

US EPA ARCHIVE DOCUMENT



June 2, 2011

Mr. Stephen Hoffman
US Environmental Protection Agency
Two Potomac Yard
2733 South Crystal Drive
5th Floor, N-5237
Arlington, VA 22202-2733

Subject: Draft Dike Assessment Report Comments
Cross Generating Station – Cross, SC

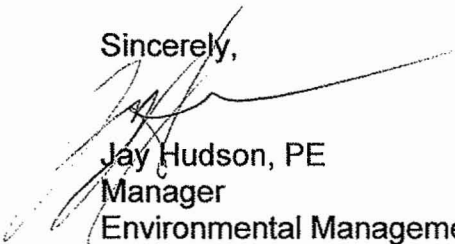
Dear Mr. Hoffman:

South Carolina Public Service Authority (Santee Cooper) received and reviewed the draft dike assessment report for the Cross Generating Station which resulted from the site assessment conducted by your contractor, Dewberry & Davis, LLC., on February 23, 2011. Attached is a summary of recommended corrections and comments.

The impoundments are under the regulatory authority of the South Carolina Department of Health and Environmental Control. Santee Cooper has an excellent track record with regard to the safety of our coal combustion residual storage impoundments and is fully committed to maintaining this record.

Santee Cooper makes no confidentiality claims with respect to material contained in the draft report or with respect to this correspondence. Please contact me at 843-761-8000 if you have any questions.

Sincerely,



Jay Hudson, PE
Manager
Environmental Management

JAH:SKJ:DBB:dss

Attachment

**Santee Cooper Cross Generating Station
Comments on Draft Dam Assessment Report**

**By
Dewberry & Davis, LLC
Dated April 2011**

Santee Cooper has reviewed the draft assessment report prepared by Dewberry & Davis, LLC, for the impoundments containing coal combustion residuals at the Cross Generating Station. Santee Cooper appreciates the consultant's thoroughness and we concur with the conclusions, that there are no apparent indications of any unsafe conditions, and that the facility is generally satisfactory for continue safe and reliable operation. The following corrections and comments are provided:

Draft Report Correction:

1. Section 4.1.1 Original Construction –

Bottom Ash Pond 2 was commissioned for service in 1995 when Unit 1 came into service. Unit 2 and Ash Pond 1 were commissioned for service in 1983.

2. Section 7.1.6, Critical Geological Conditions -

The consultant states the CCR impoundments are located in an area anticipated to experience about 0.98g peak (horizontal) ground acceleration with a 2-percent probability of exceedance in 50 years. In addition, the consultant notes the expected horizontal ground acceleration at the dikes, derived from a site response analysis, would be *higher* than the indicated value shown on the 2008 USGS Seismic-Hazard Maps for Central and Eastern United States.

Santee Cooper agrees the Cross Generating Station is located in a "seismic impact zone." This is based on data published in the 2008 U.S. Geological Survey National Seismic Hazard Map (NSHM), 2% in 50-yr, showing the peak ground acceleration (PGA) for this region of South Carolina is between 80%g and 120%g. The USGS hazard maps present the estimated peak ground acceleration for a hypothetical bedrock outcrop at the site. If bedrock is not present at or near the ground surface, the peak acceleration from the USGS map must be modified to account for local site conditions.

Based on work by Odom, (et al., 2003) bedrock is not at or near the ground surface at the Cross Generating Station. The depth to bedrock is approximately 600 meters (approximately 1,900 ft) below ground surface. Since bedrock is not present at or near the ground surface, the peak acceleration of 1.0348g predicted by USGS may not be valid as a ground surface motion at the site and may require modification to account for local site conditions.

An independent study commissioned by the South Carolina Department of Transportation (SCDOT) involving probabilistic seismic hazard mapping for South Carolina was prepared by Chapman and Talwani (2006). The resulting report was incorporated into the SCDOT Geotechnical Design Manual, dated August 2008, and includes a series of hazard maps to estimate peak ground acceleration taking into account sediment thickness and/or near surface weathering.

Based on the SCDOT Geotechnical Design Manual, a conservative estimate for the peak ground acceleration (PGAB-C) at the Cross Generating Station is approximately 0.55g for a hypothetical outcrop of "firm coastal plain sediment," and is equivalent to the National Earthquake Hazards Reduction Program (NEHRP) B-C boundary having a shear wave velocity, $V_s = 2,500$ ft/s. Therefore, the horizontal ground acceleration at the CCR impoundments, derived from a site response analysis, would be *lower* than the indicated value shown on the 2008 USGS Seismic-Hazard Maps for Central and Eastern United States.

Comments to Consultant's Recommendations:

Section 1.2.1 - Recommendations Regarding Maintenance

"It is recommended that routine maintenance pay particular attention to:

- a. Re-establishing good grass cover in areas of sparse grass growth and in areas eroded by surface runoff;
- b. Removing or otherwise controlling vegetation growing on (or in thin sediment on) the Fabriform revetment on the interior slopes of the ash pond dikes."

Comment -

Santee Cooper agrees with the consultant's recommendations to re-establish good grass growth along sections of the exterior slope and control vegetation growing on sections of the interior slopes of the ash pond dikes.

Comments to Consultant's Impoundment NID Hazard Potential Ratings:

Ash Pond 1 & Ash Pond 2 – Santee Cooper concurs with the Low Hazard Potential Classification for Ash Pond 1 and Ash Pond 2; and the Less Than Low Hazard Potential Classification for the Gypsum Pond.

Comments to Consultant's Impoundment Condition Ratings:

Santee Cooper concurs with the SATISFACTORY condition rating given by EPA's Consultant for the Cross Generating Station CCR impoundments.

NOTE

Subject: EPA Comments on Santee Cooper (South Carolina Pub Serv Auth), Cross Power Station, Pinesville, SC
Round 9 Draft Assessment Report

To: File

Date: October 13, 2011

1. Although each unit was rated satisfactory, there is a problem with the seismic loading analyses and potential for liquefaction. The following excerpt from Section 7.3 ASSESSMENT OF STRUCTURAL STABILITY does not appear to warrant a satisfactory rating for these units: "From review and evaluation of the available analyses and site subsurface data, it appears that with respect to seismic stability and liquefaction potential the CCR Pond dikes probably would safely withstand a low to moderate intensity earthquake with short duration; they probably would not withstand the strong earthquake for which the main plant structures are designed." We are concerned with the "satisfactory" condition ratings given to units that do not meet the minimum FOS requirements. We understand that two units had seismic FOS less than the minimums but were still rated "satisfactory". We understand these units may not pose much risk, it is our policy to ensure that a rating of "satisfactory" is reserved for those units that meet all FOS requirements. Mitigating factors may be stated or explained.
2. On p. ii, INTRODUCTION, SUMMARY CONCLUSIONS AND RECOMMENDATIONS, first paragraph, please remove the excess period at the end of the paragraph.
3. On p. ii, INTRODUCTION, SUMMARY CONCLUSIONS AND RECOMMENDATIONS, second paragraph, replace "Section 1.2.5" with "Section 1.2.1."
4. On p. 1-2, Section 1.1.5, replace "(see Subsection 1.2.5)" with "(see Subsection 1.2.1)."
5. On p. 2-3, Table 2.2a is highlighted for gypsum pond only, should either indicate that it is for just that pond, or show a labeled highlighted area for all three ponds.
6. On p. 5-3, section 5.2.3, first paragraph, please add a period at the end of the paragraph.
7. On p. 5-8, photo 5.7.b, there is a section of the upper part of the photo that is blacked out. Please include the photo without redactions.
8. On p. 5-11, section 5.5.1, replace "see Section 5.5.3." with "see Section 5.5.2." On p. 7-4, section 7.1.2, please rephrase the following statement to be grammatically correct: "Undrained strength parameters were assumed for all the foundation soil layers under both the newer on the dike east side and the original dike."

9. On p. 5-17 (photo 5.16) show the emergency overflow outlet for the gypsum pond with a yellow/rust-colored discharge, however, Page 6-1 says "no reported flows through the emergency overflow structure, the water surface presumably has always been below the emergency overflow weir elevation of 84.5 feet (according to design drawings), leaving more than 1.3 feet of freeboard." Please clarify.

MEMORANDUM

TO: Jana Englander

FROM: Jerry Strauss

cc:

Date: December 14, 2011

SUBJECT: Santee Cooper, Cross, Response to Comments

EPA Comments:

- The pseudo-seismic analysis (a screening method) showed one pond did not meet the most severe earthquake for 2%, 50-year (Draft Report). Dewberry evaluated a more in-depth (fewer assumptions) analysis performed for that pond by Santee Cooper's engineer and others concerning seismicity in the area (see utility's comments, dated April 2011). This more detailed analysis showed satisfactory performance under a return period of 2,475 years, which is the return period equal to 2%, 50-year. So the dam does meet the minimum Factor of Safety. We now can state that all 3 ponds are Satisfactory for static and seismic stability.
- Section references changed.
- Took out photo redactions (particularly 5.7b).
- Clarified discussion of rust-colored soils (p. 5-17)
- Editorial changes made.

Utility Comments:

- Corrected commissioning dates
- Revised the discussion of stability under seismic conditions, incorporating more information provided by the utility. (See bullet #1 EPA comments)