Comments

EPA: None

State: None

Company: See attachment dated October 29, 2010.

Comments on Draft Dam Assessment Report – Welsh Plant

- October 29, 2010 -

AEP has reviewed the draft report provided by Dewberry & Davis (D&D) as part of their assessment of the ash impoundment facilities at the Welsh Plant and would like to offer the following comments. AEP's comments are denoted in *italic* print after each excerpt from the D&D draft report. Also included are AEP's more detailed comments on specific inaccuracies in the report.

INTRODUCTION, SUMMARY, CONCLUSION AND RECOMMENDATIONS

In summary, the Welsh Generating Station Ash Ponds and Slurry Ponds are rated **POOR** for continued safe and reliable operation. These ratings are based on the lack of critical studies and investigations available to the assessors to determine the structural soundness of the dams and potential for dam safety deficiencies. Upon receipt of structural integrity studies and data showing adequate structural soundness the rating will be changed to either FAIR or SATISFACTORY.

There are three ash impoundments at the Welsh Plant which are referenced as the Primary Ash Pond, Secondary Ash Pond and the Active Bottom Ash Storage Pond throughout the report. We request that the reference to "Slurry Ponds" be removed as this term is used nowhere else in the report and incorrectly implies that there are other ponds present. Further, we request that it be clearly stated that each of the ponds is being rated individually, rather than collectively as the wording implies.

AEP takes exception to the overall rating of these ponds as "POOR" as explained below. It is clear from our review of the report that all aspects of the ponds were, in fact, found to be satisfactory with only one exception, and that exception relates to the lack of a study that the draft report clearly depicts as "non-critical". We also take exception to the fact that the summary of the report incorrectly characterizes the breadth of the "POOR" rating. In the summary it states that the ponds are collectively rated "POOR <u>for continued safe and reliable operation.</u>" Yet the conclusion in Section 1.1.8 states that "(t)he facilities are SATISFACTORY <u>for continued safe and reliable operation.</u>" (emphasis added.)

It is our understanding that EPA's position with respect to the overall rating of these ponds as "POOR" is based solely on the perceived lack of "critical" studies associated

with the hydrologic/hydraulic safety of the ponds. We also understand that EPA's instructions to its contractors include details which define a "POOR" rating as one to be applied to any facility lacking "critical" studies. A "FAIR" rating is one which may be applied to facilities that lack certain "secondary" studies. Given the site-specific considerations at Welsh Plant, as summarized below and as characterized throughout the report, we firmly believe that hydrologic/hydraulic studies of the ash ponds should be considered as "secondary" studies and not "critical" studies. Therefore, we believe an appropriate overall rating for each of these ponds is at least "FAIR" (if not "SATISFACTORY") and should be changed in the final report.

As documented at several places in the report, a failure of any one of these three ponds would result in the contents of the Primary and Secondary Bottom Ash Ponds flowing into the adjoining Welsh Plant cooling water reservoir. As stated in Section 1.1.2, the cooling reservoir "has sufficient capacity to contain the total storage of all ponds <u>even if a catastrophic failure were to take place.</u>" (emphasis added.) This is based on information contained in the Welsh Reservoir Dam Breach Analysis report by Freese and Nichols and we agree with this conclusion.

Further, we note that the only recommendation in the report regarding the hydrologic/hydraulic safety of these ponds (Section 1.2.2) indicates that the facility should "perform (a) hydrologic/hydraulic analysis to document that the basins can safely store and pass the appropriate design flood" if it is found that substantial off-site drainage flows into the Primary Bottom Ash Pond. Based on this recommendation, we believe it is inappropriate to label this study as truly a "critical" study, given that it is contingent on a verification of the size of any upgradient drainage area. Also, we note that there are no recommendations for such studies with respect to the Secondary Ash and Active Bottom Ash Ponds. We do not understand how EPA can rate these two ponds "POOR" and yet make no recommendation to directly address the reason for the rating. In fact, EPA's consultant states in Section 6.2 of the report that "(t)he hydrologic/ hydraulic documentation is considered <u>non-critical</u> based on the generally low consequences of failure of the perimeter Dam and cross Dam that were constructed in 1973 and the satisfactory performance of the basins over 36 years." Therefore the "POOR" rating is not warranted.

Based on the overwhelming number of statements in the report that clearly indicate that the hydrologic/hydraulic study of these ponds is not of "critical" concern, and that all other aspects of the dam are accurately described as satisfactory, AEP believes that the appropriate rating, given the site-specific factors discussed, should be at least "FAIR", if not "SATISFACTORY".

While we do not view these studies as "critical", AEP does agree that an analysis should be performed to verify the storage and hydraulic capacity of the Primary and Secondary Ash ponds. This study would also confirm and set the maximum operating water levels. AEP will select the design flood event applicable to a small, low hazard dam as per the State of Texas requirements for this evaluation.

1.1.7 Conclusions Regarding the Adequacy of the Surveillance and Monitoring Program

Primary Ash, Secondary Ash, and Active Bottom Ash Storage Ponds– The surveillance program is generally adequate. The informal daily drive-by inspections by plant personnel and quarterly formal internal inspections by AEP Welsh engineers are of sufficient frequency and should continue. Informal visual inspections of the spoil bank along the bank with the Welsh Reservoir are currently conducted from a boat by plant personnel. Internal inspection of the outlet structures should be performed at a frequency of at least once every year and documented.

The dams and dikes are classified as small, low hazard structures. AEP believes that internal inspections conducted once every five years, as noted in Section 9.3.1, is adequate for this size and hazard facility. The annual frequency noted above is not consistent with the recommendation within the report.

7.1.1 Stability Analyses and Load Cases Analyzed

Primary Ash, Secondary Ash, and Active Bottom Ash Storage Ponds – ETTL Engineers & Consultants Inc. was contracted to perform a stability analyses of the embankment dams for the Secondary Ash Pond in conjunction with the slope failure of the east embankment. The analyses concluded that:

> *" The existing berm slopes are acceptable if conditions are maintained and the existing surface failure is repaired. A minimum factor of safety of 1.7 in the long term was found on the Primary Ash Pond. Rapid drawdown of the level of water in the lake lowers the predicted overall stability factors of safety to a minimum of 1.4."*

These conclusions can be used for the Primary Ash Pond also, since the two ponds were constructed of the same materials and at the same time.

D&D was provided two reports prepared by ETTL Engineers & Consultants Inc. (ETTL) related to the stability of both the Primary and Secondary Ash Ponds. The reports contained documentation of subsurface investigation, laboratory testing of embankment and foundation soils, phreatic surface based on piezometer data, liquefaction potential evaluation, seismic potential evaluation and slope stability analyses. Section 7.1 indicates that this information was not available for review by D&D; however, the documents are included in Appendix C of the report. These sections should be revised based on the reports provided to the consultant or the sections should be rewritten to provide more clarification of the draft statements.

In addition, the computed factors of safety presented in both reports are considered adequate for existing earthen embankments (and even new dams) based on the USACOE

Engineering Manual 110-2-1902. Section 3.3 of the manual provides guidance related to the stability evaluation of existing dams and embankments. This Section states that computed factors of safety less than the preferred values for new dams (FS = 1.5 static conditions) may be acceptable based on past performance and current condition of the dam.

Therefore, AEP would conclude that the ETTL reports properly document the structural stability of the Primary and Secondary Ash Ponds and that there is no basis for these facilities to be rated as Poor.

9.3.2 Adequacy of Instrumentation Monitoring Program

Primary Ash, Secondary Ash, and Active Bottom Ash Storage Ponds– There is no dam performance monitoring instrumentation in place. No problem or suspect condition, such as excessive settlement, seepage, shear failure, or displacement was observed in the field that might be reason for installation of instrumentation. In the absence of stability problems or seepage issues, there is no need for performance monitoring instrumentation at this time.

Section 9.3.2 indicates that additional monitoring instrumentation should be installed if there are any further indicates of stability issues at either the Primary or Secondary Ash Ponds. The consultant has reviewed the design of the remediation to the exterior slope of the Secondary Ash Pond and concurred with the design and construction of the repair. AEP interprets the above statement to apply to future stability issues. AEP agrees that monitoring would be necessary and prudent if there are additional signs of instability as the ash impoundments. AEP installed four piezometers in 2009 as part of the stability analyses prepared by ETTL. AEP believes that this current level of instrumentation and monitoring is adequate for the low dams with generally low consequence of failure as noted by D&D in section 6.1.4 of the assessment report.

AEP will continue to monitor these facilities and in particular the repaired area as part of its Dam Inspection and Maintenance Program (DIMP). Quarterly inspections of the facility are performed by Plant personnel and AEP Engineering conducts an annual inspection. If there are areas of concern noted during the inspections, AEP will implement an appropriate monitoring and evaluation plan of the suspect areas, including a slope monitoring system. Therefore, there seems to be an inconsistency between Section 9.3.2 and the recommendation in Section 1.2.7 to install a slope monitoring system at the Primary and Secondary Ash ponds.

7.2 ADEQUACY OF SUPPORTING TECHNICAL DOCUMENTATION

The ETTL Engineers & Consultants Inc. structural stability documentation was sufficient to determine the adequacy of the embankments for both the Primary and Secondary Ash Ponds.

There was not any documentation for the Active Bottom Ash Storage Pond. However, it does not appear to be critical documentation that is needed at this time. Structural stability documentation is considered non-critical based on 1) the low height and generally low consequences of failure of the Dam, 2) the good condition of the basins and embankments based on visual observation, and 3) satisfactory performance over the past 10 years. Therefore, the lack of supporting structural stability documentation is not essential at this time.

The Active Bottom Ash Storage Pond was constructed as a dredge receiving area and permanent disposal area for bottom ash dredged from the Primary Ash Pond. Typically, the pond retains some free water from the dredging operations because the openings in the discharge structure do not extend the full height of the structure. It is a lined facility. The draft assessment report has noted that the Active Bottom Ash Pond appears to be performing as designed and there are no visual indicates of instability.

Therefore, AEP concludes that the inspectors did not find any evidence that would support a "POOR" rating for the Active Bottom Ash Storage Pond.

Overall, AEP believes that documentation for all applicable analytical conditions have been performed for the facilities to render an assessment of the structural integrity of the dikes. Therefore, AEP respectfully requests that EPA revise the overall condition rating of each facility.

Plant:	Welsh Plant
Project:	US EPA Inspection Report – Ash Impoundments
Consultant:	Dewberry & Davis
Document:	Draft Assessment of Dam Safety
Document Date:	August 2010
Review Comments By:	AEP
Review Date:	October 5, 2010

#	REFERENCE	COMMENT
1.	1.1.1/p1-1	There is no reference to the site investigation and stability evaluation that was performed for these structures. Also, the primary and secondary ash ponds were constructed in 1974 and initially went into service in 1977 with Unit 1. There are numerous places where the consultants stated that the impoundments went into service in 1973, which is the date of the contract with the site dirt work / grading contractor, not the date the impoundments went into service.
2.	1.2.1	This paragraph is not clear – please reword
3.	1.3	List of attendees should include Brett Dreger – AEP Geotechnical Engineer and Tommy Slater is misspelled.
4.	2.1	The third impoundment initially referenced as the Active Bottom Ash Pond appears to be called the "New Ash Storage Area" in this paragraph. Please clarify this naming.
5.	2.1	The crest of the primary ash pond dam is approximately elevation 340 which is 20 feet above the normal water level of the cooling lake. The dam actually has a maximum height of 40 feet above the natural stream bed. The 20-ft height was incorrectly provided to the consultant and should be revised to 40 feet. Also the secondary ash pond dam has a maximum height of 25 feet rather than 20 feet.
6.	2.1/p2-1	The impoundments have a native clay liner and not a "compacted clay liner".
7.	2.2	The heights of the dams should be revised as noted in the comment for Section 2.1. Active Bottom Ash Storage Pond dam – The pond is listed as having a max height of 16 feet, which should be 34.6 feet.
8.	2.3	The Primary bottom ash pond is dredged every 18 months, not once a year
9.	2.3	3rd para: Effluent from the Secondary ash pond flows through Outfall 001 and not Outfall 003 as written in this section
10.	2.3	The Active Bottom Ash Storage Pond is referenced as a landfill in several statements. This facility is not a landfill – it is a bottom ash storage pond.
11.	2.4.1	The subsurface investigation by ETTL did not include drilling through the Active Bottom Ash Pond
12.	P2-6	Table 2.4 – The first and second row are for B-2. No permeability testing was performed on samples from B-1
13.	2.4.2	First Paragraph – The outlet for the primary pond is a concrete stoplog, not a sharp crested weir. Also the piezometer is located on the crest, not at the

		outfall. Also the pond has an emergency spillway.
14.	2.4.2	Second Paragraph – The outlet for the secondary pond is a sharp crested rectangular weir The three piezometers are located on the crest of each of the three dikes, not at the outfall. Also the pond has an emergency spillway.
15.	3.1	Second Paragraph – The slope failure of the Secondary pond was the north outside embankment, not the southeast embankment
16.	4.1.3	4.1.3 – Second Paragraph – ETTL inspected the slope failure "during initial repairs" on May 7, 2010. They initially inspected the berm in October 2009 during the initial slope stability work
17.	5.2.1	There is only one section of dike for the Primary ash pond, not an south, east and north dike
18.	6.1.2	The value listed for the PMP seems low and should be checked.
19.	7.1.4-7.1.6	The report implies this information was not available but the ETTL were reviewed and discussed previously in the report. These reports contain information that was noted as not available.
20.	P5-3	Figure 5-3 title should be as follows: "Secondary Ash Pond Dam – north and west interior slopes". Also correct the reference in the text to Fig 5-3 on page 5-2.
21.	P5-3	Section 5.2.1 – Last paragraph on page - Photo 5-4 is not of the east primary embankment inside slope
22.	P5-4	Figure 5-4 – title should be as follows: Interior Toe "of Secondary Ash Pond" and Discharge Channel of Primary Ash Pond
23.	P5-5	Figure 5-6 - title should be as follows: Effluent Outlet from Secondary Ash Pond "to Cooling Lake"
24.	P5-12	Figure 5-14 – the line pictured is 30 inch not 18 inch
25.	P5-22	Figure 5-22 – the pipe pictured is actually a maintenance pigging line from the Lake O' the Pines makeup line.
26.	1.1.5	The comment regarding visual observations of the dikes being severely hampered due to the presence of thick vegetation is not correct and is contradicted later in the report.
27.	Table 2.2	The dam heights, lengths, and outside side slopes are incorrect and the primary crest width is wrong. The primary dike is 40 feet high, 1200 feet long, has a 3:1 outside slope, and is about 60 wide at the crest. The secondary is 25 feet high, about 1400 feet long, about 30 feet wide at the crest and has a 3:1 outside slope. The Ash Storage is 36.5 feet high, 4000 feet long, and has a 3:1 outside slope.
28.	2.1	Welsh does not have a scrubber to remove SO2