

2020 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

**Rockport Plant
Indiana Michigan Power Company
Rockport, Indiana**

September 2020

Prepared for: Indiana Michigan Power Company – Rockport Plant

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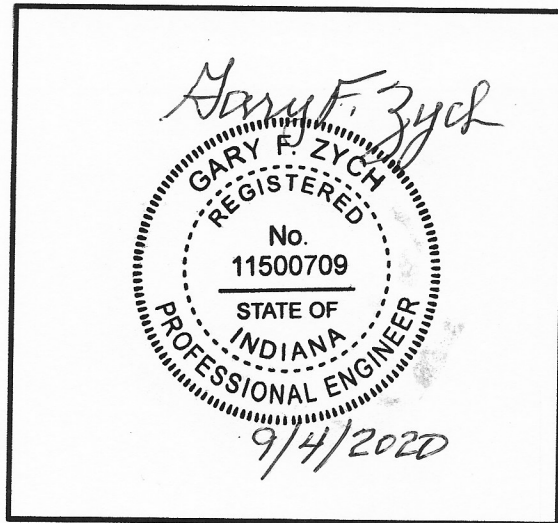
Bottom Ash Pond Complex

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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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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 Clearwater Pond at the Rockport Station.

Mr. Mitch Montgomery, landfill supervisor for the Plant, was the facility's contact during the inspection. Dan Murphy of AEP Geotechnical Engineering performed the inspection on August 25-26, 2020. Weather conditions were mostly sunny and the temperature was near 90 °F with good visibility. There was about 1.5 inches of 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 Clearwater Pond (see Figure 1 of Attachment A).

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, & Clearwater Pond are not CCR Impoundments but are included as part of this overall inspection report.

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 2H: 1V.

The WBAP dike is approximately 2000 feet long and has a maximum height of 13 feet (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)	12 ft. (390 msl)
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)	12 ft. (390 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 pool was at elevation 390 ft msl. 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.
2. A piece of angle iron has been installed at the diverter structure to reinforce the slide gate seal to the East Bottom Ash Pond at the diverter discharge structure. This angle iron was observed to be loose, due a concrete expansion anchor that has pulled out.
3. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The riprap protection along the slope appeared in good condition and has not deteriorated.
4. Erosion rills up to 3 feet in depth were observed in the bottom ash deposits at the north end of the pond. These erosion rills appear limited to the sluiced sediments and have not eroded through soil.
5. The portion of diked embankment adjacent to the metal cleaning tank containment area had an erosion rill in the groin between the metal cleaning tank containment and the east bottom ash pond. This portion of the embankment was otherwise in good condition. 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.
6. The low-level discharge structure was reported to have become plugged and is non-functioning. The low-level discharge structure has been used in the past to periodically drain water to facilitate bottom ash removal. This is not considered a deficiency because the primary discharge structure is suitable for conveying flows from storm events.

7. The primary discharge structure was in good condition and functioning properly. The water level was about 10 inches below the concrete sill that the stoplogs rest upon. The stoplogs were removed on all 3 sides of the box weir structure. The skimmer structure was in good condition.
8. 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.
9. There are scattered areas on the interior side slopes where vegetation is starting to grow.

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 395.8 ft msl, which is near the maximum operating level.
2. The interior slopes showed no signs of distress such as sloughing, bulges or erosion. The riprap 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. Erosion rills measuring about 1 foot in depth were observed in the bottom ash/coal fines deposit located southeast corner of the dike. These erosion rills are limited to the sluiced sediments and do not appear to have eroded through the soil of the dikes.
5. 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 and was mowed the day after the inspection.
6. There were no seepage or wet areas observed on the embankment. However, there was an area of standing water noted beyond the downstream toe; no signs of flowing water were observed. This area was investigated and appears to be the result of the flat topography surrounding the bottom ash complex.
7. 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.
8. 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.
9. 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. A patch of cattails was observed growing on the inside of the skimmer structure.
10. There are scattered areas on the interior side slopes where vegetation is starting to grow.

East and West Waste Water Ponds

1. Wastewater flows were entering both the EWWP and WWWP at the northern end of each pond. The pool elevation of the WWWP was 389.0. The pool elevation of the EWWP was 389.0.
2. The interior slopes of the EWWP and WWWP Ponds were in good condition. The riprap showed no signs of deterioration or weathering. Some minor areas with patches of vegetation were observed.
3. At the outlet of the WBAP discharge structure (coming from the WBAP into the WWWP), some deterioration was observed at the horizontal pipe/concrete wall interface. Minor deflections

estimated at 0.5 inches were observed at the mostly submerged pipe, as water flowed through the pipe.

4. 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.
5. The separation of the rectangular concrete weir channels in both ponds does not appear to be any different from the conditions noted in previous inspection reports.
6. 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 Clearwater 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 Clearwater Pond.
2. Flows within the Clearwater Pond are discharged through the primary discharge structure and to Outfall 001. The pool elevation of the Reclaim pond was 385.3 msl. The pool elevation of the Clearwater Pond was 385.0 msl.
3. The Reclaim Pond is an incised impoundment. The interior slopes of the Reclaim Pond were in good condition. The riprap was free of any vegetation and showed no signs of deterioration or weathering. Further, the crest 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 Clearwater Pond appeared in good condition with no obstruction.
6. The outlet structure of the Clearwater Pond was in fair condition with no obstructions. The skimmer board and weir structure was in fair condition, however, several of the steel brackets were broken and few of the wood timbers are rotten. Some vegetation was growing at the entrance to the weir structure.
7. There was an area of standing water noted to the southwest of the Clearwater Pond. This area was investigated and no signs of flow were observed. This area appears to be the result of the relatively flat topography surrounding the ash pond complex.
8. A small sinkhole feature was observed at manhole 13-A, which provides access to the corrugated metal pipe conduit for outfall 001. A tape measure was inserted into the sinkhole, measuring a depth of roughly 26 inches. Based on discussions with plant personnel, this manhole has experienced concrete deterioration and been repaired in the past.

Further, additional manholes were located and inspected for similar problems. Some trees and brush were present around four of the manholes. Several of the manholes were observed to be not level. The location of the manholes were marked with pink survey ribbon to make them easier to locate.

Manhole 13-F was found with the lid removed, and it appears the lid may have been removed by nearby farmer to provide surface drainage to cropland.

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 4 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 the scattered riprap areas using appropriate herbicide. Eliminate/ remove vegetation growth from within Clearwater pond discharge structure and the west bottom ash pond skimmer structure.
- 2) Replace rotten wood logs and deteriorated steel brackets at the skimmer at the Clearwater pond outlet structure.
- 3) Repair the loose angle iron in diverter structure for the bottom ash ponds.
- 4) Consider installing an open grated manhole cover at manhole 13-F to allow surface drainage in the cropland area.
- 5) Repair the erosion gully in the groin of the metal cleaning tank containment area and the west bottom ash pond.

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) Monitor the deterioration of pipe penetration and deflection of the horizontal outlet pipe at the outlet of the west bottom ash pond structure, flowing into the west wastewater pond for further deterioration or excessive movement.
- 2) It is recommended to perform a camera inspection/investigation of the corrugated metal conduit for outfall 001. This is based on the presence of a sinkhole around manhole 13-A, the potential for tree roots to have entered into the pipe, the age of the pipe, manholes which have shifted out of level, and the overall importance of this conduit to the pond complex.

AEP Engineering will coordinate this item with the plant to determine feasible options and timelines for stopping the flow of water into this conduit to facilitate the inspection. It is anticipated that this work will occur over a week of or so, as the flow of water out of the pond complex can only be shut off for small windows of time without overfilling the ponds.

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

Inspection Location Map

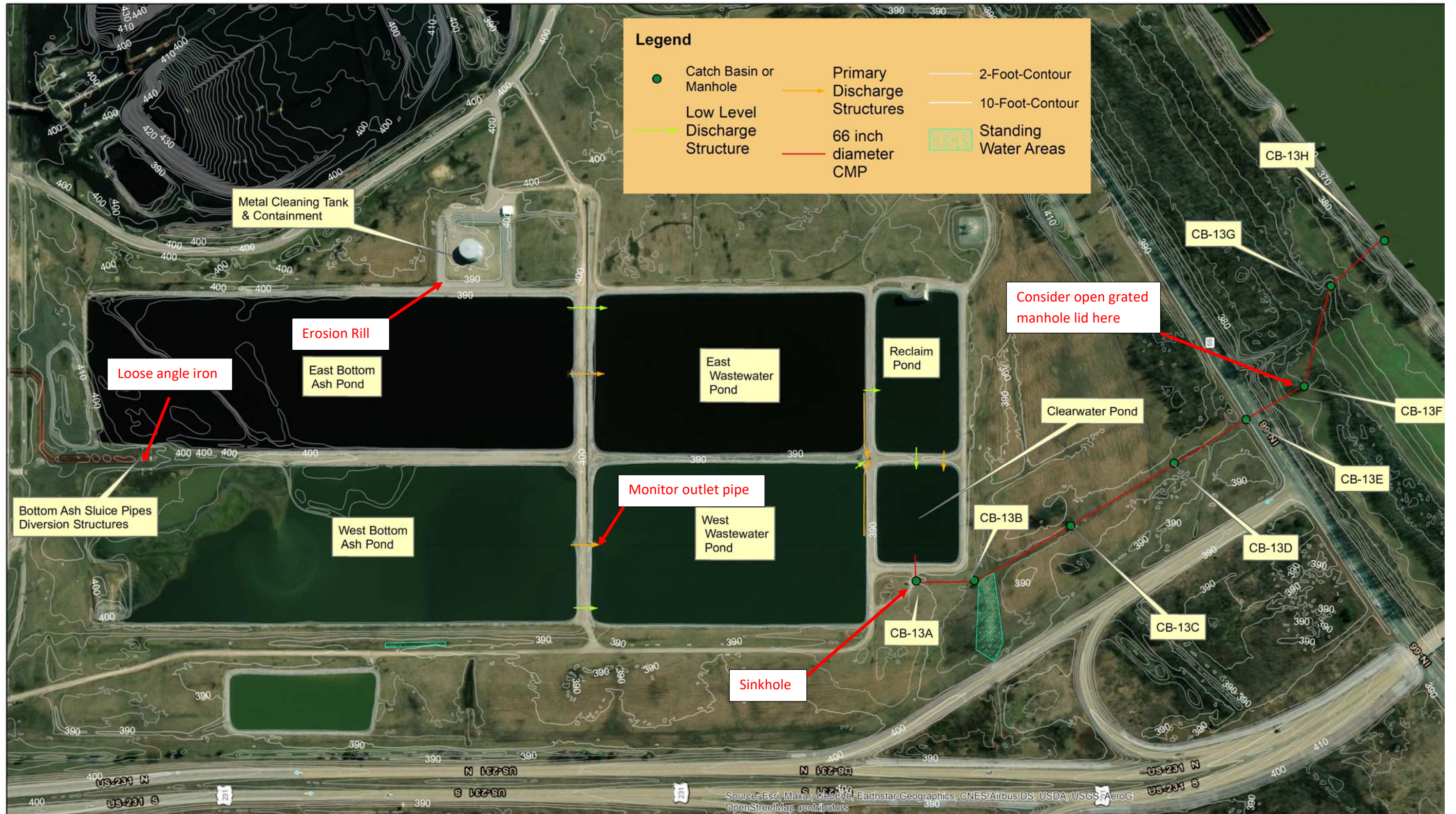
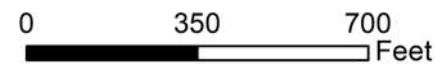


Figure 1: Rockport Dam Inspection Site Map
 Drawn by: Dan Murphy
 Date: September 1, 2020



Note: Contours as shown were determined from LiDAR made publicly available through the Indiana Geospatial Data Portal.

Location of manholes/catch basins and 66-diameter CMP were made in reference to AEP drawings 12-30024-6 and 12-30013sh1-14

ATTACHMENT B

Inspection Photos

#W – West bottom ash pond

#E – East bottom ash pond

#WW – Wastewater ponds

- Reclaim or Clearwater as described



Photograph 1: #W

View of the embankment dike of the west bottom ash pond, looking north.



Photograph 2: #W

View of standing water noted beyond to the toe of the embankment dike of the west bottom ash pond.



Photograph 3: #W

View of the low-level discharge structure at the west bottom ash pond.



Photograph 4: #W

View of the bottom ash sluice lines discharging into the diverter structure. The red arrow notes the loose angle iron.



Photograph 5: #E

View of the primary discharge structure of the east bottom ash pond. The water level was about 10 inches below the concrete sill.



Photograph 6: #E

View of the low level Discharge structure. The water level was about 6 feet below the normal operating pool mark.



Photograph 7: View of erosion rill on the northern groin between the metal cleaning tank containment dike and the east bottom ash pond dike.



Photograph 8: #WW

View of the discharge entering into the west wastewater pond from the west bottom ash pond. Concrete deterioration was noted at the joint between the pipe and concrete wall. Deflections were observed at the end of the pipe, noted by the white arrow.



Photograph 9: #WW

View of the primary discharge structure for the east wastewater pond.



Photograph 10: #WW

View of the discharge structure for the west wastewater pond.



Photograph 11: #Clearwater

View of the skimmer at the Clearwater pond discharge. Notice the vegetation, deteriorated timbers and broken metal brackets.



Photograph 12: #Clearwater

View of the sinkhole found at the southwest corner of manhole CB-13A



Photograph 13: #Clearwater

View of the open manhole found at CB-13F



Photograph 14: #Clearwater

View inside the manhole at CB-13F, notice the flowing water and minimal corrosion on the visible areas.



Photograph 15: #Clearwater

View of CB-13C, notice the trees/brush around the manhole, which has also shifted out of level.