

US EPA ARCHIVE DOCUMENT



November 16, 2009

Mr. Dennis Miller
Lockheed Martin
REAC Program
2890 Woodbridge Avenue #209
Edison, New Jersey 08837

**RE: Peer Review of the Dewberry and Davis Philip Sporn Site Assessment Draft Report
CHA Project No. 20085.2040.1510**

Dear Mr. Miller:

This letter presents CHA's peer review of the Dewberry and Davis draft report for the Philip Sporn Generation Station Site Assessment and associated response documentation from American Electric Power (AEP).

Background

Lockheed Martin provided CHA with the aforementioned Dewberry and Davis draft report dated October 2009, the AEP response document dated November 2009 which included Attachments A, B, C, and D addressing specific items of the draft report, and the evaluation of the AEP response by Dewberry and Davis dated November 2009 developed to ascertain if a change in the original assessment from POOR to FAIR was warranted. CHA was subsequently charged with reviewing these documents and to discuss how the peer review was accomplished, what materials were reviewed, and to determine if appropriate engineering judgment was applied in the evaluation of the Philip Sporn Generation Station ash impoundments.

Information Summary

CHA reviewed the aforementioned documents and provides the following summary of the available information:

Dewberry and Davis Draft Report

The draft report references 25 documents that were reviewed as part of the facility assessment process. These documents include internal reports AEP generates for their annual inspections, AEP stability analyses, WVDEP DWWM Dam Safety Section inspection reports, outside consultant reports concerning scour analyses and instrument data, aerial mapping, and several plans, including those regarding modifications to the Fly Ash and Bottom Ash ponds. In these documents one is able to develop a quantitative understanding of the impoundments related to historical development, past function and previous slope stability issues, and critical items such as physical geometry, safety factors concerning dike stability for various load cases, and hydrologic and hydraulic design adequacy. Particular items highlighted during the document review process included:

- The construction of certain sections of the Fly Ash Pond eastern and southern dikes above sluiced ash in a loose to very loose condition.
- Instability and subsequent slope repair in 1995 of the South Fly Ash Pond eastern dike.
- Back calculated material strength parameters from a safety factor of 1.2.
- Use of a seismic acceleration factor equal to 0.05g instead of 0.06g in the seismic analysis.
- A missing seismic stability analysis on the upper portion of the eastern dike of the Fly Ash Pond.
- A missing seismic analysis on a section of the Fly Ash Pond eastern dike active sloughing on the western dike of the Fly Ash Pond adjacent to a railroad.

In addition to the aforementioned documents, the draft report includes visual observations obtained during a site visit that involved walking the dike crests, outboard and inboard slopes, and slope toe areas. This site visit also included documenting the condition of appurtenant structures affecting dike such as the overflow inlets, risers, and pond outlets. These visual observations detail items such as recent or active sloughs, older deformations, erosion features, and roadway deterioration that may not be evident in the document review process. Other site specific items such as the vibrations in areas adjacent to a railroad service line were also noted in the draft report.

On the basis of the site visit and document review, an assessment rating of POOR was stated in the draft report. Specific items contributing to this rating were as follows:

- Dike construction in certain sections of the Fly Ash Pond above sluiced fly ash and the associated liquefaction risk.
- Back-calculated soil strength parameters for slope stability analysis as opposed to site specific in-situ and laboratory soil testing to develop the strength parameters.
- A lower seismic acceleration factor used in the seismic stability analysis than USGS seismic mapping would indicate for the site.
- A missing seismic stability analysis on the upper portion of the eastern dike of the Fly Ash Pond.
- Active sloughing on the western dike of the Fly Ash Pond adjacent to a railroad.
- Observed vibratory loading from the railroad line potentially causing the aforementioned sloughing on the dike.

AEP Response Documentation

Upon reviewing the draft report, AEP provided a response along with supplementary research documentation amid concerns about the poor rating and a USEPA press release citing the conclusions about the Philip Sporn impoundments. The AEP response addressed most of the issues highlighted in the draft report, which included outlining proposed fixes and related analyses for the active sloughing on the western dike of the Fly Ash Pond and setting up vibration monitoring to determine the extent to which the railroad activity affected the western dike. The AEP response also referenced compliance with an order from WVDEP to perform a detailed structural integrity and safety investigation as well as additional soil borings with laboratory testing to verify the soil strength parameters utilized in the dikes and foundations. In regards to the dike construction above loose to very loose sluiced ash and the potential liquefaction hazard, AEP provided documentation on liquefaction research on fly ash conducted at The Ohio State University and at the Indian Institute of Technology. This research indicated that fly ash sampled for those studies does not tend to liquefy at the seismic excitation levels likely to be encountered at the Philip Sporn site.

Dewberry and Davis Assessment Revision

Dewberry and Davis received and reviewed the AEP response information and held a conference call with USEPA, AEP, and West Virginia DEP personnel regarding the draft report and original site assessment rating. Based upon the AEP response information and the conference call, it appears as if most of the issues highlighted in the draft report, including the slope erosion, slough repair and railroad vibration monitoring, were being addressed or would be addressed within a reasonable period of time. The one area not fully resolved was the liquefaction risk under some of the dikes constructed above the sluiced fly ash, primarily because site specific data regarding the sluiced fly ash was not studied to ascertain its liquefaction susceptibility. As a result, despite indications from the referenced research that the liquefaction risk may not be as pronounced as originally believed, a site specific liquefaction study was recommended as a condition to revise the site assessment to FAIR status.

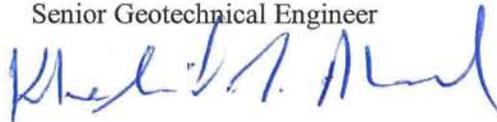
Conclusion

CHA's peer review included the Dewberry and Davis initial draft assessment document, the AEP response documentation, and the Dewberry and Davis assessment revision. Based upon this review, CHA concludes that appropriate engineering judgment was exercised to develop the revised site assessment rating.

Sincerely,



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Senior Geotechnical Engineer



Khalid J. Abed, P.E.
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MDH/KJA/ms

cc: Steve Hoffman USEPA