

2023 Annual Dam and Dike Inspection Report

Bottom Ash Pond Complex

Mitchell Plant

Wheeling Power Company & Kentucky Power Company

Marshall County, West Virginia

June 2023

Prepared by: American Electric Power Service Corporation

1 Riverside Plaza

Columbus, OH 43215



Document ID: GERS-23-008

ENGINEER'S INSPECTION VERIFICATION STATEMENT

For Compliance with Dam Safety Rules §47-34-15.4.c

I hereby verify that I supervised the visual inspection of the Mitchell Bottom Ash Complex (ID# 05108) and its appurtenances on May 11, 2023. The attached signed and sealed inspection report documents:

- 1) the current conditions as observed;
- 2) any maintenance items necessary to prolong safe functioning of the dam;
- 3) any conditions observed during the inspection which indicate that the dam has a serious problem⁽¹⁾;
- 4) any conditions that will not allow proper functioning of the dam during normal or maximum reservoir water level conditions.

Signature

Mohammad A. Ajlouni, P.E., Ph.D.

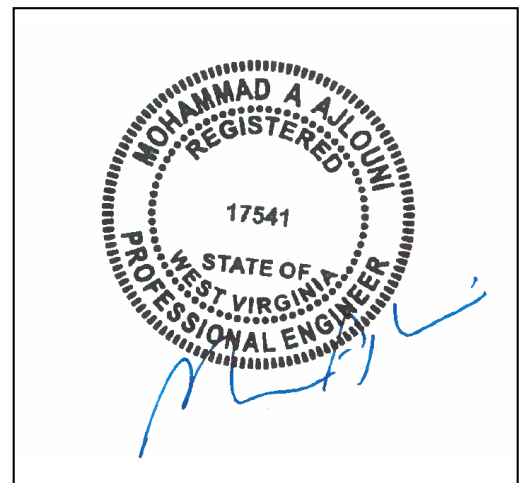
Engineer Staff

Geotechnical Engineering Services

American Electric Power Service Corporation

6/06/2023

Date



SEAL

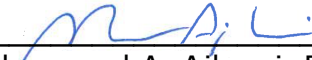
⁽¹⁾ As defined in Section 2.47 of the Dam Safety Rules


2023 Annual Dam and Dike Inspection Report


Mitchell Plant

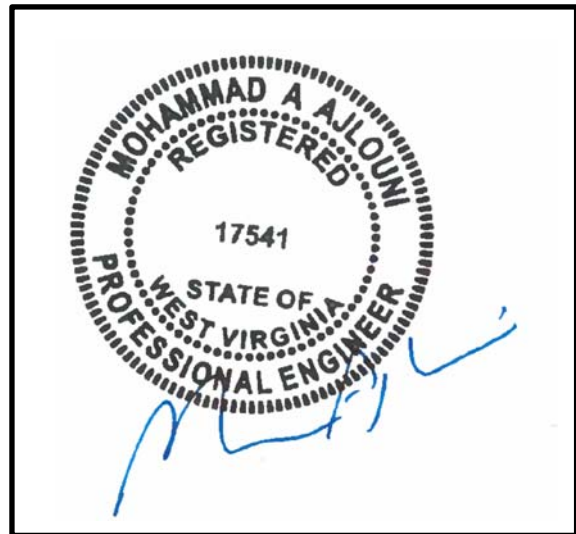
Bottom Ash Pond Complex

Document Number: GERS-23-008

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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 Mitchell Plant an evaluation of the entire Bottom Ash Complex.

The 2023 Annual Dike and Dam Inspection at the Mitchell Plant's Bottom Ash Complex was conducted on May 11, 2023. Mohammad Ajlouni, of AEPSC Civil Engineering & Geotechnical Services conducted the inspection and was accompanied by Danielle Roski, Dennis Henderson and Tammy Wade of the Mitchell Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Weather conditions were sunny, and the temperature was in the low 70's F. There were 1.22 inches of rainfall over the seven days prior to the inspection.

2.0 DESCRIPTION OF IMPOUNDMENTS

The Bottom Ash Complex is comprised of the Bottom Ash Pond (BAP) and the Clear Water Pond as shown on Figure 1 – Inspection and Instrumentation Map. Within the Bottom Ash Complex, the BAP is positioned immediately north of the Clear Water Pond and the south dike of the BAP separates the two ponds. The BAP is an active CCR surface impoundment. The Clear Water Pond is not considered part of the Mitchell BAP CCR Unit.

The Mitchell BAP was constructed utilizing dikes comprised of compacted local sandy soils for the north, west and south perimeters and is partially incised into a natural hillside along the east side. The interior slopes of the BAP are lined with a polyvinyl chloride (PVC) liner which is overlain by 3 feet of composite soils. The exterior and interior pond/dike slopes are vegetated (above the pool level on the interior slopes) to minimize erosion.

In order to meet the requirement, set forth in the Coal Combustion Residual (CCR) Rule 40 CFR Part 257 and the Effluent Limit Guidelines (ELG) 40 CFR Part 423, the ponds are being modified. By the time of this inspection, the completed work included:

- A temporary sheet piling inside the BAP was installed between the east and west portion of the pond. During this phase of construction, the east part of the bottom ash pond is being used to sluice the ash and other plant effluents while the west portion is being prepared to be cleaned of CCR materials and lined with the approved liner.

- A temporary treatment area was installed in the east inboard slope of the clear water pond. This sheeting provides a stable area within the incised east pond slope to house the temporary treatment area equipment. Installation of the concrete slab supporting the temporary treatment area equipment.

- The installation of inflow/outflow piping including temporary outfall and related work.

- The installation and commissioning of the temporary treatment system (disc filters and related mechanical and electrical equipment).

- The construction of the west part of the bottom ash pond including the soils and geosynthetic liners is completed and submitted for approval.

- The temporary treatment system that was put into operation last year is being dismantled.

Bottom ash continues to be sluiced to the BAP Complex and deposited near the northeast corner of the East BAP. Periodically, waste is mechanically dredged from the northernmost bay of the east pond, stacked just inside the north dike within the east pond to dewater, and then loaded and hauled to the lined Mitchell Landfill. Related to this process, the ash sluice pipes entering the pond were shortened in June to improve the efficiency of how these flows enter the east pond and how the bottom ash is deposited in the north bay. Additional turbidity curtains also were added to the northernmost bay of the East BAP in June 2022.

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

A review of available information regarding the status and condition of the Bottom Ash Complex which include files available in the operating record, such as design and construction information, previous periodic structural stability assessments, previous 7 day inspection reports, and previous annual inspections has been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions noted.

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

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

As mentioned in section 2, the pond complex is undergoing construction activities in order to meet the CCR and ELG requirements. The ongoing changes affected the operation of the ponds, however, the geometry of the impoundments has remained essentially unchanged with the exception of lowering the height of the outer dikes of the BAP by approximately 4 feet.

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

There are four stand pipe piezometers installed around the bottom ash pond as shown on Figure 1. Regular readings are recorded for each piezometer at a minimum 30-day interval. All piezometer readings exhibited minor fluctuations and were at safe levels.

Table 1 includes the maximum reading of each piezometer since the last inspection.

Table 1 Maximum Recorded Instruments Readings (since the previous annual inspection)

Instrument	Type	Maximum Reading since last annual inspection	Date of reading
B-2	Piezometer	660.5	5/31/2023
B-3	Piezometer	665.12	2/8/2023
B-4	Piezometer	669.37	2/8/2023
B-5	Piezometer	664.248	5/3/2023

Figure 2 presents the pond water levels as well as the piezometers water levels. Changes in piezometers levels does not appear to be affected by the bottom ash pond level because of the presence of the PVC liner.

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

Table 2 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 2 Summary of Relevant Storage Information

IMPOUNDMENT CHARACTERISTICS	
	Bottom Ash Pond
Approximate Minimum depth (elevation) of impounded water since last annual inspection	11.39ft. (680 ft msl)
Approximate Maximum depth (elevation) of impounded water since last annual inspection	11.39ft. (680 ft msl)
Approximate Present depth of impounded water at the time of the inspection	11.39 ft. (680 ft msl)
Approximate Minimum depth (elevation) of CCR since last annual inspection	10 ft. (670.0 ft msl)
Approximate Maximum depth (elevation) of CCR since last annual inspection	20 ft. (680 ft msl)
Approximate Present depth (elevation) of CCR at the time of the inspection	20 ft. (680 ft msl)
Approximate Storage Capacity of impounding structure at the time of the inspection	145,000 C.Y.
Approximate volume of impounded water at the time of the inspection	50,000 C.Y.
Approximate volume of CCR at the time of the inspection	50,000 C.Y.

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 is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure 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 defined by deficiency are considered maintenance or items to be monitored.

A “deficiency” is some evidence that a dam has developed a problem 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 picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and 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.

Note: 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 large scale movement of part of the dam. Common signs of displacement are cracks, scarps, bulges, depressions, sinkholes and slides.

3. Blockage of Control Features

Blockage of Control Features 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 BAP and Clear Water Pond 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 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 A. Additional pictures taken during the inspection can be made available upon request. A map presenting locations of the inspection observations is included in

Figure 1.

Bottom Ash Pond

1. The Bottom Ash Pond was in service at the time of the inspection. Plant inflows were entering the pond along the northeast side. The pool was at an elevation of 680 which is around its normal operating level. Construction activities related to the bottom ash pond repurposing included splitting the BAP into east and west segments by installing sheet pile along the central part of the pond from the north to the south directions.
2. The east portion of the pond is used for dewatering and removal of sluiced bottom ash. The dewatering activities were not observed to impact the structure or stability of the dam and the impounding area of the pond appeared in good condition (Photos 1 through 7).
3. The construction of the west portion of the pond was completed and awaiting approval. (Photos 8 through 10).
4. There were no seepage or wet areas observed along the embankment.

Clear Water Pond

1. The Clear Water Pond was in good operating condition during the time of the inspection. Inflows from the East side of BAP enter the pond through the newly constructed temporary treatment system and the flow appeared to be unobstructed (Observation 3, Photos 11 through 13).
2. The interior slopes showed no signs of distress such as sloughing or bulges. The grass was recently mowed before the inspection. One animal burrow was observed during this inspection along the north interior dikes (Observation 4, Photo 14).
3. The splitter dike separating the Clear Water Pond and BAP appeared to be in good condition and showed no signs of distress.
4. The outboard slope of the Clear Water Pond was in good condition. There were no signs of movement or misalignment, sloughing or bulges.
5. There were no seepage or wet areas observed along the embankment.
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 or ruts.
7. The visible portions of the concrete discharge structure were in good condition and function properly. The concrete and metal stair structures were in good condition. There was a spare stop log available. There was a sediment curtain and boom installed just upstream and it appeared to be in good condition.

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

As mentioned in section 2, the pond complex is undergoing construction activities in order to meet the CCR and ELG requirements. The ongoing changes effected the operation of the ponds, however, the outer geometry of the impoundments has remained essentially unchanged with the exception of slightly lowering the BAP dikes. The ongoing changes doesn't appear to 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 dike of the impoundments were generally in good condition. The embankments did not show any signs of structural weakness or instability. The vegetation along the embankments was recently mowed in most locations. The crest did not contain any ruts, cracks, depressions or other signs of instability. Construction activities are ongoing which appear to have no significant impact on the stability of the pond dikes. 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) Repair animal burrows along the north slope of the interior dike of the clear water pond (Observation 4).

5.3 ITEMS TO MONITOR

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

- 1) None

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

The Bottom Ash Pond Complex, consisting of the Bottom Ash Pond and Clear Water Pond, exhibited no signs of structural weakness or disruptive conditions during 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 either 1) uncontrolled seepage, 2) displacement of the embankment, 3) blockage of control features, or 4) erosion, more than minor maintenance. If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

FIGURES

FIGURE 1

Annual Inspection
by Mohammad Ajlouni, P.E., Ph.D.
Date: 5/11/2023
Weather: Sunny ; Low 70's



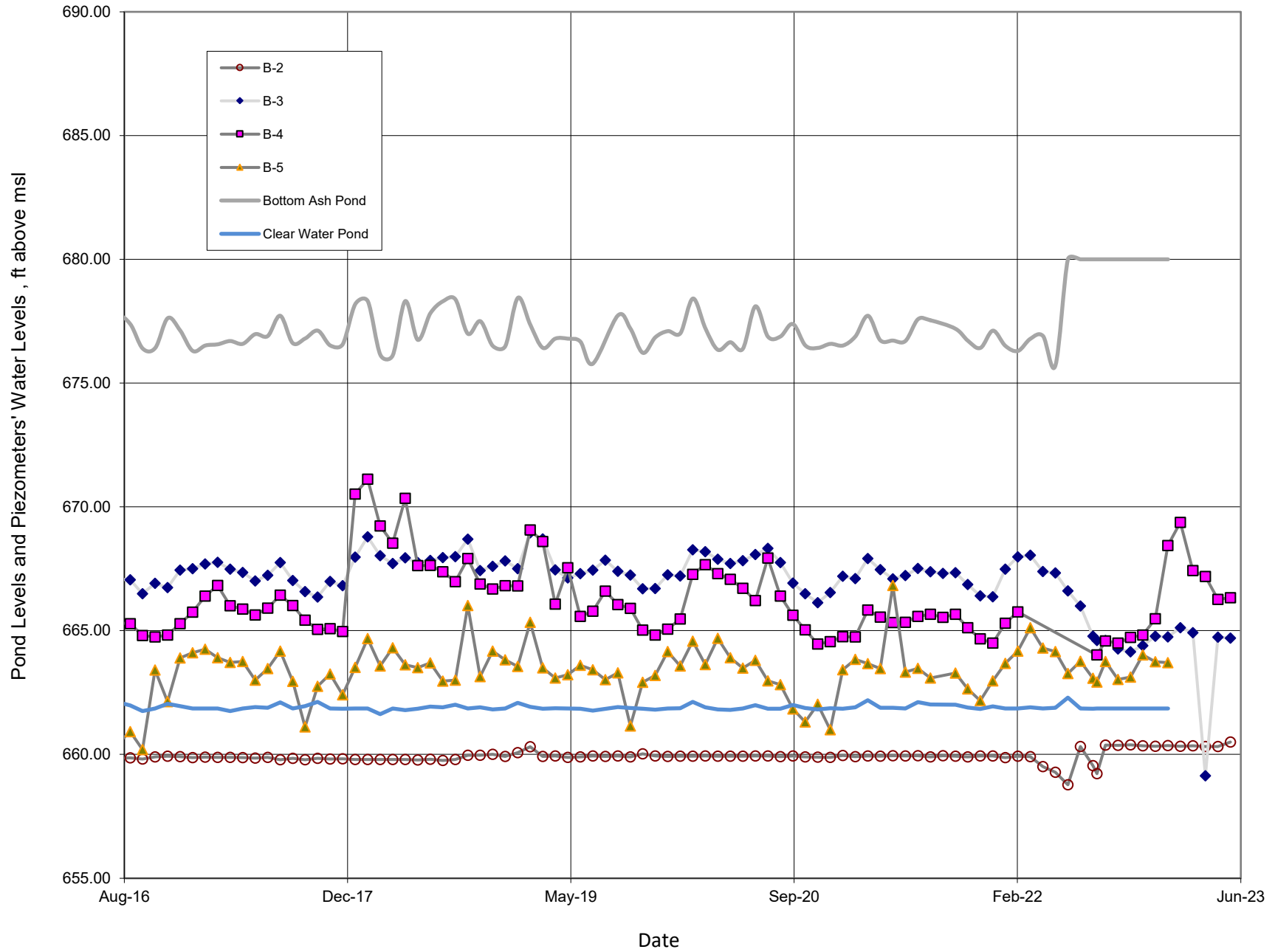


Figure 2 Bottom Ash Pond Complex Piezometers' & Ponds Level

ATTACHMENT A

Photos

**2023 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT**



Photo No. 1

Observation 1: Construction Activities

Location: East inboard slope of the East section of Bottom Ash Pond looking south.



Photo No. 2

Observation 1: Construction Activities

Location: East inboard slope of the East section of Bottom Ash Pond looking north.

Bottom ash is being dredged



Photo No. 3

Observation 1: Construction Activities

Location: North inboard slope of the East section of Bottom Ash Pond looking west.

**2023 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT**



Photo No. 4

Observation 1: Construction Activities

Location: West inboard side of the East section of Bottom Ash Pond looking Southwest.



Photo No. 5

Observation 1: Construction Activities

Location: East inboard side of the East section of Bottom Ash Pond looking North.



Photo No. 6

Observation 1: Construction Activities

Location: South inboard side of the East section of Bottom Ash Pond looking West.

**2023 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT**



Photo No. 7

Observation 2: Construction Activities

Location: West inboard side of the West section of Bottom Ash Pond looking South.



Photo No. 8

Observation 2: Construction Activities

Location: West section of Bottom Ash Pond looking South.



Photo No. 9

Observation 2: Construction Activities

Location: West inboard side of the West section of Bottom Ash Pond looking South.

**2023 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT**



Photo No. 10

Observation 2: Construction Activities

Location: West inboard side of the West section of Bottom Ash Pond looking South.

Bottom Ash excavation



Photo No. 11

Observation 3: Construction Activities

Location: Clear Water Pond looking East.

Installed temporary water treatment Structure is being dismantled



Photo No. 12

Observation 3: Construction Activities

Location: Clear Water Pond west Inboard dike.

**2023 INSPECTION PHOTOS
BOTTOM ASH POND COMPLEX
MITCHELL PLANT**



Photo No. 13

Observation 3: Construction Activities

Location: East inboard side of the Clear Water Pond looking South.

temporary treatment system is being bypassed.



Photo No. 14

Observation 4: Burrow Hole.

Location: North inboard slope of Clear Water Pond

Recommendations: Repair by fill in with soil.