

US EPA ARCHIVE DOCUMENT

## COMMENTS

Comments received for CHA Draft Report (*July 6, 2009*, CHA Project No. 20085.1000.1510) for the Assessment of Dam Safety of Coal Combustion Surface Impoundments, American Electric Power – General James Gavin Power Plant, Cheshire, OH. Comments include;

- EPA comments received on July 22, 2009;
- OH Department of Natural Resources comments on September 14, 2009; and
- American Electric Power comments received on August 20, 2009.

Final Report  
Assessment of Dam Safety of Coal Combustion Surface Impoundments  
American Electric Power – General James Gavin Power Plant  
Cheshire, OH

*Comments Received from the EPA (July 22, 2009)  
In Response to CHA Draft Report (July 2, 2009)*

CHA Project No. 20085.4000.1510



-----Original Message-----

From: Killeen, Deborah A [mailto:deborah.a.killeen@lmco.com]  
Sent: Wednesday, July 22, 2009 3:36 PM  
To: Harris IV, Warren; Nattress, Annette  
Cc: Hoffman.Stephen@epamail.epa.gov; Kohler.James@epamail.epa.gov; Miller, Dennis A  
Subject: RE: No Comments on CHA's Draft Assessment Report for: American Electric Power - General James Gavin Power Plant

Warren,

EPA has no comments on CHA's Draft Assessment Report for: American Electric Power - General James Gavin Power Plant.

Deborah A Killeen  
Quality Assurance Officer  
Lockheed Martin/REAC  
732-321-4245 (office)  
609-865-9308 (cell)  
732-494-4021 (fax)

Final Report  
Assessment of Dam Safety of Coal Combustion Surface Impoundments  
American Electric Power – General James Gavin Power Plant  
Cheshire, OH

*Comments Received from the OH DNR (September 14, 2009)  
In Response to CHA Draft Report (July 2, 2009)*

CHA Project No. 20085.4000.1510



**Everleth, Jennifer**

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**From:** Harris IV, Warren  
**Sent:** Monday, September 14, 2009 10:28 AM  
**To:** Everleth, Jennifer  
**Subject:** FW: Request for Review: American Electric Power - General James Gavin PowerPlant

-----Original Message-----

From: Miller, Dennis A [mailto:dennis.a.miller@lmco.com]  
Sent: Monday, September 14, 2009 10:24 AM  
To: Harris IV, Warren; Killeen, Deborah A  
Subject: FW: Request for Review: American Electric Power - General James Gavin PowerPlant

-----Original Message-----

From: Kohler.James@epamail.epa.gov [mailto:Kohler.James@epamail.epa.gov]  
Sent: Monday, September 14, 2009 10:20 AM  
To: Miller, Dennis A; Killeen, Deborah A  
Cc: Hoffman.Stephen@epamail.epa.gov  
Subject: Fw: Request for Review: American Electric Power - General James Gavin PowerPlant

FYI

----- Forwarded by James Kohler/DC/USEPA/US on 09/14/2009 10:10 AM -----

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| From: |  
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| "Brian Queen" <brian.queen@epa.state.oh.us>  
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| To: |  
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| <keith.banachowski@dnr.state.oh.us>, <mark.ogden@dnr.state.oh.us>, James  
Kohler/DC/USEPA/US@EPA |

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| Cc: |  
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| "Dave Schuetz" <dave.schuetz@epa.state.oh.us>, Craig Dufficy/DC/USEPA/US@EPA, Stephen  
Hoffman/DC/USEPA/US@EPA |

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|Re: Request for Review: American Electric Power - General James Gavin PowerPlant

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I have completed my review of the report assessing dam safety at the American Electric Power - General James Gavin Power Plant. I do not have any recommended changes to the report.

It appears to summarize the situation at the Gavin Power Plant Dams quite well. However, I would like to note my concurrence with CHA's recommendation for further stability investigations of the Bottom Ash pond.

Brian Queen  
(740) 380-5420  
brian.queen@epa.state.oh.us

>>> <Kohler.James@epamail.epa.gov> 8/4/2009 3:45 PM >>>

Dear All:

On June 1-2, 2009, USEPA conducted a site assessment of coal combustion waste management units at the American Electric Power - General James Gavin Power Plant. Brian Queen, Keith Banachowski, and Mark Ogden were the state representatives present during the assessment. Please paste the link below in your browser to download a copy of the draft report prepared by EPA's engineering contractor. I am requesting that you review and comment on this draft report. I would appreciate it if you would send me your comments no later than 10 days from the receipt of this email (August 18, 2009). This draft report has also been sent to the facility. After EPA receives all comments, a final report will be prepared and released to the public.

If you have any questions about this effort, please call me (703-347-8953) or Steve Hoffman (703-308-8413). Please acknowledge receipt of this email. Be aware this is not a public document and should be handled accordingly. Thank you!

Jim

Attachment link:  
<https://www.yousendit.com/download/Y1Rya3ZDVnNwcFVLskE9PQ>

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Jim Kohler, P.E.  
Environmental Engineer  
LT, U.S. Public Health Service  
U.S. Environmental Protection Agency  
Office of Resource Conservation and Recovery  
Phone: 703-347-8953  
Fax: 703-308-8433  
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Final Report  
Assessment of Dam Safety of Coal Combustion Surface Impoundments  
American Electric Power – General James Gavin Power Plant  
Cheshire, OH

*Comments Received from the American Electric Power (August 20, 2009)  
In Response to CHA Draft Report (July 2, 2009)*

CHA Project No. 20085.4000.1510

## Everleth, Jennifer

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**From:** Miller, Dennis A [dennis.a.miller@lmco.com]  
**Sent:** Thursday, August 20, 2009 8:28 AM  
**To:** Harris IV, Warren  
**Cc:** Hoffman.Stephen@epa.gov; Kohler.James@epamail.epa.gov; Killeen, Deborah A  
**Subject:** FW: Company Comments on: AEP Gavin Plant Report (call required)

**Attachments:** Gavin Plant - Comments on CHA Draft Report.pdf; Gavin Plant - Attachment to Comments.pdf



Gavin Plant -



Gavin Plant -

Comments on CHA ..Attachment to Co...

Warren: Attached are the company's comments for the draft AEP General James Gavin Plant assessment report. When is a convenient time for you and the appropriate engineer(s) to have a conference call to discuss the company comments?

-----Original Message-----

**From:** Kohler.James@epamail.epa.gov [mailto:Kohler.James@epamail.epa.gov]  
**Sent:** Thursday, August 20, 2009 8:04 AM  
**To:** Miller, Dennis A; Killeen, Deborah A  
**Cc:** Hoffman.Stephen@epamail.epa.gov  
**Subject:** Company Comments on: AEP Gavin Plant Report (call required)

Dennis and Deb:

Attached are company comments on the AEP Gavin Plant Draft Report. Please set up a conference call with me/Steve, you, and CHA to discuss all the comments attached...in particular:

>On 4.9 bottom ash pond hydraulic analysis: Does their comment on this section equate to a "complete study"? To what extent does it satisfy CHA's recommendation?

>On CHA's recommendations for the bottom ash pond (comment numbers correspond to recommendation bullets):

>>Comment 1: AEP explains why they don't think additional subsurface investigation is warranted.

>>Comment 2: Is AEP saying they want to use a different model (or method) or they don't need to do this analysis entirely?

>>Comment 4: Is AEP disagreeing with your analysis here? (see second attachment - seepage/slope stability plot)

>>Comment 5: AEP feels a rapid drawdown condition cannot be developed at this facility.

>On CHA's recommendations for the stingy run dam (comment numbers correspond to recommendation bullets):

>>Comment 2: AEP does not agree that max surcharge stability analysis needs to be performed for a maximum surcharge above current conditions.

>>Comment 3: AEP does not believe a rapid drawdown analysis is warranted for this dam.

>General comment: AEP wants to receive a "satisfactory" rating given that some of the deficiencies noted in the "fair" rating have been addressed.

For all these conference calls: We first want to find out if you agree with the company comments. If not, we suggest inserting a footnote or comment into the report that says: "In comments, the company

disagrees..." or "The company asserts that..." We want to be clear that we are not asking you to agree with the company or change the report; we just want to indicate that there was a difference of opinion - that doesn't alter the PE's ultimate decision. We want to be sure you are comfortable with this approach.

Also: remember not to finalize any reports until we inform you that all comments (from EPA/state/company) have been received. Please do not call the companies directly; we can coordinate questions on the comments with EPA.

If you have any questions or concerns with these directions please feel free to call me or Steve. Thanks!

Jim

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Jim Kohler, P.E.  
Environmental Engineer  
LT, U.S. Public Health Service  
U.S. Environmental Protection Agency  
Office of Resource Conservation and Recovery  
Phone: 703-347-8953  
Fax: 703-308-8433  
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----- Forwarded by James Kohler/DC/USEPA/US on 08/20/2009 07:49 AM -----

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| arwood@aep.com  
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| James Kohler/DC/USEPA/US@EPA, Stephen Hoffman/DC/USEPA/US@EPA  
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Jim and Steve,

Attached please find AEP's comments, and a related attachment, on CHA's draft dam assessment report for our Gavin Plant. I would like to draw your attention in particular, to our summary comments regarding the overall rating of the bottom ash pond and fly ash pond dams. If you have any questions, please let me know. Thanks for the opportunity to provide these comments on the draft.

Alan R. Wood, PE  
Manager  
Water & Ecological Resource Services Section  
Environmental Services Division  
American Electric Power  
Direct dial (614) 716-1233  
Audinet 200-1233

Kohler.James@epamail.epa.gov

08/10/2009 10:09 AM

To  
arwood@aep.com  
CC  
Hoffman.Stephen@epamail  
.epa.gov  
Subject  
Re: AEP Gavin Plant  
Report

Alan:

Please download the Gavin Plant report from this link:

<https://www.yousendit.com/download/Y1Rya3ZDVnNwcFVLSkE9PQ>

I would appreciate it if you would send me your comments no later than 10 days from the receipt of this email. Let me know if you have any questions.

\*\*\*\*\*  
Jim Kohler, P.E.  
Environmental Engineer  
LT, U.S. Public Health Service  
U.S. Environmental Protection Agency  
Office of Resource Conservation and Recovery  
Phone: 703-347-8953  
Fax: 703-308-8433  
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Jim & Steve,

I am in the process of compiling our comments on the draft Tanners Creek dam assessment reports. Can you tell me when the draft report for our Gavin Plant will be made available for review?

Thanks,  
Alan

(See attached file: Gavin Plant - Comments on CHA Draft Report.pdf)(See attached file: Gavin Plant - Attachment to Comments.pdf)

**Gavin Plant  
US EPA Dam Assessment Inspection  
Civil Engineering Response to CHA Assessment of Ash Impoundments  
August 18, 2009**

AEP has reviewed the recommendations provided by CHA as part of their assessment of the ash impoundment facilities at the Gavin Plant and would like to offer the following comments. AEP's comments are denoted in italic print after each of CHA's recommendations.

**General: Maintenance of the facilities**

*AEP concurs that maintenance of the facilities is part of the actions required to ensure the integrity of the dam and dikes at the AEP facilities. Therefore, AEP will continue a proactive maintenance and monitoring program as established.*

**Dam Inspection Checklist Forms**

*It appears after section 2.4 of the report that the consultant has inadvertently inserted two copies of the checklist forms for the bottom ash pond, rather than one copy of the forms for the bottom ash pond, and one copy of the forms for the fly ash pond (Stingy Run dam).*

**4.9 Bottom Ash Pond Hydraulic Analysis**

AEP was not able to provide CHA with a hydraulic analysis showing the Bottom Ash Pond's ability to safely pass the PMP. However, preliminary analyses performed by CHA suggest there is enough storage capacity at the current operating pool to safely withstand this rainfall event. We recommend AEP perform a complete study to confirm this, and update the study if operating levels of the pond change in the future.

*The design criteria established by the Ohio Department of Natural Resources, Dam Safety Division, for this facility is a minimum 5 feet of freeboard above the maximum operating level. The 24-hour PMP for this region is 34.5 inches. AEP maintains a normal operating level of elevation 578. The lowest elevation along the crest of the bottom ash pond dike is 586. This provides 8 feet of freeboard. The facility is visited daily so any unusual change in water surface will be observed and reported to the Operations Department.*

#### 4.11 Recommendations for Additional Stability Analyses – Bottom Ash Pond

Based on our review of available information for the Bottom 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.

- We recommend that an investigation be performed in which the properties of the alluvium silt/clay layer can be investigated in more detail in order to determine the presence and thickness of the soft layer of material indicated in the boring logs from June 2009. This scope of work should include laboratory testing of samples retrieved from the alluvium layer.
- We recommend that a stability analysis model be developed for the maximum surcharge pool (flood) condition. The model should reflect soil parameters for the soft alluvium layer described above. Because the observed and BBCM calculated phreatic surface within the embankment does not reflect a “classic” shape, we recommend a seepage analysis at flood pool be developed and subsequent stability model be analyzed.
- CHA modeled the upstream slope using the south embankment geometry and the steady state loading condition and the soil parameter provided in the June 2009 report. The calculated factor of safety was 1.3 which is below the minimum required factor of safety (according to the USACOE). We recommend that a model be prepared for this load case using the soil parameters for the soft alluvium layer described above.
- The downstream slope stability outputs for the steady state load condition for Cross Sections A and B show failure planes within the embankment soils. If the alluvium silt/clay was modeled with a soft layer at the depth corresponding to the low sample effort the failure plain may actually fail within the alluvium foundation soils and not the embankment soils. We recommend that a model be prepared for this load case using the soil parameters for the soft alluvium layer described above.
- The rapid-draw load case was not evaluated as part of the June 2009 investigation. CHA performed a preliminary analysis of the south embankment slope which indicated that the calculated factor of safety for the rapid draw-down load condition is close to 1.0, which is the minimum required value (according to the USACOE). We recommend that a model be prepared for this load case.
- We recommend that a liquefaction analysis be performed, especially if it is determined during the recommended investigation of the soft alluvium layer that the soils are susceptible to liquefaction.



- 1) *The bottom ash facility at the Gavin Plant has been in operation since 1974. Therefore, the current failure mode of principal interest is the steady-state seepage mode. In accordance with the Corps of Engineers EM 1110-2-1902, revised 2003, drained strengths expressed in terms of effective stress parameters should be used to evaluate long term conditions of dams. During the recent subsurface investigation and analysis, efforts were made to obtain undisturbed samples of the soft foundation materials. Acceptable samples could not be obtained; therefore, the consultant tested the disturbed samples to select strength parameters based on the Index properties. While both SPT N values and pocket penetrometer values are measures of undrained strengths, it is the Index tests which have been reported to provide reliable correlations with “drained” shear strength parameters (Terzaghi, Peck and Mesri, 1996; Stark et.al. 1997; Hall 1974). The selected strength of 29 degrees and cohesion equal to zero is based on the mode value of 31 samples tested as shown on the table presented in the investigation report. AEP believes that the selected parameter is representative of the weaker foundation material and that the recent (2009) analysis of the facility is a reasonable verification of its stable condition. Therefore, no additional subsurface investigation is warranted.*
- 2) *As indicated in response to 4.9, it is recognized that a surcharge pool approaching 3 feet above the normal pool may develop under the PMP. This will be a short term condition since the ODNR requires flood surcharge waters to be discharged within 10 days of achieving the peak pool level. As such, and considering the permeability of the embankment cohesive fill, the surcharge pool will not penetrate the embankment and create a steady-state seepage phreatic surface (ACOE EM-1110-1902). Instead, the additional water associated with the surcharge pool should be modeled as a distributed surface load equal to the 34 inches of water, which would serve as an additional stabilizing force for inboard slope, and not affect FS for outboard slope.*
- 3) *AEP concurs that the ACOE EM 1110-2-1902, 2003, Table 3-1 recommends a minimum 1.5 factor of safety for the long-term design condition of new dams. For existing embankments that have been in service for some period of time, the manual indicates a factor of safety may be less than the minimum value when evaluating the embankments based on their actual performance. Certainly, this is the case for the bottom ash pond where there is no history of deformation or instability of the dikes. However, AEP agrees that the inboard slopes should be reshaped to the original design configurations. AEP’s consultant has confirmed that regrading the slopes will improve the factor of safety to at least 1.5.*
- 4) *AEP’s consultant has performed additional analyses to force the failure plane through the weaker alluvium foundation material. Based on the design strength of 29 degrees, as documented in the report, a failure surface through this zone is not the critical surface as indicated by the factor of safety of 1.74 obtained in the additional analyses (see attached summary plot).*
- 5) *Due to the fixed operations of the facility and physical design of the discharge tower, a rapid drawdown condition cannot be developed at this facility. Please see AEP response to 4.12 (3).*
- 6) *Several screening techniques are commonly used to determine if materials have a potential for liquefaction. In general, liquefaction potential decreases with*

*increasing fines content and increasing plasticity index. Soils having a clay content (particles finer than 0.005 mm) greater than 20 percent are considered as non liquefiable (Seed and Idriss, 1982). A review of the laboratory testing data of the alluvium soils reveals that the clay fraction is in the range of 22-48 percent. On this basis, the alluvium soils at this site have a low potential for liquefaction, particularly under the seismic action of a credible earthquake for this region.*

#### **4.12 Stingy Run Dam Recommendations for Additional Stability Analyses**

Based on our review of available information for the Bottom 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.

- CHA recommends that AEP confirm that the Upper Sand and Lower Sand strata do not pose a liquefaction risk at this site.
- CHA recommends a maximum surcharge stability evaluation be performed for the current conditions.
- CHA recommends a rapid drawdown analysis be performed for the current conditions.

*(Please note that the opening sentence should state Stingy Run Dam and not the Bottom Ash Pond.)*

1. *AEP concurs that an evaluation of the foundation materials to determine if they are susceptible to liquefaction is warranted.*
2. *The pool level has remained fairly constant at elevation 696 since September 1993. As part of the engineering for the 735 Dam Raising, the facility was analyzed for steady state conditions for a maximum operating pool elevation of 726. At the time of the design the surcharge for the PMF was estimated to raise the pool elevation by 5 feet (elevation 731). Under the current operating elevation at 696, the flood surcharge from the PMF will raise the pool elevation by approximately 15 feet or elevation 711 as determined by a previous analysis. This temporary condition will not pose a greater risk to the structure than the steady state condition analyzed at the higher pool elevation, 726, during the design of the facility, which resulted in factor of safety greater than 1.5. Therefore, AEP does not agree that the analysis recommended is warranted for a maximum surcharge above the current conditions. Such analysis may be pertinent when current operating conditions are expected or proposed to change in the future.*
3. *Rapid drawdown is defined in the USACOE EM 1110-2-1902, 31 Oct 03, as a condition when the "Embankment may become saturated by seepage during a prolonged high reservoir stage. If subsequently the reservoir pool is drawn down faster than the pore pressure can escape, excess pore pressures and reduced stability will result."*

*AEP agrees that there is a relatively deep pool of water around the discharge tower that contains low suspended solids. However, there is no low level drain for the facility that will allow a rapid draw down of the water. To lower the pool level at this facility, stop logs must be removed from the discharge tower one at a time. AEP has performed this work at some other facilities for partial drawdown, when needed to perform repairs to the decanting structure, without upsetting environmental limits imposed by NPDES permits. The work effort takes about 4 hours to remove the initial stop log (generally a height of about 6 inches, but it could be in the range of 4 to 8 inches) and a full day to remove the second stop log, due to the flow depth over weir. Two stoplogs are the maximum number that are removed at a time because it is not possible or safe to remove any more stoplogs until the pool level recedes to the level of the stoplog. This time period is about 2 days to drop the reservoir level by about 12 to 16 inches, depending on the size of the individual stoplog and reservoir area.*

*General practice considers an acceptable rate to lower a reservoir to be usually 12 inches over a 24-hour period. Due to safety and operational constraints AEP can only drop the reservoir at a rate that is not considered a rapid drawdown condition. Therefore, AEP does not believe that a rapid drawdown analysis is warranted for this dam.*

### **Conclusion/Recommendations**

*The condition of the Stingy Run Dam and Bottom Ash Pond at the Gavin Plant have been rated as FAIR in this Assessment Report. AEP understands that in addition to the visual inspection conducted on June 1 and 2, 2009, the US EPA consultant reviewed AEP documentation that was forwarded to the consultant after the inspection date. Based on some apparent missing analyses, the consultant noted a few deficiencies in the overall background data. These deficiencies resulted in the FAIR condition rating, even though a SATISFACTORY rating was implied during the exit interview on June 2. Based on the above responses, AEP believes that documentation for all applicable analytical conditions have been performed for both facilities. Therefore, AEP respectfully requests that the consultant re-evaluate the overall condition rating. AEP Engineers, independent consultants, as well as the ODNR Dam Safety Section, all consider the facilities to have a SATISFACTORY condition. Such conditions have been documented over the past 10-15 years.*

