2019 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

Rockport Plant
Indiana Michigan Power Company
Rockport, Indiana

September 2019

Prepared for: Indiana Michigan Power Company – Rockport Plant

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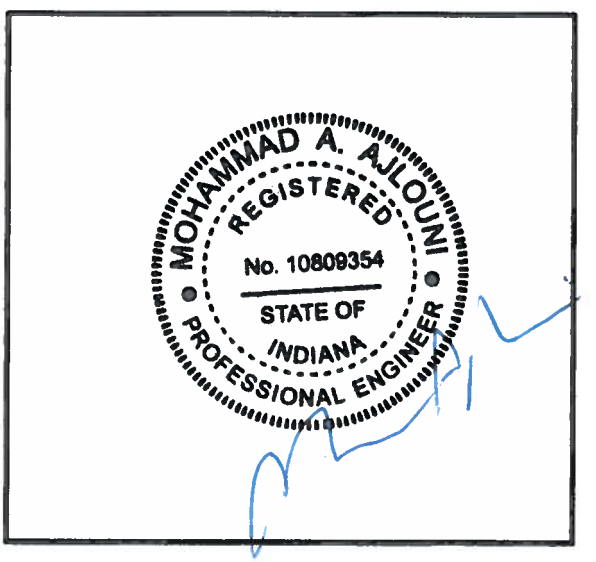

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.83(b).

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Attachments

1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.83 for the CCR impoundments and to provide the Rockport Plant an evaluation of the entire Bottom Ash Pond Complex.

American Electric Power Service Corporation's Civil Engineering Division administers the Rockport Plant Dam Inspection and Maintenance Program (DIMP). As part of the DIMP, staff from the GES annually conducts dam and dike inspections. This report contains the inspection findings, observations, photographic descriptions, conclusions, and maintenance recommendations. This inspection report addresses the East Bottom Ash Pond (EBAP) and the West Bottom Ash Ponds (WBAP), the East Waste Water Pond (EWWP), and the West Waste Water Pond (WWWP), the Reclaim Pond, and the Clear Water Pond at the Rockport Station.

Mr. Mitch Montgomery, landfill supervisor for the Plant, was the facility's contact during the inspection. The inspection was performed on August 28, 2019 by Mohammad Ajlouni of AEP Geotechnical Engineering. Weather conditions were clear and the temperature was in the mid 70's (°F) in the morning to the upper 70's F in the afternoon, with good visibility. There was a 0.9" rainfall recorded over the seven days prior to the inspection.

2.0 DESCRIPTION OF IMPOUNDMENTS

The Bottom Ash Pond Complex consists of the East Bottom Ash Pond (EBAP) and the West Bottom Ash Ponds (WBAP), the East Waste Water Pond (EWWP), and the West Waste Water Pond (WWWP), the Reclaim Pond, and the Clear Water Pond (see Figure 1 of Attachment A). The Bottom Ash Complex is generally a below ground facility with only the west dike of the WBAP extending above grade such that the normal pool elevation is maintained above ground level. The exterior slopes are 2.5 Horizontal to 1 Vertical (2.5H:1V) with interior slopes of 2 H:1V. The East and West Bottom Ash Ponds are considered a CCR impoundment per 40 CFR 257 and items have been included in this report to fulfill these requirements. The EWWP, WWWP, Reclaim Pond, & Clear Water Pond are not CCR Impoundments but are included as part of this overall inspection report.

The WBAP dike is approximately 2000 feet long and is 13 feet high (as measured from interior toe) with a design crest width of 30 feet. The dike is a compacted soil earthen embankment. The top of the dike is at elevation 399.0 feet with the natural ground surface beneath the dikes at about elevation 390 feet. The exterior side slope of the embankment fill is designed to be 2.5:H to 1:V that transitions to 3:H to 1:V. The interior design side slopes are 2:H to 1:V. The bottom elevation of the WBAP is at elevation 386 ft msl with a minimum operating pool elevation of 394 ft msl providing a CCR storage capacity of 211 ac-ft.

The EBAP is an incised pond with the surrounding ground at elevations above 399 ft msl. The EBAP also has interior design slopes of 2:H to 1:V. The bottom elevation of the EBAP is at elevation 377 ft msl with a minimum operating pool elevation of 391 ft msl providing a CCR storage capacity of 337 ac-ft.

3.0 REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i))

In addition to the current visual inspection, a review of available information regarding the status and condition of the EBAP and WBAP, including files available in the operating record, was conducted. Available information consists of design and construction information, previous structural stability assessments, previous 7 day inspection reports, and previous annual inspection reports. Based on the findings of the current visual inspection and the review of the available data, it is concluded that there were no signs of actual or potential structural weakness or adverse conditions and that the facility is performing

as intended in the design documents.

4.0 INSPECTION (257.83(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i))

No modifications have been made to the geometry of the EBAP and WBAP since the last annual engineering inspection. The geometry of the impoundments has remained unchanged.

4.2 INSTRUMENTATION (257.83(b)(2)(ii))

There is no instrumentation located at the EBAP and WBAP.

4.3 IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v))

Table 1 is a summary of the minimum, maximum, and present depth and elevation of the impounded water & CCR since the previous annual inspection; the storage capacity of the impounding structure at the time of the inspection; and the approximate volume of the impounded water and CCR at the time of the inspection.

Table 1

IMPOUNDMENT CHARACTERISTICS Bottom Ash Ponds		
	West Bottom Ash Pond	**East Bottom Ash Pond**
Approximate **Minimum** depth (elevation) of impounded water since last annual inspection	4 ft (394 ft msl)	13 ft.(391msl)
Approximate **Maximum** depth (elevation) of impounded water since last annual inspection	6 ft. (396 ft msl)	14 ft.(392 ft msl)
Approximate **Present** depth of impounded water at the time of the inspection	5.8 ft. (395.8 ft msl)	13.75 ft. (391.25 ft msl)
Approximate **Minimum** depth (elevation) of CCR since last annual inspection	1.0 ft. (387.0 ft msl)	<1 ft. (378 ft msl)
Approximate **Maximum** depth (elevation) of CCR since last annual inspection	5 ft.(391 ft msl)	<1 ft.(378 ft msl)
Approximate **Present** depth (elevation) of CCR at the time of the inspection	4 ft. (390 ft msl)	<1 (378 ft. msl)
Storage Capacity of impounding structure at the time of the inspection [crest el]	352 ac-ft.	557 ac-ft.
Approximate volume of impounded water at the time of the inspection	133 ac-ft.	352 ac-ft.
Approximate volume of CCR at the time of the inspection	133 ac-ft.	<50 ac-ft.

4.4 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.

Fair/Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.

Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

Minor: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.

Significant: A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what it is normal or desired, or which may have affected the ability of the observer to properly evaluate the structure or particular area of interest or which may be a concern from a structure's safety or stability point of view.

This document also uses the definition of a "deficiency" as referenced in the CCR rule section §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not identified as a deficiency are considered routine maintenance activities or items to be monitored.

A "deficiency" is some evidence that a dam has developed a condition that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

   Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not collected and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely transported. Seepage that is not clear and is turbid would also be considered as uncontrolled. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage. [Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored more frequently.]

2. Displacement of the Embankment

   Displacement of the embankment is a large scale movement of part of the dam. Common signs of displacement are cracks, scarps, settlement, bulges, depressions, sinkholes and slides.

3. Blockage of Water Control Appurtenances

   Blockage of water Control Appurtenances is the restriction of flow at spillways, decant or pipe spillways, or drains.

4. Erosion

   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.5 VISUAL INSPECTION (257.83(b)(2)(i))

A visual inspection of the Bottom Ash Pond Complex including the EBAP and WBAP was conducted to identify any signs of distress or malfunction of the impoundment and appurtenant structures. Specific items inspected included all structural elements of the dam such as inboard and outboard slopes, crest, and toe; as well as all appurtenances.

Overall the facility is in good condition. The impoundment is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the impoundment. Inspection photos are included in Attachment B. Additional pictures taken during the inspection can be made available upon request. A map presenting the locations of the inspection observations is included in Attachment A.

East Bottom Ash Pond

1. The EBAP was in operation during the time of the inspection, however, all CCR related flow has been stopped. The diverter discharge structure was blocked. The concrete portion of the structure showed signs of wear but is in fair condition. The pool was at elevation 391.25 msl.
2. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The rip rap protection along the slope appeared in good condition and has not deteriorated.
3. The portion of diked embankment adjacent to the metal cleaning tank containment area was in good condition and showed no signs of distress. There are two pipes that are used to pump storm water from the containment area into the EBAP and they appeared to be functioning properly.
4. Flow was discharging into the low level drain structure. While this structure is typically used for draining the pond it appears to be functioning properly as part of the primary discharge for the pond. The structure appeared in good condition. Flow was unobstructed.
5. The primary discharge structure was in good condition and functioning properly. Flow was entering from all 3 sides of the box weir structure. The skimmer structure was in good condition.
6. The access road located at the crest of the pond appeared in good and stable condition with no signs of distress such as settlement, cracking or ruts.
7. There are areas within the pond and side slope where unwanted vegetation is starting to grow due to the pond being out of service for a long period last year.

West Bottom Ash Pond

1. The WBAP was in operation during the time of the inspection. The diverter discharge structure was configured to allow all CCR flow to enter the WBAP. The concrete portion of the structure

showed signs of wear but is in fair condition. The pool was at elevation 395.8msl which is near the maximum operating level.

2. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The rip rap protection along the slope that was visible appeared in good condition and has not deteriorated.
3. The splitter dike between the two ash ponds appeared to be in good condition and showed no signs of distress. The splitter dike separating the WBAP from the WWWP was also in good condition and showed no signs of distress.
4. The outboard slope of the WBAP was in good condition. There were no signs of movement or misalignment, sloughing or bulges. The inspection was conducted prior to mowing, but the vegetation was not excessively high.
5. There were no seepage or wet areas observed along the embankment.
6. The crest of the west dike appeared in good and stable condition with no signs of distress such as settlement or ruts, and no erosion.
7. Flow was discharging into the low level drain structure. While this structure is typically used for draining the pond, it appears to be functioning as part of the primary discharge for the pond. The structure appeared in good condition. Flow was unobstructed.
8. The primary discharge structure was in good condition and functioning properly. Flow was entering from all 3 sides of the box weir structure. The skimmer structure was in good condition.

East and West Waste Water Ponds

1. Waste water flows were entering both the EWWP and WWWP at the northern end of each pond. The pool elevation of the WWWP was 389.1. The pool elevation of the EWWP was 389.0.
2. The interior slopes of the EWWP and WWWP Ponds were in good condition. The rip rap was free of any vegetation and showed no signs of deterioration or weathering.
3. The spillway structures in the EWWP and the WWWP were in good condition. There were no obstructions at either structures and they appear to be functioning properly. Flow over the weir in the EWWP and WWWP was smooth. The water discharged into the distribution structure where the flow was directed to the Reclaim Pond.
4. The separation of the rectangular concrete weir channels in both ponds does not appear to be any different than the conditions noted in previous inspection reports.
5. The EWWP and WWWP are incised impoundments. The crests of the ponds were well maintained with no signs of settlement or depressions.

Reclaim Pond and Clear Water Pond

1. Flow was entering the Reclaim Pond from the EWWP and WWWP. Flow within the Reclaim Pond was either pumped back to the plant at the existing pump structure or discharged to the Clear Water Pond.
2. Flows within the Clear Water Pond are discharged through the primary discharge structure and to Outfall 001. The pool elevation of the Reclaim pond was 385.5msl. The pool elevation of the Clear Water Pond was 385.1msl.
3. The Reclaim Pond is an incised impoundment. The interior slopes of the Reclaim Pond were in good condition. The rip rap was free of any vegetation and showed no signs of deterioration or weathering. The crests of the pond was well maintained with no signs of settlement or depressions.

4. The reclaim pump structure was in good condition and appeared to be pumping properly.
5. The outlet structure between the Reclaim Pond and Clear Water Pond appeared in good condition with no obstruction.
6. The outlet structure of the Clear Water Pond was in fair condition with no obstructions. The skimmer board and weir structure was in fair condition, however, two of the steel brackets were broken and few of the wood logs rotten. Some vegetation was growing at the entrance to the weir structure.

4.6 CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations there were no changes to the EBAP or WBAP, as well as the entire Bottom Ash Pond Complex since the last annual inspection that would affect the stability of the impounding structure. Sluiced inflow has been directed into the WBAP for the past 2 years.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

The following general observations were identified during the visual inspection:

1) The outboard slopes, crest and inboard slopes and splitter dikes of the impoundments were generally in good condition. The embankment along the west side of the complex did not show any signs of structural weakness or instability. The crest did not contain any ruts, cracks, depressions or other signs of instability. Specific maintenance items and items to monitor are described in the subsequent sections of this report.

5.2 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection, see inspection map for locations. Contact GES for specific recommendations regarding repairs:

1) Eliminate vegetation growth within rip rap areas using herbicide.
2) Replace rotten wood logs and weld steel brackets at the clear water outlet structure.
3) Eliminate/ remove vegetation growth from within Clearwater pond discharge structure.

5.3 ITEMS TO MONITOR/INVESTIGATE

The following items were identified during the visual inspection as items to be monitored, see inspection map for locations:

1) No items were noted for monitoring.

5.4 DEFICIENCIES (257.83(b)(2)(vi))

At the Bottom Ash Pond Complex including the East & West Bottom Ash Ponds there were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day or 30-day inspections. A deficiency is defined as: 1) uncontrolled seepage, 2) displacement of the embankment, 3) blockage of control features, or 4) erosion, more than that requiring minor maintenance. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

ATTACHMENT A

Site Plan and Inspection Location Map

FIGURE 1

INDIANA MICHIGAN POWER

ROCKPORT POWER STATION

BOTTOM ASH COMPLEX

AEP AMERICAN ELECTRIC POWER

AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

ATTACHMENT B

Photos
#W – West bottom ash pond
#E – East bottom ash pond
#WW – Wastewater ponds
 # - Reclaim or Clearwater as described

Photo #1W – interior slope of west dike

Photo #2W – crest of west dike

Photo #3W – toe of west dike

Photo #4W – low level drain operation at full pond

Photo #5W – main discharge structure.
p.s. the vegetation shown in the photo was removed during the inspection

Photo #6W– splitter dike between ash ponds

Photo #7W– discharge structures at full pond

Photo #1E –Interior West Slope of East ash pond

Photo #2E – South Interior Slope- Discharge Structures

Photo #3E – Interior of east slope and ash pond

Photo #4E – Interior of east slope Looking North

Photo #1WW – interior north slope of West WW pond

Photo #2WW– interior north slope of West WW pond

Photo #3WW – operating discharge structure in West WW pond

Photo #4WW – interior south slope Of West WW pond

Photo #5WW – interior north slope of East WW pond

Photo #6WW– discharge weir structure at East WW pond

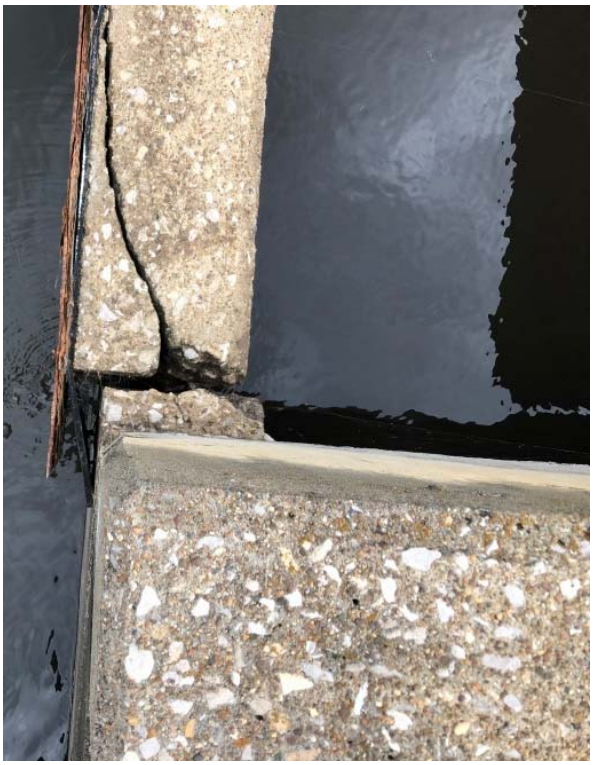

Photo #7WW – old displacement of concrete weir – rebar is still engaged.

Photo #1 – interior slope of north Clearwater pond

Photo #2– discharge structure at Clearwater pond

Photo #3 – interior south slope of Clearwater pond

Photo #4 – discharge structure at Clearwater pond