

US EPA ARCHIVE DOCUMENT



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Via E-Mail and Overnight Courier

December 7, 2009

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

RE: US EPA Request/ICR # 2350.01
Riverbend Steam Station
175 Steam Plant Road
Mount Holly, North Carolina 28120

Dear Mr. Hoffman,

Duke Energy Carolinas, LLC (DEC) received and has reviewed the final draft report for Riverbend Steam Station that resulted from the site assessment of the Primary and Secondary Ash Ponds conducted by the US EPA and its engineering contractors on June 4-5, 2009. Duke Energy supports the EPA's objective to ensure ash basin dam safety. We have a comprehensive and robust monitoring, maintenance, and inspection program in place for all of **our** coat ash basin dams and remain committed to operating and maintaining **these** facilities safely.

The impoundment facilities at Riverbend are currently under the regulatory authority of the North Carolina Utilities Commission. The Commission requires Duke Energy to have an inspection performed every five years by an independent consultant using qualified licensed Professional Engineers. The consultants utilized by Duke Energy to meet this requirement are equally qualified as those used **by** the EPA for its assessment. Effective **January 1, 2010**, the facilities **will** be under the regulatory authority of the North Carolina Department of the Environment and Natural Resources (NCDENR), Division of **Land** Resources, Office of Dam Safety. The Office of Dam Safety will conduct an **assessment/inspection** of the impoundments at a minimum of once every **two** years and in practice, plans to do the inspections once a year. Duke Energy also plans to continue our rigorous internal inspection program.

EPA's engineering contractor has rated the Riverbend impoundments in accordance with the National Inventory of Dams rating criteria as "Significant Hazard Potential". As previously noted, this rating is **not** an indication of the **structural** integrity of **the** impoundment, but of the hazard potential if the impoundment were to fail. "Significant Hazard Potential" is used where failure results in no probable

loss of human life but can cause significant economic loss, environmental damage, disruption of lifeline facilities, or impact other concerns. In our response to the CERCLA 104(e) Request for Information Question #1 submitted last March for Riverbend, we stated that no National Inventory of Dams criteria rating had been assigned to the Riverbend structures by a State or Federal agency; however, the North Carolina Utilities Commission had classified the structures as "high hazard" under the North Carolina Dam Safety Rules due to the potential environmental damage of an ash release in the event of failure. This highlights the difference between the North Carolina rating criteria where high hazard potential is a classification also used if economic damage of greater than \$200,000 is expected; versus the National Inventory of Dams criteria where high hazard potential is reserved for those cases where there would be a probable loss of human life. The National criteria rating of "Significant Hazard Potential" from the contractor is an accurate reflection of the reasoning behind the North Carolina rating of "High Hazard Potential". The EPA's engineering contractor's rating is a reduction in rating from that previously released by the EPA of high hazard from the CERCLA 104(e) Request for Information.

Duke Energy remains committed to meeting all state and federal requirements and to managing its coal combustion byproducts impoundments in a very safe and responsible manner. We are confident, based on our ongoing monitoring, maintenance and inspections, that each of our ash basin dams has the structural integrity necessary to protect the public and the environment. EPA's report supports this conclusion and found that acceptable performance is expected in accordance with the applicable safety regulatory criteria. EPA's contractor did; however, make several recommendations to address minor deficiencies and secondary studies/investigations to provide further assurance of continued structural integrity. Duke Energy responds to each of these recommendations as follows:

- 4.2. ***Maintaining Vegetation Growth.*** *Appropriate grass vegetated the dikes. However, there were areas of sparse vegetation where reseeding maintenance should be performed. There are also some areas where the grass cover appeared to be removed by sliding mower wheels. Duke Energy should perform reseeding as required yearly to maintain a good grass cover on the dikes. If mower damage routinely occurs in the same areas each time grass is re-established, consideration should be given to using alternative methods (such as weed-whacking) of cutting the grass in these areas.*

Duke Energy will address areas of sparse vegetation in accordance with our current vegetation management practices. If areas are damaged routinely by mowers, alternative grass cutting methods will be considered. Some of the concerns noted were the result of mowing in wet weather (not a best practice) at the contractor's request in preparation for EPA's inspection. Duke Energy will re-seed the identified areas prior to January 31, 2010.

- 4.3. ***Drainage Swale Maintenance.*** *Sediment was evident in rip rap drainage swales. The sediment observed appeared to be related to surface runoff and tended to accumulate at the toe of the swales. Duke Energy should monitor the condition of these drainage swales and if the sediment appears to be clogging the rip rap and impeding surface runoff from being adequately conveyed away from the earthen embankments, the rip rap should be cleaned of sediment.*

Duke Energy will continue to monitor the condition of the drainage swales and will investigate the source of the erosion as necessary. If clogging occurs, the rip rap will be cleaned of sediment. This recommendation is considered complete.

- 4.4. **Tree and Root Removal.** Tree roots were observed at the slope surface near the northwest end of the secondary dike. These roots appear to be from trees growing beyond the toe of the dam. CHA recommends that Duke Energy, under the direction of a professional engineer, remove trees from beyond the toe of the dam, and remove large root masses in the embankment toe. Similarly, trees have established themselves in ash sediment adjacent to or over the toe of the intermediate dike at the west end. CHA recommends these trees be removed under the direction of a professional engineer.

Duke Energy will address all trees and roots in these areas by January 31, 2010, in accordance with the guidance issued by the North Carolina Department of Environment and Natural Resources, Land Quality Section, Dam Safety Office. We will continue to monitor these areas in accordance with the Station's current inspection practices.

- 4.5. **Exposed Soil Beyond Primary Dike Toe.** CHA recommends filling and revegetating an area of exposed soil beyond the toe of the north end of the primary dike. Although not directly related to the embankment stability, this area is undergoing erosion from stormwater runoff. Regrading and revegetating this area will minimize erosion and make observations of any future changes more easy to observe.

Duke Energy will regrade and re-seed the areas identified by January 31, 2010. We will continue to monitor this area in accordance with the Station's current inspection practices.

- 4.6. **Outlet Pipe Inspections.** During our site visit, the outlet pipe from the primary pond to the secondary pond was submerged. This concrete pipe was constructed beneath the intermediate dike on top of sluiced ash. We recommend a condition survey be performed on this pipe to check for condition degradation, leaking joints, joint settlement, etc., that could impact the performance of the overlying intermediate dike.

The secondary pond outlet pipe was inspected in 2008 via video survey. This pipe is a corrugated metal pipe that was installed in 1958. Corrugated metal pipes are subject to corrosion and, although commonly used in the era when this dam was constructed, currently industry practice recommends against using this type of pipe. CHA recommends Duke Energy consider replacing or slip lining this pipe with a less corrosive material, or at a minimum, perform periodic video inspection of the pipe to observe for changes that will indicate when the pipe has reached the end of its useful life.

Duke Energy will institute a program of annual condition surveys, including video inspections where warranted. Repairs or other action will be taken as appropriate based on the results of those surveys. Duke Energy's program will include periodic video inspections of the secondary pond outlet pipe as the 2008 video survey indicated the corrugated pipe was in comparatively good condition. The inspection of the primary pond concrete outlet pipe will be complete by January 31, 2010.

- 4.7. **Seepage Monitoring.** As discussed in Section 2.3.1, flowing seepage was observed at the toe of the secondary dike. Duke Energy was aware of this seepage and makes observations of this area during their routine inspections. CHA recommends a collection trench or pipe and monitoring weir be installed in this area to facilitate quantifiable volume measurements and sample collection.

Quantifiable measurements will allow Duke Energy and outside consultants to see changes if they occur. Any changes would need to be addressed.

Duke Energy will develop a plan to monitor seepage at the toe of the secondary dike by January 31, 2010.

- 4.8. **Artesian Monitoring Wells.** Two of twelve recently installed groundwater monitoring wells beyond the toes of the dikes show artesian conditions. This condition has been noted in MW-1S and MW-6D. CHA recommends that Duke Energy include these monitoring locations in monthly piezometer readings. Accurate measurements of head can be performed at these locations either by extending the well casings, by fitting each well with a low pressure gage.

The recently installed groundwater monitoring wells were not designed for piezometric data collection. The Riverbend Station dikes have an adequate network of piezometers and retrofitting these two additional wells is unnecessary. They are located significantly beyond the toe of the dike and would provide no useful data about the piezometric surface within the dike. This recommendation is considered complete.

- 4.9. **Hydrologic and Hydraulic Evaluation Update.** As discussed in Section 3.2, CHA recommends the hydrologic and hydraulic analysis be updated to confirm that the primary and secondary ponds can safely store or pass the design storm, which is the inflow from the 3/4 PMP. Changes in topography to the south of the primary pond with the filling of the former dredge pond along with an apparent lack of routing analysis of inflows through the primary pond outlet pipe warrant this updated analysis. Consideration to available storage volume in the primary pond based on anticipated ash volumes should be included in this analysis.

Duke Energy will review and update the hydrologic and hydraulic analyses for this pond and demonstrate that the design is adequate for the 3/4 PMP. This review will account for the changes in topography discussed above and will be completed by June 1, 2010.

- 4.10. **Hazard Assessment.** We recommend that a breach analysis be performed for the Primary and Secondary Ash Ponds to determine whether development downstream would suggest a high hazard classification is warranted for these impoundments.

Although not discussed during EPA's site assessment, a breach/dam break analysis was conducted for the Riverbend Steam Station dikes on or about 1992. A copy of this analysis was forwarded to CHA on November 24, 2009 and is currently being reviewed. Based on this analysis, the peak downstream flood is approximately 14 feet above normal stage, within the normal flood plain boundary.

- 4.11. **Stability Analysis.** The CHA recreated cross sections outlined in Section 3.3.2 indicate that the factors of safety for the loading conditions calculated are above the minimum required factors of safety as discussed in Section 3.3. CHA recommends that soil properties, including shear strength under current conditions, be confirmed for the primary dike. We also recommend that a rapid drawdown analysis be performed for the dike once the soil properties are confirmed. CHA was not provided with stability analyses for the secondary dike. We recommend Duke Energy perform stability analyses for this embankment including steady state, flood surcharge, rapid

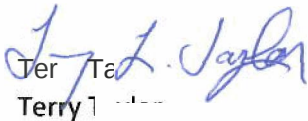
drowdown and seismic conditions. CHA performed preliminary analyses for each of these loading conditions, except for the rapid drawdown condition, using similar parameters as used by Duke Energy for the primary dike. These preliminary analyses indicate that the factors of safety are at or slightly the minimum required factors of safety as discussed in Section 3.3. However, the soil properties need to be confirmed.

Stability analyses should also be performed for the intermediate dike.

Duke Energy, through a third-party engineering contractor, has previously completed the stability analyses for the primary and secondary dikes as well as confirmed the soil properties within the dikes. The completed analyses confirmed the dikes are adequately constructed for the design conditions. Duke Energy will review the studies and analyses previously performed for the Riverbend impoundments, and through collaboration with our third-party consultants, determine if any additional analyses are required. This review will be completed by March 31, 2010.

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

General Manager II, Riverbend Steam Station
Regulated Fossil Stations