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Via E-Mail and Overnight Courier

May 17, 2011

Mr. Stephen Hoffman
US Environmental Protection Agency
Two Potomac Yard
2733 S. Crystal Drive
5th Floor, N-237
Arlington, VA 22202-2733

Reference: US EPA Request/ICR # 2350.01
Lee Steam Station
Williamston, South Carolina

Dear Mr. Hoffman,

Duke Energy Carolinas, LLC (DEC) has received and reviewed the final Specific Site Assessment for Coal Combustion Waste Impoundments report prepared by GEI Consultants, Inc. on behalf of the US EPA. This report was the result of a specific site assessment of the dam safety of two coal combustion waste (CCW) impoundments located at the Lee Steam Station in Williamston, South Carolina. The site assessment was conducted on June 22, 2010.

Duke Energy supports the EPA's objective to ensure dam safety of CCW impoundments and remains committed to managing its CCW impoundments in a safe and responsible manner. As such, we continue to implement our comprehensive operating, maintenance and inspection programs for each of our ash basin dams to help protect the public and the environment. EPA's report on the Lee Steam Station found that the dams and outlet works facilities associated with the CCW impoundments at the Lee Steam Station were generally found to be in a satisfactory, well-maintained condition. However, the EPA's contractor did make several recommendations to correct minor performance deficiencies, for supplementary engineering analyses, and to improve instrumentation and monitoring. Duke Energy responds to each of these recommendations as follows:

12.1 Corrective Measures and Analyses for the Structures

1. *We recommend formal monitoring and analysis of the seepage area downstream of the right abutment of the Secondary Ash Basin in order to evaluate whether seepage could potentially compromise the stability of the dam. Monitoring should include installation of a weir and grading to direct seepage toward the weir. The weir should then be monitored monthly in order to establish a baseline measurement of seepage quantity. Continued monitoring will*

then show whether the seepage quantity changes with time. In addition, we recommend measuring turbidity in the seepage. A large amount of fines in the seepage could indicate piping of material through the dam.

Duke Energy will develop a plan to monitor seepage at the toe of the secondary dike by October 31, 2011.

2. *We recommend updated stability analyses be performed for both dams and the divider dike. Stability analyses for the dams should include piezometric surfaces based on recent readings of the standpipe piezometers installed on the downstream face. A further evaluation of the upstream slope steady state seepage and rapid drawdown load cases should be performed. Stability analyses should include pseudo-static seismic analyses.*

   Duke Energy will perform supplemental stability analyses for the primary and secondary dikes using updated stability models to reflect current piezometric surfaces. The analyses will consider steady-state, rapid drawdown, and pseudo-static conditions for the upstream slope. Steady-state and pseudo-static conditions will also be evaluated for the downstream slope. The supplemental analyses will be completed by June 30, 2012.

3. *The liquefaction potential of the sandy silt comprising the embankment fill and the foundation should be evaluated.*

   Duke Energy will perform a liquefaction susceptibility analysis if materials that comprise the dam embankments or foundations appear potentially liquefiable as determined by the current state of engineering practice. Please note Section 9.5 of the EPA report states:

   > *"Certain conditions are necessary for liquefaction, including saturated, loose, granular soils and an earthquake of sufficient magnitude and duration to cause significant strength loss in the soil. The soils comprising the dam and the foundation are described as micaceous sandy silt. The borings drilled in 1984 for the divider dike study indicate that blowcounts as low as 3 to 4 blows per foot were obtained near the surface in the foundation soils. These soils may be susceptible to liquefaction when subjected to the design earthquake."*

   We understand that the main factors for triggering liquefaction are earthquake intensity/duration, groundwater elevation, soil type, soil relative density, particle size gradation, placement conditions, drainage conditions, confining pressures, and aging. It appears the opinion in the EPA report loosely correlates the low "blowcounts" (SPT N-values) to liquefaction potential. Duke Energy does not concur with this opinion.

   Alternately, we have reviewed the available laboratory data associated with these materials where low N-values were recorded. It appears that the low SPT N-values are not indicative of liquefiable soils or representative of the soil's actual density or shear strength. This is evidenced by the triaxial shear strength test data, which indicates these low N-value materials actually exhibit relatively high shear strength properties and densities. Instead,

these N-values recorded in this soil stratum were likely augmented (lowered) due to the presence of shallow ground water. This phenomenon can occur if the level of water in the borehole is less than in situ groundwater level. Also, saturated soils with appreciable silt content may contract during the undrained shear conditions associated with driving the SPT sampler producing abnormally low N-values.

Furthermore, review of the boring logs indicates these soils are generally classified as sandy silt using the Unified Soil Classification System (USCS, ASTM D 2487). The soil classification suggests that these soils are comprised of 50% or more (by weight) of materials finer than the No. 200 sieve. While it is not impossible for silts to liquefy (depending on plasticity characteristics), liquefiable soils are more commonly associated with materials with lesser fines content.

Also, the boring logs indicate these materials are residual in deposition. Residual soils were formed by in-place weathering of the parent bedrock. The parent bedrock is reported as consisting of Lower Cambrian and Late Proterozoic age Sillimanite-mica schist. As such, these materials have undergone significant aging processes, a condition that suggests low liquefaction potential.

Based on these factors and the relatively low seismicity in this geologic setting, the potential for liquefiable soils is not apparent. As such, a formal liquefaction susceptibility analysis is not warranted.

4. *The water level in piezometer L-9, near the toe of the Secondary Ash Basin dam, is about 10 feet higher than the water levels in the piezometers at the toe of the Primary Active Ash Pond dam, and is higher than the piezometric surface assumed at this location in the stability analyses performed in 1984. The elevated water level may be caused by the seepage downstream of the right abutment of the Secondary Ash Basin dam, and may indicate that the toe drain in this area is not functioning properly. Stability analyses should specifically investigate whether the elevated water level in this area could compromise the stability of the dam.*

   This recommendation will be included with the stability analysis referred in recommendation 2 of Section 12.1. If the stability analysis indicates the elevated water level in the area could compromise the stability of the dam, Duke Energy will investigate the cause of the elevated water and develop corrective measures. The supplemental analyses will be completed by June 30, 2012.

5. *The water level in piezometer L-4 began rising in October 2009, and was elevated until April 2010. The cause of the elevated water level should be investigated and corrected if necessary, and analyses should be performed to evaluate whether an elevated water level in the vicinity of L-4 could potentially compromise the safety of the Primary Ash Pond Dam.*

   This recommendation will be included with the stability analysis referred in recommendation 2 of Section 12.1. If the stability analysis indicates the elevated water level in the area could compromise the stability of the dam, Duke Energy will investigate the cause of the elevated water and develop corrective measures. The supplemental stability analyses will be completed by June 30, 2012.

6. *The inside and outside of the drop box downstream of the Secondary Ash Basin should be monitored for continued degradation, and repaired or replaced if necessary.*

   Duke Energy will continue to monitor the condition of the drop box monthly, and repairs or replacement will be performed as necessary. This recommendation is considered complete.

12.2 Corrective Measures Required for Instrumentation and Monitoring Procedures

1. *A weir should be installed near the seepage area downstream of the Primary Active Ash Pond dam in order to monitor quantity and quality of the seepage.*

   This will be evaluated when developing the seepage monitoring plan addressed in recommendation 1 of Section 12.1. The seepage monitoring plan will be developed by October 31, 2011.

2. *The quantity of water flowing from the toe drains at the dam should be measured regularly.*

   This will be evaluated when developing the seepage monitoring plan addressed in recommendation 1 of Section 12.1. The seepage monitoring plan will be developed by October 31, 2011.

3. *A staff gauge or other means of measuring the water level in the Primary Active Ash Pond so the water level in the pond can be recorded regularly. The flow from this pond into the Secondary Ash Basin should also be monitored.*

   The current measuring device used by the monthly inspector is adequate. However, consideration will be given to this recommendation to improve our monitoring program. Monitoring flow into the secondary ash basin will be evaluated for potential merits and value. This recommendation is considered complete.

If you have any questions regarding the above responses, please contact Ed Sullivan at our corporate offices at 980-373-3719 or via e-mail.

Sincerely,
Duke Energy Carolinas, LLC

Terry Taylor
Station Manager, Lee Steam Station
Duke Energy Regulated Generation