

2022 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

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

September 2022

Prepared for: Indiana Michigan Power Company – Rockport Plant

Prepared by: American Electric Power Service Corporation

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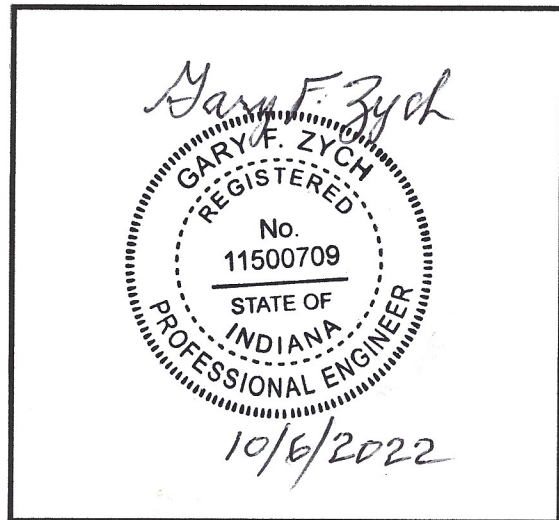
Bottom Ash Pond Complex

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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).

Table of Contents

1.0	INTRODUCTION.....	4
2.0	DESCRIPTION OF IMPOUNDMENTS.....	4
3.0	REVIEW OF AVAILABLE INFORMATION (257.83(b)(1)(i)).....	4
4.0	INSPECTION (257.83(b)(1)(ii)).....	5
4.1	CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.83(b)(2)(i)).....	5
4.2	INSTRUMENTATION (257.83(b)(2)(ii)).....	5
4.3	IMPOUNDMENT CHARACTERISTICS (257.83(b)(2)(iii, iv, v)).....	5
4.4	DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES.....	6
4.5	VISUAL INSPECTION (257.83(b)(2)(i)).....	7
	East Bottom Ash Pond.....	7
	West Bottom Ash Pond.....	8
	East and West Wastewater Ponds.....	8
	Reclaim Pond and Clearwater Pond.....	9
4.6	CHANGES THAT EFFECT STABILITY OR OPERATION (257.83(b)(2)(vii)).....	9
5.0	SUMMARY OF FINDINGS.....	9
5.1	GENERAL OBSERVATIONS.....	9
5.2	MAINTENANCE ITEMS.....	10
5.3	ITEMS TO MONITOR/INVESTIGATE.....	10
5.4	DEFICIENCIES (257.83(b)(2)(vi)).....	11

Attachments

Attachment A – Inspection Location Map

Attachment B – Inspection Photographs

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. Larry Hofius, Landfill Supervisor for the Plant, was the facility's contact during the inspection. Dan Murphy of AEP Geotechnical Engineering performed the inspection on September 14, 2022. Weather conditions were sunny and the temperature was near 80°F. There was about a 0.3 inches of rainfall recorded over the seven days prior to the inspection. On 9/3/2022, the Rockport plant received about 4.5 inches of rain and on 9/5/2022 another 2.5 inches of rain.

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 grade 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 splitter dike separating the EBAP and WBAP is about 2000 feet long and has a maximum height of 22 feet, as measured from the top of dike to floor of the EBAP. The splitter dike is constructed out of compacted cohesive soil and has design slopes of 2H: 1V. 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 WBAP since the last annual engineering inspection.

As part the closure of the EBAP, CCR material and an additional foot of soil was being removed from the EBAP, effectively temporarily deepening the impoundment. The bottom of the pond will be raised to original grades during the liner retrofit project.

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

There is no instrumentation at the EBAP or 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.

The information in this table is based on bathymetric survey of the ponds from September 2020 and observations made during 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	0 ft (396 ft msl)	0 ft. (N/A)
Approximate Maximum depth (elevation) of impounded water since last annual inspection	8 ft. (396 ft msl)	1 ft. (378 ft msl)
Approximate Present depth of impounded water at the time of the inspection	4 ft. (396 ft msl)	0 ft. (N/A)
Approximate Minimum depth (elevation) of CCR since last annual inspection	2 ft. (388 ft msl)	0 ft. (NA)
Approximate Maximum depth (elevation) of CCR since last annual inspection	13 ft. (399 ft msl)	7 ft. (384 ft msl)
Approximate Present depth (elevation) of CCR at the time of the inspection	6 ft. (392 ft msl)	0 ft. (N/A)
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	108 ac-ft.	0 ac-ft.
Approximate volume of CCR at the time of the inspection	162 ac-ft (262,000 CY)	0 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 East Bottom Ash Pond was drained during this inspection to facilitate excavation of CCR material.
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. 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 interior slope has been partially removed as part of the pond closure.
4. There was evidence of seepage though the splitter dike separating the East Bottom Ash Pond and East Waste Water Pond. The soils at the toe of the slope and across the southern quarter of the EBAP were soft and saturated. The seepage was diffused over a wide area, making flow rate estimates difficult.
5. The low-level discharge structure has been permanently plugged with grout and partially demolished.
6. The primary discharge structure was in good condition and normally submerged components could be inspected. There were signs of corrosion noted along the stop log seals that are embedded in the concrete walls of the structure. The skimmer structure has been demolished.
7. 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.

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 396 msl, which is at 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 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 grass cover is in good condition.
6. There were no seepage or wet areas observed on the embankment. Areas of standing water as previously identified areas in past inspections were observed to be dry.
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. 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. Vegetation is growing on the inside of the skimmer structure.
9. There are scattered areas on the interior side slopes where vegetation is starting to grow.

East and West Wastewater 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. The 42-inch-diameter header pipe running along the north side of the wastewater ponds was observed to have a leak near the outlet of the EBAP primary discharge structure. The leakage flows across the interior slope riprap and into the EWWP. The pond water in this immediate area of the EWWP did appear to have a slightly different coloration and could be sign that erosion is occurring due to the leaking header pipe. A sand delta appears to have accumulated within the pond where the flows from the leaking pipe enter into the pond.
4. 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. The deflections of the pipe as noted in past inspections were not detectable.
5. 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.
6. The separation of the rectangular concrete weir channels in the EWWP does not appear to be any different from the conditions noted in previous inspection reports. During this inspection, a white line was marked at the joint to observe any additional movement.

7. The EWWP and WWWP are incised impoundments.
8. A 6-inch-deep erosion rill was observed in the crest of the East Waste Water Pond.

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 385.0 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 had vegetation growing 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 42-inch-diameter fiberglass pipe between the Reclaim Pond and the Clearwater Pond was observed to have two open joints on the crown of the pipe, at both ends where the pipe is exposed.
6. The outlet structure of the Clearwater Pond was in fair condition. A 5 bucket was observed to be trapped against the trash rack bars, slightly obstructed flows. 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 inside the skimmer structure.
7. 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 42 inches, and the diameter of the hole on the surface was about 4 inches. Stone has been placed around the manhole to repair the sinkhole since the last inspection, however it has reappeared. Based on discussions with plant personnel, this manhole has been repaired in the past.

Some trees and brush were present around four of the manholes. Several of the manholes were observed to be not level.

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. This was found during the last inspection, and subsequently the manhole was closed by Rockport plant staff. However, the manhole has been removed once again.

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.

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) Continue with the vegetation maintenance & mowing efforts at the facility.
- 2) Consider repairing the deteriorated skimmer structure at the Clearwater Pond discharge structure.
- 3) Repair the loose angle iron in diverter structure for the bottom ash ponds.
- 4) Remove the bucket from the trash bars at the Clearwater Pond Discharge structure.
- 5) Repair the leaking header pipe running along the surface of the splitter dike between the wastewater pond and the bottom ash ponds.
- 6) Replace the lid to Manhole 13-F. Consider installing an open-grated lid at this manhole to allow surface drainage from the cropland area.
- 7) 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.

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) Monitor the seepage at the toe splitter dike at the southern end of the EBAP, until this issue is addressed by the retrofit project.
- 3) Monitor the fiberglass pipe between the Reclaim Pond and the Clearwater Pond for signs of soil migration through the open joints.
- 4) Monitor the interior slope of the East Wastewater Pond in the area of the leaking header pipe for signs of erosion. There are nearby discharge structures and walkway platforms that may complicate repairs to the interior slopes in this area.
- 5) Monitor the offset joint at the discharge structure for the East Wastewater Pond. A permanent white reference line has been placed at the joint to identify any future movements.
- 6) Monitor the sinkhole next to manhole 13-A for increased subsidence.

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

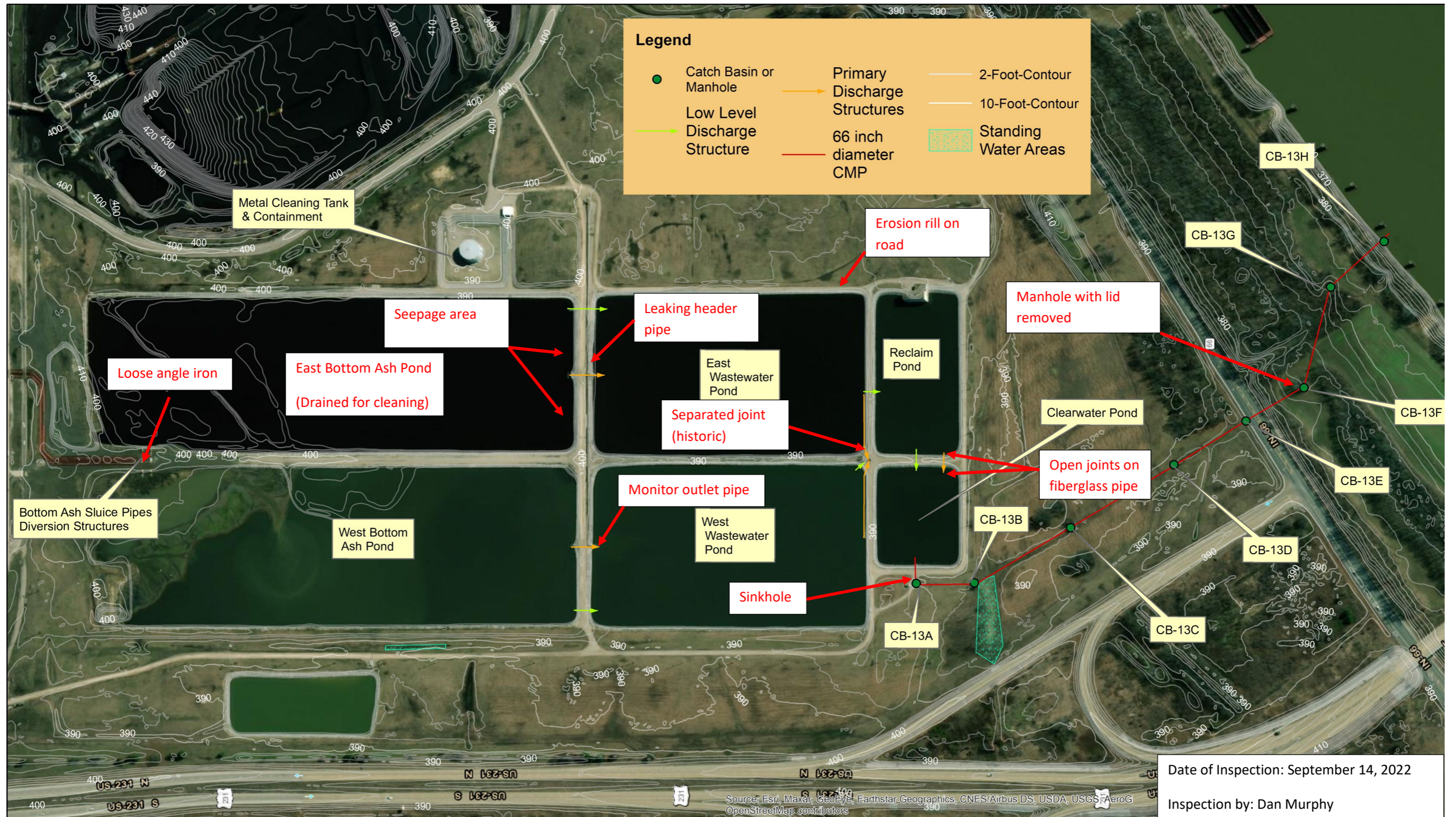
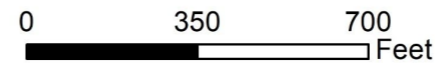
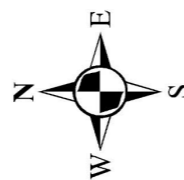


Figure 1: Rockport Dam Inspection Site Map
 Drawn by: Dan Murphy
 Date: September 1, 2020



Note: Contours as shown were determined from LIDAR made publically 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**
- #EW – East Wastewater pond**
- #WW – West Wastewater pond**
- # - Reclaim or Clearwater as described**



Photograph 1: #W

View of the crest of the west dike of the West Bottom Ash Pond.



Photograph 2: #W

Another view of the crest of the dike of the West Bottom Ash Pond.



Photograph 3: #W

View of the influent structure at the West Bottom Ash Pond.



Photograph 4: #W

View of the inlet of primary discharge structure for the West Bottom Ash Pond.



Photograph 5: #W

View of flows entering into the low level discharge structure of the West Bottom Ash Pond.



Photograph 6: #E

View of the primary discharge structure for the East Bottom Ash Pond.



Photograph 7: #E

View the interior slope of the EBAP, the plugged and partially demolished low level discharge structure noted by the red arrow.



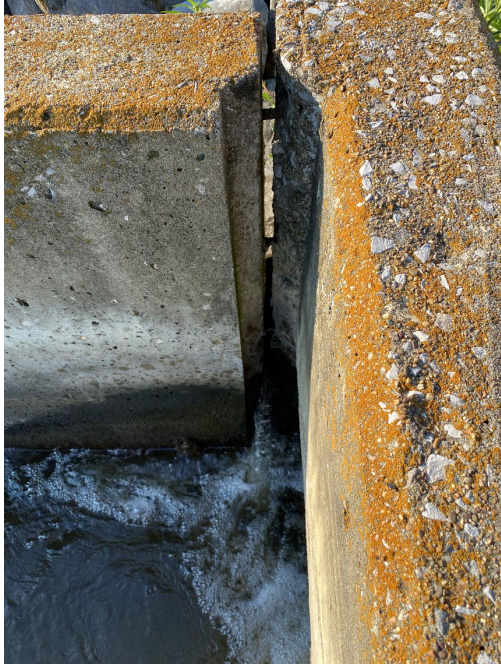
Photograph 8: #E

View of the soft, wet areas at the toe of splitter dike separating the East Bottom Ash Pond and East Wastewater Pond.



Photograph 9: #E

View of the pond bottom of the East Bottom Ash Pond.



Photograph 10: #EW

View of the separated joint at the weir channel located inside the East Wastewater Pond



Photograph 11: #EW

View of the leaking 42-inch header pipe, flowing into the EWWP.



Photograph 12: #EW

View of erosion rill on the crest of the East Wastewater Pond.



Photograph 13: #WW

View of the discharge structures in the West Wastewater Pond. Note the vegetation present by the skimmer structure.



Photograph 14: #Clearwater

View of the removed manhole lid at 13-F.



Photograph 15: #Clearwater

View of the final outlet for the pond complex into the Ohio River.



Photograph 16: #Clearwater

View of bucket trapped against the trash bars at the discharge structure of the Clearwater pond.



Photograph 17: #Clearwater

View of the skimmer structure of the Clearwater pond.