UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

SEP 15 2009

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

VIA E-MAIL AND FEDERAL EXPRESS

Mr. Fred Holt
Progress Energy Carolinas
P.O. Box 1551
Raleigh, North Carolina 27602

Dear Mr. Holt,

On June 15-16, 2009 the United States Environmental Protection Agency ("EPA") and its engineering contractors conducted a site assessment of the 1985 Ash Pond, 1978 Ash Pond, 1963/1970 Ash Pond, and the 1956 Ash Pond at the Cape Fear facility. The purpose of this visit was to assess the structural stability of the impoundments or other similar management units that contain "wet" handled coal combustion residuals (CCRs). We thank you and your staff for your cooperation during the site visit. Subsequent to the site visit, EPA sent you a copy of the draft report evaluating the structural stability of the units at the Cape Fear facility and requested that you submit comments on the factual accuracy of the draft report to EPA. Your comments were considered in the preparation of the final report .

The final report for the Cape Fear facility is enclosed. This report includes a specific rating for each CCR management unit and recommendations and actions that our engineering contractors believe should be undertaken to ensure the stability of the CCR impoundment(s) located at the Cape Fear facility. These recommendations are found on pages 100-106 in the final assessment report and are listed in Enclosure 2.

Since these recommendations relate to actions which could affect the structural stability of the CCR management units and, therefore, protection of human health and the environment, EPA believes their implementation should receive the highest priority. Therefore, we request that you inform us on how you intend to address each of the recommendations found in the final report. Your response should include specific plans and schedules for implementing each of the recommendations. If you will not implement a recommendation, please explain why. Please provide a response to this request within 14 calendar days of receipt of this letter. Please send your response to:

Mr. Stephen Hoffman
US Environmental Protection Agency (5304P)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

If you are using overnight of hand delivery mail, please use the following address:

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

You may also provide a response by e-mail to hoffman.stephen@epa.gov

This request has been approved by the Office of Management and Budget under EPA ICR Number 2350.01.

You may assert a business confidentiality claim covering all or part of the information requested, in the manner described by 40 C. F. R. Part 2, Subpart B. Information covered by such a claim will be disclosed by EPA only to the extent and only by means of the procedures set forth in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies the information when EPA receives it, the information may be made available to the public by EPA without further notice to you. If you wish EPA to treat any of your response as "confidential" you must so advise EPA when you submit your response.

EPA will be closely monitoring your progress in implementing the recommendations from these reports and could decide to take additional action if the circumstances warrant.

You should be aware that EPA will be posting the non-CBI portions of the report for this facility on the Agency website shortly.

Given that the site visit related solely to structural stability of the management units, this report and its conclusions in no way relate to compliance with RCRA, CWA, or any other environmental law and are not intended to convey any position related to statutory or regulatory compliance.

If you have any questions concerning this matter, please contact Mr. Hoffman in the Office of Resource Conservation and Recovery at (703) 308-8413. Thank you for your continued ongoing efforts to ensure protection of human health and the environment.

Sincerely,

Matt Hale, Director
Office of Resource Conservation and Recovery

Enclosures

4.2 Maintaining Vegetation Growth

All of the ash pond dikes at the Cape Fear Plant lack appropriate vegetation cover, and thick brush and weeds in non-wooded areas hampered field observations. CHA recommends an increased mowing schedule on the 1985 Ash Pond dikes, and tree and brush removal on all of the ash pond dikes. Proper, short vegetation cover allows for more thorough observation on changing conditions that may require routine maintenance before they become larger problems. On impoundments with either standing water, or high water levels within the deposited ash (i.e., not at the surface of the ash, but not as low as the toe of the dike either), tree roots can allow for seepage of the retained water through the dikes, which could lead to internal erosion such as is the concern in an impoundment with free water. Internal erosion would weaken the dike, and could result in a slope failure.Additionally, the uprooting of trees during storms can create large voids in the embankment that are then susceptible to erosion. Considering the progressive erosion that could occur during a storm which blows the tree over during heavy rains (i.e., hurricane type storm systems) progressive erosion could potentially result in enough loss of soil from the dike to create an unstable situation, which if failure occurs could result in a release of ash.

4.3 Toe Drainage and Buttressing Against Softened Toe

CHA recommends improved drainage and/or buttressing of the toe in this area where water flows or is ponded against the toe of the dikes with erosion resistant materials, to reduce the risk of dike instability from a softened or eroded toe.

Ponding water at the toe of an embankment constructed from silty/clayey soils can result in weakening of the soils where saturated, a condition that can be observed by the softened ground that provides little resistance to the penetration of a steel rod, such as exhibited in Photos 8 and 9. Along the west dike of the 1985 Ash Pond, an area of ponded water occurs between the toe of the dike and the access road. While there is a twin culvert extending below the access road and railroad tracks, it appears from evidence of the depth of ponding and erosion from this ponding observed during CHA's visit, that the capacity and or pitch of these culverts is inadequate to drain the area. The result of the standing water is not only the softening exhibited in Photos 8 and 9 but beaching erosion resulting in toe loss as shown in Photo 3.

The 1978 Ash Pond dike parallels the Discharge Canal. This area exhibits erosion from the flows in the Discharge Canal, and surficial sloughing has occurred. This area needs to be protected not only from toe softening, but from the velocities in the discharge canal eroding the toe.At the southeast corner of the 1978 dike to the south of the outlet pipe, there is a large area of ponded water. The grading in this area should be improved to minimize the ponding of the water in this area, and if the area cannot be fully drained, the toe buttressed.

4.4 Stability Monitoring at the 1985 Ash Pond West Dike

During CHA's site visit, Progress Energy Carolinas personnel indicated that filled holes, and voids in the downstream slope of the west dike on the 1985 Ash Pond were rodent burrows. In CHA's review of historic documents, we found descriptions of similar voids dating back to 1985 immediately following construction. While different consultants had differing opinions on the cause of these voids, a general theme was that the voids were likely related to differential settlement from underlying soft soil resulting in cracks that then eroded from storm water runoff, or were related to shallow slope strain surfaces.

CHA recommends that these voids be filled and an engineered monitoring program be implemented. The monitoring program should include the use of piezometric measurements in the embankment and foundation soils and inclinometers to monitor movement within the embankment at various depths.

4.5 Erosion Protection and Repair

Many areas of the Cape Fear Ash Ponds show surficial erosion and sloughing resulting from exposed soil because of poor vegetation coverage. CHA recommends areas of erosion and sloughing be re-graded and properly vegetated. Not only does erosion and slough steepen the embankment slopes reducing overall stability, but the erosion areas concentrate storm water runoff which leads to further erosion and worsening of the condition.

4.6 Animal Control

Evidence of animal burrows and slides were observed on the 1985 and 1978 Ash Pond dikes. CHA recommends vigilance by Progress Energy Carolinas to make note of areas disturbed by animal activity, trapping of the animals responsible, and repair to the areas to protect the integrity of the dikes. Although not seen on other dikes, vegetation cover hides these features.

4.7 Closure of Non-Permitted Ash Ponds

The 1956 and 1963/1970 Ash Ponds were installed prior to current regulations requiring permits for these types of facilities. CHA recommends that best management practices be applied to these facilities for consideration of stabilization of the dike slopes so as to reduce the risk of a release. In CHA's experience, tree growth on slopes of dams and landfills is not desirable.

4.8 Hydraulic Analysis Recommendations

Hydraulic analyses are needed at each of the ash ponds as summarized below:

- Since the hydrology evaluation of the 1985 impoundment was performed, the 2007 "pond within a pond" has been constructed. CHA recommends that the hydraulic and hydrologic analyses be updated to evaluate the ability of the 2007 and 1985 combined pond capacity to safely pass the 1/3 PMP.
- The summary of the 1978 hydraulic and hydrologic analyses concluded that the available freeboard was available throughout the 1978 Ash Pond to safely store the ½ PMP. While only a 1/3 PMP storm is currently required to be used as the design storm based on North Carolina Dam Safety Regulations and therefore, should be safely stored, CHA observed that the freeboard ranges from about 0 at the north end of the pond, to 3 to 8 feet at the south end of the pond. CHA recommends that an updated evaluation be prepared accounting for the actual available storage capacity of the 1978 Ash Pond.
- No analysis appears to have been performed for the 1963/1970 or the 1956 Ash Ponds. Similar to the 1978 Ash Pond, the surface of the deposited ash slopes from north to south in the 1963/1970 Ash Ponds and from west to east in the 1956 Ash Pond, resulting in almost no freeboard at one end of the impoundments to about 8 to 10 feet at the other end. CHA recommends that an evaluation be prepared for the ability of the 1963/1970 and 1956 Ash Ponds to safely store or pass the 1/3 PMP with the actual available storage capacity.

4.9 Additional Stability Analyses – 1985 Ash Pond

Based on our review of available information for the 1985 Ash Pond, we recommend that the following tasks be performed to confirm that the embankments are indeed stable under the various loading conditions outlined in Section 3.3.1.

- We recommend that an investigation be performed in which the properties of the embankment and the foundation soils are determined. Stability models indicate failure surfaces through the embankment and have assumed that foundation soils have strength properties that are consistent with or better than the embankment soils. In the design report, it indicates that a layer of soft soil should be removed prior to construction of the dike, but documentation confirming that this was done was not provided to CHA and several of the summaries of observation on the dikes were attributed to soft foundation soils compressing. It should be verified through the recommended investigation that the soft layer is appropriately accounted for or that the layer does not exist. This scope of work should include laboratory testing of samples retrieved from the embankment and foundation soils and installation of piezometers in the embankments for accurate

measurement and monitoring of the phreatic surface in for stability analysis and for long term monitoring.

- CHA was not provided with stability analyses of the 2007 "pond within a pond". CHA recommends that Progress Energy Carolinas should perform stability analyses for the current conditions as well as any changes should additional capacity be required such as moving forward with their plan to increase the height of the existing 2007 Ash Pond embankments. An investigation should be performed to sample and test the sluiced ash on which the 2007 pond is sitting, as well as the in-situ strength of the compacted ash from which the 2007 dikes are constructed.

We recommend that remediation work, if-required, be performed by Progress Energy Carolinas on the embankment slopes to improve the factor of safety to the minimum values required by North Carolina Dam Safety Regulations and as recommended by the USACOE for all loading conditions. The design of the remediation work should be based on the findings of the subsurface investigation described above.

4.10 Additional Stability Analyses – 1978 Ash Pond

CHA was not provided with results of the stability analyses reportedly performed for the 1978 Ash Pond dikes. Previous inspection reports summarize that a factor of safety of 1.4 was determined for the steady state conditions at the 1978 Ash Pond. CHA recommends that a detailed analysis be performed for the pond that includes flood pool and seismic loading and that appropriate modifications be made to the slopes to ensure that the calculated factors of safety meet those required and/or recommended by North Carolina Dam Safety and the USACOE, respectively. These stability analyses should be performed with actual phreatic surface evaluations through the installation of piezometers on the dikes of the 1978 Ash Pond.

4.11 Additional Stability Analyses – 1963/1970 and 1956 Ash Ponds

No stability analyses were provided for the 1963/1970 or 1956 Ash Ponds. CHA recommends that a detailed analysis be performed for these ash ponds. As described in Sections 4.9 and 4.10, these analyses should be based on in-situ soil properties of the embankment fills, foundation soils and existing phreatic surfaces. Subsurface investigations will be required to determine these properties