The attached is the final annual inspection report for the Amos BAP as a CCR unit.

The Amos BAP was certified closed (Closure by Removal) as a CCR unit on September 26, 2024.

Consulting
Engineers and
Scientists

GEI Consultants

Bottom Ash Pond Complex

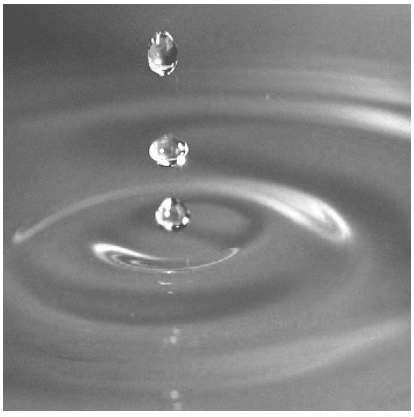
2024 Annual Dam and Dike Inspection Report

John E. Amos Plant, Putnum County, West Virginia

Submitted to:
American Electric Power Service Corporation
1 Riverside Plaza
Columbus, OH 43215

Submitted by:
GEI Consultants, Inc.
3159 Voyager Drive
Green Bay, Wisconsin 54311
920.455.8200

October 16, 2024
Project 2305686
AEP Document ID: GEVR-24-021



Pedro Amaya, PE
Senior Consultant

Jeff Piaskowski, PE
Senior Engineer

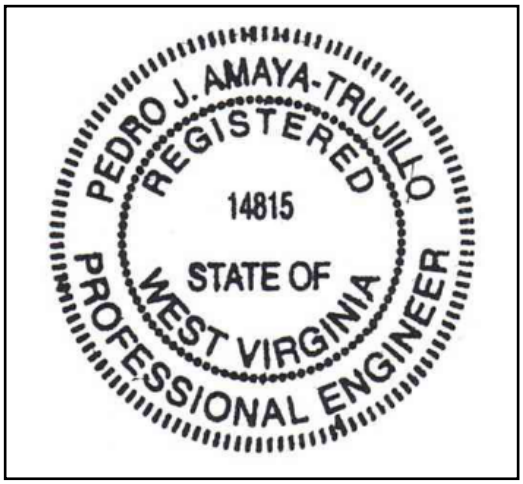
2024 Annual Inspection Report

Bottom Ash Pond Complex
Amos Power Plant
AEP Document ID: GEVR-24-021

Signature

Pedro Amaya, PE
Senior Consultant
GEI Consultants, Inc.

October 23, 2024
Date



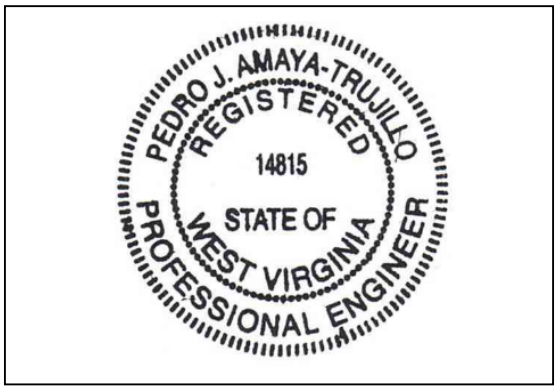
I certify, to the best of my knowledge, that the information provided in this report satisfies the requirements of 40 CFR 257.83(b).

OWNER'S ENGINEER
INSPECTION VERIFICATION STATEMENT

For Compliance with Dam Safety Rule 47CSR34-15.4.c

I hereby verify that I *or an experienced engineer under my supervision,* conducted a visual inspection of the **Amos Bottom Ash Complex** Dam (ID # **07918**) and its appurtenances on **July 22, 2024**. 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* and 4) any conditions that will not allow proper operation of the dam during normal or maximum reservoir water level conditions.

Signature



Pedro Amaya, PE Senior Consulant
Printed Name and Title

October 23, 2024
Date

*as defined in Section 2.56 of the Dam Safety Rule

Submit to:
DEP Dam Safety Section
601 57th Street SE
Charleston, WV 25304
DEPDamSafetyProgram@wv.gov

Table of Contents

JRP
B:\Working\AEP\2305686 2024 Dam & Landfill Field Insps\08_FINAL INSPECTION REPORTS\01Amos\Bottom Ash Complex\DRAFT_2024 Amos Bottom Ash Complex.docx

1. Introduction

GEI Consultants, Inc. was retained by AEP to implement the 2024 Dam Inspection and Maintenance Program (DIMP) at AEP facilities. As part of the program, GEI's Pedro Amaya, P.E. performed the 2024 inspection of the Bottom Ash Pond Complex at the Amos Power Generating Plant to fulfill requirements of 40 CFR 257.83 for the CCR impoundment and to provide the facility an evaluation of the units. Mr. Derrick Brumfield and Mr. Jack Smith were the AEP facility contacts. This report was prepared by Pedro Amaya, PE and Jeff Piaskowski, PE of GEI and serves as a summary of the inspection and an assessment of the general conditions of the Bottom Ash Pond Complex at the Amos Power Generating Plant.

The inspection was performed on July 22, 2024, in general accordance with the Mining Safety and Health Administration (MSHA) Dam Inspection Guidelines. Weather conditions were cloudy with mild temperatures between 70 and 80 degrees Fahrenheit. Approximately 0.5-inches of precipitation was recorded in Winfield, West Virginia in the 7 days prior to the inspection.

The Amos Power Generating Plant is located near Winfield, West Virginia as shown on Figure 1 – Site Location Map. The facility arrangement is provided on Figure 2 – Facility Plan. The Bottom Ash Pond Complex and their appurtenances are shown on Figure 3 – Site Plan.

2. Description of Impoundments

The Bottom Ash Pond Complex consists of the following four ponds:

- Ash Pond 1A
- Ash Pond 1B
- Reclaim Water Pond
- Treatment Pond

Ash Ponds 1A and 1B were used for sedimentation and storage of bottom ash produced when generating electricity at the Amos Power Generating Plant. The layout of the Bottom Ash Pond Complex is shown on Figure 3 – Site Plan.

The Bottom Ash Pond, Reclaim Water Pond, and Treatment Pond were generally formed by the construction of a dike at the confluence of Bill's Creek with the Kanawha River. The primary dike is on the north side of the Reclaim Water Pond and the Treatment Pond. Additional dikes were constructed at the northwest corner of Bottom Ash Pond 1B to redirect Bills's Creek.

The north dike of the Reclaim Water Pond and Treatment (Clearwater) Pond is approximately 800 feet-long. The dam's side slopes are approximately 2.5:1 (H:V) with a height of 29-feet and a crest width of 10 feet. The upstream face of the dam was constructed with concrete block filled with compacted cohesive soil. The top of the dike is at elevation 588 feet with the natural ground surface beneath the dikes is at about elevation 559 feet.

Both bottom ash ponds formerly discharged sluice water through 36-inch-diameter pipes to the Reclaim Water Pond. A portion of the flow into the Reclaim Water Pond was pumped backed to the Amos Generating Power Plant for reuse. The remaining portion flowed through a 36-inch diameter pipe to the Treatment (Clearwater) Pond. From the Treatment (Clearwater) Pond the water flowed through a 24-inch x 38-inch elliptical reinforced concrete pipe that transitions to a 36-inch diameter steel pipe. There is a flange connection from the steel pipe to the 36-inch diameter HDPE pipe that conveys the effluent to six diffuser ports submerged along the bottom of the Kanawha River.

36-inch diameter Overflow Spillway pipes exist along the Reclaim Pond and Pond 1B that will discharge directly to Bill's Creek during an overflow event.

In 2022 the CCR material in Ash Pond 1B was removed and the pond repurposed as a Wastewater Pond. In October 2022 all sluicing of CCR material to the Bottom Ash Pond Complex had stopped. During 2023 CCR material was removed from the Reclaim Pond and Treatment (Clearwater) Pond and the ponds were lined for use as part of the wastewater treatment process. The unlined historical Bottom Ash Pond cease receipt of non-CCR

wastewaters in September 2023. CCR removal and final repurposing continued in 2024. At the time of the 2024 inspection, no CCR material remained within the Bottom Ash Complex, and the final aspects of the closure and repurposing were being completed.

3. Review of Available Information (257.83(b)(1)(i))

A review has been conducted of available information regarding the status and condition of the Amos Bottom Ash Pond Complex that includes files available in the operating record such as previous 7-day inspection reports, piezometric measurements and previous annual inspections.

4. Inspection (257.83(b)(1)(ii))

4.1 Changes in Geometry Since Last Inspection (257.83(b)(2(i))

Since the 2023 annual inspection the Bottom Ash Pond Complex has continued closure and repurposing. As part of the removal and repurposing, Ash Pond 1A had all CCR material removed, and the area was partially backfilled with structural fill to serve as a decant area for management of non-CCR solids. The geometry of the remaining areas of the pond complex were unchanged since the 2023 annual inspection.

4.2 Instrumentation (257.83(b)(2)(ii))

The location of the instrumentation is shown on Figure 3 – Site Plan. The piezometer readings generally exhibited minor fluctuations month to month during 2024. It should be noted that the elevation of PZ-1 rose approximately 6-feet from May to June in 2024, but trended back to normal elevations near elevation 567.5 in July 2024. A graph of the piezometer readings is provided in Appendix B – Instrumentation Data. The maximum recorded readings of each instrument for past two annual inspections are shown in the table below.

Table 1: Maximum Annual Piezometer Elevation

Piezometer	Max Groundwater Elevation 2023	Max Groundwater Elevation 2024	Difference (feet)
PZ-1	568.0	573.7	5.7
PZ-3	566.2	566.4	0.2
PZ-6	566.6	566.8	0.2
PZ-7	567.9	567.6	0.3

Note: Elevations reported in feet mean sea level.

The instrumentation for the Bottom Ash Pond Complex consists of staff gauges used to measure the pond water levels and four piezometers installed along the perimeter dike.

The elevations of pond water levels have varied as ponds during the closure and repurposing project. The piezometer water levels have generally remained constant with no adverse trends observed that would impair the structural stability of the perimeter dike.

4.3 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

Below is a summary of Bottom Ash Pond Complex impoundment characteristics.

IMPOUNDMENT CHARACTERISTICS Bottom Ash Pond Complex		
	Bottom Ash Pond 1A	**Bottom Ash Pond 1B**
Water Surface Elevation at time of the inspection	NA	NA
Approximate **Minimum, Maximum, and Present** depth/elevation of impounded water since last annual inspection	NA NA NA	NA NA NA
Approximate **Minimum Maximum and Present** depth/elevation of CCR since last annual inspection	None None None	None None None
Storage Capacity of impounding structure at the time of the inspection	NA	NA
Approximate volume of impounded water at the time of the inspection	NA	NA
Approximate volume of CCR at the time of the inspection	None	None

Notes:

1. All CCR material has been removed from 1A and 1B.

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, cracks, concrete surface 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, cracks, concrete surface etc.) where the current maintenance program has neglected to improve the condition. Usually, conditions that have been identified in previous inspections, but have not been corrected.

Excessive: A reference to an observed item (e.g. erosion, seepage, vegetation, cracks, concrete surface etc.) where the current maintenance condition is below or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or 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 §257.84(b)(5) Inspection Requirements for CCR Landfills. 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 the CCR Unit has developed a problem that could impact its structural integrity. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage

   Uncontrolled seepage is an uncontrolled release from the unit.

2. Displacement of the Embankment

   Displacement of the embankment is large scale movement of part of the pond embankment. 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 Amos Bottom Ash Pond Complex was conducted to identify signs of distress or malfunction of the impoundment and appurtenant structures which includes its hydraulic structures. Specific items inspected included structural elements of the dam such as upstream and downstream slopes, crest, and toe; as well as appurtenances such as the outlet structure at the Wastewater Pond, Reclaim Pond and the primary decant structure located within the Treatment (Clearwater) Pond. Photographs taken during the inspection are provided in Attachment A - Photolog. The locations where the photographs were taken are shown on Figure 3 – Site Plan.

The following summarizes the visual inspection of the Bottom Ash Pond Complex:

- The stone wall along the crest of the Main Dam along the Clearwater and Reclaim Ponds appeared in good condition. Photographs No. 1 and No. 2.

- The downstream slope of the Main Dam was observed to be in good condition. No significant settlement, misalignment, erosion, or seepage were observed. Vegetation was maintained to 12-inches or less as shown in Photographs No. 4 and No. 7.

- The inboard slope of the Main Dam was in good condition. There were no visual signs of misalignment, settlement, or sloughing that would indicate any instability within the dike as shown in Photograph No 3.

- The geosynthetic liners on the interior slopes appeared in good condition as shown in Photograph No. 9.

- The Bottom Ash Pond Complex outfall structures were observed to be in good condition with no obstructions observed.

- The riprap revetment on the downstream toe of the Main Dam appeared in good condition. Woody vegetation continues to exist along the toe area and Bills Creek but is being maintained as shown in Photograph No. 7

- The Reclaim Pond 36-inch diameter HDPE emergency overflow pipe was observed to be in good condition from the block wall and no erosion was noted along the pipe. The outlet to the 36-inch diameter overflow pipe was free of vegetation and could flow unobstructed to Bills Creek as shown in Photograph No. 5 and Photograph No. 6.

- The South Dike (former BAP 1A/Reclaim splitter dike) has been raised as part of the repurposing of the Reclaim Pond. The Reclaim Pond slope is in good condition with vegetation starting to appear. The crest generally appears in good condition as shown in Photograph No. 12.

- The primary decant structure in the Clearwater Pond has been reconstructed and in operation as shown in Photographs No. 2.

4.6 Changes that Effect Stability or Operation (257.83(b)(2)(vii))

Based on interviews with plant personnel and field observations the only changes since last inspection that effect stability and operations was continued CCR removal as part of the pond closure and repurposing the area as wastewater and stormwater ponds. The stability of the new dike configurations were reportedly analyzed as part of the design of the repurposed non-CCR pond complex and found to be in compliance with applicable safety standards.

5. Summary of Findings

5.1 General Observations

The facility is generally in good condition. The Bottom Ash Pond Complex Main Dam appears to be functioning as intended with no signs of structural weakness. The constructed dikes appear in good condition. The vegetation was maintained to 12-inches or less and the outfall structures were clear of obstructions and appear to be functioning as designed.

5.2 Items to Monitor

- Static water levels should continue to be measured on its current frequency for piezometers PZ-1, PZ-3, PZ-6, and PZ-7.
- Monitor the dam and dikes for movement or changes in conditions.
- The pond pool stages should continue to be recorded on a periodic basis.
- Monitor upstream and downstream embankment side slopes for animal burrows.

5.3 Maintenance Items

The following maintenance items were identified during the visual inspection:

- Continue to maintain the vegetation on the upstream and downstream side slopes to a height of 12-inches or less.
- Some woody vegetation was observed growing in the riprap at the toe of the Main Dam and along Bills Creek. Continue to maintain the woody vegetation to 12-inches or less.

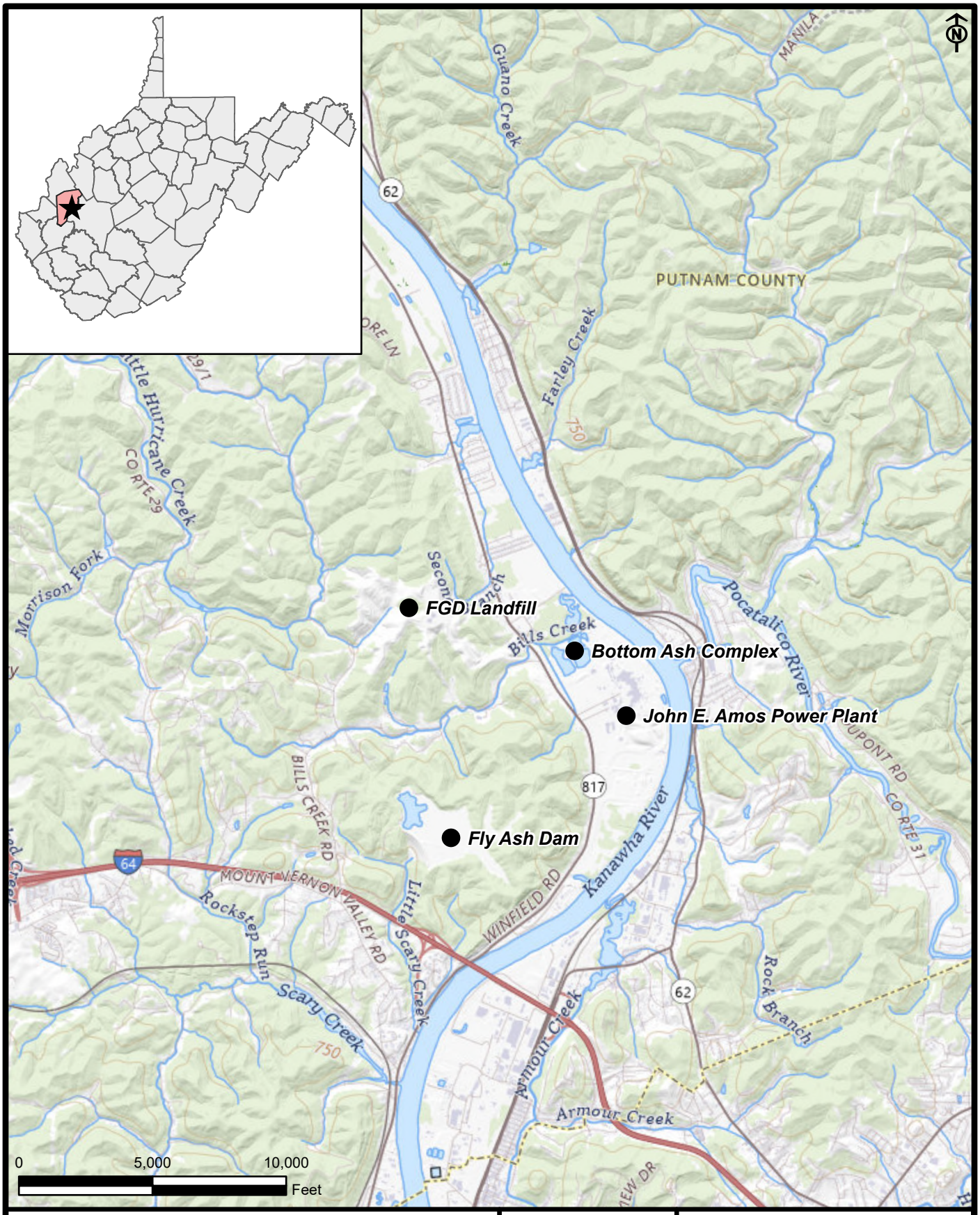
6. Deficiencies (257.83(b)(2)(i))

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 inspections. A deficiency is defined as either:

- uncontrolled seepage
- displacement of the embankment
- blockage of control features
- erosion, more than minor maintenance

If any of these conditions occur or if you have any questions with regard to this report, please contact Brian Palmer at 614-716-3382 bgpalmer@aep.com or Bryan Brunton at 614-716-3090 bwbrunton@aep.com.

Figure 1 – Site Location Map



2024 Annual Bottom Ash Complex Inspection Report
Amos Power Plant
Putnam County, West Virginia

American Electric Power Service Corporation
Columbus, OH 43215

GEI Consultants

Project 2305686

SITE LOCATION DIAGRAM

September 2024

Fig. 1

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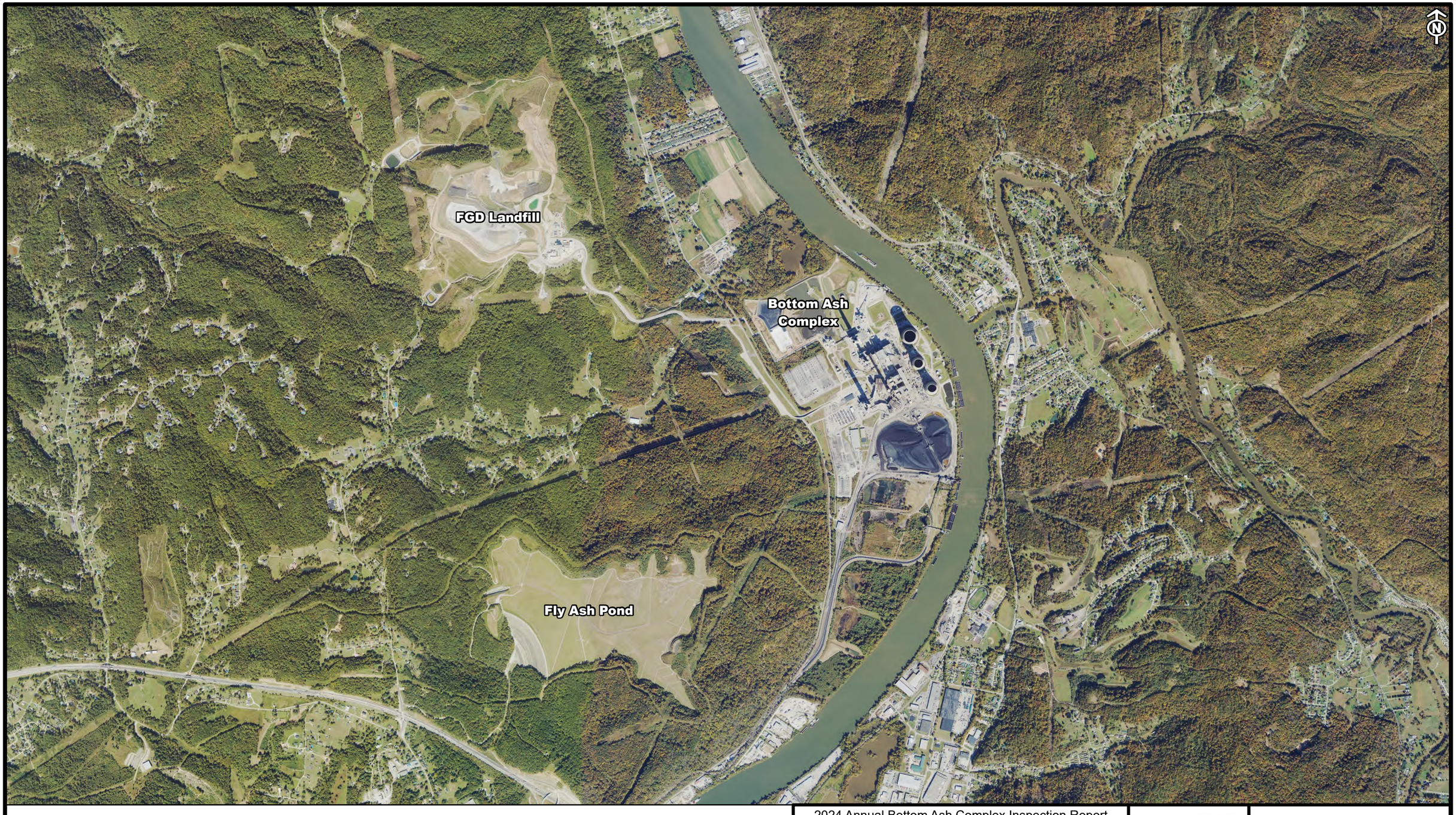
Figure 2 – Facility Plan



NOTES:

1. Aerial image obtained from USDA NAIP. Image captured spring of 2021.

2. Site conditions may change over time, accuracy is not guaranteed.

0 2,000 4,000 Feet

2024 Annual Bottom Ash Complex Inspection Report
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FACILITY PLAN

Project 2305686

September 2024

Fig. 2

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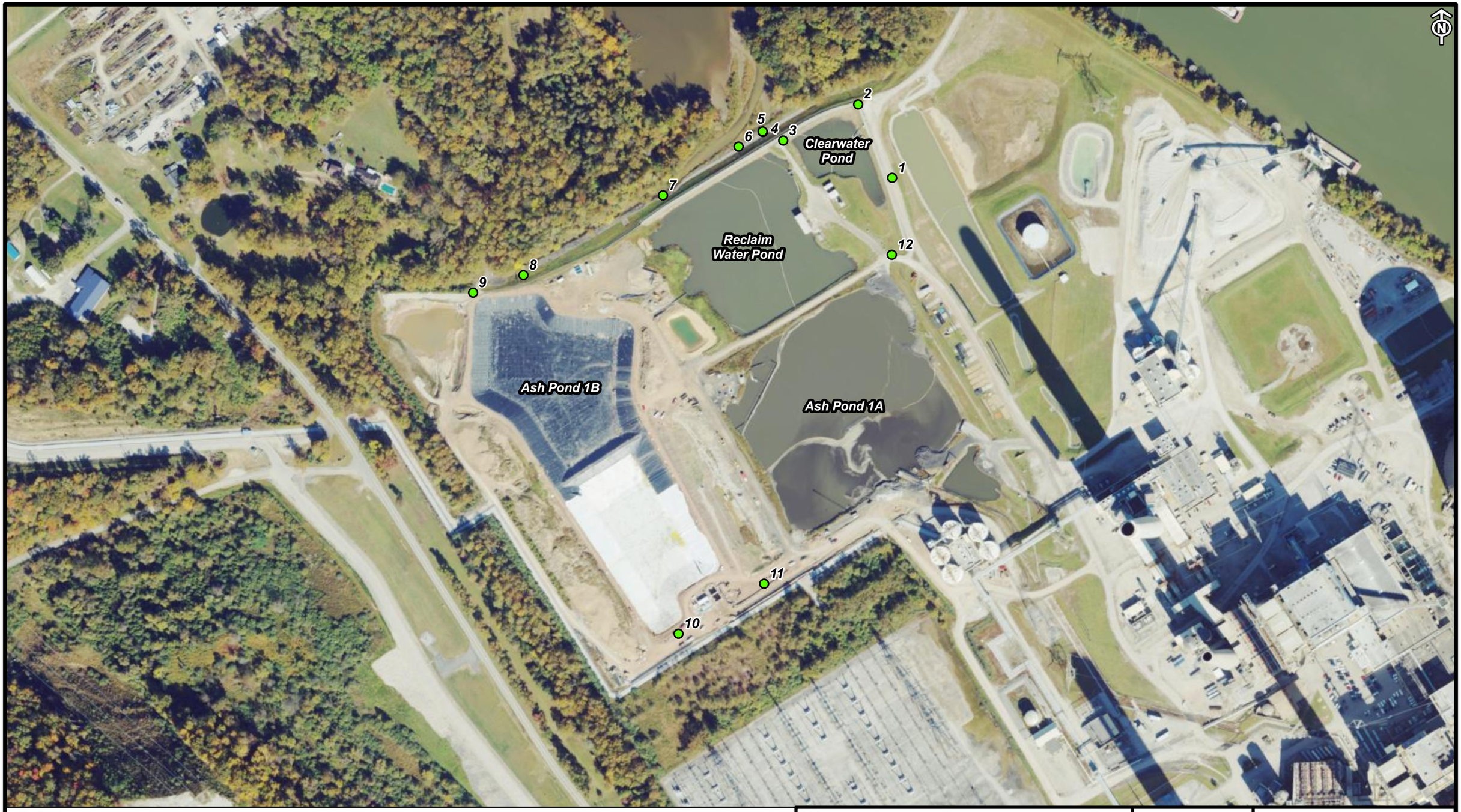
Figure 3 – Site Plan



LEGEND:

- General Observation

NOTES:

1. Aerial image obtained from USDA NAIP. Image captured spring of 2021.
2. Points shown represent site conditions during time of inspection. Conditions may change overtime, accuracy is not guaranteed. Map should not be used for measurement.

0 300 600 Feet

2024 Annual Bottom Ash Pond Complex Inspection Report
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Columbus, OH 43215

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SITE PLAN

October 2024 Fig. 3

Path: B:\Working\AEP\2305686 2024 Dam & Landfill Field Insps\05_GIS\ArcGIS_Pro\2305686 2024 Dam & Landfill Field Insps.aprx

Appendix A - Photolog

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 1	DATE: July 22, 2024 8:58 AM	LATITUDE: 38.47928453	LONGITUDE: -81.82864491
DIRECTION: 164°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Clearwater Pond. Main Dam Crest of stone wall – looking West. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 2	DATE: July 22, 2024 9:02 AM	LATITUDE: 38.47996583	LONGITUDE: -81.82898953
DIRECTION: 77°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Clearwater Pond, top of stone wall – Looking South. Ground Cover, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 3	DATE: July 22, 2024 9:06 AM	LATITUDE: 38.47967904	LONGITUDE: -81.82987244
DIRECTION: 84°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Reclaim Pond. Crest and Upstream Slope of splitter dike with Clearwater Pond. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 4	DATE: July 22, 2024 9:09 AM	LATITUDE: 38.47976373	LONGITUDE: -81.83010007
DIRECTION: 360°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Downstream Slope of Main Dam below Reclaim Pond – Looking East. General Photo, Typical Vegetation.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 5	DATE: July 22, 2024 9:10 AM	LATITUDE: 38.47977008	LONGITUDE: -81.83010162
DIRECTION: 147°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Downstream slope below reclaim pond. Looking West, Typical Conditions, Note Emergency Spillway Pipe.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 6	DATE: July 22, 2024 9:13 AM	LATITUDE: 38.47964545	LONGITUDE: -81.83038621
DIRECTION: 80°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Reclaim Pond. Toe of downstream slope / drainage feature. Typical Conditions. Note Animal Guard Grate.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 7	DATE: July 22, 2024 9:19 AM	LATITUDE: 38.47924457	LONGITUDE: -81.8312832
DIRECTION: 160°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Downstream Slope of Main Dam. Looking West between Wastewater and Reclaim Ponds. General Photo, Typical Vegetation.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 8	DATE: July 22, 2024 9:26 AM	LATITUDE: 38.47859683	LONGITUDE: -81.83293785
DIRECTION: 218°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Wastewater Pond. Drainage feature at Toe of Dam. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 9	DATE: July 22, 2024 9:31 AM	LATITUDE: 38.47846469	LONGITUDE: -81.83352687
DIRECTION: 58°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Wastewater Pond. Looking South. General Photo, Typical Conditions.			
PHOTO BY: GEI CONSULTANTS, INC.			

PHOTOGRAPH NO: 10	DATE: July 22, 2024 9:42 AM	LATITUDE: 38.47528644	LONGITUDE: -81.83139549
DIRECTION: 244°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		
DESCRIPTION: Upstream Slope of Wastewater Pond. Note Synthetic Liner and Fabriform Protective Cover in the Forebay Area for Non-CCR solids management.			
PHOTO BY: GEI CONSULTANTS, INC.			

Photographic Log

Project: Amos Power Plant, Bottom Ash Pond Complex Inspection
Client: American Electric Power **GEI Project:** 2305686

PHOTOGRAPH NO: 11	DATE: July 22, 2024 9:47 AM	LATITUDE: 38.47569159	LONGITUDE: -81.83038223
DIRECTION: 307°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		

DESCRIPTION:

Ash Pond 1A, Storm Drainage Collection Area.

Additional Context:

Former Bottom Ash Pond 1A (Closed by CCR Removal). Area repurposed to control stormwater and small lined area used to treat process water solids from the wastewater pond.

PHOTO BY:

GEI CONSULTANTS, INC.

PHOTOGRAPH NO: 12	DATE: July 22, 2024 10:03 AM	LATITUDE: 38.47859003	LONGITUDE: -81.82870174
DIRECTION: 342°	SITE LOCATION: PUTNAM COUNTY, WEST VIRGINIA		

DESCRIPTION:

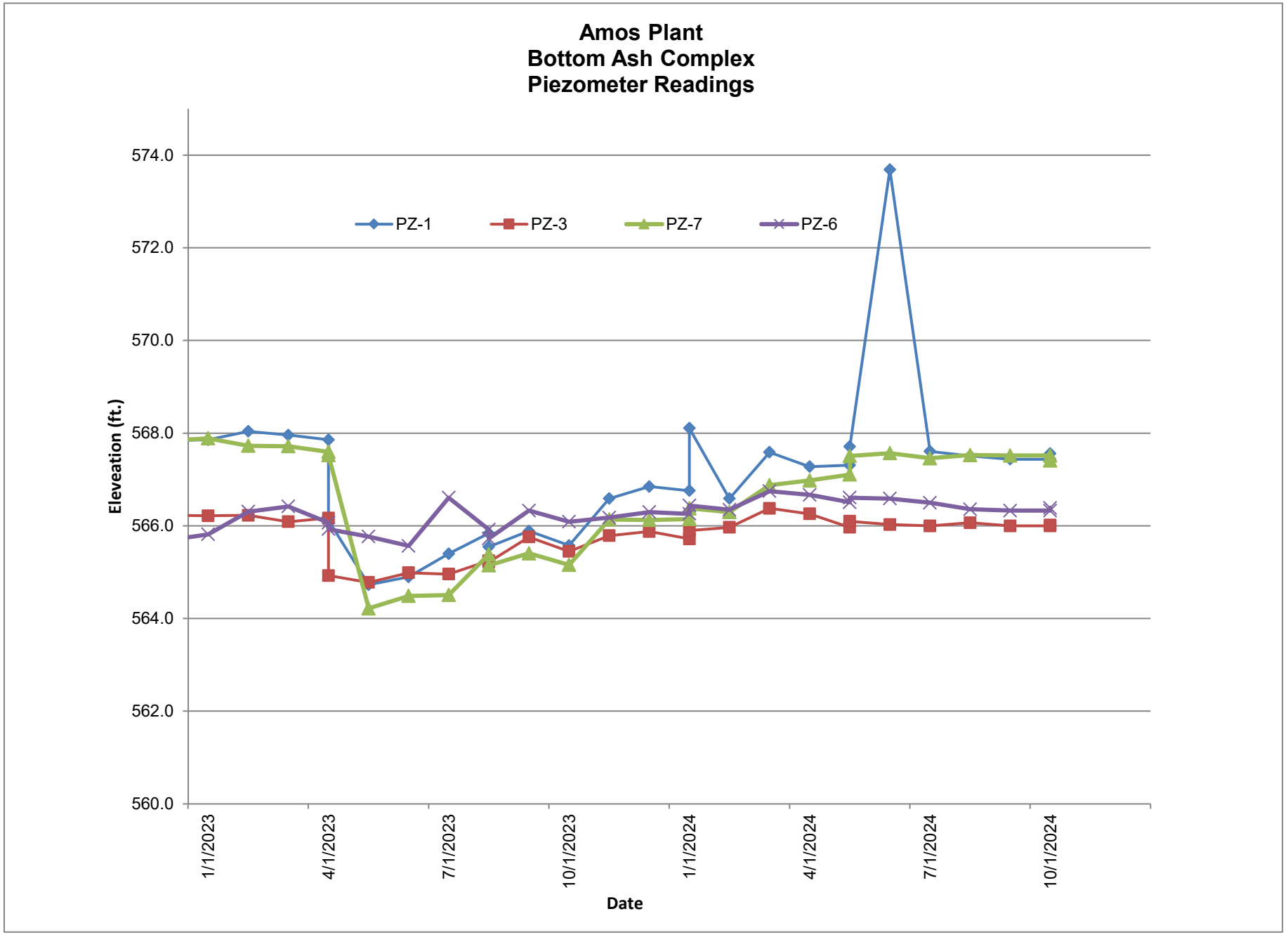
Clearwater Pond. Inboard Dike. General Photo, Monitor Conditions.

Area noted in 2023 for maintenance related to construction project which has been completed.

PHOTO BY:

GEI CONSULTANTS, INC.

Appendix B – Instrumentation Data


Amos Plant
Bottom Ash Complex
Piezometer Readings
PZ-1
PZ-3
PZ-7
PZ-6
574.0
572.0
570.0
568.0
566.0
564.0
562.0
560.0
Eleveation (ft.)
1/1/2023
4/1/2023
7/1/2023
10/1/2023
1/1/2024
4/1/2024
7/1/2024
10/1/2024
Date