Progress Energy

September 28,2009

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

RE: Carolina Power & Light d/b/a Progress Energy Carolinas, Inc. (PEC)
Cape Fear Steam Electric Plant – Moncure, NC
Coal Combustion Waste Impoundment Dam Assessment Report

Dear Mr. Hoffman:

This letter is in response to the letter of September 15, 2009 from Matt Hale, Director, Office of Resource Conservation and Recovery. This format shall present the recommendations that elicit a response and our applicable responses.

The following information should be noted:

- The EPA is currently evaluating and developing regulatory options for Coal Combustion Byproducts (CCBs). This rulemaking activity should produce proposed regulations before the end of this year. The final regulation promulgated as the result of this activity could significantly impact the way coal ash is managed in the future.

  In North Carolina our coal ash impoundments will shortly be subject to NCGS §143-215.23 Dam Safety Law (NC Law). As we develop our interaction with the state regulatory agency, we will be evaluating whether or not some of the older dams are considered to be dams as they do not impound or divert water. As for those dams that will remain under the purview of the NC Law, we will be working with the state regulatory agency to assess the dams' structural integrity and need for further studies.

- Finally, EPA recently announced they will revise the effluent guidelines for the Steam Electric Power Generation Industry. It is likely that these guidelines will impose restrictions on the sluicing of ash and the management of ash ponds.

These expected new requirements could very well change the way we approach using and maintaining our current ash impoundments. Significant construction projects on a dam that has been in place for decades and has not demonstrated any signs of structural issues should be carefully considered until the above mentioned regulatory activities have been resolved. PEC is

Progress Energy Carolinas, Inc.
P.O. Box 1551
Raleigh, NC 27602

keenly aware of the TVA Kingston incident and the safety and environmental concerns it has generated. It is with this backdrop that we provide our responses.

In regard lo the 14 calendar day turnaround for our response - to assess comments, make decisions, develop plans, and develop schedules will take much longer than 14 days to compile. Therefore, our comments will reflect our best efforts to respond at this time.

4.2 Maintaining Vegetation Growth

All of the ash pond dikes at the Cape Fear Plant Iack 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.

PEC Response –

*1985 Ash Pond – PEC will increase frequency of vegetation management. Mowing is currently slated to be performed every three to four months, or at a frequency that will allow for suitable monthly field inspection. **PEC** has already mowed the dikes of the 1985 ash pond to facilitate assessment, study and response.*

1978 Ash Pond – PEC will contract for tree and brush removal within 30 days and conduct the activity within 60 days after contract execution. Once the tree and brush removal is completed, mowing is slated to be performed every three to four months, or at a frequency that will allow for suitable monthly field inspection.

1963-1970 & 1956 Ash Ponds – These structures have not received ash sluice water for. decades. PEC will assess the character of these structures in regard to their function of impounding wafer. If these structures are considered to be dams and are no/ considered to be a candidate for decommissioning, PEC will assess the need for a vegetation maintenance program. If they are candidates for decommissioning, PEC will pursue this avenue with the NC Division of Land Resources who administer /he NC Law. Activities related to these ash ponds will also be assessed in light of the proposed regulations that the EPA is currently evaluating and developing.

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 comer 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.

PEC Response –

1985 Ash Pond – Drainage improvements will be scheduled for the second quarter 2010.

1978 Ash Pond – PEC must gain permission from an adjacent landowner to adequately access these areas for assessment and improvements. PEC will attempt to do so within 30 days. Providing access is allowed, PEC will assess the situation and make the necessary improvements by second quarter 2010.

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.

PEC Response – PEC will contract to assess the voids within 30 days and the voids will be assessed within 30 days of contract execution. PEC will then fill the voids within 15 days after assessment and implement any monitoring program deemed necessary within 60 days.

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.

PEC Response – PEC will assess the 1985 and 1978 ash ponds for surficial erosion and sloughing within 60 days. PEC will implement means to properly vegetate applicable areas within second quarter of 2010.

1963-1970 & 1956 Ash Ponds – These structures have not received ash sluice water for decades. PEC will assess the character of these structures in regard to their function of impounding water. If these structures are considered to be dams and are not considered to be a candidate for decommissioning, PEC will assess the need for additional vegetation cover. If they are candidates for decommissioning, PEC will pursue this avenue with the NC Division of Land Resources who administer the NC Law. Activities related to these ash ponds will also be assessed in light of the proposed regulations that the EPA is currently evaluating and developing.

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.

PEC Response – PEC will be vigilant in their inspection and repair of animal activities on the 1985 and 1978 dikes.

1963-1970 & 1956 Ash Ponds – These structures have not received ash sluice water for decades. PEC will assess the character of these structures in regard to their function of impounding water. If these structures are considered to be dams and are not considered to be a candidate for decommissioning, PEC will assess the need for an inspection program that addresses animal control measures. If they are candidates for decommissioning, PEC will pursue this avenue with the NC Division of Land Resources who administer the NC Law. Activities related to these ash

ponds will also be assessed in light of the proposed regulations that the EPA is currently evaluating and developing.

4.7 Closure of Non-Permitted Ash Ponds

The 1956 and 196311970 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.

PEC Response – 1963-1970 & 1956 Ash Ponds – These structures have not received ash sltrice water for decades. PEC *will assess the character.of these structures in regard to their function of impounding water. If these structures are considered to be dams and are not considered to be a candidate for decommissioning, PEC will assess the need for additional vegetation control. If they are candidates for decommissioning, PEC will pursue this avenue with the NC Division of Land Resources who administer the NC Law. Activities related to these ash ponds will also be assessed in light of the proposed regulations that the EPA is currently evaluating and developing.*

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.

  PEC Response – PEC will conduct the analyses within 60 days.

- 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.

  PEC *Response – In the report freeboard is defined as the difference in elevation between the surface of impounded ash and the top of the dike. This provides a mistaken claim that there may be insufficient freeboard for prevention of overtopping during a storm flood event. Freeboard is the difference in the top of the dam and the maximum expected water elevation; the water elevation will be the same a! any point in the impoundment, regardless of where or how high the ash delta may be. Of course, this assumes the dike crest is at the same elevation for its entire length.* PEC *will evaluate the actual freeboard in the context of the adequacy of the storage capacity.*

- No analysis appears to have been performed for the 196311970 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.

  PEC Response - In the report freeboard is defined as the difference in elevation between the surface of impounded ash and rhe top of the dike. This provides a mistaken claim that there may be insufficient freeboard for prevention of overtopping during a storm flood event. Freeboard is the difference in the top of the dam and the maximum expected water elevation; the water elevation will be the some at any point in the impoundment, regardless of where or how high the ash delta may be. Of course, this assumes the dike crest is at the same elevation for its entire length. PEC will assess the need for the analysis on these ponds in light of their current state of not having received ash sluice water for decades.

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 tluough 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.

  PEC Response – PEC will conduct applicable analyses by the end of this year.

- 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.

PEC Response – PEC will conduct applicable analyses by the end of this year.

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 Darn **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.

PEC Response – Recommendation is acknowledged.

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.

PEC Response – PEC will conduct applicable analyses by the end of this year.

4.11 Additional Stability Analyses – 196311970 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.

PEC Response – These structures have not received ash sluice water for decades. PEC will assess the character of these structures in regard to their function of itnpounding water. If these structures are considered to be dams and are not considered to be a candidate for decommissioning, PEC will further assess their stability. If they are candidates for decommissioning, PEC will pursue this avenue with the NC Division of Land Resources who administer the NC Law. Activities related to these ash ponds will also be assessed in light of the proposed regulations that the EPA is currently evaluating and developing.

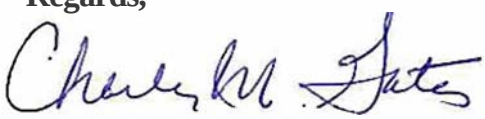
PEC Overall Comment - Should applicable analyses indicate acceptable margins of safety, tve *will contact your office to request the "poor" razing be replaced with a satisfactory rating. We remain unconvinced that the criteria for a poor rating us derived from the New Jersey* **DEP is**

appropriate or recognized on a national level, or was carried out in a uniform manner throughout the country.

We appreciate the gravity of concerns regarding ash ponds in the wake of the TVA Kingston incident. We are working to better understand the EPA's assessment, since it does not reflect our own evaluations or those conducted at regular intervals by a third-party inspector. However, we take seriously the recommendations to protect the structural stability and functionality of these important units, as reflected by the above responses.

If you have questions concerning this matter, please contact Mr. Fred Holt in Environmental Health & Safety Services at (919) 546-5286.

Regards,



Mr. Charles M. **Gates**
Vice President, Power Generation Carolinas
Progress Energy Carolinas, Inc.