

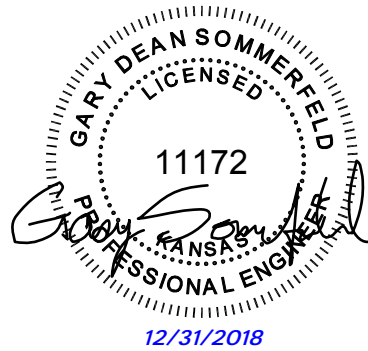
FINAL

ANNUAL INSPECTION REPORT

NEARMAN CREEK BOTTOM ASH IMPOUNDMENT

Kansas City, Kansas

B&V PROJECT NO. 190719
B&V FILE NO. 41.0403



PREPARED FOR



Kansas City Board of Public Utilities

31 DECEMBER 2018

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1.0 Executive Summary

This report presents a summary of the annual inspection for the Kansas City Kansas Board of Public Utilities (KCBPU) Nearman Bottom Ash Impoundment in Kansas City, Kansas. The annual inspection was completed by Black & Veatch on November 20, 2018. The annual inspection was completed in compliance with 40 CFR § 257.83 and included review of available information regarding the impoundment as well as a visual inspection of the impoundment and appurtenant structures.

1.1 SUMMARY OF FINDINGS

Inspection of the bottom ash impoundment did not identify any signs of structural weakness or conditions that would disrupt or affect the safety of the impoundment. There were no current concerns with existing conditions or the existing maintenance.

1.2 RECOMMENDATIONS

Based on the results of the inspection, Black & Veatch has no recommendations for improvements of the existing conditions or the maintenance program.

2.0 Inspection Team and Date of Inspection

2.1 INSPECTION TEAM

The inspection team consisted of one KCBPU Staff Scientist and one Black & Veatch geotechnical engineer. The inspection team members included:

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2.2 DATE OF INSPECTION

The inspection team began their work at 1:00 p.m. on Tuesday, November 20, 2018 and completed their work at 2:00 p.m.

2.3 WEATHER DURING INSPECTION

The weather on the day of the inspection was sunny with an ambient temperature about 44° Fahrenheit and no wind. There had been no significant precipitation within the previous week and all surrounding conditions were dry.

3.0 Description of Surface Impoundment

3.1 LOCATION AND GENERAL DESCRIPTION

The KCBPU Nearman Creek Power Station Surface Impoundment is located in Kansas City, Kansas, within Wyandotte County, in northeastern Kansas. The surface impoundment is a bottom ash settling pond and a clear water pond that are separated by an internal dike. Descriptions within this report may identify the facility as the surface impoundment, bottom ash pond, or ash pond.

The impoundment was designed by Lutz, Daily & Brain of Shawnee Mission, Kansas. Construction was completed May 30, 1980 and was permitted by the Kansas Department of Health and Environment (KDHE) on February 11, 1982. The impoundment was constructed by building a perimeter dike consisting of on-site clay and clayey silt materials on the existing soils. Both ponds were designed with a 3-foot thick layer of impervious fill as a base.

At the time of this inspection, bottom ash was being excavated from the impoundment and being hauled offsite for beneficial use. The KCBPU received approval from KDHE on March 16, 2018 for a low-volume wastewater discharge of the surface impoundment via KDHE permit No. I-MO25-B001. The two ponds are normally hydraulically connected by a 24-inch diameter reinforced concrete pipe (RCP). The pipe has been abandoned in place and the water is intermittently pumped from the bottom ash pond to the clear water pond. The dry condition of the impoundment allowed a single backhoe and multiple dump trucks to excavate and remove the bottom ash. (See Figure 1).



Figure 1 – Dry Bottom Ash Impoundment – Removal by Backhoe and Dump Trucks

The pipes used to sluice the bottom ash to the pond had been removed as part of the plant conversion from a wet bottom ash system to a dry system. No additional bottom ash is being pumped into the impoundment. (See Figure 2).



Figure 2 – Remaining Pipe Supports along Sluce Pipe Alignment.

The bottom ash pond was originally designed with a discharge structure that consisted of a 30-inch diameter RCP. The original purpose of the pipe was to permit emergency inflow into the pond in case of exterior flooding to help stabilize the embankments and to allow emergency discharge of impounded water. The pipe had previously been closed by mechanical means and was later sealed with concrete. The bottom ash pond does not impound water for bottom ash. (See Figure 3).



Figure 3 - Dry Condition of Bottom Ash Impoundment

3.2 POND DIMENSIONS AND CAPACITIES

Based on the original construction drawings, the impoundment's exterior and internal dikes have a nominal crest elevation of 763 feet. The side slopes of the dikes, both interior and external are designed with 3 horizontal to 1 vertical slopes. The exterior slopes are covered with riprap on the northern portion only and grass vegetation cover on all other external slopes. The interior slopes were originally designed without riprap cover; however, due to erosion issues, riprap was later placed on all interior slope surfaces. The interior rip rap has been removed as part of the bottom ash hauling for beneficial use. Rip rap was removed from the interior sections of the bottom ash impoundment and the clear water pond. (See Figure 4). Rip rap remains on the exterior of the bottom ash impoundment dike. (See Figure 5).

The impoundment covers approximately 21.5 acres and has a design storage capacity of 294,870 cubic yards. The bottom ash pond is not in service and bottom ash is continually being removed from the impoundment for beneficial use. Subsequent operation of the impoundment will not store bottom ash at this location.



Figure 4 – Interior Slope of Clear Water Pond without Rip Rap.



Figure 5 – Rip Rap on Exterior North Dike of Bottom Ash Impoundment

3.3 POND OPERATING AND INSPECTION PROCEDURES

In accordance with the Operations Plan updated by Burn and McDonald Engineering (February 26, 2016) and approved by KDHE on June 14, 2016, the impoundment is inspected on a weekly, monthly and an annual basis by plant personnel. Weekly and monthly inspections were initiated on October 19, 2015. The weekly and monthly reports have been completed during the past year and were reviewed for this inspection.

4.0 Inspection Findings

Black & Veatch completed the annual inspection based on the requirements of §257.83 of the CCR rules. The inspection was completed as a visual inspection with the main goals of identifying signs of distress or malfunction of the impoundment, appurtenant, and hydraulic structures. As part of this inspection, Black & Veatch also performed a review of the available information which included the following documents;

- a. Geotechnical Engineering Report, Bottom Ash Pond Evaluation, prepared by GeoSource, LLC September 2, 2015.
- b. Geotechnical Report, Erosion, Ash Ponds Dike Slopes, prepared by Terracon, June 20, 2008.
- c. Original Ash Pond Design Drawings and Specifications, prepared by Lutz, Daily & Brain, various dates.
- d. Operations Plan KCBPU Nearman Creek Power Plant Bottom Ash Surface Impoundment, prepared by Blackstone Environmental, November 11, 2015.
- e. Operations Plan for the Bottom Ash Pond at the Nearman Creek Power Station KDHE Permit No. 0413, prepared by Burns and McDonnell, February 26, 2016.
- f. Bottom Ash Surface Impoundment Hazard Potential Classification Assessment, prepared by Black & Veatch, October 2016.
- g. History of Construction Report – Nearman Creek Bottom Ash Surface Impoundment, prepared by Black & Veatch, October 2016.
- h. Bottom Ash Impoundment Liner Assessment, prepared by Black & Veatch, October 2016.
- i. Bottom Ash Pond Closure Plan, prepared by Burns and McDonnell, Revision 2, November 2, 2018.

Black & Veatch also reviewed the weekly and monthly inspection reports. The KCBPU personnel responsible for the completion of the inspection reports was part of the inspection team. Field inspection of the impoundment included a site walk to observe the dike crest, upstream slope, downstream slope, and discharge structures.

4.1 RESULTS OF INSPECTION

4.1.1 Crest

The interior and exterior dike crest surfaces are covered with gravel road base material. The crest of the dikes was in good condition (See Figure 6). No signs of cracking, settlement, movement, erosion or deterioration were observed during the assessment.

No vegetation was observed along the crest. The KCBPU staff indicated that vegetation has been periodically sprayed as part of the landscape maintenance and dead vegetation was observed.



Figure 6 - Clear Water Pond Dike Crest Condition

4.1.2 Interior Slopes

The interior slopes of the bottom ash impoundment are dry and have been shaped as bottom ash has been removed. (See Figure 7). Rip rap has been removed from the interior slopes of the clear water pond but no damage to the slopes was observed. There were no signs of surface instability.



Figure 7 – Shaping of Interior Slopes as Bottom Ash is Removed.

4.1.3 Exterior Slopes

In the northern portion of the impoundment, the exterior dike slope surface is covered with large riprap and appears to be in excellent condition (See Figure 5). There were no indications of slumping or instability observed on this portion of the impoundment. No vegetation was noted within the riprap. The maintenance program includes periodic spraying of vegetation. The base of the slope is dry.

In the remaining portions of the impoundment, the exterior slopes are generally covered with grass and low vegetation cover. There were no indications of slumping, instability, or erosion observed on these portions of the dike. The farmer of the adjacent land had been informed that tilling should not occur within 10 feet beyond the toe of the exterior slope. This can be seen in the right of the embankment pictured in Figure 6.

4.1.4 Discharge Structures

The former discharge structure was not visible due to the additional rip rap that had been placed in 2016. There were no signs of seepage or structural instability. The bottom ash dikes do not impound water. The 24-inch diameter pipe that connects the bottom ash and the clear water ponds has been abandoned in place to prevent water flow from the clear water pond into the bottom ash area.

5.0 Conclusions and Recommendations

Based on the condition of the dry bottom ash impoundment and water level in the clear water pond, as observed during the inspection in November 2018, the impoundment is considered sufficient to function as intended. There were no signs of distress or instability problems associated with the impoundment.

There are no recommendations for the future of the impoundment area or the related structures.