

**Make-Up Pond C Audit Follow-Up Requests for Additional Information  
William States Lee III Nuclear Station, Units 1 and 2  
Combined Operating License Application**

RAI Number	Supplement to ER Site Audit Info Need No.	ESPR/ER Section	RAI	Supporting Information
RAI 206	Alt-1 <sup>(a)</sup>	ESRP 9.3  10 CFR 51.45(b)(3)	Provide justification of the sizes and locations of cooling pond reservoirs at the Lee site and the alternative sites. Details should include: (1) calculations showing actual numbers and all the steps taken to come up with the final reservoir size estimates for the four sites (Lee, Perkins, Keowee, Middleton Shoals). The analysis should also include a clear description justifying why 20 percent of the mean annual daily flow (MADF) in the Yadkin River was used as opposed to contacting the relevant water permitting agency for the drawdown limit; (2) area/volume tables and elevation/volume tables for the alternative site reservoirs; and (3) references that support the 20-ft depth being representative of the upper portion of the thermocline in the Piedmont region (if specific references are unavailable, explain how a 20-ft thermocline depth was derived).	The response to RAI 124 (ADAMS Accession No. ML102070357) provided a summary of the methods used to estimate the sizes of the cooling water reservoirs at the Lee site and the alternative sites. However, more detail is needed regarding the model input parameters and calculations to fully understand the connection between these and the resultant reservoir sizes and locations.
<p>(a) The list of Site Audit Information Needs provided to Duke Energy Carolinas, LLC (Duke) in preparation for the Make-Up Pond C audit held August 11-13, 2010, is publicly available in the NRC Agencywide Documents Access &amp; Management System (ADAMS) under ADAMS Accession No. ML102110501. ADAMS is accessible at <a href="http://www.nrc.gov/reading-rm/adams.html">http://www.nrc.gov/reading-rm/adams.html</a>. Persons who do not have access to ADAMS or who encounter problems in accessing the documents located in ADAMS should contact the NRC's Public Document Room Reference staff at 1-800-397-4209/301-415-4737 or by e-mail at <a href="mailto:pdr@nrc.gov">pdr@nrc.gov</a>.</p>				

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RAI 207	AQ-1	ESRP 4.3.2 10 CFR 51.45(c) 10 CFR 51.71(d)	Describe the methods by which water will be removed from the farm ponds both outside and inside the footprint of Pond C, how the dikes will be breached, and the condition the ponds will be left in after the breaching is completed. Also, describe the potential disposition of fish and other aquatic organisms and how their transplanted (or other disposition) will be determined.	Duke's response to RAI 143 (ADAMS Accession No. ML101880072) provided justification for breaching all farm ponds in the vicinity of Make-Up Pond C. Breaching the dams will affect the environment in different ways depending on the method employed. More description is needed to describe the process for breaching the farm pond dams and describing the condition they will be left in after the breaching has been completed.
RAI 208	AQ-1	ESRP 4.3.2 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a copy of the report on electrofishing and other sampling conducted to survey aquatic species found in the farm ponds after it is finalized.	Duke's response to RAI 143 provided justification for breaching all farm ponds in the vicinity of Make-Up Pond C. Further discussion revealed that a study has been performed to characterize the aquatic species living in the ponds and that a report would soon be available for review. A copy of this report is needed to further evaluate the environmental impact of breaching the farm ponds.
RAI 209	AQ-2	ESRP 4.3.2 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a list of the permitting agencies being consulted regarding potential mitigation related to the construction of Pond C and the Lee Nuclear Station. Describe the stage of discussions with each of these agencies. Also, provide a description of Duke's approach for determining potential mitigation projects that will be likely to satisfy agency requirements.	Duke's response to RAI 146 (ADAMS Accession No. ML101810147) did not provide information on potential mitigation plans because permits have not yet been issued. During the site audit, Duke provided an indication of how preliminary talks with the permitting agencies are being conducted in ecological and hydrological subject areas. A written summary is needed so the NRC may describe the current status and approach for consultation and mitigation in the environmental impact statement (EIS).

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RAI 210	AQ-3	ESRP 5.3.1.2 10 CFR 51.45(c)	Provide bathymetric maps of Ponds A, B, and C that show clearly labeled contour lines with the locations of the intake screen and supporting structures superimposed. Provide plan and section views of each intake structure. For clarity and legibility, print the maps in black and white. Describe what is known about the options for wedge wire slot sizes for the traveling screens, particularly if an estimate or range of potential slot sizes is known. Provide information about the height the Pond B and C drum screens will be elevated above the substrate. Also, describe the potential cleaning methods for the Ponds A, B, and C intake screens. Indicate in the response when and how through-screen velocity calculations will be provided to the NRC (e.g., through submittal of a copy of the National Pollution Discharge Elimination System permit application).	<p>Duke's response to RAI 148 (ADAMS Accession No. ML102070357) indicated the Make-Up Pond A intake system will utilize a dual-flow type traveling screen. Duke also indicated the Make-Up Ponds B and C intakes will utilize passive wedge wire cylindrical drums, but did not describe the screen slot size.</p> <p>At the site audit, Duke described the proposed systems, but a written description and improved bathymetry maps are required to document this information in the EIS.</p>
RAI 211	AQ-4	ESRP 6.5.2 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a status summary of all issued, applied for, and anticipated environmental permits associated with the Lee project. Include in the discussion Duke's best estimate of when anticipated applications will be submitted. Provide copies of the permits that have been acquired, and of the permit applications that have been submitted.	Duke's response to RAI 152 (ADAMS Accession No. ML101810147) indicated they have not yet received any environmental permits. At the site audit, Duke provided an update on permit status. A written statement is required to document this information in the EIS.

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RAI 212	TE-1	ESPR 4.3.1 10 CFR 51.45(c) 10 CFR 51.71(d)	For each portion of the project (e.g., Lee site, railroad corridor, Pond C, transmission line corridors) provide information regarding Duke's commitment to disturb forest vegetation (particularly hardwood forest vegetation) outside the local March through June migratory bird nesting season. Also, include in the response the types (pine or hardwood), location, and extent of forests potentially affected. If it is not possible for all forest disturbances to occur outside the nesting season, describe additional actions Duke will take, such as modification of the existing U.S. Fish and Wildlife Service migratory bird depredation permit.	In the response to RAI 166 (ADAMS Accession No. ML101950211), Duke indicated that, where possible, it would conduct vegetation disturbance activities outside the migratory bird nesting season. More detailed information is needed to estimate construction impacts to migratory birds for each portion of the project (i.e., Lee site, railroad corridor, Pond C, transmission line corridors) and in hardwood versus pine forest. It is necessary to distinguish pine versus hardwood disturbance because hardwood forest is generally preferred over pine forest as nesting habitat, therefore hardwood disturbance during the nesting season could result in greater impacts to migratory birds than pine disturbance during the same period.

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RAI 213	TE-2	ESRP 4.3.1 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide information regarding conceptual mitigation planning for losses of wetlands, and losses of riparian and upland areas associated with streams and wetlands, in the Pond C area, as well as in other parts of the project (i.e., Lee site, railroad corridor, transmission line corridors). In the response, consider the mitigation sequence required under the Clean Water Act - avoidance, minimization, and compensatory mitigation. Where appropriate, consider compensatory mitigation at the watershed level, as emphasized in <i>Compensatory Mitigation for Losses of Aquatic Resources; Final Rule</i> (40 CFR Part 230). Include a list of the agencies being consulted about potential mitigation and describe the stage of discussions with each of these agencies.	In the response to RAI 184 (ADAMS Accession No. ML101810147) Duke indicated that mitigation plans are typically provided to the U.S. Army Corps of Engineers (USACE) as part of the 404 permit application and not finalized until the 404 permit is issued. Since Duke will not be submitting its 404 permit application until after the draft EIS is issued, this approach would prevent the preparers of the EIS from considering mitigation when assessing impacts to terrestrial and aquatic ecology in the draft EIS. A conceptual description of mitigation plans and commitments is needed so the NRC can provide a complete and accurate evaluation of impacts in the EIS.
RAI 214	TE-3	ESRP 6.5.1 10 CFR 51.50(c)	Provide a conceptual approach for monitoring transplanted Georgia aster ( <i>Symphyotrichum georgianum</i> ) and state plant species of concern outside of the Pond C inundation area, as well as monitoring in conjunction with other more general mitigation discussed in TE-2.	In the response to RAI 175 (ADAMS Accession No. ML101810147), Duke indicated that to date it has not developed any plans to monitor impacts to terrestrial resources. Monitoring is part of assessing the potential success of the mitigation, as discussed in RAI 213. Description of potential monitoring is necessary to determine environmental impacts associated with transplanting state plant species of concern.

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RAI 215	TE-4	ESRP 2.4.1 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide information on the methods and results for herpetofauna and bird surveys that is lacking, but was intended to be included, in the transmission line survey report (230 kV and 525 kV Transmission Line Ecological Survey Report – ADAMS Accession Nos. ML092710473, ML092710474, and ML092710472).	In the response to RAI 179 (ADAMS Accession No. ML101810147), Duke indicated that the Rare, Threatened, and Endangered Species portion of the transmission line survey report included information on herpetofauna and birds. However, the report provides no information on the methods or results these surveys.
RAI 216	ALT-3	10 CFR 51.70(b), 40 CFR 227	<p>Provide the following information that will be cited in the response to RAI 128 (to be received by NRC in October 2010):</p> <ol style="list-style-type: none"> <li>1. Table of stage-volume and stage-area data used to model Ponds B and C;</li> <li>2. Water balance model results including daily stage, volume, surface area, inflow and outflow for Ponds A, B, and C;</li> <li>3. Broad River daily flows used as input and the computed daily discharge from Ninety-Nine Islands Dam;</li> <li>4. Daily evaporation rates for each pond; and</li> <li>5. Any assumptions such as sources and sinks of water, and other initial and boundary conditions for these ponds or the Ninety-Nine Islands Reservoir.</li> </ol> <p>The requested information is to be repeated for any alternative cooling scenario evaluated.</p>	<p>Duke will be providing a response to RAI 128 (ADAMS Accession No. ML101370398) in October 2010. During the Pond C site audit, Duke discussed its progress and methods for developing the response. The NRC requested that the information to the left be presented in the response to RAI 128.</p> <p>As stated in RAI 128, additional quantitative data used in the evaluation of plant cooling requirements during drought conditions is needed to evaluate hybrid wet-dry alternatives, in comparison with the proposed cooling system, and to identify any systems that would be environmentally preferable to the proposed system.</p>

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RAI 217	SW-6	10 CFR 51.70(b) and 40 CFR 227	<p>Provide the following documents on the docket for Staff's review:</p> <ol style="list-style-type: none"> <li>1. Devine Tarbell &amp; Associates, Inc, February 2, 2009. <i>Lee Nuclear Station Make Up Pond C Bathymetry Report.</i></li> <li>2. HDR/DTA. June 2009. <i>William S. Lee III Nuclear Station Reservoir Bathymetry Report, Rev 1.</i></li> <li>3. HDR/DTA. June 2009. <i>William S. Lee III Nuclear Station Make-Up Ponds B and C Histogram Report Permitting Case.</i></li> <li>4. HDR. December 2007. <i>Broad River Water Supply Study: Final Report.</i></li> </ol>	<p>The listed documents were referenced in the Supplement to the ER (ADAMS Accession No. ML092810257) as providing support and additional description of the water budget model.</p>

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RAI 218	CR-2	ESRP 4.1.3 ESRP 2.5.3 ESRP 5.1.3 and 2010 supplemental guidance ML100550730 SC State Law (SC Code 16-17-600)  36 CFR 800	Provide an update to the large site map provided in RAI 140 (non-publicly available), adding McKown and unnamed cemeteries, and a small 8.5 x 11 inch map showing the water pipeline in relation to the McKown Cemetery <sup>(b)</sup> .	Duke's supplemental response to RAI 119 (ADAMS Accession No. ML092170642) provided a copy of the 2009 Cultural Resources Survey of the Lee Nuclear Station Utilities Project and four historic cemeteries are identified within the boundaries of the Lee Site (Moss, Stroup, McKown, and unnamed). Neither the McKown Cemetery nor the unnamed cemetery within the direct and indirect areas of potential effect for Pond C and associated developments appear on the map of cultural resources and project Areas of Potential Effect (APEs) provided by Duke Energy in response to RAI 140. The water pipeline associated with Pond C, also shown on the map included as a response to RAI 140, appears to be located very close to the McKown Cemetery. These maps are needed to understand the overall impacts of construction and operation to these cemeteries for the impact analysis.
(b) Any sensitive cultural resources material submitted to the NRC should include a request to protect the information, as appropriate, in accordance with 10 CFR 2.390(a)(3) and Section 304 of the National Historic Preservation Act.				

RAI Number	Supplement to ER Site Audit Info Need No.	ESPR/ER Section	RAI	Supporting Information
RAI 219	CR-2	ESRP 2.5.3 ESRP 4.6 ESRP 4.1.3 ESRP 5.1.3 and 2010 supplemental guidance ML100550730 SC State Law (SC Code 16-17-600, 27-43-10 through 27-43-30, 27-43-310)	Provide a written response outlining the overall management and protection plans for historic cemeteries, with a statement confirming that Duke will follow State law with regard to the Service Family Cemetery relocation and continued public access to other cemeteries. Also include a list of individuals who have requested access to historic cemeteries on the Lee Site (McKown, Stroup, Moss, Service, and unnamed) and the frequency of their requests <sup>(c)</sup> .	Historic cemeteries are protected under State law in South Carolina, including provisions for ongoing public access. Pond C construction and development will cause direct impacts to one historic cemetery (Service Family Cemetery), which Duke proposes to relocate. Duke's response to RAI 134 (ADAMS Accession No. ML101880072) indicates that planning activities related to this relocation will not occur until 2012. To adequately assess potential cultural resource impacts for the EIS, additional information is needed on Duke's overall strategy for cemetery relocation as well as overall protection, management and provisions for continued public access. Confirmation of the overall approach to these resources is needed to support the analysis of impacts under NEPA and because it is possible that they will not be included in the overall cultural resource management plan/agreement under development between Duke, the South Carolina State Historic Preservation Office (SC SHPO), and the USACE. If historic cemeteries are not included in this overall plan/agreement, then the protective measures that will be employed must be outlined in a documented RAI response.
<p>(c) Any sensitive cultural resources material submitted to the NRC should include a request to protect the information, as appropriate, in accordance with 10 CFR 2.390(a)(3) and Section 304 of the National Historic Preservation Act.</p>				

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RAI 220	CR-3	ESRP 2.5.3 ESRP 4.1.3 ESRP 5.1.3 and 2010 supplemental guidance ML100550730 SC State Law (SC Code 16-17-600)  36 CFR 800	Provide a written summary of the approach to consider sensitive areas, such as 38CK172, during transmission line construction and maintenance, including provisions for inclusion of sensitive areas on GIS maps used for design, construction, and maintenance, hand clearing of vegetation, and 50 ft protective buffers <sup>(d)</sup> .	Duke's response to RAI 138 (ADAMS Accession No. ML101950211) indicates that impacts to the possible burial site (38CK172) will be avoided because the new transmission line will span the site. Duke Energy's response to RAI 140 indicates that the entire corridor for the transmission lines will be cleared by heavy machinery and the planners do not know the exact location of each power pole excavation. Written confirmation of the techniques that will be employed during construction and maintenance of the transmission line to protect sensitive sites like 38 CK172 is needed (e.g., integration of sensitive areas in overall project GIS maps for design and construction, hand clearing of vegetation during construction and maintenance, routing of service roads and access roads around sensitive areas, establishment of 50 ft protective buffers, etc.).
(d) Any sensitive cultural resources material submitted to the NRC should include a request to protect the information, as appropriate, in accordance with 10 CFR 2.390(a)(3) and Section 304 of the National Historic Preservation Act.				

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RAI 221	CR-4	ESRP 9.3 and 2010 supplemental guidance ML100621042 ML100550730  36 CFR 800 40 CFR 1502	Provide summaries of archival/records searches for the three alternative sites: Perkins, Keowee, and Middleton Shoals <sup>(e)</sup> .	Duke's response to RAI 47 (ADAMS Accession No. ML083080273) provided very limited information on historic and cultural resources identified at the three alternative sites (Keowee, Perkins, Middleton Shoals) derived from a search of only one public source (online National Register of Historic Places listings). Additional reconnaissance level information is needed to adequately assess potential impacts. During brief visits to local historic archives in public libraries near the Perkins (Mocksville, NC), Keowee, and Middleton Shoals (Anderson, SC) alternative sites on August 11 and 12, 2010, it was confirmed that many prehistoric and historic cultural resources have been recorded in the vicinity of each of the alternative sites. SHPO archives should contain general info on these resources that would provide the review team with the reconnaissance-level information necessary to make valid comparisons between the sites.
<p>(e) Any sensitive cultural resources material submitted to the NRC should include a request to protect the information, as appropriate, in accordance with 10 CFR 2.390(a)(3) and Section 304 of the National Historic Preservation Act.</p>				

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RAI 222	SE-1	ESRP 4.4.2 10 CFR 51.45(c) 10 CFR 51.71(d)	Provide an estimate of the total workforce by month during construction of the Lee project, including all related projects on- or off-site.	The construction workers for Pond C are in addition to the Lee site workforce. Estimates of the monthly total workforce are necessary for the analysis of socioeconomic impacts.
RAI 223	SE-4	ESRP 4.4  10 CFR 51.45(c) 10 CFR 51.71(d)	Provide a revised analysis or a detailed description of the methodology used for determining the percentage of impacts with regard to preconstruction and construction.	Duke has used a 20/80 split (20 percent construction and 80 preconstruction) to attribute environmental impacts of building the Lee Nuclear Station. The applicant for the nearby Summer site (also an AP1000) included the opposite percentages – 80 percent construction and 20 percent preconstruction. Additional information is needed to explain the differences between these apparently similar sites (using the same reactor design), and to determine impact levels related to NRC authorized construction.
RAI 224	N/A	ESRP 5.7  10 CFR 51.45(c)	Reconcile the statement in ER, Rev.1, Section 5.7.5 that "The organ-specific dose weighting factors from 10 CFR 20 are applied to the bone and lung doses to estimate the 100-year dose commitment from Rn-222 to the whole body" with the whole-body dose values contained in Table 5.7-3.	The second sentence of the first full paragraph on ER Rev.1 page 5.7-6 indicates that the bone and lung values in NUREG-1437, Table 6.2 (based on ICRP Publication 2), were modified by recent organ weighting factors to approximate current effective "whole body" doses. However, the values in ER Table 5.7-3 appear to be the Total Body doses in NUREG-1437 Table 6.2 (based on ICRP Publication 2) scaled only by the factor of 2.675, and not a combination of bone and lung doses as indicated on page 5.7-6.

