EPA Comments

SUBJECT: Comments on "DRAFT REPORT - TVA Shawnee Fossil Power Plant"

DATE: September 3, 2012

COMMENTS:

1. Please include a header page similar to that used in the Appendices for Exhibits 1 through 3.
2. On page ii, third paragraph: add "rated" in front of Fair. Also, fourth paragraph, revise first sentence to read:
   The U.S. Environmental Protection Agency (EPA) is embarking on an initiative to investigate the potential for catastrophic failure of ~~Coal-Fired~~ Coal Combustion **Residual** Surface Impoundments (i.e., management unit**s**) from occurring at **coal-fired** electric utilities in an effort to protect lives and property from the consequences of a dam failure or the improper release of impounded slurry.
3. On page iii, Insert at the end of the page the same note that Dewberry had in the Kingston draft report, that is:
   Note: The terms "embankment", "berm", "dike", and "dam" are used interchangeably within this report, as have the terms "pond", "basin", and "impoundment".
4. On page v, correct table of contents, there is text from the body of the report in section 7.
5. On page 2-2, Figure 2.1-2, please indicate the location of the impoundment in the Figure.
6. On page 2-2, section 2.2, is the "Watts Bar site" noted in this section, the old coal fired power plant or is it the nuclear plant?
7. On page 2-3, section 2.3, this unit (according to Appendix A, Document 2) is categorized as having a hazard potential rating of significant by TVA. Please identify this in the report and explain the rationale for the different rating by the contractor.
8. On page 2-4, section 2.6, please identify where the Tennessee River is in relation to the downstream direction of the ash pond?
9. Section 5 indicates that the unit was in fair condition based on observation which included notations of embankment erosion, tree growth and excess vegetation and some areas of sloughing. Section 1.2.2 stated that if H&H analyses were performed with an inference to satisfactory results, this alone could lead to a change in the condition rating to Satisfactory. With this statement in section 1.2.2, does this mean if none of the other recommendations were implemented, all other factors involved would still lead to a Satisfactory rating? If not, please correct the statement.
10. On page 7-2, Section 7.1.5, the report states that no assessment of liquefaction potential was performed. Please include a statement indicating the rationale for not requiring this type of assessment.
11. On page 8-1, section 8.3.2, the first statement in this section appears redundant from that stated in section 8.3.1 and perhaps not appropriate for section 8.3.2.

12. On page 9-1, section 9.3.2, if the instrumentation equipment exist, but according to section 9.2, reading are not being taken or recorded, is this not the same as stating that the instrumentation is not monitored? How is instrumentation monitoring considered adequate?
13. Appendix B, Document 6, page 4, please respond to the question of liner existence with a yes or no. N/A is not an appropriate response.

Dewberry

MEMORANDUM

Date:	4/22/2013
To:	Jana Englander
From:	James Filson
Subject:	TVA Watts Bar Fossil Plant Response to EPA April 1, 2013 Comments

In response to Environmental Protection Agency (EPA) comments dated April 1, 2013 on the Revised Final report for TVA Watts Bar Fossil Plant, Dewberry has revised the report as needed. EPA's comments and Dewberry responses have been prepared in the following format with additional information for the reviewer to understand the site and address any comments/concerns.

EPA Comment 1: In Section 1.18, please refrain from rating the facility, the condition rating should be made per individual impoundments.

Dewberry Response: *There is only one impoundment being assessed at this site, the facility rating of FAIR pertains to only this impoundment. Section 1.18 to remain.*

EPA Comment 2: In Section 1.2.2, the report does not recommend the performance of a formal H/H study, despite Section 1.1.2 and 1.1.3 noting the lack of H/H analysis. Recommendation should reflect the performance of an H/H analysis.

Dewberry Response: *See response to EPA Comment 12.*

EPA Comment 3: In Section 1.2.3, the report states that "TVA has removed the large trees." This should reflect the date the trees were removed and on what basis, e.g., "…subsequent to the submittal of Dewberry's draft report, TVA undertook removal of large trees from embankment…"

Dewberry Response: *Addressed in Report, Page 1-2, Section 1.2.3.*

EPA Comment 4: In Section 2.1 "Location and General Description," it would be appropriate for the report to note the current status of the coal-fire plant in addition to how this relates to the Watts Bar Nuclear Power Generating Station located adjacent to the Fly Ash Pond. The report makes no mention of the existence of a nuclear power station adjacent to the fly ash pond and the report remains unclear on the current status of the coal-fired plant, e.g., do the coal boilers still exist on-site or have they been removed?

Dewberry Response: *Watts Bar Fossil plant was decommissioned in 1983; however, it has not been formally closed by the State of Tennessee. Currently no boilers exist on site. The Watts Bar Nuclear Power Plant, constructed to the southwest of the previous fossil plant, is located downstream from the Old Ash Pond and Settling Basin. The nuclear plant is at elevation 720, higher than that of the pond, which is at elevation 700; therefore the nuclear plant would not be impacted by a dam failure. In addition, the inspection was on the Watts Bar Fossil facility not the nuclear site, therefore, not required to mention. Section 2.1 to remain, added information for reviewer.*

EPA Comment 5: Should the Watts Bar Nuclear Generating Station be identified in Section 2.6, "CRITICAL INFRASTRUCTURE WITHIN FIVE MILES DOWN GRADIENT"?

Dewberry Response: *See response to EPA Comment 4.Section 2.6 to remain.*

EPA Comment 6: Figure 2.1-2: Aerial Photograph is inadequate. The scale of the photo is not detailed enough. This becomes an issue when attempting to determine the perimeter of the CCR unit. Additionally, the call out in the Figure states "Dry Flay Ash…" – Please correct the typo.

Dewberry Response: *Addressed in Report.*

EPA Comment 7: In Section 2.2, the report notes that fly ash and bottom ash are not currently being added to the pond. It would be advantageous to note that fly ash and bottom ash, in addition to any other CCR's, are no longer being produced by the plant, as the plant has been "closed for 25 years."

Dewberry Response: *Addressed in Report Section 2.2 on page 2-2.*

EPA Comment 8: In Section 2.3, Dewberry must expound on its rating the unit as "LOW" hazard potential. The reasoning should explain the disagreement with TVA's March 25, 2009 report that rated the unit as "SIGNIFICANT" and additionally explain why no economic/ environmental damage is expected from a release given the proximity to the Tennessee River, which immediately abuts the impoundment. Typically, EPA has felt that significant environmental damage can be expected from units adjoining water bodies, particularly major rivers.

Dewberry Response: *Currently there is no fly ash or bottom ash stored on-site. Dewberry rated the facility as a "Low" hazard potential due to the fact that if a dam failure were to occur, only a minimal amount fly ash or bottom ash (what is currently in the facility, only) would become re-suspended and released into the environment. The original site has been cleaned up and there are no dry stacks on site. A dam failure is less likely due to the embankment being constructed of earth (clay), as opposed to fly ash. Additionally, there is no critical infrastructure within five miles downstream, minimizing economic damages. Furthermore, the drainage area to the Tennessee River at the point of analysis is over 17,000 square miles; the release of the pond's volume would have little impact on water surface elevations. TVA reported that the Watts Bar impoundment has a Significant Hazard Classification. Based on documents review and current conditions this is in contrast with the current guidelines. Section 2.3 to remain, added information for reviewer.*

EPA Comment 9: In Section 2.4, it may be advantageous to note that the unit has not been formally closed by the state of Tennessee, and this is why the unit was assessed.

Dewberry Response: *Addressed in Report, Section 2.4 page 2-3.*

EPA Comment 10: In Section 2.5.1, the report notes that the embankment is between 30' and 35' wide. Is this at the crest or toe of the embankment? Combination of both? The width remains unclear.

Dewberry Response: *Addressed in Report, Section 2.5.1 page 2-4.*

EPA Comment 11: In Section 2.6, there exists a grammatical error in the sentence "The Tennessee River is borders the facility on the…"

Dewberry Response: *Addressed in Report, Section 2.6 page 2-4.*

EPA Comment 12: In Section 6.3, the report states that based on factors, including "Dewberry's evaluation," the h/h of the unit appears to be satisfactory, even in the absence of formal h/h analysis. The report should expound on what exactly "Dewberry's evaluation" consisted of regarding h/h. As the report stands, it appears that the h/h should be seen as insufficient based on the lack of analysis. In other reports, Dewberry has performed informal H/H calculations for units which address a minimal contributing run-on volume, standard operating freeboard in units, and

appropriate design calculations. If such calculations were undertaken by Dewberry, they should be noted. If not, the technical documentation may warrant an inadequate in h/h based on lack of analysis.

Dewberry Response: *Due to the contrast in size between contributing drainage areas to the Tennessee River and Old Ash Pond and Stilling Basin at the point of analysis, the release of the pond volume is insignificant. Additionally the mapped FEMA floodplain would not overtop the pond embankment. The surface drainage to this facility is via ditch flow and majority of the original flow has been reduced and reroute due to cleanup and grading of the site. An H&H would only show that during higher frequency storms that the flow will not get to this facility. For these reason, a hydrologic/hydraulic study is not necessary or provide additional information. No adjustments were made to this section.*

EPA Comment 13: Table 7.1.4 is misleading. The report notes "Required Safety Factor (US Army Corp of Engineers)" to be >1.0. This is correct for the seismic loading condition. The table should reflect the minimum factors of safety for appropriate loading conditions, i.e., ASCE EM 1110-2-1902 standards.

Dewberry Response: *Addressed in Report, Table 7.1.4 page 7-2.*

EPA Comment 14: In Section 7.1.5, Dewberry notes that no assessment of liquefaction potential was performed based on closure of the facility for 25 years and no water being sent to the impoundment. This does not exempt the unit from proper analysis. Dewberry must explain why lack of liquefaction potential analysis was allowable based on qualitative analysis of the unit's representative soil sampling.

Dewberry Response: *The dam embankment material was described in the CDM Smith January 2012 Report, Existing Conditions Stability Analysis, as layered in fill, medium stiff to stiff clay, soft clay and silt, sand, weathered rock and gravel, and inter-bedded shale and limestone bedrock. The report further states that "the soils at the site are not considered to be susceptible to liquefaction."*

If you have any question or need additional information, you may contact Jerry Stauss at 703.849.0135.

Stantec Consulting Services Inc.
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October 3, 2012 let_004_175551015_rev_0

Mr. John C. Kammeyer, PE
Vice President
Tennessee Valley Authority
1101 Market Street, LP 5G
Chattanooga, Tennessee 37402

Re: Response to Recommendations
USEPA CCR Impoundment Assessment DRAFT Report
Watts Bar Fossil Plant (WBF)
Spring City, Tennessee

Dear Mr. Kammeyer:

As requested, Stantec has reviewed the DRAFT report *Coal Combustion Residue Impoundment Dam Assessment Report, Watts Bar Fossil Plant, Tennessee Valley Authority, Spring City, Tennessee,* dated May 2012 prepared by Dewberry and Davis, LLC (Dewberry) for the United States Environmental Protection Agency (USEPA). The purpose of this letter is to address Dewberry's conclusions and recommendations pertaining to structural stability, hydrologic/hydraulic capacity, and technical documentation; and to provide additional supporting information relative to ongoing plant improvements, further analysis, and planned activities where applicable. Dewberry's recommendations and Stantec's corresponding responses are listed below.

Dewberry Report Section 1.2.1 – Old Ash Pond and Stilling Basin: *It is recommended that the banks of the Tennessee River which are adjacent to the ash pond be laid back and lined with rip-rap to prevent future erosion due to wear action along the banks. It is also recommended that frequent inspections of the management unit embankment be completed until final closure is complete to visibly assess whether existing conditions are altered, helping to ensure structural stability.*

Stantec Response: Stantec understands that TVA will undertake a future project to mitigate the erosion along the banks of the Tennessee River below/adjacent to the ash pond. Also, TVA will continue its inspection program for this facility.

Dewberry Report Section 1.2.2 – Old Ash Pond and Stilling Basin: *It is recommended that a hydraulic/hydrologic analysis be performed to demonstrate that ash is not released to the Tennessee River during the design storm event. Receipt of this analysis could lead to a change in the rating to Satisfactory.*

Stantec Response: A TVA project has been designed, and it is currently under construction at the Old Ash Pond and Stilling Basin. Its purpose is to reduce the potential for ash release. The spillway system will be modified and dike height/impounding volume reduced, so that the facility will not be defined as a dam, in accordance with the Federal Guidelines for Dam Safety. Construction is scheduled to be complete in February 2013. In conjunction with the design, a hydrologic/hydraulic analysis was performed for the design storm, which was determined by the Engineer-of-Record to be the 100 year – 24 hour storm. The analysis is documented in TVA Calculation Package GENWBFFESCDX0000002012001005, dated 8/17/12, prepared by CDM Smith which demonstrates that the new outlet/spillway system will safely pass the design storm without overtopping the containment dike and without a release of ash to the river. It is Stantec's opinion that an adequate hydrologic/hydraulic analysis has been completed, as recommended by Dewberry, and the final rating can be upgraded to Satisfactory.

Dewberry Report Section 1.2.3 – Old Ash Pond and Stilling Basin: Tree growth was observed along the pond's embankment. The field report notes 3 trees with a maximum diameter of 3-4 inches. It is recommended that the embankment be properly maintained to remove existing trees, remove excess vegetation, and prevent future growth.

Stantec Response: TVA has removed the noted trees and will continue to maintain excess vegetation.

We appreciate the opportunity to provide these responses. If you have any questions or need additional information, please call.

Sincerely,

STANTEC CONSULTING SERVICES INC.

Stephen H. Bickel, PE
Senior Principal

Randy L. Roberts, PE
Principal

/db/cmw

c: Roberto L. Sanchez, PE
Michael S. Turnbow

Tennessee Valley Authority, 1101 Market Street, BR4A, Chattanooga, Tennessee 37402

October 19, 2012

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

TENNESSEE VALLEY AUTHORITY (TVA) – COMMENTS ON COAL ASH SITE ASSESSMENT ROUND 11 DRAFT REPORTS FOR ALLEN (ALF), BULL RUN, (BRF) COLBERT (COF), CUMBERLAND (CUF), GALLATIN (GAF), JOHN SEVIER (JSF), JOHNSONVILLE, (JOF) KINGSTON (KIF), PARADISE (PAF), SHAWNEE (SHF), WATTS BAR (WBF), AND WIDOWS CREEK (WOF) FOSSIL PLANTS

Dear Mr. Hoffman:

Tennessee Valley Authority (TVA) appreciates the opportunity to provide responses to the recommendations outlined in the Draft Coal Ash Site Assessment Round 11 Draft Reports for TVA's fossil plants. The Draft Reports were attached to EPA's September 5, 2012 email from Jana Englander to TVA's Susan Kelly. This EPA review process has provided TVA a public forum to confirm that our coal ash facilities meet current state requirements.

TVA has contracted with Stantec Consulting Services Inc., to assist in the technical review and responses to the EPA draft reports. The draft report responses are attached for your consideration in finalizing the Coal Ash Site Assessment Round 11 Reports. The following is a summary of our responses;

Allen: A seismic stability analysis and liquefaction analysis have been completed indicating acceptable performance under seismic loading. TVA recommends the Allen East Ash Pond be upgraded from Poor to Satisfactory.

Bull Run: TVA has no additional comments to EPA's analysis.

Colbert: TVA has no additional comments to EPA's analysis.

Cumberland: The operating pool level for the Ash Pond has been lowered 6.2 feet and the seepage analysis has been revised. Piping factors of safety are now satisfactory. TVA recommends the final rating for the Ash Pond be upgraded from Fair to Satisfactory.

A liquefaction potential assessment was performed for the Gypsum Disposal Area and showed the saturated ash materials are anticipated to undergo liquefaction for the 2,500-year earthquake. Therefore, a higher level of slope stability analysis was completed demonstrating that the factor of safety is satisfactory. TVA recommends the final rating for the Gypsum Disposal Area be upgraded from Poor to Satisfactory.

Additional seismic analysis and field investigation is underway for the Dry Fly Ash Stack. The results are indicating the possibility of a favorable response. However, the analysis is not complete. We anticipate its completion during EPA's review of these comments.

Gallatin: A seismic stability analysis for Ponds A and E has been completed with acceptable results. TVA recommends the final rating be upgraded from Fair to Satisfactory.

An additional stability and seepage analysis for the saddle dikes on the stilling ponds has been completed and a project to increase the hydrologic/hydraulic capacity of the ponds is underway. Based on the analysis and improvement plans underway, TVA recommends the Gallatin Stilling Ponds rating be upgraded from Poor to Fair and from Fair to Satisfactory once the project is completed.

John Sevier: The static and seismic slope stability analysis were reviewed and deemed to be appropriate for the soil materials present.

Johnsonville: A quantitative liquefaction analysis and a post-earthquake static slope stability analysis were performed. Results showed the slope to remain stable. As a result, TVA recommends that final rating for Ash Disposal Area 2 be upgraded from Fair to Satisfactory.

Kingston: TVA has no additional comments to EPA's analysis.

Paradise: A liquefaction analysis was performed and the hydrologic/hydraulic capacity was evaluated. The liquefaction analysis indicated that the materials would remain stable and not liquefy during a 2,500 year event. The H&H analysis confirmed that the ponds safely pass the 100-year 24-hour storm. However, they do not pass the Probable Maximum Flood. TVA has plans to design and construct features to correct this issue at the ponds. TVA recommends that the facilities at Paradise be upgraded from Fair to Satisfactory once the H&H issues have been addressed.

Shawnee: A liquefaction analysis and post-earthquake static stability analysis were performed with acceptable results. TVA recommends that the rating for Ash Pond No. 2 be upgraded from Poor to Satisfactory.

Watts Bar: A hydrologic/hydraulic analysis was performed for the design storm and the new spillway system currently under design and in construction. Based on the satisfactory outcome of the analysis; TVA recommends the final rating be upgraded from Fair to Satisfactory.

Widows Creek: TVA has no additional comments to EPA's analysis.

The following is a summary of the draft facility ratings and TVA's proposed final ratings.

EPA Draft Report Results				
Plant	Facility	Draft Rating	Driver for Rating	Stantec Proposed Final Rating
ALF	East Pond	Poor	Seismic	Sat
BRF	FA Pond	Sat		Sat
	BA Pond	Fair	Liquefaction	Fair
	Gyp Pond	Fair	Liquefaction	Fair
COF	Dry Stack	Sat		Sat
	BA Pond	Fair	Liquefaction	Fair
CUF	Ash Pond	Fair	Piping	Sat
	Dry Stack	Poor	Seismic	Poor
	Gyp	Poor	Seismic	Sat
GAF	Ash Ponds	Fair	Liquefaction	Sat
	Stilling Ponds	Poor	H&H and static	Fair
JSF	Dry Stack	Sat		Sat
	Ash pond	Sat		Sat
JOF	Island	Fair	Liquefaction	Sat
KIF	Ash/stilling	Fair	Liquefaction	Fair
	GDA	Sat		Sat
PAF	Scrubber sludge	Fair	H&H - overtopping	Fair
	Ash Pond	Fair	H&H - overtopping	Fair
	Slag Ponds	Fair	H&H - overtopping	Fair
SHF	Ash Pond	Poor	Seismic	Sat
WBF	Pond	Fair	H&H	Sat
WCF	Gyp stack	Sat		Sat
	Ash Pond	Fair	Liquefaction	Fair

TVA takes its environmental responsibilities very seriously and appreciates EPA's efforts to verify the quality of our impoundments. We would like to arrange a conference call once your staff has received this letter and briefly reviewed the attached reports so we can answer any immediate questions or concerns. Please contact Susan Kelly at (423)-751-2058 or sjkelly0@tva.gov to arrange this conference call.

Sincerely,

Cynthia M. Anderson
for

Brenda E. Brickhouse
Vice President
Compliance Interface and Permits

Enclosures

SJK:LMB
Enclosures
cc (electronic distribution with enclosures):
C. M. Anderson, BR 4A-C
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