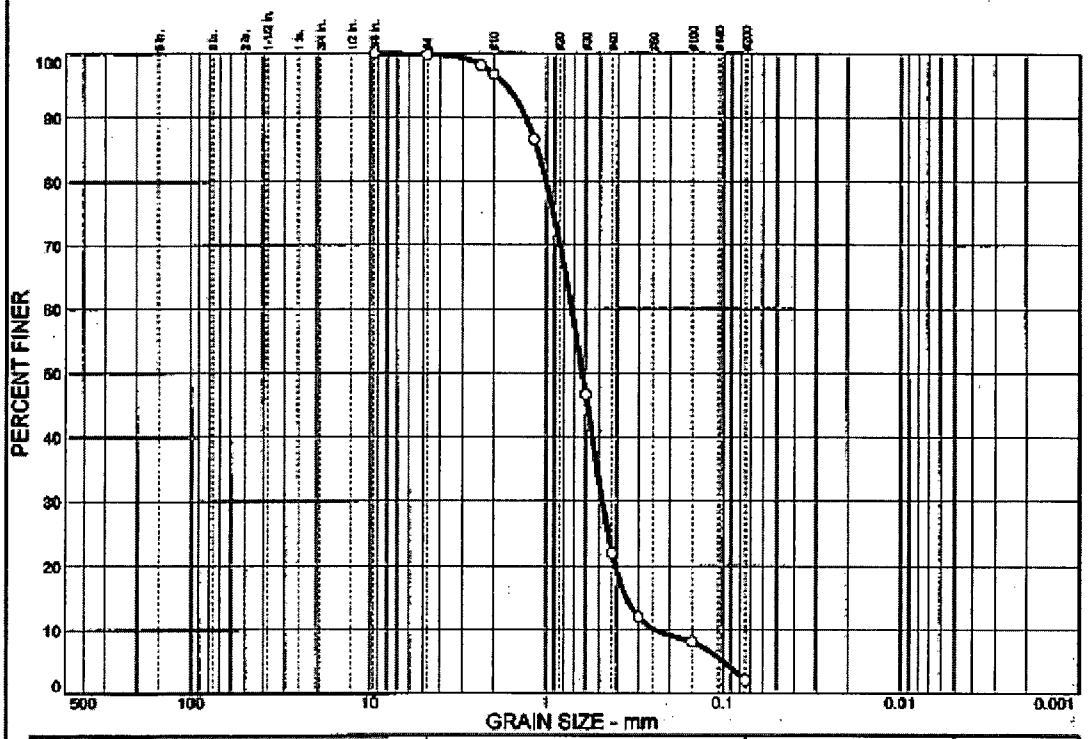
Remarks

Sample No.: MA112806 - 1 Source of Sample: Date: 12/06/06
Location: Discharge Elev./Depth:

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - Lab# 1

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	0.2	97.7	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375 in.	100.0		
#4	99.8		
#8	98.2		
#10	96.8		
#16	86.6		
#30	46.6		
#40	22.0		
#50	12.0		
#100	8.1		
#200	2.1		

* (no specification provided)

Soil Description

Brown Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.13 D_{60}= 0.720 D_{50}= 0.627
D_{30}= 0.483 D_{15}= 0.353 D_{10}= 0.243
C_u= 2.96 C_c= 1.33

Classification

USCS= SP AASHTO=

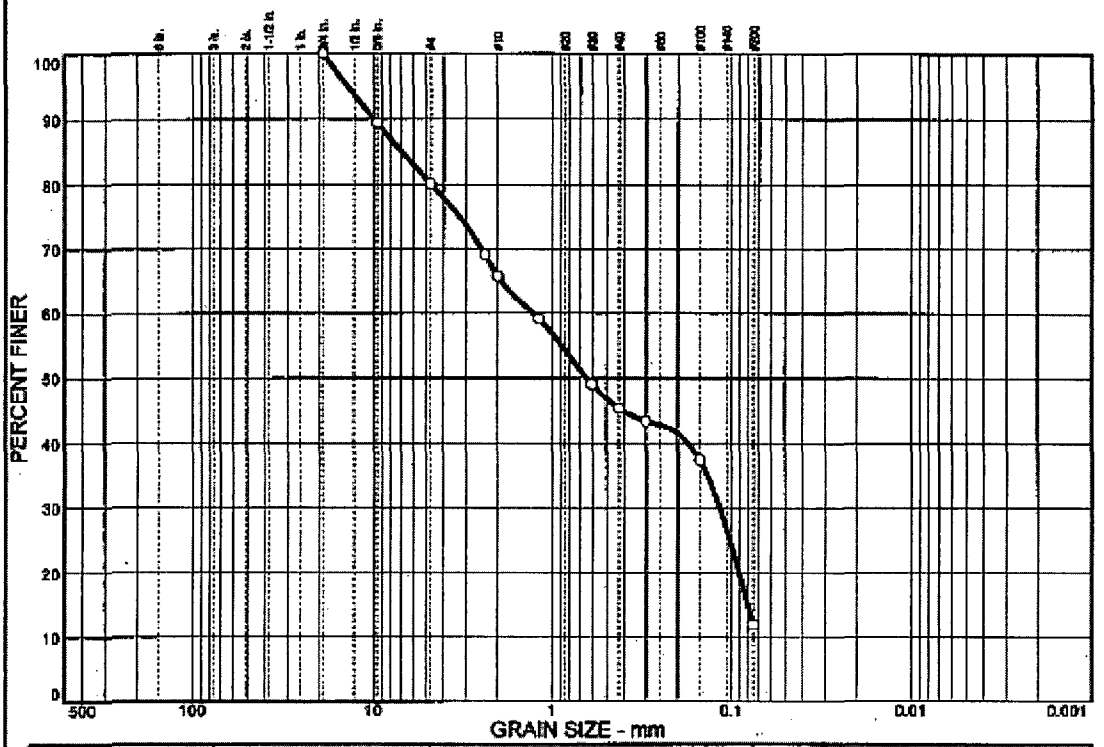
Remarks

Sample No.: MA112806 - 2 **Source of Sample:** **Date:** 12/06/06
Location: Upper River Shoreline **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 2

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	19.9	68.2	11.9	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
.375 in.	89.4		
#4	80.1		
#8	69.1		
#10	65.7		
#16	59.1		
#30	49.0		
#40	45.3		
#50	43.3		
#100	37.4		
#200	11.9		

* (no specification provided)

Soil Description

Brown Poorly graded sand with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.91 D_{60}= 1.28 D_{50}= 0.644
D_{30}= 0.116 D_{15}= 0.0805 D_{10}=
C_u= C_c=

Classification

USCS= SP-SM AASHTO=

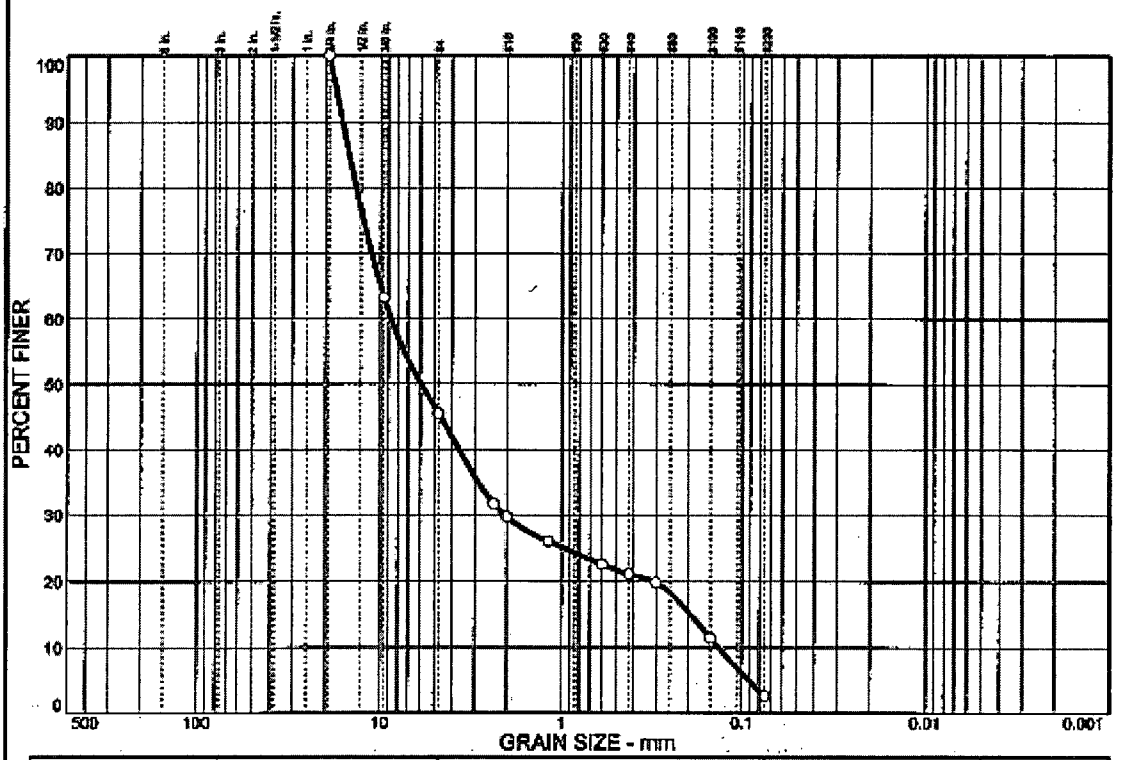
Remarks

Sample No.: MA112806 - 3 **Source of Sample:** **Date:** 12/06/06
Location: Upper River Middle **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 3

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	54.5	42.9	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NC)
0.75 in.	100.0		
.375 in.	63.2		
#4	45.5		
#8	31.7		
#10	29.7		
#16	26.0		
#30	22.6		
#40	21.1		
#50	19.8		
#100	11.4		
#200	2.6		

* (no specification provided)

Soil Description

Brown Poorly graded gravel with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 14.8 D_{60}= 8.72 D_{50}= 5.93
D_{30}= 2.06 D_{15}= 0.193 D_{10}= 0.135
C_u= 64.34 C_c= 3.59

Classification

USCS= GP AASHTO=

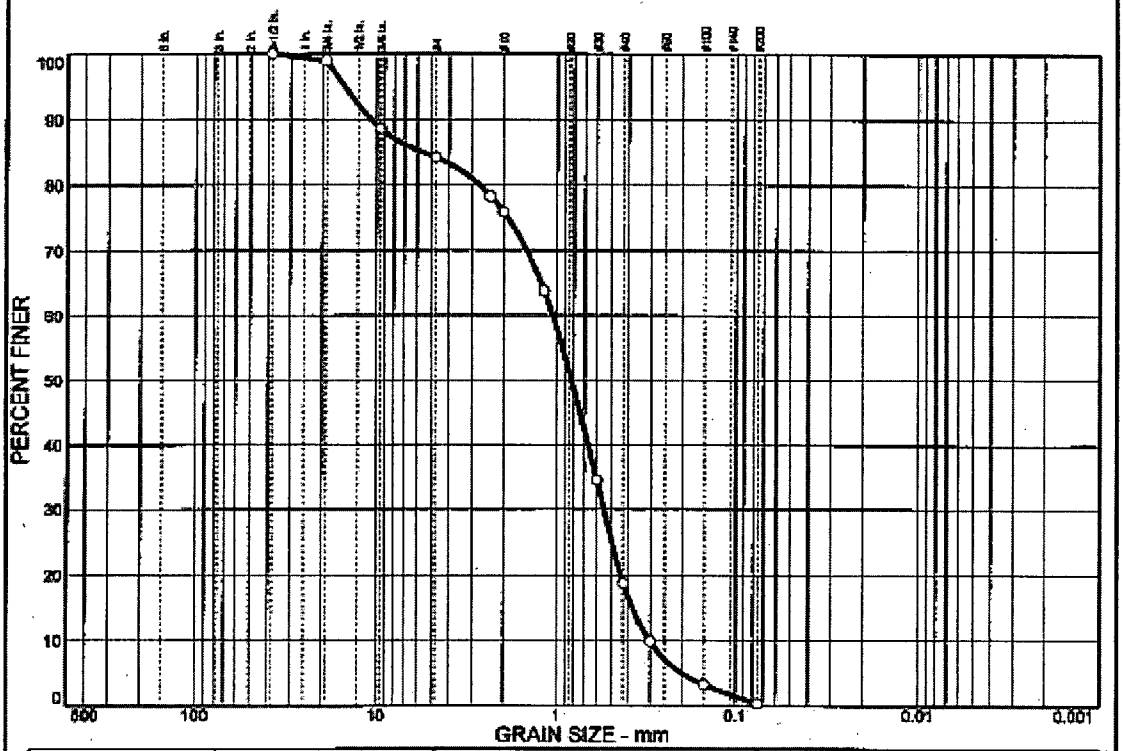
Remarks

Sample No.: MA112806 - 4 **Source of Sample:** **Date:** 12/06/06
Location: Upper River Deep **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 4

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	15.8	83.8	0.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.50 in.	100.0		
0.75 in.	99.0		
.375 in.	88.6		
#4	84.2		
#8	78.3		
#10	75.9		
#16	63.7		
#30	34.5		
#40	18.7		
#50	9.8		
#100	3.3		
#200	0.4		

* (no specification provided)

Soil Description

Brown Poorly graded sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 5.58 D_{60}= 1.06 D_{50}= 0.831
D_{30}= 0.548 D_{15}= 0.379 D_{10}= 0.303
C_u= 3.50 C_c= 0.93

Classification

USCS= SP AASHTO=

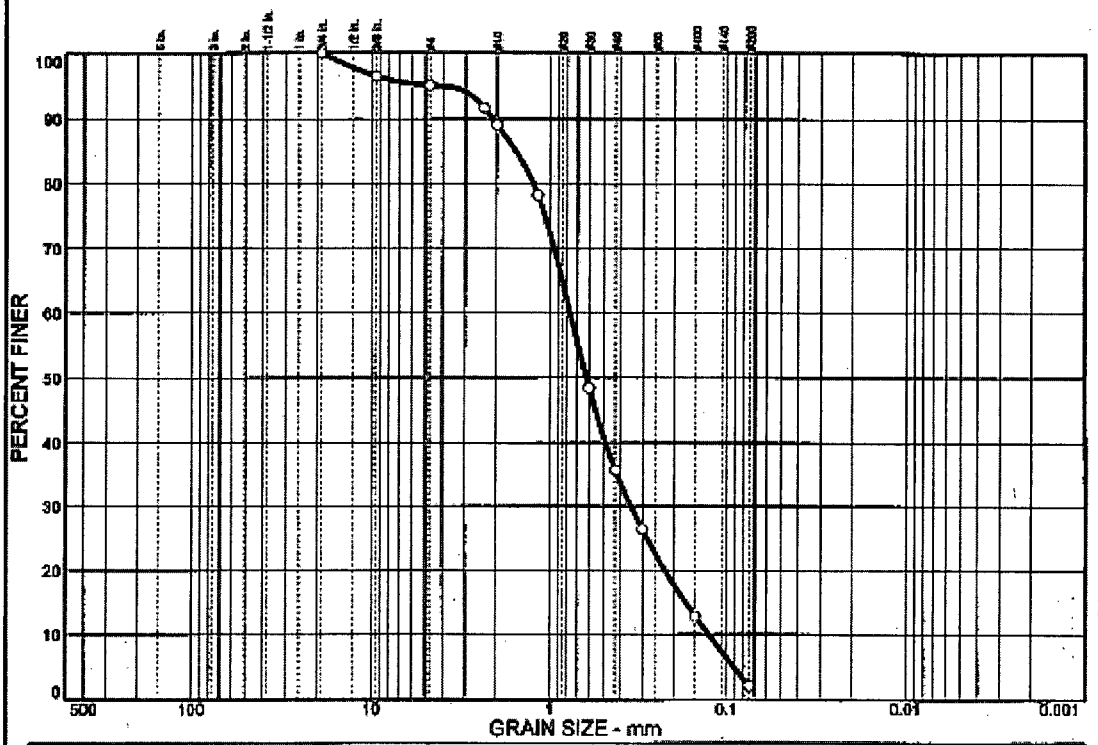
Remarks

Sample No.: MA112806 - 5 **Source of Sample:** **Date:** 12/06/06
Location: Middle River Shoreline **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Monrer
Project: Plant Vogtle
Project No: EWO - **Lab#** 5

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	4.9	93.0	2.1	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
.375 in.	96.5		
#4	95.1		
#8	91.7		
#10	89.0		
#16	78.2		
#30	48.4		
#40	35.7		
#50	26.4		
#100	12.8		
#200	2.1		

* (no specification provided)

Soil Description

Brown Well-graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.57 D_{60}= 0.770 D_{50}= 0.622
D_{30}= 0.347 D_{15}= 0.171 D_{10}= 0.126
C_u= 6.09 C_c= 1.24

Classification

USCS= SW AASHTO=

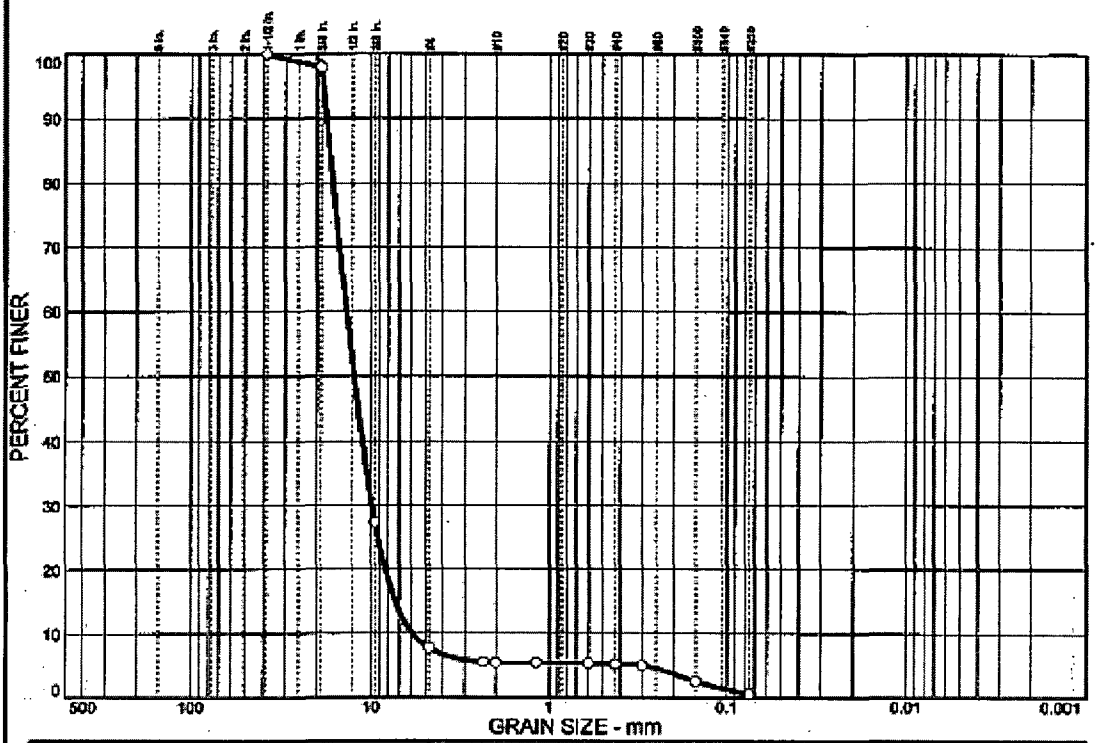
Remarks

Sample No.: MA112806 - 6 **Source of Sample:** **Date:** 12/06/06
Location: Middle River Middle **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 6

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	92.2	7.2	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.50 in.	100.0		
0.75 in.	97.9		
.375 in.	27.4		
#4	7.8		
#8	5.6		
#10	5.5		
#16	5.5		
#30	5.4		
#40	5.3		
#50	5.1		
#100	2.6		
#200	0.6		

* (no specification provided)

Soil Description

Brown Poorly graded gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 17.1 D_{60}= 13.7 D_{50}= 12.5
D_{30}= 9.89 D_{15}= 7.36 D_{10}= 5.92
C_u= 2.32 C_c= 1.21

Classification

USCS= GP AASHTO=

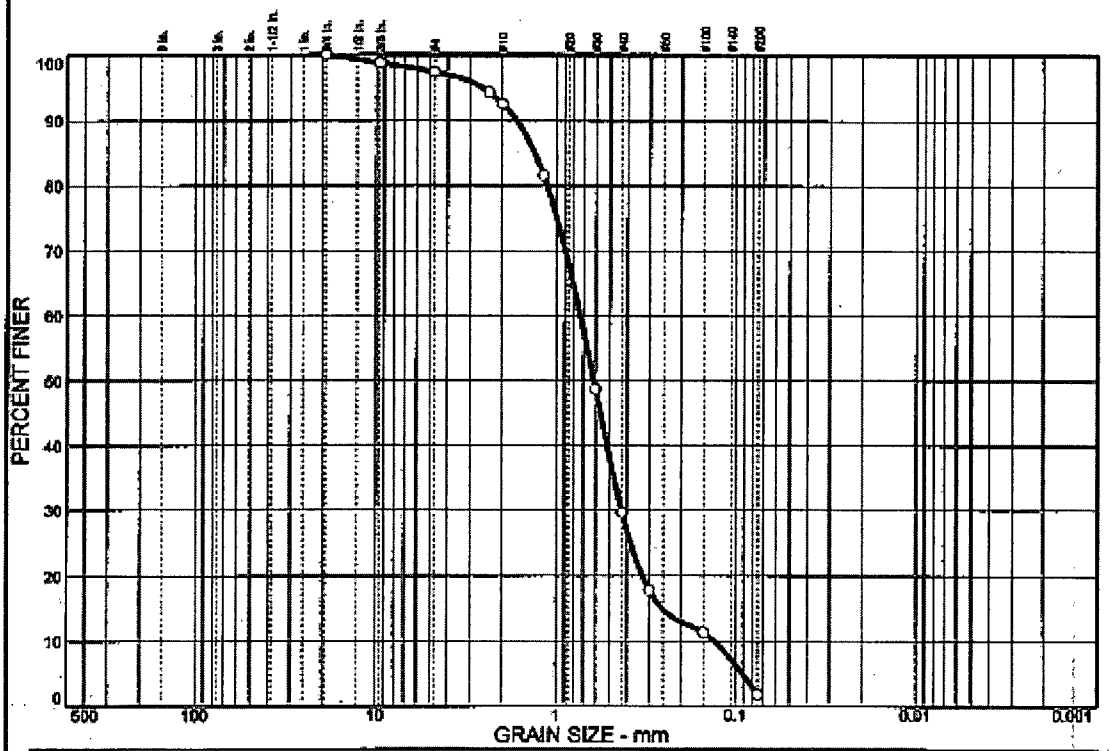
Remarks

Sample No.: MA112806 - 7 **Source of Sample:** **Date:** 12/06/06
Location: Middle River Deep **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 7

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	2.6	95.6	1.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
.375 in.	98.8		
#4	97.4		
#8	94.3		
#10	92.6		
#16	81.6		
#30	48.7		
#40	29.7		
#50	17.8		
#100	11.3		
#200	1.8		

* (no specification provided)

Soil Description

Brown Poorly graded sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.32 D_{60}= 0.733 D_{50}= 0.614
D_{30}= 0.428 D_{15}= 0.254 D_{10}= 0.131
C_u= 5.61 C_c= 1.91

Classification

USCS= SP AASHTO=

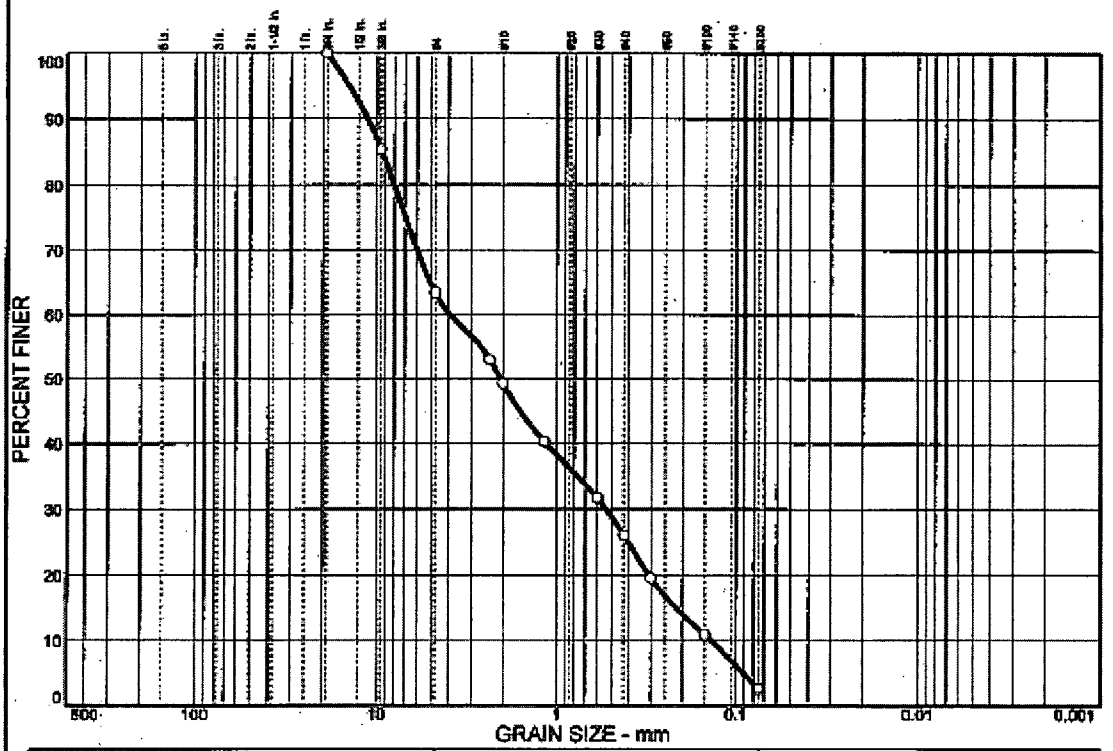
Remarks

Sample No.: MA112806 - 8 Source of Sample: Date: 12/06/06
Location: Down River Shoreline Elev./Depth:

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - Lab# 8

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	36.6	60.8	2.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
0.75 in.	100.0		
.375 in.	85.4		
#4	63.4		
#8	53.0		
#10	49.3		
#16	40.3		
#30	31.7		
#40	26.0		
#50	19.5		
#100	10.9		
#200	2.6		

* (no specification provided)

Soil Description

Brown Poorly graded sand with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 9.40 D_{60}= 3.92 D_{50}= 2.06
D_{30}= 0.536 D_{15}= 0.218 D_{10}= 0.138
C_u= 28.36 C_c= 0.53

Classification

USCS= SP AASHTO=

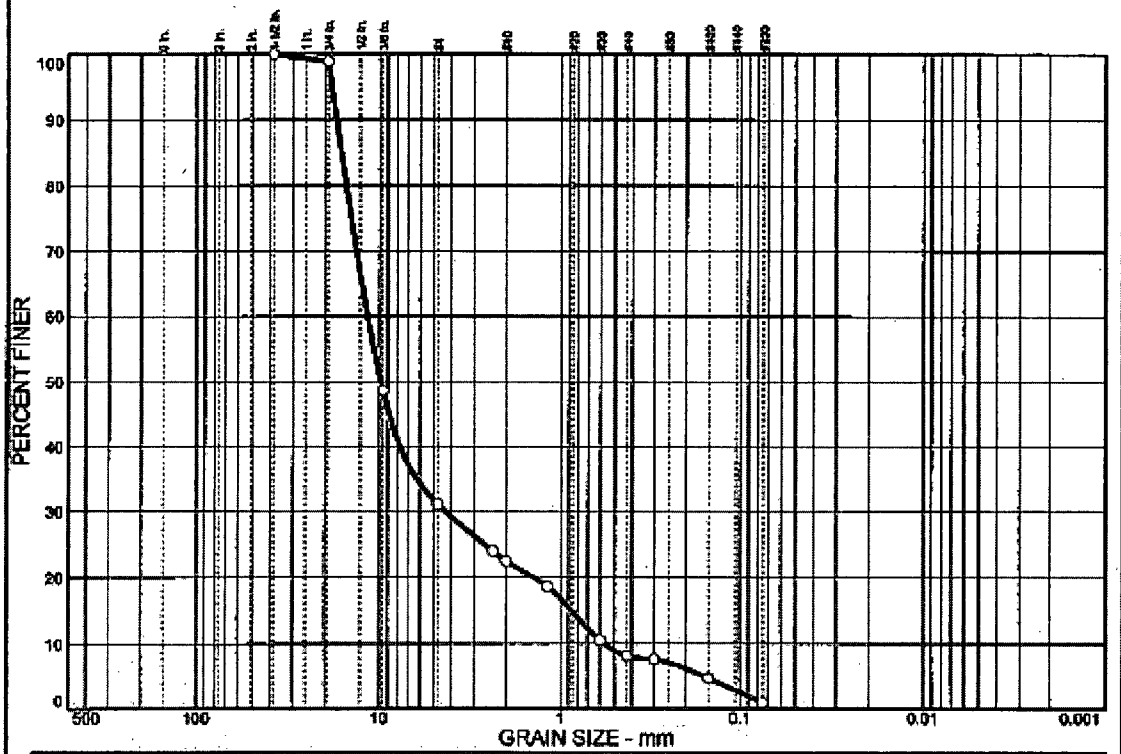
Remarks

Sample No.: MA112806 - 9 **Source of Sample:** **Date:** 12/06/06
Location: Down River Middle **Elev./Depth:**

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - **Lab#** 9

Particle Size Distribution Report



% COBBLES	% GRAVEL	% SAND	% SILT	% CLAY
0.0	68.9	30.1	1.0	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.50 in.	100.0		
0.75 in.	98.9		
.375 in.	48.5		
#4	31.1		
#8	24.0		
#10	22.5		
#16	18.6		
#30	10.5		
#40	8.1		
#50	7.6		
#100	4.7		
#200	1.0		

(no specification provided)

Soil Description

Brown Well-graded gravel with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 16.1 D_{60}= 11.6 D_{50}= 9.81
D_{30}= 4.31 D_{15}= 0.867 D_{10}= 0.570
C_u= 20.35 C_c= 2.81

Classification

USCS= GW AASHTO=

Remarks

Sample No.: MA112806 - 10 Source of Sample: Date: 12/06/06
Location: Down River Deep Elev./Depth:

SOUTHERN COMPANY

Client: Southern Nuclear / Mike Nichols and Tom Moorer
Project: Plant Vogtle
Project No: EWO - Lab# 10

On November 28, 2006, substrate samples were collected from the Savannah River along three transects perpendicular to the shoreline and adjacent to the proposed intake area of Plant Vogtle. Additionally, a single shoreline sample was taken at the proposed discharge area. Transects included the uppermost reach (upper river), middle (middle river), and lowermost reach (lower river) of the proposed intake area as determined by prior placement of survey flagging by Southern Nuclear personnel. Shoreline latitude/longitude coordinates were recorded at each transect and single quart-jar samples were taken by hand via a boat and diver at depths of 0.5m (shoreline), 1.0m (middle), and 1.5m (deep). Samples were labeled, preserved on ice, and analyzed. In order to further characterize the substrate underwater pictures were taken using an Oceans System Deep Blue Pro Splashcam underwater video camera with auxiliary lighting and PVR-Plus Video Capture software. A single representative picture was chosen for each depth.

Shoreline coordinates

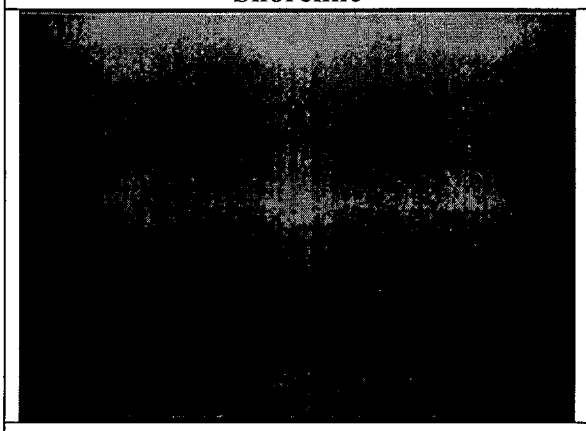
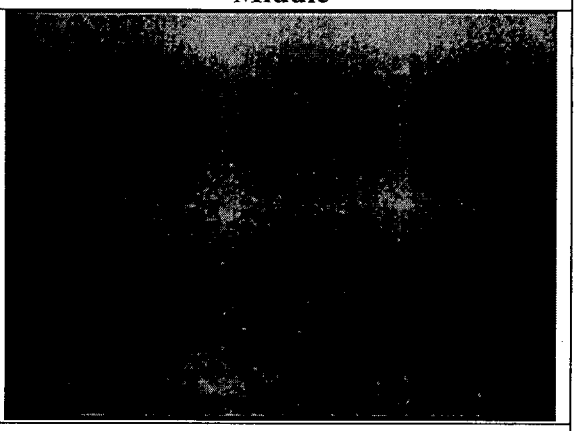
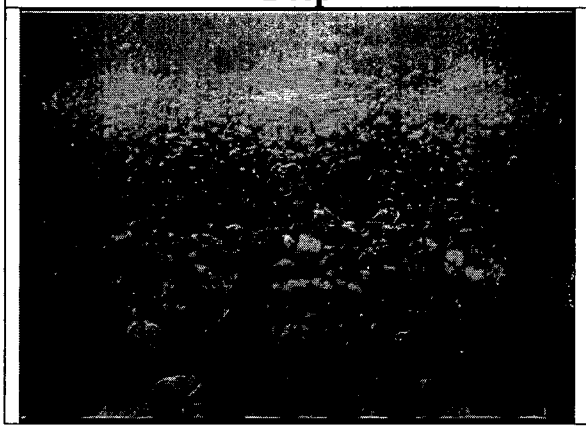
	Latitude	**Longitude**
Upper River	N 33°09'18.1"	W 81°45'32.4"
Middle River	N 33°09'16.5"	W 81°45'30.8"
Lower River	N 33°09'14.9"	W 81°45'29.6"
Discharge	N 33°08'54.3"	W 81°45'10.8"

Substrate Description

	Shoreline	**Middle**	**Deep**
Upper River	Brown poorly-graded sand	Brown poorly-graded sand with silt and gravel	Brown poorly-graded gravel with sand
Middle River	Brown poorly-graded sand with gravel	Brown well-graded sand	Brown poorly-graded gravel
Lower River	Brown poorly-graded sand	Brown poorly-graded sand with gravel	Brown well-graded gravel with sand
Discharge	Brown Silt	No sample	No sample

M. Abney
Georgia Power Environmental Lab

Representative Substrate

Shoreline	Middle
	
Deep	**Discharge**
	

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Georgia Power Environmental Lab

AR-06-2684

Enclosure

Attachment C-4 #89

REVISED
July 19, 2004

Title 22 Compliance Requirements Manual

Introduction

The 2004 Georgia General Assembly passed a law amending Chapters 2 and 3 of Title 22 of the Official Code of Georgia Annotated. The amendments add new requirements that a utility must meet before exercising the power of eminent domain in constructing certain electric transmission lines.

The new requirements become effective on July 1, 2004, and include the following:

- Holding one or more public meetings in each county where a transmission line is to be constructed with an opportunity for comment and questions.
- Documenting compliance with the requirements, such as a description of the alternative construction approaches the utility considered for each transmission line construction project and why it rejected those alternatives.
- Demonstrating that the utility, in selecting the route for a transmission line, considered factors such as existing land uses, existing environmental conditions, existing corridors, engineering practices related to the construction and operation of the line, and costs related to construction, operation, and maintenance of the line.
- Providing that in condemnations for transmission lines, hearings before the Special Master must take place no sooner than 30 days, but no more than 40 days, from the date on which the petition and order are served on the condemnee(s).

This manual includes the protocols Georgia Power must follow to meet the new requirements of Title 22. The protocols are organized in the order in which they occur in the process of constructing a transmission line. Each section begins with a Protocol Checklist and is followed by details on how to comply with the protocols.

The process begins with the planners identifying a particular transmission problem and then forming a Solution Team to choose a preferred solution. The next step involves the Location Committee's analyzing route options and siting the new line, and public meetings then follow to provide an opportunity for comment by members of the public. The Land Department will then try to obtain the necessary property rights by negotiating in good faith with affected landowners. If necessary, condemnation proceedings occur next, followed by a post-condemnation process and litigation of any appeals.

In the case of many transmission line projects undertaken by Georgia Power Company, the departments listed below have some responsibility in the protocols that are required for each step in the process of planning such projects and acquiring the necessary property rights:

Southern Company Services:

Transmission Planning–East

Georgia Power Company:

Area Planning
Project and Administration
Land Department
Environmental Affairs
Line Design and Engineering
Acquisition Group
Land Department Legal Services
Transmission Maintenance Center
Transmission Construction
Transmission Planning and Administration
Corporate Communication
Community and Economic Development

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Section A: Problem Identification and Selection of Preferred Solution

Protocol Checklist

In the case of most Georgia Power transmission line projects, a Planner in Southern Company Services Transmission Planning–East is responsible, in conjunction with Georgia Power Area Planning and Transmission Support, for the following activities:

- ☐ Assess the transmission problem.
- ☐ Identify alternative solutions
- ☐ Assess alternate solutions for Title 22 implications
- ☐ Evaluate alternatives for viable solutions
  - o Select the best practical and feasible solutions
  - o Assess these solutions for Title 22 implications
- ☐ Organize a Solution Team to review and evaluate viable solutions
- ☐ Determine – with guidance and advice from the Land Acquisition and Legal Services departments – whether any of the proposed solutions from the narrowed-down list will require acquisition of property rights and, therefore, require compliance with the new Title 22 requirements.
- ☐ Implement the Alternative Construction Approaches Checklist (**Exhibit A-1**) and make sure alternative construction approaches are identified and documented for the proposed solutions in the narrowed-down list.
- ☐ Work with the Solution Team to select a preferred solution and document the preferred solution that is selected.
- ☐ Clear Solution Team documentation with Legal Services and transmit Title 22 Project File to Land Legal Services.

Section A: Problem Identification and Selection of Preferred Solution

Protocols

1. Problem Identification

Southern Company Services Transmission Planning–East and Georgia Power's Area Planning and Transmission Support groups are responsible for developing new 115 kV, 230 kV, and 500 kV transmission line facilities and documenting the need for such facilities. Transmission Planning–East takes primary responsibility for network transmission needs in Georgia, and Area Planning assumes primary responsibility if the radial transmission system needs to be developed to serve new customer load. These groups conduct the following activities to identify problems on the transmission system in Georgia:

- Perform load flow analysis of the system.
- Consider new load/demand creates a need for system improvements.

2. Alternative Solutions

A Planner in Transmission Planning, with input from Area Planning and Transmission Support, determines first whether the scope and nature of the electrical problem require that alternative solutions be considered.

- If there is only one electrical solution:
    1. Send project to the Solution Team
    2. Request estimates.
- If there are multiple possible electrical solutions:
    1. Perform internal planning review.
    2. Analyze solutions to develop viable alternatives.
    3. Send project to the Solution Team.
    4. Request estimates.

3. Solution Team

Transmission Planning and Area Planning pull together and chair a Solution Team that includes representatives from Transmission Planning, Project Management, Line Engineering, Transmission Maintenance Center, the Regions, and Land Acquisition (Location Engineer), as well as a Staff Attorney from Land Legal Services and estimators.

The Planner – with guidance and advice from a Land Legal Services Staff Attorney and a Land Location Engineer – determines whether any of the proposed alternative solutions will require

new or additional property rights and, therefore, make the project subject to the new requirements of Title 22.

The Planner chairs the Solution Team and is responsible for:

- Identifying the specific participants in the Solution Team.
- Providing the Solution Team the necessary information to gain an in-depth understanding of the electrical problem to be solved and the alternative electrical solutions by:
    1. Identifying overloaded facilities, the conditions that cause the overload, and the magnitude of the overload.
    2. Reviewing the list of alternative solutions prepared by the Planner.
- Soliciting information and input from Solution Team members so the Team can become familiar with the existing transmission facilities and the geography, topography, and land uses in the problem area by:
    1. Reviewing Transmission Key Map, Grid Maps, and System One-Line Diagrams.
    2. Reviewing STOMP facility information and ABSITS.
    3. Reviewing Line Design and TMC facility records (including Job Spec Books, Plan Sheets, and Profiles).
    4. Making a site visit to the problem area to review geography, topography, existing land uses, archaeological and environmental concerns, mechanical and electrical condition of existing facilities, and access to rights-of-way.
- Preparing and presenting all relative information/documentation regarding the problem, the internal review process, and feasible alternatives for further review and analysis.
- Implement the Alternative Construction Approaches Checklist (**Exhibit A-1**) to determine which construction approaches are feasible for the solutions.
- Charging the Solution Team with identifying a preferred solution from the feasible alternatives derived from the internal planning review.
- Requesting and helping complete cost estimates for the feasible alternative solutions.
- Reviewing cost estimates by:
    1. Seeking input from each representative on the Solution Team.
    2. Including site visits to validate/clarify any assumptions.
- Requesting revised cost estimates if needed.
- Taking minutes at the meeting(s).

4. Selection of Preferred Solution

The Planner charges the Solution Team with identifying a preferred solution and leads participants to:

- Gather more detailed information about the narrowed-down list of alternative solutions.
- Develop and review cost estimates of each alternative solution.
- Request revised estimates if necessary.
- Review information, input, and decisions of Solution Team members.
- Identify a preferred solution.
- Document the selection of the preferred solution and forward the documentation, as a part of the Project Business File, to the Project Manager.

For each of the alternative solutions that are subject to the Title 22 requirements after feasible alternative construction approaches have been considered, the Planner is responsible for:

- Documenting the analysis of the proposed solutions and the alternative construction approaches.
- Preparing a statement as to why any alternative construction approaches were rejected.
- Including all documentation in the Project Business File.

Exhibits for Section A:

Exhibit A-1: Alternative Construction Approaches Checklist

Exhibit A-1: Alternative Construction Approaches Checklist

This Alternative Construction Approaches Checklist should be implemented by the Planner and the Line Design Engineer after they have gained an in-depth understanding of the electrical problem to be solved and the alternative solutions and have become familiar with the existing transmission facilities and the geography, topography, and land uses in the problem area.

1. Explore possible solutions that would use existing Georgia Power rights-of-way ("ROW"):
   - ☐ Generate high-level cost estimates of both underground and overhead construction approaches.
   - ☐ Proceed with more detailed cost estimates of underground construction approaches or document why the underground options are not selected.
     - o Utilize the Underground Transmission Line Decision-Making Matrix to explore underground options.
     - o Utilize the Underground Transmission Line Cost-Estimating Tool to produce high-level cost estimates.
     - o If underground options appear feasible, prepare detailed cost estimates.
   - ☐ If underground options are not selected, proceed with more detailed cost estimates of overhead construction approaches or document why the solutions using existing Georgia Power ROW are not selected.
     - o Explore possibilities to upgrade, reconductor, or rebuild existing Georgia Power transmission lines.
     - o For new transmission lines, consider compacting existing lines on existing ROW, building double circuit lines, or acquiring new ROW adjacent to existing ROW.
     - o Consider whether existing facilities can be taken out of service for the duration of the construction project.
     - o Prepare cost estimates using TEAMS and following Line Design estimating process and conventions.
2. Explore possible solutions that would use existing public ROW:
   - ☐ Generate high-level cost estimates of both underground and overhead construction approaches.
   - ☐ Proceed with more detailed cost estimates of underground construction approaches or document why the underground solutions are not selected.
     - o Utilize the Underground Transmission Line Decision-Making Matrix to explore underground options.
     - o Utilize the Underground Transmission Line Cost-Estimating Tool to produce high-level cost estimates.

- If underground options appear feasible, prepare detailed cost estimates.

- ☐ If underground options are not selected, proceed with more detailed cost estimates of overhead construction approaches or document why the solutions using public ROW are not selected.
  - Utilize state and county road maps to develop possible routes for new transmission line.
  - Determine whether the line can be built on public ROW or just off public ROW by acquiring new Georgia Power ROW adjacent to the public ROW.
  - Determine whether there are plans to modify the existing public ROW and whether the new transmission line would create any public safety hazards (such as clear roadside issues).
  - Contact public officials responsible for the public ROW to determine if they would allow the new line to be installed on the public ROW and if permits could be acquired in a timely manner.
  - Prepare cost estimates using TEAMS and following Line Design estimating process and conventions.

3. Explore possible solutions that would use new ROW:
   - ☐ Generate high-level cost estimates of both underground and overhead construction approaches.
   - ☐ Proceed with more detailed cost estimates of underground construction approaches or document why the underground solutions are not selected.
     - Utilize the Underground Transmission Line Decision-Making Matrix to explore underground options.
     - Utilize the Underground Transmission Line Cost-Estimating Tool to produce high-level cost estimates.
     - If underground options appear feasible, prepare detailed cost estimates.
   - ☐ If underground options are not selected, proceed with more detailed cost estimates of overhead construction approaches or document why the solutions of using new ROW are not selected.
     - Make a site visit to the problem area to review geography, topography, existing land uses, archaeological and environmental concerns, mechanical and electrical condition of existing facilities, and access to new ROW.
     - With input from the Location Engineer, conduct a high-level assessment of public impact and likelihood of locating a route on new ROW.
     - Prepare cost estimates using TEAMS and following Line Design estimating process and conventions.
4. Determine a preferred solution and review decisions with Transmission Line Engineering Supervisor, Principal Engineer, and Team Leader.

Section B: Siting

Protocol Checklist

- ☐ The Location Engineer shall gather data pertaining to the transmission line project.
- ☐ The Location Engineer shall complete a Project Scope Document (**Exhibit B-1**) with key information about the project and shall obtain visuals pertaining to the project.
- ☐ The Land Department shall organize a Location Committee made up of individuals from designated areas.
- ☐ The Location Committee is responsible for ensuring compliance with Title 22 requirements and, therefore, must consider the following in selecting a route for the location of an electric transmission line:
  - ☐ Alternative construction approaches. (see **Exhibit A-1**)
  - ☐ Existing land uses in the geographic area where the line is to be located. (see **Exhibit B-2**)
  - ☐ Existing corridors. (see **Exhibit B-3**)
  - ☐ Existing environmental conditions in the area. (see **Exhibit B-4**)
  - ☐ Engineering practices related to the construction and operation of the line. (see **Exhibit B-6**)
- ☐ The Location Committee shall determine a Final Study Route.
- ☐ The Land Department shall ensure that documentation of compliance with Title 22 requirements is complete and is included in the Project Business File.

Section B: Siting

Protocols

The location, or siting, process is the first step in determining a route for an electric transmission line and is followed by acquiring the necessary property rights for the line and releasing for construction a right-of-way corridor on which the line will be built. In carrying out that first step, the Location Committee must select a route that is practical and feasible taking into consideration Title 22 in addition to reliability and safety in making its decision. While the Location Committee is conducting its analysis of potential routes, the property owners remain anonymous.

Title 22 requires that Georgia Power document its process for selecting a transmission line route. Specifically, § 22-3-161(a) states:

> "In selecting the route for the location of the electric transmission line, the utility shall consider existing land uses in the geographic area where the line is to be located, existing corridors, existing environmental conditions in the area, engineering practices related to the construction and operation of the line, and costs related to the construction, operation, and maintenance of the line."

The work of the Location Committee, as described in this section, leads to the selection of a route for a transmission line. Thus, the Location Committee is directly responsible for complying with these requirements of Title 22.

1. Data Gathering

Data gathering and preliminary route analysis tasks will vary depending on whether the Location Engineer, who is the project manager for the overall location process, utilizes Land Engineering GIS services or a consultant as a resource for the data necessary to locate a route for a transmission line.

The Location Engineer is responsible for defining a general project area and outlining the basic project assumptions for the preferred solution (voltage, construction type, schedule, purpose, and need) as determined by the Solution Team. The Location Engineer also may identify preliminary routes or route segments to serve as starting points from which additional alternatives or adjustments can be made.

The Location Engineer is responsible for:

- Obtaining the Project Business File from the Solution Team.
- Identifying the possible corridors for the transmission line.
- Ordering aerial photography of the project area.
    1. Determine scale
    2. Black and white or color

- Reviewing and updating applicable ARC GIS Data Layers to include data on:
    1. Land uses
        a. Evaluation criteria (such as airports, cemeteries, churches, schools, cultural resources, historical sites, residences, and businesses)
        b. Zoning
    2. Environmental issues
        a. Rivers, streams, and wetlands
        b. Endangered species
    3. Existing corridors
        a. Utilize the ITS transmission grid
        b. Identify other corridors (such as pipelines and telecommunications facilities)
- Obtaining county property tax records/maps (with identities of property owners excluded)
- Considering access for construction and maintenance.
- Coordinating work activities between the consultant and the Location Committee, if applicable.

2. Location Committee Preparation

The Location Engineer is responsible for reviewing the Project Business File and preparing the Project Scope Document (in the form of **Exhibit B-1**) to be presented to the Location Committee that includes the following information:

- Need for the project
- Required right-of-way width
- Line construction type
- Guys/guy flares
- Underbuild (transmission, distribution, other)
- Required substation area
- Terrain of project area

The Location Engineer also obtains visuals to be presented as needed, including:

- Aerial photography or ARC GIS output of the possible corridors
- Tax parcel information (with identities of property owners excluded to assure no ownership is known prior to route selection)
- Other maps (such as USGS topographical maps, county maps, and ITS grid maps)

- Demographic data

3. Location Committee Formulation

A representative from the Land Department is responsible for organizing a Location Committee made up of individuals from the following areas:

- Land (chairs the committee)
- Environmental Affairs
- Regions
- Transmission Planning
- Transmission Maintenance Center ("TMC")
- Transmission Line Design (Line/Substation)
- Transmission Line Construction (Line/Substation)
- Area Planning
- Advisory members, as appropriate, from Corporate Communication, Legislative Affairs, and Community and Economic Development

If the Location Committee is siting a substation in conjunction with a transmission line that is subject to the new Title 22 requirements, the committee will include representatives from Substation Design, Substation Construction, and Land Engineering.

The chair of the Location Committee is responsible for sending notification of the project to managers/supervisors of committee members. The notification should:

- Briefly describe the location process.
- Identify the project.
- State the scope of the project.
- State the responsibilities of committee members.
- Emphasize the commitment of time and effort required of committee members.
- Ask for a recommendation or approval of a representative from their departments.

4. Location Committee Key Responsibilities

The Location Committee must comply with the requirements of Title 22, which states that in selecting a route for the location of an electric transmission line, a utility shall consider:

- Alternative construction approaches. (see **Exhibit A-1**)
- Existing land uses in the geographic area where the line is to be located. (see **Exhibit B-2**)

- Existing corridors. (see **Exhibit B-3**)
- Existing environmental conditions in the area. (see **Exhibit B-4**)
- Engineering practices related to the construction and operation of the line. (see **Exhibit B-6**)
- Costs related to the construction, operation and maintenance of the line.

5. Determination of a Final Study Route

The Location Committee shall consider potential routes and shall determine a Final Study Route, which is the general corridor within which the final engineered transmission line will be located.

6. Documentation of Compliance with Title 22 Requirements

After a Final Study Route has been determined, the Land Compliance Coordinator and the Land Department Staff Attorney responsible for the Acquisition Team for the project shall ensure that documentation of compliance with the Title 22 requirements is complete and is included in the Project Business File.

Exhibits for Section B:

Exhibit B-1: Project Scope Document
Exhibit B-2: Existing Land Uses Checklist
Exhibit B-3: Existing Corridors Checklist
Exhibit B-4: Existing Environmental Conditions Checklist
Exhibit B-5: Preliminary Location Process Environmental Report ("LPER")
Exhibit B-6: Engineering Practices Checklist

Exhibit B-1: Project Scope Document

Project Definition

Scope

Project Name:
(Complete name)

Project Need:
(High level understanding of the need for the project based on planning projections and load demand)

Type of Facilities Needed:
(Transmission line voltage or substation configuration, along with land rights – ROW requirements.)

Termination Points or Site Location:
(Beginning and ending substations, taps, and load centers for substations)

Schedule:
(Start, finish, duration)

Additional Information:
(Additional information pertinent to identifying the scope of the project)

Preliminary Findings

Physical Elements:
(Things that may impact the project, such as topography, airports, navigable rivers, railroads, and existing utilities)

Special Conditions:
(Territorial or franchise issues, DOT, or federal or state issues)

Other Information:
(Any other information that is needed or will help in the analysis)

Assumptions

(Information that is understood or ideas being considered that will underlie location constraints for the project. For example: underground solution has been ruled out because of cost, or topography suggests using certain structures.)

Identification of Preferred Solution

(Information about the preferred solution selected by the Solution Team)

Exhibit B-2: Existing Land Uses Checklist

Cultural Resources

- ☐ Environmental Affairs provides information about proposed transmission line corridors to Land Resources.
- ☐ Land Resources contracts with a professional consultant to conduct background research on potential cultural resources in the proposed corridor areas.
- ☐ The consultant prepares background report for Land Resources on the locations and descriptions of previously recorded cultural resources (archaeological or architectural).
- ☐ Land Resources forwards copies of the consultant's report to the Acquisition Supervisor, Environmental Affairs, and the Location Engineer.
- ☐ When the Location Committee selects a route and a survey of the selected route is completed, Land Resources requests the consultant to conduct a cultural resource investigation of the surveyed route.
- ☐ If a significant issue develops during the investigation by the consultant, the consultant contacts Land Resources, which coordinates with the Location Engineer and Environmental Affairs to resolve the issue.
- ☐ The consultant submits to Land Resources a draft report that identifies previously unknown, significant archaeological and architectural resources, if any, and recommends a determination of eligibility for each resource.
- ☐ Land Resources reviews the consultant's draft report and forwards copies of the draft report to Land Acquisition, the Location Engineer, and Environmental Affairs for review and comment.
- ☐ Land Resources provides comments back to the consultant for preparation of a final report.
- ☐ If Section 106 of the Historic Preservation Act applies, Land Resources submits the report to the State Historic Preservation Office ("SHPO") for Section 106 review and response.

Current Zoning

- ☐ The Location Committee utilizes current land use maps and zoning ordinances to develop an understanding of the current land issues in the proposed transmission line corridors.

Exhibit B-3: Existing Corridors Checklist

- ☐ The Location Committee reviews Transmission Key Map, Grid Map, and System One-Line Diagrams for existing electric transmission line corridors.
- ☐ The Location Committee utilizes aerial photography to identify other existing corridors (such as pipeline or telecommunication corridors) in the proposed corridor areas.
- ☐ The Location Committee utilizes information from field inspections to identify other existing corridors (such as newly constructed corridors or others not identifiable in the aerial photography) in the proposed corridor areas.

Exhibit B-4: Existing Environmental Conditions
(Overview followed by Checklist)

The Location Process includes two stages involving environmental issues:

Stage 1

Stage 1 consists of the more broad scale, generally public domain research and analysis that are performed under the auspices of the Location Committee. These investigations provide useful data for the selection of a Final Study Route. Because field surveys and inspections have not begun within the study area at this point in the process, these analyses must be performed using "off the shelf" data and are typically conducted within a Geographic Information System ("GIS") environment.

- Environmental work generally begins with the establishment of an Environmental Project Area, which creates the boundary for subsequent analyses, both formal and informal. The project area may be a logical boundary of geographic/land use features, or it may be defined by environmental determinants, such as watershed limits.

- The Location Committee develops alternatives for consideration within the project area.

- Environmental Affairs prepares the Preliminary Location Process Environmental Report ("LPER") (**Exhibit B-5**) in a GIS and documents the LPER with a map.

  1. Additional alternatives and/or modifications to existing alternatives are likely at this point in the process as a result of environmental constraints revealed by the LPER map.

  2. Coordination with regulatory agencies can occur at any point in the process, but typically occurs subsequent to alternative development and preliminary LPER preparation. These factors facilitate meaningful consultation with the necessary agencies.

  3. At project inception, Environmental Affairs creates a project folder/binder to collect and establish the necessary components of the final LPER.

  4. The LPER worksheet is intended to guide environmental compliance activities and facilitate documentation. The main components of the LPER worksheet are:

     a. Project Information
     b. Study Area Characteristics
     c. Environmental Resource Characteristics
     d. Agency Coordination
     e. Meeting/Activity Log
     f. Mitigation Commitments
     g. Permit Assessment

- Stage 1 is complete when the Location Committee selects a Final Study Route.

- This Exhibit B-4 includes a checklist entitled "Baseline Regulatory and Environmental Determinant Framework," which covers Stage 1 activities that are relevant to the location process.

[Note: GIS is the primary framework around which the Stage 1 activities are performed. The GIS for location activities is **location.mxd**. (Under the ArcView 3.x series, it was formerly named **location.apr** reflecting previous file conventions.) References to shapefiles and layers will be used interchangeably for the purposes of this document.]

Stage 2

Stage 2 is focused and field-oriented and begins after survey notification is complete for parcels along the Final Study Route. On-the-ground surveys of the Final Study Route provide detailed information and locations of, among other things, wetlands, streams, habitat types, vegetation communities, protected species, and potential cultural resources within the Final Study Route.

Stage 2 activities include:

- Field surveys for waters of the U.S. (including streams and wetlands), waters of the State, and protected species are performed along the Final Study Route.
- Minor modifications to the project centerline may occur to minimize project impacts.
- The Stage 2 process is documented through the completion of the LPER worksheet (**Exhibit B-5**), which begins in Stage 1. The worksheet, Preliminary LPER Map, and relevant attachments (such as consultant reports and contact database) collectively constitute the Final LPER.

The information gathered in Stage 2 is then utilized for three primary purposes:

- To make fine-scale adjustments (minor route changes and structure location modifications) to minimize environmental impacts to the extent practicable.
- To supply hard data to the environmental permitting process as needed (such as NPDES permitting, §404 CWA permitting, and USFWS coordination).
- To assist construction staff in designing and implementing access roads and stream crossings.

Exhibit B-4: Existing Environmental Conditions (continued)

Baseline Regulatory and Environmental Determinant Framework

[Note: "Location.mxd" is the base ESRI ArcGIS 8.x project file from which all LPER reports and maps are generated. Shapefiles and layers are presented here in italics and refer to those files included in the project document Location.mxd.]

Wetlands

Does the project cross and/or impact any wetlands?

☐ YES ☐ NO

☐ *Analyze National Wetlands Inventory (NWI) mapping within the GIS.*

☐ *Investigate USGS 7.5' Quadrangles with contour mapping within the GIS.*

☐ *Investigate Color Infrared Photos.*

☐ Perform Windshield Survey.

Land Use

Does the project cross any areas of a National Forest?

☐ YES ☐ NO

☐ *Analyze USFS National Forest Land shapefile within the GIS to determine whether the project impacts the Chattahoochee National Forest or the Oconee National Forest.*

☐ Perform Windshield Survey.

Does the project cross any areas of state ownership/management?

☐ YES ☐ NO

☐ *Analyze GA DNR Managed Lands shapefile within the GIS.*

☐ *Analyze Stewardship Lands.*

☐ Perform Windshield Survey.

Does the project cross any other areas of non-private ownership?

☐ YES ☐ NO

☐ *Analyze Stewardship Lands.*

☐ *Investigate Appalachian Trail CL.*

☐ Perform Windshield Survey.

☐ Analyze GDOT County Road Maps on paper.

Wildlife

Does the project affect any important avian habitat areas?

☐ YES ☐ NO

☐ *Analyze Known Wading Bird Concentrations shapefile within the GIS.*

☐ *Analyze Audubon Society Important Bird Areas shapefile within the GIS.*

☐ *Analyze Bald Eagle Nest Locations (one-mile buffer).*

☐ *Analyze Woodstork Nest Locations (three-mile buffer).*

Protected Species

Does the project impact any federally listed species?

☐ YES ☐ NO

☐ *Analyze Federal TES List by County (hyperlink).*

☐ *Analyze Heritage Database Locations (2004-2001).*

☐ *Analyze EO Quarter Quad.*

☐ *Analyze Known Woodstork Locations shapefile within GIS (three-mile buffer).*

☐ *Analyze Known Bald Eagle Nest Locations shapefile within GIS (one-mile buffer).*

Does the project impact any state listed species?

☐ YES ☐ NO

☐ *Analyze State TES List by County (hyperlink)*

☐ *Analyze Heritage Database Locations (2004-2001)*

☐ *Analyze EO Quarter Quad*

Streams and Rivers

Does the project cross and/or impact any streams or rivers?

☐ YES ☐ NO

☐ *Analyze USGS Streams shapefile within the GIS.*

☐ *Analyze USGS Lakes shapefile within the GIS.*

☐ *Investigate USGS 7.5' Quadrangles with contour mapping within the GIS.*

☐ Perform Windshield Survey.

Does the project cross and/or impact any National Wild and Scenic Rivers?

☐ YES ☐ NO

☐ *Investigate National Wild and Scenic Rivers shapefile within the GIS.*

Does the project cross any "navigable waters"?

☐ YES ☐ NO

☐ *Determine crossing of navigable waters.*

☐ *Investigate USGS 7.5' Quadrangles with contour mapping within the GIS.*

Does any part of the project occur within 2000 feet of the Chattahoochee River?

☐ YES ☐ NO

☐ *Investigate USGS 7.5' Quadrangles with contour mapping within the GIS.*

☐ *Investigate USGS Streams.*

Does the project occur within a county containing designated trout waters?

☐ YES ☐ NO

☐ *Investigate Trout Counties (hyperlink).*

Does the project cross any "major" rivers?

☐ YES ☐ NO

☐ *Investigate flow 400 cfs.*

☐ *Investigate USGS Streams.*

Does the project cross any impaired waters?

☐ YES ☐ NO

☐ *Analyze 305(b)/303(d) Listed Streams*

Does the project occur in a regulated "coastal county"?

☐ YES ☐ NO

☐ *Analyze Coastal Counties shapefile within the GIS.*

Early Coordination

While not required during Stage 1 of the location process, early coordination with state and federal agencies is beneficial. This coordination is in advance of any specific permitting activities. The following agencies may be contacted to acquire information about the study area for the proposed project and/or to coordinate future permitting actions:

☐ US Fish and Wildlife Service – regarding Federally listed protected species and locations of designated critical habitat.

- ☐ GA DNR Natural Heritage Program – regarding Federal and state-listed protected species.
- ☐ GA DNR Coastal Resources Division – regarding projects occurring within one or more of the designated coastal counties.
- ☐ US Corps of Engineers – regarding projects with anticipated substantive stream/river crossing, navigable waters, and/or involving crossings or impacts to Corps lakes or property.
- ☐ Georgia State Historic Preservation Officer ("SHPO") – regarding projects involving known locations of existing National Register properties and/or other important heritage resources.

Exhibit B-5: Preliminary Location Process Environmental Report ("LPER")

LPER WORKSHEET

GEORGIA POWER
A SOUTHERN COMPANY

PROJECT INFORMATION

Date:

Project Name:
Brief Description of Project:

Worksheet Completed By:
Location Committee Members:

Other Information:

STUDY AREA CHARACTERISTICS

Has a Study Area Been Defined? YES☐ NO☐
Study Area Size (in acres or square miles):
County(ies):
Physiographic Province(s):

Other Information:

ENVIRONMENTAL RESOURCE CHARACTERISTICS

Check all Environmental Determinants that exist within the Study Area (refer to the Preliminary LPER Map, location.mxd)

Stage 1

Environmental Determinant	YES	NO
Wetlands	☐	☐
Streams/Lakes	☐	☐
National Forest	☐	☐
DNR Land	☐	☐
Other Non Private Land (Describe below)	☐	☐
Important Avian Habitat Areas	☐	☐
Known Locations of Federally Listed Species	☐	☐
Known Locations of State Listed Species	☐	☐
Known Bald Eagle Nests	☐	☐
Known Woodstork Nests	☐	☐
Wild and Scenic Rivers	☐	☐
Navigable Waters	☐	☐
Chattahoochee River	☐	☐

Designated Trout Waters	☐	☐
Major Rivers (>400cfs)	☐	☐
303(d) Listed Streams	☐	☐
"Coastal Counties"	☐	☐
Other:	☐	☐
Other:	☐	☐
Other:	☐	☐

Stage 2

Environmental Field Surveys	**Date(s)**	**Consultant Used**
Streams/Wetlands/Buffers		☐
Protected Species		☐
Other:		☐
Other:		☐

AGENCY COORDINATION

Check all boxes that apply to coordination (formal and informal) with respect to the location process. Document dates of coordination in the log below.

Review Georgia Natural Heritage Program Element Occurrence Database (Quarter Quad) ☐

Literature Review GA DNR State-Listed Species (by County) ☐

Review US Fish and Wildlife Service-Listed Species (by County) ☐

Preliminary Contact/Coordination with USFWS Ecological Services ☐
Details:

Preliminary Contact/Coordination with USCOE ☐
Details:

Preliminary Contact/Coordination with GA DNR Natural Heritage Program ☐
Details:

Other: ☐

MEETING/ACTIVITY LOG

Briefly describe and date the meetings, agency coordination, work product production, field visits and other project milestones relevant to the location process.

Date: Activity/Meeting:
Date: Activity/Meeting:
Date: Activity/Meeting:

Date: Activity/Meeting:
Date: Activity/Meeting:
Date: Activity/Meeting:
Date: Activity/Meeting:
Date: Activity/Meeting:

MITIGATION COMMITMENTS

Describe below with as much detail as relevant any mitigation commitments that are made with agencies, private property owners, etc. Provide action items to ensure compliance.

Mitigation:
Agency or Individual Name:
Action Item(s):

Mitigation:
Agency or Individual Name:
Action Item(s):

Mitigation:
Agency or Individual Name:
Action Item(s):

Mitigation:
Agency or Individual Name:
Action Item(s):

PERMIT ASSESSMENT

Check all items that apply. Use responses to the list below to guide early coordination and scheduling with regulatory agencies.

Clean Water Act
- Section 404
  - Nationwide Permit (no notification) ☐
  - Nationwide Permit (PCN) ☐
  - Individual Permit ☐
- Section 401 ☐

National Environmental Policy Act
- CE ☐
- EA ☐
- EIS ☐

Rivers and Harbors Act
Section 10 Permit ☐

Endangered Species Act
Section 10
HCP ☐

Georgia Environmental Policy Act
Permit ☐

Historic Preservation Act
Section 106
MOU ☐

Georgia Erosion and Sedimentation Act
Buffer Variance ☐

Other: ☐

Other: ☐

Other: ☐

Exhibit B-6: Engineering Practices Checklist

After the Solution Team has identified a preferred solution to a transmission problem and the decision has been made to construct a new transmission line, the Location Committee should address the following issues related to the construction and operation of the line:

1. Evaluate overhead vs. underground option.

- ☐ Is underground a feasible option? If so, prepare a preliminary estimate for underground design.

2. Evaluate three overhead-line options:

a. Option 1: Rebuild existing GPC facility to accommodate new transmission line circuit.

- ☐ Can existing facility be taken out of service?
- ☐ If no, go to Option 2.
- ☐ If yes, is existing right-of-way width adequate for a rebuild?
- ☐ If no, can existing right-of-way be perfected for additional width?
- ☐ If no, go to Option 2.
- ☐ If yes, prepare a preliminary estimate for double-circuit design.

b. Option 2: Construct new transmission line on state or county road right-of-way.

- ☐ Will DOT/county allow new transmission line to be placed on road right-of-way?
- ☐ If no, can new right of way be acquired adjacent to road right-of-way?
- ☐ If no, go to Option 3.
- ☐ If DOT/county will allow new TL to be placed on the road right-of-way or if a new right-of-way can be acquired adjacent to the road right-of-way, prepare a preliminary estimate for single-pole design.

c. Option 3: Construct new transmission line on new right-of-way corridor.

- ☐ Can new right-of-way be acquired adjacent to existing GPC right-of-way?
- ☐ If no, acquire new right-of-way corridor and prepare preliminary estimates for:
  - Short span (single-pole) design
  - Long span (H-frame/tower) design
- ☐ If yes, prepare preliminary estimates for:
  - Short span (single-pole) design
  - Long span (H-frame/tower) design

3. Evaluate estimates to select preferred solution.

Section C: Public Meetings

Protocol Checklist

Before the public meetings occur, the Land Compliance Coordinator is responsible for:

- ☐ Preparing a list or lists of the owners of all property over which the transmission line is to be constructed or expanded.
- ☐ Determining the number of public meetings to be held in each affected county and setting the date(s) and time(s).
- ☐ Planning the logistics of the public meeting(s).
- ☐ Preparing and distributing public meeting notice(s) to appropriate newspaper(s).
- ☐ Preparing and sending, by certified mail, notice of public meeting(s) to property owners and local government officials.

A few days before and on the day of the meeting(s), the Land Compliance Coordinator is responsible for:

- ☐ Meeting with the venue manager to review logistics and discuss last-minute details of the meeting.
- ☐ Hosting a pre-meeting gathering of company participants.
- ☐ Overseeing set-up of the meeting.
- ☐ Providing ample opportunity for the public to express views and ask questions.
- ☐ Making sure media relations issues are being handled and directing the photographer.

After the meeting(s), the Land Compliance Coordinator is responsible for:

- ☐ Conducting a wrap-up session with meeting participants.
- ☐ Placing appropriate documentation in the Project Business File.

Section C: Public Meetings

Protocols

Protocols 1 through 5 describe what needs to occur before the public meeting(s) is (are) held:

1. Property List(s)

The Land Compliance Coordinator is responsible for:

- Instructing the Acquisition Coordinator to generate a Tax Records List of impacted property owners not less than two weeks after the Location Engineer sends out the project location letter.

  The Tax Records List includes the owners of property over which the line is to be constructed or expanded and is prepared by using the tax records of each county in which any portion of the electric transmission line is to be constructed or expanded.

- Making sure the necessary maps, including parcel numbers, are provided to the Acquisition Coordinator by the Location Engineer for Acquisition Agents to begin research in the county or counties where the properties are located to determine the owners' names and contact information as recorded in the county tax records.

The Acquisition Coordinator is then responsible for:

- Conducting research in a manner to ensure full contact information is obtained.
- Confirming the number of impacted property owners.
- Ensuring the Tax Records List is entered into LAC along with all data requested in LAC at this phase of the project.
- Presenting the Tax Records List and contact information to the Land Compliance Coordinator.

In each affected county, if the number of property owners identified in the Tax Records List is 50 or less, the Land Compliance Coordinator is responsible for obtaining a second list (the Title Records List) of each of the owners of affected property, as indicated in the vesting document(s) in the chain of title for each such property.

In some instances, there may be more property owners in the chain of title than are shown in the tax records. For example, where title is held by an estate, there may be large number of heirs that are property owners according to the vesting document but a single name may be on the tax records for the property. Because Title 22 requires that the number of public meetings be determined based on the number of property owners, it is the purpose of the Title Records List to confirm whether more than one public meeting is required in those instances where there is the potential for uncertainty regarding the actual number of property owners in the chain of title.

If it can be objectively determined, without reference to the Tax Records List, that the number of property owners in the chain of title from whom property rights must be acquired is less than 50, it is not necessary to prepare the Title Records List. A Title Records List is also not necessary if the number of property owners identified in the Tax Records List is more than 50 or the decision has already been made to hold two or more public meetings based on factors other than the number of property owners from whom property rights must be acquired.

The Land Compliance Coordinator is responsible for placing copies of the property list(s) in the Project Business File.

2. Number and Scheduling of Public Meetings

The Land Compliance Coordinator is responsible for determining the number of public meetings to be held in each affected county and setting the date(s) and time(s) by reviewing the Tax Records List and, where applicable, the Title Records List to determine the total number of property owners in any county from whom property rights must be acquired.

If the number of property owners from whom property rights must be acquired in any county is 50 or less, one public meeting is required. If the number of property owners from whom property rights must be acquired exceeds 50 in any county, two (or more) public meetings must be scheduled.

In the event only one public meeting is held, that meeting shall be planned to commence between 6 p.m. and 7 p.m., inclusive, on a business weekday. If more than one public meeting is held, at least one of the public meetings shall commence between 6 p.m. and 7 p.m., inclusive, on a weekday.

Meetings should be scheduled far enough in advance to allow for adequate preparation and timely public notification.

3. Logistics of Public Meeting

In consultation with Region Management, the Land Compliance Coordinator secures, in each county in which the transmission line would be located, an accessible location open to the public, suitable for the public meeting to be held in an "open house" format with anticipated attendance. The Land Compliance Coordinator should:

- Identify the appropriate contact person for each venue.
- Visit the venue(s) with the contact person(s).
- Confirm adequate space for public and company participants.
- Set the date(s) for the public meeting(s) and establish a timeline for newspaper and certified mail notices and other preparation milestones. The timeline should anticipate potential delays and ensure adequate time for public meeting notice and preparation.
- Identify the departments to be represented at the public meeting.
- Identify personnel to represent the departments.

- Arrange for a Court Reporter to be present.
- Appoint front desk and sign-in personnel and ensure that a sign-in sheet or book is available for all attendees to sign upon entering the venue.
- Review venue information with corporate security.
- Confirm the number and size of exhibits to be presented and that venue space is sufficient.
- Coordinate and facilitate pre-public meeting preparation sessions for identified personnel to ensure everyone understands his/her role; confirm that all participants understand what supplies and equipment they will need to bring (such as paper, pens, easels, and handouts).
- In consultation with Corporate Communication and the Location Engineer, arrange for the creation, publication, and presentation of brochures, maps, and exhibits sufficient to provide:
    1. A description of the proposed project including the general route of the transmission line and the general property area within which the utility intends to construct or expand the electric transmission line. (Corporate Communication)
    2. The width of the proposed transmission line route. (Corporate Communication, Location Engineer)
    3. A description of the alternative construction approaches considered by the utility and why such alternatives were rejected by the utility. (Corporate Communication)

    Note: Maps should be labeled: "Proposed Project – Final Study Route." (Location Engineer)
- Arrange for a photographic record of the meeting. (Corporate Communication Photographer)

4. Public Meeting Newspaper Notice

The Land Compliance Coordinator is responsible for preparing and distributing public meeting notice(s) to appropriate newspaper(s). (see **Exhibit C-3**) The notice, which should be reviewed and approved by the Legal Services Manager, must contain the following essential elements:

- Date, time, and location of each meeting.
- A statement that the purpose of the meeting or meetings is to provide public notice of the utility's intent to construct or expand an electric transmission line for which the right of eminent domain may be exercised.
- A description of the proposed project including the general route of the electric transmission line and the general property area within which the utility intends to construct or expand the electric transmission line.
- The width of the proposed transmission line route.

- A description of the alternative construction approaches considered by the utility and a statement of why such alternatives were rejected by the utility.

The Land Compliance Coordinator is responsible for making sure the notice is published in a newspaper of general circulation in each county in which any portion of the electric transmission line is to be constructed or expanded. (see **Exhibit C-1**)

The Land Compliance Coordinator is responsible for identifying which newspaper(s) is/are the general circulation newspaper(s) in each affected county and submitting the notice for publication on a date not less than 30 days before the date of the first public meeting.

With respect to statutes in which the term "newspaper of general circulation" is not defined, the following criteria are helpful in determining which publications satisfy the requirements of the statutes:

- The publication should be available in all parts of the county.
- It should be published at least once weekly.
- It should be intended for general distribution and circulation.
- It should contain news of general interest to the public.
- It should be sold at fixed prices per copy, per week, per month, per year, to subscribers and readers without regard to business, trade, profession, or class.

The Land Compliance Coordinator is responsible for sending the notice to the newspaper(s) under cover of a letter (in the form of **Exhibit C-2)** and placing the requested publisher's certificate in the Project Business File.

5. Certified Mail Notice of Public Meeting(s) to Property Owners and Local Government Officials

With respect to property owners, the Land Compliance Coordinator:

- Sends the same notice that was sent to the newspaper(s) to affected property owners identified in the Tax Records List.
- Signs and includes with the notice a cover letter (in the form of **Exhibit C-4)**.
- Sends the notice by certified mail at least 30 days prior to the date of the first public meeting.
- Places copies of each letter and notice to property owners, along with certified mail coupons, in the Project Business File.

With respect to local government officials, the Land Compliance Coordinator:

- Sends the same notice that was sent to the newspaper(s) to the chairpersons and chief executives of the counties and the mayors of any municipalities in which any affected property is located.

- Signs and includes with the notice a cover letter (in the form of **Exhibit C-5** or **Exhibit C-6).**
- Sends the notice by certified mail at least 30 days prior to the date of the first public meeting.
- Places copies of each letter and notice to local government officials, along with certified mail coupons, in the Project Business File.

Protocols 6 through 10 describe what needs to occur a few days before the public meeting(s) is (are) held and what should be done the day of the meeting:

6. Meeting with venue manager

The Land Compliance Coordinator meets with the venue manager to review specific details about the set up of the meeting.

7. Pre-meeting Gathering

The Land Compliance Coordinator hosts a pre-meeting gathering of participants to remind all participants of their role, to confirm attendance of all essential participants and, if necessary, to distribute GPC logo shirts.

8. Conduct Meeting

The Land Compliance Coordinator oversees set-up of all exhibits, tables, comment cards and collection boxes, and refreshments.

9. Public Comments and Questions

The Land Compliance Coordinator ensures that a reasonable opportunity is allowed for members of the public to express their views on the proposed project and to ask questions by providing at each table and at the venue entrance and exit a sufficient number of comment and/or question cards, along with receptacle boxes to collect them.

10. Media Relations and Photography

The Land Compliance Coordinator makes sure media relations issues are being handled before, during, and after the meeting and, if necessary, directs the Corporate Communication photographer to capture certain themes/scenes during the meeting.

Protocols 11 and 12 describe what needs to occur after the public meeting(s):

11. Wrap-up Session

The Land Compliance Coordinator conducts a wrap-up session with the meeting participants to:

- Make sure all public comment cards have been collected.

- Collect all exhibits.
- Pick up sign-in sheet.
- Get a time frame from the photographer for receipt of pictures.
- Check with participants for problems, issues, contacts, and things that need improving.

12. Documentation

The Land Compliance Coordinator, who is responsible for the general execution and administration of the public meeting and ensuring compliance with these protocols, makes sure that all documents (including brochures, exhibits, public comment cards, question cards, and photography) from the public meeting(s) are preserved in the Project Business File for the subject line.

Exhibits for Section C:

Exhibit C-1: Newspaper Notice of Public Meeting Comments/Suggestions
Exhibit C-2: Sample Form Cover Letter Submitting Public Notice
Exhibit C-3: Public Notice of Public Meeting on Proposed Electric Transmission Line
Exhibit C-4: Cover Letter to Property Owner
Exhibit C-5: Cover Letter to County Chairperson/Chief Executive
Exhibit C-6: Cover Letter to City Mayor

Exhibit C-1

NEWSPAPER NOTICE OF PUBLIC MEETING COMMENTS/SUGGESTIONS

- Georgia Power currently places public notices in newspapers of general circulation in compliance with requirements of the Georgia Environmental Protection Division ("EPD"). Since this establishes an acceptable methodology used by Georgia Power, it is suggested that a consistent approach be adopted for the public notice requirements under O.C.G.A. 22-3-160.
- The public notice is treated as a Legal Notice and submitted to an appropriate newspaper of general circulation. A form cover letter **(Exhibit C-2)** submits the public notice **(Exhibit C-3)** for printing with no specified format, location, or font size, since typically newspapers have a specific section for such legal notices and standard format for such notices. Our practice has been to request, within that cover letter, an Affidavit of Publication, which is a sworn and notarized statement from a representative of the newspaper that the public notice was published on specified dates and includes a copy of the actual legal notice as printed. This Affidavit of Publication should be part of the documentation placed in the Project Business File. Additionally, actual copies of the page of the newspaper containing the public notice should be included in the Project Business File.
- Care should be taken to submit the public notice to the newspaper within the lead time required for publication. (For example, The Atlanta Journal-Constitution deadline for submission of legal notices is 72 business hours prior to publication.) The notice for each public meeting must be published at least thirty days prior to the date of the first public meeting.

Exhibit C-2: Sample Form Cover Letter Submitting Public Notice

{*Date*}

{*Name of Newspaper*}
Attention: Legal Notices/Classifieds
{*Street Address*}
{*City/State/Zipcode*}

RE: Public Notice

Dear {*Name of Newspaper*}

Attached is a public notice as required by the State of Georgia, pursuant to O.C.G.A. 22-3-160, which needs to run in your newspaper on {*Day*}, {*Month*} {*Date*}, {*Year*}. Enclosed is a check for {*Amount of Check*} to cover the cost of the notice. In addition, I would like to request an affidavit sent to my attention, certifying that the attached notice ran in your newspaper on this date. If you have any questions, please call me at {*Phone Number*}.

Thank you for your assistance in this matter.

Sincerely yours,

{*Signature*}
{*Printed Name*}

Attachments

Exhibit C-3

PUBLIC NOTICE OF PUBLIC MEETING ON PROPOSED ELECTRIC TRANSMISSION LINE

This is to inform all interested persons, pursuant to O.C.G.A. 22-3-160, that Georgia Power Company will be holding a public meeting on {*Day*}, {*Month*} {*Date*}, {*Year*}, at {*Time*}at {*Location*}. [*NOTE-If more than one hearing, insert:* A second public meeting will be held on {*Month*} {*Date*}, {*Year*}, commencing at {*Time*}and concluding at {*Time*} at {*Location*}.] The purpose of the meeting is to provide public notice of Georgia Power's intent to construct [*if applicable:* expand] an electric transmission line for which the right of eminent domain may be exercised, within {*Name of County*} County. The proposed project is a {*KV#*} KV {*insert explicit description: ex.. Overhead; lattice structure, etc.*} transmission line with a general route of {*insert general route description*} within the general property area of {*insert general property area*}. The width of the proposed transmission line route is {*width#*}. Alternative construction approaches considered by Georgia Power, with the reasons rejected, are as follows: {*insert alternative construction approaches along with the reasons rejected*}. The public will have the opportunity to ask questions and express views and comment on the project at the public meeting.

DRAFT

Exhibit C-4: Cover Letter to Property Owner

CERTIFIED MAIL

Re:_____

Dear _____:

As you may know, Georgia Power Company intends to construct a transmission line in _____ County. Once the transmission line right-of-way was located, the County Tax Records were researched to determine ownership of the land through which the transmission line will run. The results of this search reveal that the transmission line right-of-way, as located, will cross your property.

In order for you to have an opportunity to learn more about this project a meeting (or meetings) open to the public has (have) been scheduled. A copy of the notice to be published in the (name/date of newspaper) announcing this meeting (or these meetings) is enclosed for your information. We encourage you to attend and participate in this forum.

Sincerely,

DRAFT

Exhibit C-5: Cover Letter to County Chairperson/Chief Executive

CERTIFIED MAIL

Re:_____

Dear _____:

As you may know, Georgia Power Company intends to construct a transmission line in _____ County. A public meeting (or public meetings) has (have) been scheduled for informing and educating the citizens of your county as to the need for, purpose of, and location of this transmission line.

I have enclosed a copy of the notice to be published in the [*name/date of newspaper*] announcing this meeting (these meetings) for your ready reference. I invite you to come to this meeting (these meetings). We look forward to seeing you on [*date of meeting(s)*]. If you have any questions before then, please contact [*name of person*] at [*telephone number*].

Sincerely,

DRAFT

Exhibit C-6: Cover Letter to City Mayor

CERTIFIED MAIL

Re:_____

Dear _____:

As you may know, Georgia Power Company intends to construct a transmission line in _____ County. A portion of this transmission line will be located within the limits of your city. A public meeting (or public meetings) has (have) been scheduled for informing and educating the citizens of your city as to the need for, purpose of, and location of this transmission line.

I have enclosed a copy of the notice to be published in the [*name/date of newspaper*] announcing this meeting (these meetings) for your ready reference. I invite you to come to this meeting (these meetings). We look forward to seeing you on [*date of meeting(s)*]. If you have any questions before then, please contact [*name of person*] at [*telephone number*].

Sincerely,

DRAFT

Section D: Good Faith Negotiations

Protocol Checklist

The Acquisition Agent must:

- ☐ Prepare to discuss the need for the project and the project characteristics.
- ☐ Request a personal meeting with each property owner, or property owner's representative, for notification of survey.
- ☐ Obtain information from an appraiser or appraisers regarding land values in the project area.
- ☐ Request a personal meeting with each property owner, or property owner's representative, to negotiate property acquisition.
- ☐ During settlement negotiations, attempt to discuss the value of the right-of-way with each property owner and provide each property owner with a written offer letter (in the form of **Exhibit D-1**) to purchase the right-of-way. Provide a final offer letter (in the form of **Exhibit D-2**) to the property owner before negotiations end.
- ☐ File appropriate documentation concerning contacts and negotiations with property owners in the Project Business File.

Section D: Good Faith Negotiations

Protocols

1. Preparation

The Acquisition Supervisor, with assistance from Acquisition Coordinators, must ensure the Acquisition Agents have a full understanding of the need for the project and prepare fully to discuss the need for and purpose of the project. The Acquisition Agents must be able to answer the following questions:

- Why is the project needed?
- What is the construction timeframe/schedule?

The Acquisition Agents also must have a full understanding of the characteristics of the project and be prepared to discuss the following:

1. A general description, including:
   - Length of line – beginning and ending points
   - Voltage
   - Right-of-way width – new or existing
   - Structures
     a. Type – single pole, H-frame, tower
     b. Height
     c. Steel, concrete, wood

2. A site-specific description, including:
   - Impact on property
   - Right-of-way width
     a. Centerline
     b. Structure locations
     c. Guy flares, if applicable
     d. Ingress and egress needs, if applicable
     e. Construction roads
     f. Construction equipment

The Acquisition Agents must have a full understanding of the appraisal process, the acquisition process, and the location process.

2. Contact Property Owners for Notification to Survey

The Acquisition Agent must meet in person with each property owner, or property owner's representative, to review the project with the property owner and provide:

- A description of the purpose of the project.
- An explanation of the location process
- An explanation that the initial work is a review of a Final Study Route.
- An explanation of Georgia Power's need to conduct a survey, including:
  1. A survey is necessary to examine topography and environmental conditions and to determine the exact location of the proposed transmission line.
  2. Allowing Georgia Power to conduct a survey does not grant a permanent easement.
- A combination of aerial photography and tax maps to best inform and illustrate to the property owner the location and width of the proposed right-of-way.
- An explanation of the acquisition process.
- A review of the project construction schedule.

After meeting in person with each property owner or property owner's representative, the Acquisition Agent must document each contact in the contact diary. Information in the contact diary should include, but not be limited to:

- Agent's name
- Date and time of contact or attempted contact
- Person contacted or attempted to contact
- All available contact numbers (home, work, cell, fax, and email)
- Pertinent and significant details of the conversation
- Follow-up action items

If the property owner refuses to meet with the acquisition agent, he/she must document such refusal and the reasons therefore in the contact diary.

3. Obtain Information from Appraiser(s) Regarding Land Values in Project Area

The Acquisition Agent will consult with the Land Acquisition Supervisor to retain Appraiser(s) taking into consideration the preference for appraisal experience in the geographical area and the number of Appraisers to retain.

4. Contact Property Owners to Negotiate Property Acquisition

The Acquisition Agent must attempt to meet in person with each property owner, or property owner's representative, to negotiate a property acquisition. During these meetings, the Acquisition Agent must:

- Fully explain the purpose of the project to the property owner.
- Provide a written easement, with a parcel map attached as an exhibit, to the property owner for review that describes in detail the property rights sought.

- Ask and confirm whether the property owner understands the property rights being sought. Inform the property owner that he/she can seek legal counsel or assistance to clarify the property rights being sought.
- Clearly identify that the parcel map is the "Exhibit" to the easement pertaining to the tract(s) of land specific to the property owner. The parcel map must show:
  1. Proposed width of the right-of-way
  2. Proximity to property lines
  3. Proximity to property access
  4. Proximity to structures
  5. Other considerations that illustrate location of the right-of-way on the property
- Provide an additional map, if necessary, to the property owner if the Exhibit does not clearly show the right-of-way in context of the property owner's entire tract.

After meeting in person with each property owner or property owner's representative, the Acquisition Agent must document each contact after it has concluded in the contact diary daily. Information in the contact diary should include, but not be limited to:

- Agent's name
- Date and time of contact or attempted contact
- Person contacted or attempted to contact
- All available contact numbers (home, work, cell, fax, and email)
- Pertinent and significant details of the conversation
- Follow-up action items

If a property owner refuses to meet with the Acquisition Agent, he/she must document such refusal and the reasons therefore in the contact diary.

5. Settlement Negotiations

The Acquisition Agent must meet with the property owner to:

- Discuss the value of right-of-way.
  1. Explain the methodology of the appraisal and clarify that the appraisal is for an easement and not fee simple acquisition.
  2. Explain the valuation of easement area.
- Provide a written offer (in the form of **Exhibit D-1**) to purchase the right-of-way that contains the specific amount offered and any specific terms. A copy of the written offer should be included in the Project Business File.
  1. Written offer will be presented to the property owner at the time the easement is signed.

2. Written offer must be based on data book or appraisal specific to the parcel under negotiation, if available.
3. Negotiations must start at data book value or appraised value.

The Acquisition Agent must document each settlement negotiation in the contact diary. Information in the contact diary should include, but not be limited to:

- Agent's name
- Date and time of contact or attempted contact
- Person contacted or attempted to contact
- All available contact numbers (home, work, cell, fax, and email)
- Pertinent and significant details of the conversation
- Follow-up action items

Before negotiations cease, the Acquisition Agent sends by certified mail a written offer (in the form of **Exhibit D-2**) documenting a final offer to the property owner. A copy of the letter should be included in the Project Business File. If a settlement is not reached with a property owner, the Acquisition Agent is then responsible for sending the Project Business File for that property owner to Land Department Legal Services to begin the condemnation process.

6. Compliance Documentation

After settlement negotiations with a property owner have ended (whether successfully or not), the Acquisition Agent files all paperwork demonstrating compliance with Title 22 requirements, for each property owner contacted by the Acquisition Agent, in the Project Business File, including:

- Copy of easement, as signed by the property owner, if settlement negotiations are successful
- Copy of easement, as presented to the property owner, if settlement negotiations are not successful
- Copy of parcel map
- Copy of contact diary
- Copy of Written Offer letter or Settlement letter
- Copy of check, if any
- Copy of tabulation sheet from the appraisal(s)

Exhibits for Section D:

D-1: Written Offer Letter
D-2: Settlement Letter

Exhibit D-1: Written Offer Letter

[GPC Letterhead]

[Date] [Parcel ID Information]

Dear _____:

As you know from our previous discussions, Georgia Power wants to acquire an easement across your property for our proposed _____ Transmission Line. I've attached a map that shows the location of our proposed line on your property and a copy of the standard transmission line easement document that describes the property rights we need to acquire from you.

We have evaluated the value of the easement we wish to acquire from you and, based on that evaluation, Georgia Power will pay $_____ upon receipt of a signed, standard easement from you.

I continue to be available to answer any questions you may have concerning the transmission line or this proposal. If you have questions, please call me [number].

Sincerely,

[Agent's Name]

Exhibit D-2: Settlement Letter

SENT VIA CERTIFIED MAIL, RETURN RECEIPT REQUESTED

[GPC Letterhead]

[Date] [Parcel ID Information]

Dear _____:

At this time I would like to thank you for your time spent with me discussing the easement Georgia Power needs to acquire across your property for our proposed _____ Transmission Line. I recognize this has been a difficult and time consuming effort. We do, however, have an obligation to continue to provide the citizens of the State of Georgia with adequate and reliable electricity and we must move forward with this project to meet the demand and project schedule. I've attached a map that shows the location of our proposed line on your property and a copy of the standard transmission line easement document that describes the property rights we need to acquire from you.

At this time, Georgia Power Company is tendering its written good faith offer of $_____ upon receipt of a signed, standard easement from you. This offer is being presented solely as a compromise for purpose of concluding this matter without litigation and is Georgia Power's effort to reach a negotiated settlement of this matter with you. We hope you will consider Georgia Power's offer.

If you decide to accept the offer, please contact me and I will make arrangements to finalize the acquisition with you. If I have not had a response from you within 10 days of the date of this letter, I will then refer this matter to our Legal Counsel with a request that they initiate litigation proceedings to acquire the necessary interest in the property.

Please contact me at [telephone contact number] if you have any questions.

Sincerely,

[Agent's Name]

Enclosures
Cc: Letter File #_____

Section E: Condemnation Proceedings

Protocol Checklist

- ☐ The Land Compliance Coordinator is responsible for preparing a Project Business File and ensuring quality control of all documents submitted to the file.
- ☐ Land Department Legal Services includes averment of compliance with Title 22 requirements in the Condemnation Petition.
- ☐ Local counsel files the Condemnation Petition and the order appointing the Special Master and ensures that the Condemnation Petition and the order are properly served. In addition, local counsel mails the Condemnation Petition and the order via certified mail to any person shown by the public ad valorem tax records of the county in which the property is located to have an interest in the property and any other person having open and obvious possession.
- ☐ The Staff Attorney, in consultation with local counsel, is responsible for scheduling the Special Master hearing not less than 30 days, and not more than 40 days, after the date of service of the order.
- ☐ The Staff Attorney, in consultation with local counsel, is responsible for designating and preparing witnesses to testify at the Special Master hearing.
- ☐ The Staff Attorney should meet with local counsel prior to the general pre-hearing preparation meeting to review the requirements of Title 22 and, with local counsel, should schedule and conduct a pre-hearing preparation session that conforms to existing protocols.
- ☐ At the Special Master hearing, local counsel's opening statement should include information regarding Title 22 requirements. Local counsel's closing statement should include recitation of how evidence presented during the hearing established Georgia Power's compliance with the requirements of Title 22.

Section E: Condemnation Proceedings

Protocols

1. Project Business File

The Land Compliance Coordinator is responsible for:

- Preparing a Project Business File ("the File") for each transmission line that is subject to § 22-3-160. The Land Compliance Coordinator is the custodian of the File, which should contain the documents to prove Georgia Power's compliance with the requirements of Title 22. (see **Exhibit E-2**)
- Reviewing the quality control of each document submitted to the File to ensure its completeness and sufficiency. The Staff Attorney assigned to the Acquisition Team responsible for the transmission line will spot-check the File for legal sufficiency at intervals corresponding to the following milestones:
    - Solution Team Report
    - Location Committee Report
    - Property List(s) Compilation
    - Notice of Public Meeting(s)
    - Public Meeting(s)
    - Good Faith Negotiations

2. Condemnation Petition

The Legal Services Manager is responsible for ensuring that Georgia Power complies with the requirements of Title 22 for each condemnation proceeding. Land Department Legal Services should include an averment to that effect (in the form of **Exhibit E-3**) in the Condemnation Petition.

The affidavit of the Land Compliance Coordinator (in the form of **Exhibit E-4)** should be attached to the Condemnation Petition.

3. Additional Service Requirement

To comply with O.C.G.A. § 22-2-130, the Staff Attorney should instruct local counsel to ensure that in addition to personal service, a copy of the Condemnation Petition and the order appointing the Special Master is mailed by certified mail to (i) any person shown by the public ad valorem tax records of the county in which the property is located to have an interest in the property and (ii) any other person having open and obvious possession of the property. The identity and mailing address of such persons shall be provided with the Request for Condemnation turned in by the Acquisition Agent.

The Tax Records List referred to in Section C of this manual should not be relied upon for purposes of identifying persons shown by the public ad valorem tax records. Rather, the public ad valorem tax records in effect at the time of preparation of the Request for Condemnation

should be reviewed for the identity of the person(s) to be served by certified mail in compliance with O.C.G.A. § 22-2-130.

4. Adjusted Special Master Hearing Schedule

In condemnations subject to O.C.G.A. § 22-2-130, a hearing before the Special Master shall take place not less than 30 days, nor more than 40 days, from after the condemnee(s) is (are) served with a copy of the Condemnation Petition and the order appointing the Special Master.

The Staff Attorney, in consultation with local counsel, is responsible for scheduling the Special Master hearing and the pre-hearing preparation session(s) on a timeline that agrees with the above-stated schedule.

5. Designation of Witnesses for Special Master Hearing

The Staff Attorney, in consultation with local counsel, is responsible for designating and preparing witnesses to testify at the Special Master hearing. The specialties of the required witnesses and the specific area(s) about which they will offer testimony are as follows:

- Land Compliance Coordinator – Title 22 compliance
- Transmission Planning – necessity and cost
- Transmission Line Design – alternate construction approaches and engineering practices
- Location – siting, existing land uses, existing corridors, and engineering practices
- Environmental – existing environmental conditions in the area
- Cultural Resources – existing cultural resources in the area. (The need for testimony from the cultural resources expert should be evaluated on a case-by-case basis depending on the cultural resources issues associated with the parcel(s) being condemned.)
- Appraiser – value (just and adequate compensation)

6. Pre-Hearing Preparation

The Staff Attorney should meet with local counsel prior to the general pre-hearing preparation meeting. The purpose of the attorneys' meeting is to review the requirements of Title 22 and discuss the evidence to be presented at the hearing concerning compliance with such requirements. The meeting should include:

- A review with local counsel, as needed, of the new requirements of Title 22 and resulting evidentiary changes.
- A review of the Project Business File.
- A review of trial exhibits to be prepared.
- A discussion of expert testimony to be presented.

The Staff Attorney and local counsel should schedule and conduct the pre-hearing preparation session to conform to existing protocols. Additional time for the session, or more than one

session, may be necessary to accommodate preparation of additional witnesses who may testify regarding compliance with Title 22 requirements.

7. Special Master Hearing

Local counsel's opening statement should be expanded to include information regarding the new requirements of Title 22. The information presented should be sufficient to educate the Special Master regarding the requirements of Title 22 and provide a roadmap showing how the evidence to be propounded during the hearing proves Georgia Power's compliance with these requirements.

In direct testimony, witnesses should be called to testify about the following matters:

- Title 22 Compliance – The Land Compliance Coordinator testifies, as a fact witness with personal knowledge and as custodian of the pertinent business records, that Georgia Power has complied with the Title 22 requirements concerning notices, public hearing(s), and good faith negotiations.
- Necessity – An expert in transmission planning testifies about the need for the line and presents general costs estimates.
- Location – An expert in transmission line routing, or a fact witness familiar with the Location Committee and siting process, establishes that the route is a practical and feasible route and describes how existing land uses, existing corridors, engineering practices, and cost were considered during the siting process.
- Environmental – An expert in environmental science describes how existing environmental conditions in the area were considered during the siting process.
- Cultural Resources – An expert in cultural resources may testify about any existing cultural resources were considered during the siting process.
- Design – An expert in transmission line design testifies about engineering practices involved in the siting process, identifies the alternative construction approaches that were considered, and explains why the alternative construction approaches were rejected.
- Value – An expert in real property appraisal testifies about the value of the property involved in the proceeding and the amount of just and adequate compensation for the property to be taken.

Local counsel's closing statement should include a point-by-point recitation of how the evidence presented by Georgia Power during the hearing established compliance with the requirements of Title 22.

Exhibits for Section E:

Exhibit E-1: Condemnation Timeline
Exhibit E-2: Documents Needed to Prove Compliance with Title 22 Requirements
Exhibit E-3: Averment of Compliance with Title 22 Requirements
Exhibit E-4: Affidavit of Land Compliance Coordinator

Exhibit E-1: Condemnation Timeline

(Note: Allow a minimum of 90 days from the time you turn in the Request for Condemnation.)

Days	Sequence of Events
10+	Preparation of Condemnation Petition
04+	Review Condemnation File and obtain signatures; Deliver Condemnation Package to local counsel; Final preparation for filing; Judge appoints Special Master; Judge signs Order.
03	Perfect service on all parties, plus additional service requirements by certified mail of persons on ad valorem tax records of county and persons having open and obvious possession of the property.
40	Special Master Hearing set no less than 30, no more than 40, days after service; Pretrial preparation.
1+	Special Master Hearing, which is now lengthened by additional requirements; Additional witness – Land Compliance Coordinator
03	Special Master has 3 days to make an Award
10	Period in which to appeal to Superior Court on value and non-value issues from date Award filed
1+	Judgment should not be submitted to Judge for signature until at least the 11th day after the filing of Award of Special Master. If no non-value issues, Judge signs Judgment; Money paid into Registry of the Court.
?	Judge holds hearing and enters ruling on any non-value issues.
?	De Novo Superior Court Jury Trial on appeal from Award of Special Master

Exhibit E-2: Documents Needed to Prove Compliance with Title 22 Requirements

1. Planning and Solution Team documentation
   - ☐ Alternative construction approaches review
2. Location Committee documentation
   - ☐ Existing land use review
   - ☐ Existing corridors review
   - ☐ Existing environmental conditions review
   - ☐ Engineering practices review
3. Public meeting(s) documentation
   - ☐ Copy of cover letter for submitting public notice of public meeting(s)
   - ☐ Copy of newspaper notification
   - ☐ Copy of certified letters to property owners and officials
   - ☐ Sign-in sheet
   - ☐ Public comments and questions
   - ☐ Court Reporter record
   - ☐ Information pamphlet/brochure on project and purpose of the meeting(s)
4. Good faith negotiations documentation
   - ☐ Written offers for purchase of property rights
   - ☐ Documents describing property rights to be acquired
   - ☐ Maps showing location of transmission line on each owner's property

Exhibit E-3: Averment of Compliance with Title 22 Requirements

Before a condemnation proceeding is filed with respect to a particular parcel of land, the Legal Services Manager ensures that Georgia Power has complied with the requirements of Title 22 related to the property and persons having an interest in the property. The Legal Services Manager then arranges for the following averment to be inserted as paragraph no. 1 in the Condemnation Petition filed concerning that parcel of land:

> "Petitioner is a corporation operating, constructing, and preparing to construct plants for generating electricity and, as provided in O.C.G.A. §22-3-20, has the right of eminent domain under the laws of the State of Georgia. Further, Petitioner states that Petitioner may exercise the right of eminent domain in this matter as Petitioner has complied with the provisions of O.C.G.A. §§ 22-3-160 and 22-3-161 as required under the laws of the State of Georgia with respect to this matter."

Exhibit E-4: Affidavit of Land Compliance Coordinator

[STYLE OF THE CASE]

Affidavit of _____

1.

My name is _____. I reside in _____ County, Georgia; and I am ___ years of age. This affidavit is based upon my personal knowledge.

2.

I am employed by Georgia Power Company ("Petitioner") as the Land Compliance Coordinator. In my capacity as the Land Compliance Coordinator, I am responsible for the Petitioner's activities as they relate to O.C.G.A. §§ 22-3-160 and 22-3-161, and the exercise of the right of eminent domain in this matter.

3.

As to the [*name of project T/L*], for which a Petition for Condemnation has been filed, as to [*name of property owner*], a public meeting was advertised in [*name of newspaper*] on _____ and was held on _____ at _____. I was present at this public meeting. The public meeting began at _____ p.m. and ended at _____ p.m. At the public meeting, the affected property owners, as well as other residents, were afforded an opportunity to ask questions of the Petitioner's representatives and also to express their opinions.

4.

Prior to this public meeting, the Petitioner sent copies of the newspaper notice by certified mail on [*date of mailing*] to the affected property owners. This list of property owners was compiled from tax records in _____ County.

5.

The Petitioner also sent copies of the newspaper notice by certified mail on [*date of mailing*] to the Mayor of [*name of city*] and the Chairperson [or Chief Executive] of [*name of county*].

6.

The negotiations with the property owners directly affected by this project were conducted by the Petitioner's representatives in good faith.

Sworn to and subscribed before
me this ____ day of _____, 200_.

_____ _____
Notary Public [*Name of Affiant*]

Section F: Post-Condemnation Process

Protocol Checklist

- ☐ Additional compensation or reconveyance as stipulated in Chapter 3 of Title 22 applies to any easement or other property interest acquired after July 1, 2004, through exercise of eminent domain for the purposes of constructing or expanding an electric transmission line if the transmission line has not been constructed or expanded after a set time period.
- ☐ Land Records is responsible for implementing and managing a database of properties condemned for transmission line corridors. The purpose of this database is to identify and manage the properties that could be subject to reconveyance or additional compensation.
- ☐ Land Records is responsible for reporting on the status of the transmission line corridor properties acquired through condemnation.

Section F: Post-Condemnation Process

Protocols

1. Application

Additional compensation or reconveyance as stipulated in Chapter 3 of Title 22 applies to any easement or other property interest acquired after July 1, 2004, through exercise of eminent domain for the purposes of constructing or expanding an electric transmission line:

- With a capacity of 230 kV or less, if the utility has not begun construction or expansion within 12 years from date of acquisition; and land burdened is not adjacent to a transmission line corridor in existence 12 years from the date of acquisition.
- With a capacity of more than 230 kV, if the utility has not begun construction or expansion within 15 years from date of acquisition; and land burdened is not adjacent to a transmission line corridor in existence 15 years from the date of acquisition.
- Of any capacity, if the land burdened is adjacent to a transmission line corridor in existence 15 years after the date of acquisition; if the utility has not begun construction or expansion within 15 years from the date of acquisition.

2. Corridor Management

Land Records is responsible for implementing and managing a database, currently LIMS, of properties condemned for transmission line corridors. The purpose of this database is to identify and manage the properties that could be subject to reconveyance or additional compensation as outlined above. The database will be designed to query on the date of the judgment of condemnation and provide the following additional data:

- Owner's name.
- Property information, including address, tax parcel number, land lot(s)/district(s) or GMD(s), and county.
- Judgment of condemnation, including:
    1. Date on which the judgment was entered
    2. Civil Action Number
    3. Recording number, if applicable
- Departmental filing information, including:
    1. Deed file
    2. Letter file
    3. Map file

Land Records also is responsible for maintaining letter files (hard copies) and digitized copies (scanned images of documents) of the closing documents and/or condemnation documents for all

land and land rights acquisitions. The following additional data will be available from these sources and will be compiled at the request of Land Acquisition by Land Records:

- Owner's mailing address if different from property address (typically stated in the contact diary and scanned into LIMS).
- Easement information, including easement width and acreage and any special rights or conditions (shown on the parcel map, which is scanned into LIMS).
- Compensation/award specified (as stated in the judgment of condemnation or final judgment, as the case may be, and contact diary, both of which are scanned into LIMS, and as shown on the scanned image of the check(s)).

3. Reporting/Managing

Land Records is responsible for generating a quarterly report that will include no less than the information listed in the above-mentioned Corridor Management protocol of the transmission line corridor properties acquired through condemnation. Land Records will confer with the Transmission Maintenance Centers and Property Accounting to verify the status of the corridor. Each quarterly report should be forwarded to:

- Land Acquisition
- Land Legal Services

Section G: Text of House Bill 373 (setting forth changes to Chapters 2 and 3 of Title 22)

04 LC 22 5451S

The Senate Regulated Industries and Utilities Committee offered the following substitute to HB 373:

A BILL TO BE ENTITLED
AN ACT

To amend Chapter 2 of Title 22 of the Official Code of Georgia Annotate, relating to condemnation procedures, so as to change the time for hearing before a special master and to require notice by certified mail in condemnations for certain purposes; to amend Chapter 3 of Title 22 of the Official Code of Georgia Annotated, relating to exercise of the power of eminent domain for special purposes, so as to prohibit the use of the power of eminent domain to acquire any property for the construction of certain electric transmission lines without prior public notice and one or more public meetings with an opportunity for comment and questions; to provide for exceptions; to provide for factors to be considered in selecting a route for certain electric transmission lines; to provide procedures for good faith negotiations; to provide for additional compensation for or reconveyance or quitclaim of an easement or other property interest acquired through the exercise of eminent domain in certain circumstances; to provide for related matters; to provide for an effective date and applicability; to repeal conflicting laws; and for other purposes.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF GEORGIA:

SECTION 1.

Chapter 2 of Title 22 of the Official Code of Georgia Annotated, relating to condemnation procedures, is amended by striking Code Section 22-2-102, relating to petitions of condemnation, judicial orders for hearing before a special master, and proceedings in rem, and inserting in lieu thereof the following:

"22-2-102.

Whenever it is desirable, for any reason, to arrive at a quick and certain determination of the compensation to be paid first to the condemnee for the taking or damaging of private property, the condemnor shall file a petition in a superior court having jurisdiction for a judgment in rem against the property or interest therein, as provided in Code Section 22-2-130. At or before the filing of the petition, the condemnor shall present a copy of the petition to a judge of the superior court of the county wherein the property or interest sought to be condemned is located. Thereupon, the judge shall make an order requiring the condemnor, the person in possession of the property or interest, and any other person known to have any rights in the property or interest

to appear at a hearing before a special master at a time and place specified in the order and to make known their rights, if any, in and to the property or interest sought to be condemned, their claims as to the value of the property or interest, and any other matters material to their respective rights. ~~The~~ Except in condemnations for purposes of constructing or expanding one or more electric transmission lines, the hearing before the special master shall take place not less than ten days nor more than 15 days after the date of service of the order. In condemnations for purposes of constructing or expanding one or more electric transmission lines, the hearing before the special master shall take place not less than 30 days and not more than 40 days after the date of service of the order. The order shall give such directions for notice and the service thereof as are appropriate and as are consistent with this article, in such manner as to provide most effectively an opportunity to all parties at interest to be heard. In condemnations for purposes of constructing or expanding one or more electric transmission lines, in addition to service of the order, a copy of the order shall be mailed by certified mail to any person shown by the public ad valorem tax records of the county in which the property is located to have an interest in the property and to any other person having open and obvious possession of the property. It shall not be necessary to attach any other process to the petition except the order so made, and the cause shall proceed as in rem."

SECTION 2.

Chapter 3 of Title 22 of the Official Code of Georgia Annotated, relating to exercise of the power of eminent domain for special purposes, is amended by adding at the end of said chapter a new Article 8 to read as follows:

"ARTICLE 8

22-3-160.

(a) Before exercising the right of eminent domain for purposes of constructing or expanding an electric transmission line with a design operating voltage of 115 kilovolts or greater and a length of one mile or more, any person, corporation, or other entity that generates, transmits, distributes, supplies, or sells electricity for public or private use in this state or generates electricity in this state for transmission or distribution outside this state (hereinafter in this article referred to as 'utility') shall schedule and hold one or more public meetings with an opportunity for comment by members of the public. In any proceeding to exercise the right of eminent domain for purposes of an electric transmission line for which the utility began land acquisition negotiations on or after July 1, 2004, the utility shall be required to demonstrate substantial compliance with this Code section as a condition for exercising the right of eminent domain.

(b) Prior to the public meeting or meetings required by this Code section, the utility shall provide adequate public notice of the utility's intent to construct or expand an electric transmission line and adequate public notice of the public meeting or meetings related to the electric transmission line as follows:

(1) By publishing adequate public notice of said public meeting or meetings in a newspaper of general circulation in each county in which any portion of the electric transmission line is to be constructed or expanded. Said notice shall be published at least 30 days prior to the date of the first public meeting related to the electric transmission line and shall include the following: the date, time, and location of each meeting; a statement that the purpose of the meeting or meetings is to provide public notice of the utility's intent to construct or expand an electric transmission line for which the right of eminent domain may be exercised; a description of the proposed project including the general route of the electric transmission line and the general property area within which the utility intends to construct or expand the electric transmission line; the width of the proposed transmission line route; and a description of the alternative construction approaches considered by the utility and a statement of why such alternatives were rejected by the utility; and

(2) By providing written notice of the public meeting or meetings, by means of certified mail, to each owner of property, as indicated in the tax records of the county in which such property is located, over which the utility intends to construct or expand the electric transmission line and to the chairpersons or chief executives of the counties and the mayors of any municipalities in which such property is located. Such notice shall be mailed at least 30 days prior to the date of the first public meeting related to the electric transmission line and shall include all of the information required, by paragraph (1) of this subsection.

(c) At least one public meeting shall be held in each county in which the electric transmission line would be located. In any county in which the electric transmission line would require acquisition of property rights from more than 50 property owners, two or more public meetings shall be held. The public meetings shall be held in an accessible location and shall be open to members of the public. At least one of the public meetings shall commence between 6:00 P .M, and 7:00 P.M., inclusive, on a business weekday. At the public meetings, the utility shall provide a description of the proposed project including the general route of the electric transmission line and the general property area within which the utility intends to construct or expand the electric transmission line, the width of the proposed transmission line route, and a description of the alternative construction approaches considered by the utility and a statement of why such alternatives were rejected by the utility. At the public meetings, the utility shall allow a reasonable opportunity for members of the public to express their views on the proposed project and to ask questions.

(d) A utility shall not be required to give notice of or hold public meetings with respect to any of the following:

(1) An electric transmission line to be constructed or expanded by a utility on an established right of way or land that was acquired by the utility or any other utility prior to July 1, 2004;

(2) An electric transmission line for which the utility began land acquisition negotiations prior to July 1, 2004;

(3) An electric transmission line to be constructed or expanded by a utility on an established right of way or land that is owned or controlled by a state agency, a county, a municipality, or an agency, bureau, or department of the United States;

(4) An electric transmission line to be constructed or expanded by a utility for the purpose of relocating an existing electric transmission line at the direction, order, or request of a state agency, a county, a municipality, or an agency, bureau, or department of the United States;

(5) An electric transmission line to be constructed or expanded by a utility without exercising the power of eminent domain to acquire the right of way or easement area for such line; or

(6) An electric transmission line to be constructed by a utility for the purpose of serving an electric substation or switching station to be constructed on a site that is owned or controlled by a utility customer to be served by such substation or switching station.

22-3-161.

(a) On and after July 1,2004, before exercising the right of eminent domain for purposes of constructing or expanding an electric transmission line described in subsection (a) of Code Section 22-3-160, the utility shall select a practical and feasible route for the location of the electric transmission line. In selecting the route for the location of the electric transmission line, the utility shall consider existing land uses in the geographic area where the line is to be located, existing corridors, existing environmental conditions in the area, engineering practices related to the construction and operation of the line, and costs related to the construction, operation, and maintenance of the line.

(b) After the utility has selected the preferred route for the location of an electric transmission line, the utility shall attempt in good faith to negotiate a settlement with each property owner from whom the utility needs to acquire property rights for the line. In connection with the negotiations, the utility shall provide the property owner with a written offer to purchase the property rights, a document that describes the property rights, and a drawing that shows the location of the line on the owner's property.

(c) The requirements of subsections (a) and (b) of this Code section shall not apply to an electric transmission line described in subsection (d) of Code Section 22-3-160.

22-3-162.

(a) This Code section shall apply to any easement or other property interest acquired on or after July 1, 2004, through exercise of the right of eminent domain for purposes of constructing or expanding an electric transmission line:

(1) With a capacity of 230 kilovolts or less if the utility has not begun such construction or expansion within 12 years from the date of acquisition and the land burdened by the easement or other property interest is not adjacent to an electric transmission line corridor in existence 12 years from the date of acquisition;

(2) With a capacity of more than 230 kilovolts if the utility has not begun such construction or expansion within 15 years from the date of acquisition and the land burdened by the easement or other property interest is not adjacent to an electric transmission line corridor in existence 15 years from the date of acquisition; and

(3) Of any capacity if the land burdened by the easement or other property interest is adjacent to an electric transmission line corridor in existence 15 years after the date of acquisition and the utility has not begun the construction or expansion for which the easement or other property right was acquired within 15 years from the date of acquisition.

(b) When this Code section becomes applicable to an easement or other property interest, the owner of the land burdened by such easement or property interest may apply to the utility that acquired the easement or other property interest or such utility's successor or assign for reconveyance or quitclaim of the easement or other property interest or for additional compensation for such easement or other property interest. The application shall be in writing, and the utility or its successor or assign shall act on the application within 60 days by:

(1) Executing a reconveyance or quitclaim of the easement or property interest upon receipt of compensation not to exceed the amount of the compensation paid by the utility for the easement or property interest at the time of acquisition; or

(2) Paying additional compensation to the owner of the land burdened by the easement or other property interest, such compensation to be calculated by subtracting the price paid by the utility for the easement or other property interest at the time of acquisition from the fair market value of the easement or other property interest at the time this Code section becomes applicable to such easement or other property interest.

(c) The choice between additional compensation or reconveyance or quitclaim shall be at the discretion of the utility or its successor or assign."

SECTION 3

This Act shall become effective July 1, 2004, and shall apply to the exercise of eminent domain to acquire easements or other property interests for which land acquisition negotiations for

purposes of constructing or expanding one or more electric transmission lines begin on or after such date. The provisions of this Act relating to additional compensation, reconveyance, and quitclaim shall apply to easements and other property interests acquired on or after July 1, 2004, through the exercise of eminent domain.

SECTION 4

All laws and parts of laws in conflict with this Act are repealed.

Section H: Glossary of Terms

ABSITS
ABSITS tracks abnormal situations within the Standard Transmission Operation and Maintenance Program ("STOMP"). The problems are identified through field inspections.

Alternative Construction Approaches
The evaluation of construction alternatives, such as overhead vs. underground lines or single pole vs. double circuit.

Appeals Litigation
If exceptions are filed, a new trial before a Superior Court Judge with full legal process is held.

Condemnation Petition
A filing prepared by Land Department Legal Services. A Condemnation Petition contains a legal description of the property, the names and addresses of all parties that have an interest in the property, and all rights that are to be condemned.

Condemnation Proceedings
This is the statutory process for the acquisition of property through a Special Master and judicial supervision.

Contact Diary
Written history of contacts by Acquisition Agents and their negotiations with landowners.

Final Offer Letter
A letter with a final offer of monetary compensation is sent by certified mail to the property owner in an effort to resolve the acquisition of property rights before initiating a condemnation proceeding.

First Offer Letter or Written Offer Letter
As required by Title 22 Compliance Requirements and a component of good faith negotiations, all offers of fair compensation to property owners must be written and presented to the owner.

Geographic Information System ("GIS")
A computer system for capturing, storing, checking, integrating, manipulating, analyzing and displaying data related to positions on the earth's surface. Typically, a Geographical Information System (or Spatial Information System) is used for handling maps of one kind or another. These might be represented as several layers where each layer holds data about a particular kind of feature. Each feature is linked to a position on the graphical image of a map. Layers of data are organized to be studied and to perform statistical analysis.

Good Faith Negotiations
As required by O.C.G.A. § 22-3-161(b), Acquisition Agents must provide property owners with a document that describes the property rights, a drawing that shows the location of the line on the property, and a written offer of fair compensation for an easement.

LAC (Land Acquisition Database)
Application used by the Acquisition Agents to manage acquisition projects and print legal documents. It provides management with tracking, cost, productivity, and regulatory information.

LIMS (Land Information Management System)
The system used to file and research documents pertaining to Georgia Power fee simple land, easements, rights-of-ways, and other property rights.

Location Committee
Chaired by the Location Engineer in the Land Department, this committee is responsible for determining potential routes and selecting a "practical and feasible route" and the general corridor through which the transmission line will be located.

Notification of Survey
Upon completion of the field assessment by the Location Committee as to the selected line route, an Acquisition Agent contacts the property owner to obtain entrance onto their property to survey the proposed route.

Planners
Planners are responsible for developing and documenting new 115 kV, 230 kV, and 500 kV transmission line facilities in Georgia.

PowerTrac
A tool to assist the GPC Land Acquisition transmission engineer in comparing and evaluating potential transmission line routes by making current GIS information visually available at the beginning of the project.

PowerTrac Data Layer
Various layers using aerial photography, tax parcel imagery (with no ownership data), roads, railroads, rivers, streams, lakes, contour lines, historic and archaeological sites, counties and municipalities, gas pipelines, airports, and FEMA data that are used in building maps.

PowerTrac Output
The visual aids for location meetings, public meetings, and route maps for surveyors. The maps show the centerline and easement width of the proposed line route and are used for general purpose and are not survey quality.

Preferred Solution
The Solution Team narrows the list of alternative approaches and then develops, reviews, and revises estimates of alternatives to establish the best solution to the electrical problem.

Project Scope
Brief description of the name, need, and specifications of facilities needed.

Solution Team
This group evaluates and documents possible solutions to an identified electrical problem with the goal of determining a preferred solution. The team is comprised of representatives from Transmission Planning, Project Management, Line Engineering, Transmission Maintenance Center, the Regions, Land Acquisition (Location Engineer), and a Staff Attorney from Land Legal Services.

Special Master
A person appointed by the Superior Court to carry out certain duties under O.C.G.A. § 22-2-100 et seq.

STOMP (Standard Transmission Operation and Maintenance Program)
Transmission system one-line diagrams that consist of single-line drawings of the transmission grid used by transmission system operations.

Tax Records List (also known as a preliminary property list)
An agent or title specialist is responsible for researching property ownership and obtaining copies of current vesting documents or deed book/page and plat book/page and recording information, including the names, addresses, and phone numbers of all property owners along the route.

TEAMS
Program designed for the transmission project budgeting process. It assists in the creation of budgets through estimating and then keeps tracks of and provides budget and coast updates.

Title Records List (also known as a final property list)
All affected property owners from the Tax Records List will be indicated and a title examination will be required to identify current fee owners and any other parties that may have an interest in the subject property.