2024 Annual Dam and Dike Inspection Report

Cardinal Power Plant
Brilliant, OH

October 8, 2024

Fly Ash Dams 1 & 2 and Bottom Ash Pond

Prepared For:

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ACRONYM LIST

ASTM	American Society for Testing and Materials
BAP	Bottom Ash Pond
bgs	Below Existing Ground Surface
CCR	Coal Combustion Residuals
FAD	Fly Ash Dam
FAR	Fly Ash Reservoir
LVWP	Low Volume Waste Pond
MSE	Mechanically Stabilized Earth
MSHA	Mine Safety and Health Administration
MSL	Mean Sea Level
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
ODNR	Ohio Department of Natural Resources
ORC	Ohio Revised Code
OSHA	Occupational Health and Safety Administration
rBAP	Retrofitted Bottom Ash Pond
RCC	Roller-Compacted Concrete
U.S. EPA	United States Environmental Protection Agency

1.0 Introduction

The Cardinal Power Plant is located at 306 County Road 7 East in Brilliant, Jefferson County, Ohio (Plant). It is owned by Buckeye Power, Inc. and is operated by the Cardinal Operating Company. There are three (3) dam structures operated at the Plant that includes:

- Fly Ash Dam 1 (FAD 1), ODNR Dam No. 0205-009
- Fly Ash Dam 2 (FAD 2), ODNR Dam No. 0205-010, and
- Retrofitted Bottom Ash Pond (BAP), ODNR Dam No. 0105-004.

This report was prepared to fulfill the Coal Combustion Residual requirements of 40 CFR 257.83, the Ohio Department of Natural Resources Dam Safety Program – Division of Water Resources and to provide Cardinal Plant with an evaluation of their dams.

TRC was retained by Cardinal Operating Company to complete CCR Engineering Services, which includes the annual inspection of the above referenced dam facilities. The 2023 inspection was documented in the "2023 Annual Dam and Dike Inspection Report for the Cardinal Plant Fly Ash Dams 1, 2, & Bottom Ash Complex" dated September 25, 2023 and prepared by Amanda Graphics, LLC.

This report contains the observations from the inspections, conclusions, and maintenance recommendations for each of the above referenced dam structures. The inspection was performed on August 14, 2024 by Mr. Shawn McGee, P.E., TRC's Geotechnical Engineering Practice Leader, and accompanied with Mr. Nicholas Kasper C.P.G. of Buckeye Power and Mr. Zach Miller of the Cardinal Operating Company.

1.1 Fly Ash Dam 1

FAD 1, also known as Fly Ash Reservoir 1 (FAR I), is the Plant's original fly ash retention dam constructed in the early 1970s. The dam is an earthen and rockfill dam with a final design crest elevation of 1001.5 ft. Mean Sea Level (MSL). The dam has design slopes of approximately 2.5 Horizontal to 1 Vertical (2.5H:1V) on both the upstream and downstream sides. When ash placement behind FAD 1 reached its maximum allowed level, Cardinal FAD 2 was constructed and began operating in the late 1980s. FAD 1 is still listed with the ODNR as an active dam. However, its reservoir area was re-permitted by the Ohio EPA as a solid waste landfill (PTI permit # 06-07993, dated May 11, 2007) for the disposal of synthetic gypsum generated by the scrubbers constructed at the Cardinal Plant to capture sulfur dioxide air emissions (See attached Figure 1) and is subject to Ohio Department of Natural Resources Dam Safety Regulations. FAD 1 no longer impounds free standing water as a traditional dam does, but instead contains CCR materials (synthetic gypsum, fly ash, and bottom ash) trucked from the Plant and placed by dry methods. In addition to CCR, there are also stockpiles of earthen materials (to be used in future cell construction) over a portion of FAD 1 (at substantial distance from the dam).

1.2 Fly Ash Dam 2

FAD 2, also known as Fly Ash Reservoir 2 (FAR II), became operational in the 1980s and has been raised twice during its service life, the first raising performed in 1997, and the most recent raising being in 2013. Currently, FAD 2 has a design crest elevation of 983 feet, a maximum reservoir operating elevation of 974 feet, and a dam height of approximately 250 ft. The 2013

raising of Fly Ash Dam 2 was completed using back-to-back mechanically stabilized earth (MSE) walls which were constructed over the then-existing crest placed during the 1997 dam raising, which was constructed using roller-compacted concrete (RCC). The MSE walls were constructed as back-to-back MSE walls over the RCC crest surface with installation of a vinyl sheet pile cut-off wall through the MSE backfill and RCC concrete (using a slurry trench excavation), which extends into the clay core of the dam. The emergency overflow spillway was raised using mass concrete to a minimum elevation of 974.5 as part of the second dam raising.

The Cardinal Operating Company ceased sluicing fly ash into the impoundment in July 2021 and is in the process closing FAR II, in accordance with the Closure Plan and the Permit to Install issued by the Ohio Environmental Protection Agency. Cardinal's Contractor, RB Jergens, is currently dewatering FAR II, which includes draining the free-standing pool within the pond by removing stop logs from the decant structure under controlled conditions and operating a dewatering well system from behind FAD II. The first stop log was removed on July 7, 2022, lowering the pond's pool stage. Dewatering activities and storm water management are currently ongoing within the impoundment area. The closure activities include grading the CCR and installation of a final cover system. The final cover system is designed to meet the requirements of 40 CFR 257.102(d)(3). No modifications to the FAD 2 dam itself will result from closure of the FAR 2 reservoir.

The FAD II dam has a deformation review completed every 28 days which includes inclinometer and monument surveys of the dam to monitor potential deformation. TRC has been coordinating the 28-day dam deformation surveys since March 2024. Based on TRC's review of the latest set of data, the deformations being observed by the survey monuments and inclinometers appear to be within expected ranges and tolerances of an earthen dam of a similar size and age.

A plan view of FAD 2 is provided in Figure 2A of Appendix A as well as general cross section details illustrating the final dam raising provided as Figure 2B.

1.3 Retrofitted Bottom Ash Pond and Low Volume Waste Pond

Formerly known as the Bottom Ash Complex, the complex consists of a North Pond and a South Pond, located at the southern end of the Plant (south of the Unit 3 Powerhouse) and directly west of the Ohio River. The Retrofitted BAP is retained by an exterior dike with a crest elevation of approximately 670 ft. The eastern dike of the pond is located adjacent to the Ohio River with a nominal dam height of 30 ft.

Cardinal Operating Company elected to retrofit the pond complex by segregating it into two separate ponds designed to manage CCR waste in the rBAP, subject to 40 CFR 257 Subpart D and Low Volume Waste, subject to the Clean Water Act. Construction commenced in 2021 to reline the pond complex. Cardinal Operating Company completed the retrofit construction activities on March 27, 2022 for the South Pond of the Bottom Ash Complex. The retrofit activities were completed in accordance with the written retrofit plan (Bottom Ash Pond Complex South Pond Retrofit Plan, dated October 19, 2020) and the requirements of 40 CFR 257.102(k). Upon completion of the retrofit, the South Pond's name was changed from the former "Recirculation Pond" to the retrofitted "Bottom Ash Pond." On March 24, 2023, Cardinal initiated closure on the North Pond and converted the pond to receive non-CCR waste streams (i.e., low volume waste). Closure was completed on October 7, 2024.

The design arrangement of BAP is shown in Figures 3a, 3b, 3c, and 3d of Appendix A.

2.0 Annual Inspection Regulatory Requirements

This annual inspection and associated reporting are completed to comply with Ohio Department of Natural Resources Dam Safety Inspections and with the CCR Requirements of 40 CFR 257.83, as applicable. The units subjected to the CCR regulations must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The annual inspection must, at a minimum, include the following criteria specified in CCR Rule §§ 257.83(b)(1):

(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by §§ 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under §§ 257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections);

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures; and

(iii) A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

A report must then be prepared to document the annual inspection, and at a minimum, include the following criteria specified in CCR Rule §§ 257.83(b)(2):

(i) Any changes in geometry of the impounding structure since the previous annual inspection;

(ii) The location and type of existing instrumentation and the maximum recorded readings of each instrument since the previous annual inspection;

(iii) The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection;

(iv) The storage capacity of the impounding structure at the time of the inspection;

(v) The approximate volume of the impounded water and CCR at the time of the inspection;

(vi) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit and appurtenant structures; and

(vii) Any other change(s) which may have affected the stability or operation of the impounding structure since the previous annual inspection.

In addition to the annual inspections, all dams and dikes must be examined by a qualified person every 7-days for any appearances of actual or potential structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit and also the conditions of the discharge of all outlets of hydraulic structures which pass underneath

the base of the surface impoundment or through the dike and also every 30 days to monitor the CCR unit instrumentation pursuant to 40 CFR 257.83 (a). The 7-day and 30-day inspections are completed by Cardinal Operating Company personnel and are documented in the facility operating record. As part of the annual inspection program, TRC completed a review of these reports provided by Cardinal Operating Company.

3.0 Review of Available Information (357.83(b)(1)(i))

TRC completed a desktop review of available information regarding the status and condition of FAD 1, FAD 2, and the BAP. This information includes files available in the operating record, such as design and construction information, previous structural stability, and safety factor assessments, previous 7-day inspection reports, previous 30-day inspection reports, and previous annual inspections.

The available periodic structural stability (257.73(d)) and safety factor assessments (257.73(e)), which were previously completed as part of the CCR Rule requirements and posted to the Buckeye Power's CCR Compliance Website, indicate that the impoundments meet the pertinent requirements of the CCR Rule. A five-year periodic review the structural stability was performed for the BAP in 2021, and a subsequent evaluation was performed for the Retrofit Bottom Ash Pond in 2022, both prepared by Sargent & Lundy. TRC also performed the five-year periodic review of the structural stability for FAD 2 in 2021.

The Cardinal Operating Company 7-day inspections provide a visual inspection of the impoundments for signs of distress, sparse vegetation, animal burrows, erosion, and other common maintenance requirements for the dams. The 30-day inspections completed by Cardinal Operating Company are typically more detailed than the 7-day inspections and include water level measurements of piezometers and monitoring wells, measurement of seepage flows at dedicated monitoring locations, and a more thorough visual inspection of the dam structures. Additionally, slope inclinometers and deformation survey monuments at FAD 2 are currently being performed by TRC on a 28-day frequency, which are separate from the 30-day dam inspections. Tiltmeters on the MSE wall at the crest of FAD 2 are also read annually by Cardinal Operating Company.

Based on our review of the 7-day and 30-day inspection reports and the 28-day deformation survey reports for the previous year, no significant conditions of immediate concern indicating global stability issues have been identified at the impoundments.

No significant deficiencies, signs of structural weakness, or signs of disruptive conditions that would require additional investigation or remedial action were observed at the time of the 7-day and 30-day inspections of the surface impoundments.

The RCC step section of FAD 2's emergency spillway was noted to be in fair to poor condition in which the RCC exhibited a friable/weathered state.
At the BAP, the two wet areas that have observed in previous reports were not observed this year to date on the exterior embankment along the Ohio River.

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

TRC completed the annual inspection of the surface impoundments on August 14, 2024. The inspection was performed by Shawn McGee, P.E., TRC's Geotechnical Engineering Practice Leader, who was accompanied by Nicholas Kasper C.P.G. of Buckeye Power and Zach Miller of

the Cardinal Operating Company. The weather at the time of the inspection was fair to partly cloudy with temperatures ranging from 68 ºF to a high of 82 ºF. Barometric pressure remained relatively constant throughout the day at 28.9 inches. There was no precipitation reported at the site within the previous 72 hours of the inspection.

The inspection by TRC was completed in a systematic approach to ensure that visible features were observed and documented. The inspections for the surface impoundments generally started at the top of the dams and proceeded downward, where possible. We walked across the dam crest and observed both upstream and downstream slopes while inspecting the crest surface for cracks, erosion rills, settlement/low-lying areas, animal burrows, and bare spots. The downstream slopes were inspected for to look for the presence of seeps, bulges, erosion areas, bare spots, erosion damage, and sloughs. Special attention was given to the downstream slope below the impoundment water level, as applicable.

Any observations, evaluations, and conclusions made from the site visit were disclosed by our visual observations, where applicable. Our site reconnaissance was limited to visual observations and surface features free of obstruction at the time of the field visit (e.g., the portions of the upstream embankment and spillways underwater at the time of the inspection could not be completed). TRC's observations and/or reporting do not account for other non-visible, hidden, subsurface or material condition analyses, and the professional services rendered are not guaranteed to be a representation by TRC of inaccessible and unobservable site conditions or actual conditions subsequent to the date of TRC's site visit. Our authorized scope of work did not include intrusive studies (e.g., borings, test pits, etc.), geophysical surveys, underwater inspections, surveying, and/or collection of soil/water samples.

4.1 Definitions of Visual Observations and Deficiencies

Table 1 below contains standard terms that were used in this report to describe the condition of the observed item, activity, or structure. These terms are based on the opinion of the inspector at the time of the inspection to describe the physical condition, general appears or conditions of the identified component based on visual observations and are not intended to provide an overall assessment of safety based on engineering analyses and studies. To be consistent with previous inspections, the same terms were used when describing the different features.

Table 1: Standard Terms for Conditions of Surface Impoundment Features

Condition	Description
Good	A condition or activity that is generally better than what is minimally expected or anticipated based on design criteria and maintenance performed at the facility.
Fair/Satisfactory	A condition or activity that generally meets what is minimally expected or anticipated based on design criteria and maintenance performed at the facility.
Poor	A condition or activity that is generally below what is minimally expected or anticipated based on design criteria and maintenance performed at the facility.

Table 1: Standard Terms for Conditions of Surface Impoundment Features

Condition	Description
Minor	An observed deficiency (e.g. erosion, seepage, vegetation, etc.) where the current maintenance conditional is below what is minimally expected but does not currently pose a threat to structural stability.
Significant	An observed deficiency (e.g. erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is minimally expected and could pose a threat to structural stability if not addressed.
Excessive	An observed deficiency (e.g. erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is minimally and which the ability of the observer to properly evaluate the structure or particular area being observed or which poses a threat to structural stability.

This report also uses the definition of a "deficiency" as referenced in the CCR rule section §§257.83(b)(5). This definition has been assembled using the CCR rule preamble as well as guidance from the US Mine Safety and Health Administration (MSHA), "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined as deficiencies 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 (4) general categories of deficiencies, which 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 observed 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.

4.2 Fly Ash Dam 1

4.2.1 Changes in Geometry Since Last Inspection

No modifications have been made to the geometry of FAD 1 since the 2023 annual inspection, beyond minor maintenance that included some clearing of brush and vegetation on the

downstream toe of slope to prepare the surface for FAR II closure and capping activities. The geometry of the FAD I has remained unchanged over the last year.

4.2.2 Instrumentation

It is TRC's understanding that there is no instrumentation present at FAD 1. The reservoir has been drained and the site is now permitted to receive residual solid waste by "dry" methods. The permit application submitted to the Ohio EPA to license this area as a residual waste landfill was approved by Ohio EPA on May 11, 2007 (Ohio EPA PTI # 06-07993).

4.2.3 Impound Characteristics

When ash placement behind FAD 1 reached its maximum allowed level in the late 1980s, FAD 2 was constructed to the east of FAD 1 and began operating soon after. Currently, fly ash from the FAR 2 has been deposited on its downstream side of FAD 1 and only a limited portion of the original FAD 1 dam height remains exposed. The reservoir area behind FAD 1 was re-permitted by the Ohio EPA as a solid waste landfill (PTI permit # 06-07993, dated May 11, 2007) for the disposal of CCR material generated at the Cardinal Plant. FAD 1 no longer impounds free standing water, but instead contains CCR materials (synthetic gypsum, fly ash, and bottom ash) trucked from the Plant and placed by dry methods under the Ohio EPA solid waste PTI.

4.2.4 Visual Inspection

A visual inspection of FAD 1 dam was conducted to identify any signs of distress or malfunction of the berm and appurtenant structures. Specific items inspected included the structural elements of the dam such as upstream and downstream slopes, crest, toe (at the FAR 2 fill line), and abutment groins.
Results of the visual inspection of FAD 1 performed on August 14, 2024 are provided below:

1. The crest of the dam was in good condition, with no signs of significant erosion, rutting, or misalignment. The crest of the dam supports the plant's inactive ash sluice lines along with a heavy-duty asphalt roadway that is accessed by haul trucks.
2. No significant erosion was observed along the left groin areas as it is overgrown with woody vegetation. The right groin shows no significant erosion as it is overgrown with vegetation. A historic seep is also present in the right grown. It is understood that this seep will be collected and managed as part of the FAR II capping project when liner is placed along the slope.
3. The downstream dam surface is covered with rock fill material. No significant erosion was observed along the downstream slope of the dam, however, some localized erosion was occurring. No sloughs, slumps, scarps, or other signs of slope instability were observed on the downstream slope. No seeps were observed on the downstream slope. The oversized protective rock boulders are, however, continuing to weather and deteriorate. Overall, the rock fill protection is in poor condition. There is weedy/shrubby vegetation along the downstream toe where fly ash has been deposited from the previous operation of the FAR reservoir. It is understood this woody vegetation is planned to be removed as part of the surface preparation during FAR II closure activities. Several washout/erosion areas were present beneath the piping at the crest of slope.

4.2.5 Changes that Effect Stability or Operation

Based on discussions with plant personnel and existing conditions observed by TRC, there were no changes to FAD 1 since the last annual inspection that would create global instability of the dam or negatively affect the proper operation of the impounding structure.

Overall, FAD 1 is in satisfactory condition with no signs of incipient or potential structural issues that would significantly negatively affect its stability.

4.3 Fly Ash Dam 2

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

No modifications have been made to the geometry of FAD 2 since the 2023 annual inspection. As the water level behind FAD 2 was lowered as part of FAR II dewatering activities, the trash rack was installed on the inlet structure in late 2023 and early 2024. The geometry of the impoundment has remained essentially unchanged.

4.3.2 Instrumentation (257.83(b)(2)(ii))

The location and type of instrumentation at FAD 2 is shown on Figure 2A in Appendix A. Piezometer hydrographs are presented in Figure 5a in Appendix A. The maximum recorded readings of each instrument since the previous annual inspection as provided by Cardinal Operating Company is shown in Table 2 below.

Table 2: FAD 2 Maximum Recoded Piezometer Readings Since the Previous Annual Inspection

Piezometer Water Level Data Fly Ash Dam 2			
Instrument	**Type**	**Location***	**Max Reading Since Last Annual Inspection (September 2023)**
P-1A	Piezometer	Face of Dam, Zone IV	761.1
P-2A	Piezometer	Face of Dam, Zone IV	781.8
P-3A	Piezometer	Face of Dam, Zone II	803.8
P-3B	Piezometer	Face of Dam, Zone II	782.2
P-1BE	Piezometer	Face of Dam, Zone IIIC	730.5
P-1BW	Piezometer	Face of Dam, Zone IIIC	738.4
P-2BE	Piezometer	Face of Dam, Zone IIIC	761.8
P-2BW	Piezometer	Face of Dam, Zone IIIB	733.2
P-2C	Piezometer	Upstream Face of Dam, Zone I	713.8
P-5A	Piezometer	Face of Dam, Zone IV	774.7
P-8A	Piezometer	Face of Dam, Zone IV	804.9
P-8B	Piezometer	Face of Dam, Zone IV	779.0
P-9	Piezometer	Face of Dam, Zone IV	786.0
P-10	Piezometer	Face of Dam, Zone IV	776.5
P-11A	Piezometer	Face of Dam, Zone IV	804.0
P-11B	Piezometer	Face of Dam, Zone IV	799.3
MW-7	Monitoring Well	Top of Dam near left groin	960.7

*Locations are shown in plan view in Figure 2A and profile view in Figures 7A & 7B of Appendix A.

Piezometers

A total of 16 pneumatic piezometers and one monitoring well is located within the foundation and throughout the dam to monitor total hydraulic head. The piezometer locations are shown in Figure 2A in Appendix A and in cross-sections (Figures 7A-7B). Precipitation is measured at the Plant by plant personnel and continues to be within the normal ranges measured over the last five (5) years.

1) All piezometers have indicated minimal change in the measured piezometric head over the last 20 years as illustrated in Figure 5a provided in Appendix A. With the ongoing dewatering activities within FAR II impoundment, the piezometric head in piezometer P-5A is trending to lower and appears to correspond to the lowering of the pond stage (see Figure 5a). The pond's pool stage is decreasing in response to a controlled draining of the free pool to support various constructions efforts to achieve closure of the fly ash reservoir. Also, with the initiation of closure activities, the discharge from FAR II has substantially decreased in response to a cessation of sluicing operations. The discharge is currently reflective of ambient precipitation within the pond's watershed.
2) Water levels in the shallow, intermediate and deep foundation show minimal decrease to lowering the pond stage.
3) Piezometer P-3B has shown a slight decrease in water level. Water levels in the downstream shell (P-1A) and drain (P-1BW) showed a minor decrease.

4) Piezometer P-2BE, installed within the drain, reflects a higher-pressure head (about 28ft) in comparison to the western (right) P-2BW. Most piezometers showed no significant change corresponding to lowering of the pond stage.
5) Piezometer P-2C, installed within the foundations of the dam shows no change corresponding to lowering the pond stage.
6) Two standpipe type piezometers were installed in 2004 into the right bedrock abutment to monitor seepage (FA-7 & FA-8). Both piezometers are installed into the Morgantown Sandstone member, a well fractured and jointed, medium to coarse grained sandstone. Piezometer FA-7 also forms a clustered well site with M-11 (also screened within the Morgantown Sandstone) and S-9 (screened in the overlying Connellsville Sandstone). Monitoring well M-10 is located in close proximity to the dam site on the left side of the impoundment and is also screened within the Morgantown Sandstone. M-10 was drilled concurrently with the construction of the original Stage 1 dam and is used to help illustrate the following trends because of its long-term monitoring record.
7) Monitoring wells M-10 and M-11 showed an increase in static water levels coincident raising the pond level on October 5, 2016. Piezometer FA-7 monitors a 1-inch-wide open joint (observed by a borehole camera survey prior to well installation) and reflects a steady decline that closely correlates with the declines observed in the drain piezometer P-1BW, M-10 and M-11. The long-term decline before the current pond stage raising is believed to result from the progradation of the fly ash delta forming a blanket deposit and acting as a hydraulic barrier that reduces seepage from the reservoir.
8) The shallow monitoring well, S-9, is decreasing after lowering the FAR 2 pond level.
9) One standpipe type piezometer (MW-7) was installed in 2014 into the left abutment to monitor potential seepage through the PVC sheet pile. In general, a review of the data contained on the FAD 2 static water elevation plots indicates that the piezometers are responsive and are functioning properly. No new developing trends or issues were observed from the previous inspection. The piezometer depths are shown in cross sections in Figures 7A and 7B.

Seepage Collection Drains

A total of 16 drainage collection points were installed at the dam to monitor seepage. The drain locations are shown in Appendix A along with the drain discharges measured on August 25, 2023. In 2023, the discharge from the right abutment seepage as measured at the V–notched weir (Drain No. 2) has ranged from a maximum of 80 gpm and as low as 15.3 gpm.

Discharge rates from seepage drains since July 2021 have substantially decreased since sluicing operation have been terminated. The observed range of discharge since July 2021 is still reflective of ambient precipitation falling within the pond's watershed.

Seepage flows were observed to be visually clear with an absence of scouring or sediment deposition.

Vertical and Horizontal Deformation Monuments

The most recent 28-day Dam Deformation Report was prepared by TRC (dated September 18, 2024) and reports the vertical and horizontal deformations monuments for FAD 2 for the August 23, 2024 monitoring event. TRC has been preparing the monthly survey and reports since March 2024. Prior to March 2024, Amanda Graphics, LLC has completed the deformation surveys since March 2020. Thirty-three top of dam monuments (29901 thru 29933) were abandoned due to the 2013 dam raising and replaced with 33 new monuments (1401 thru 1433) that were installed on top of the dam in 2014 to establish a baseline measurement for comparison to future surveys.

Vertical and horizontal deformation measurements are made for 33 top of dam monuments (1401 thru 1433), 23 face of dam monuments (i.e. 29936 thru 29958), 2 additional monuments located at the emergency spillway (i.e.29934 and 29935) and 9 additional deformation monuments on the west side of the dam (i.e. 29959 to 29966). The location of all the monuments is surveyed on a 28-day basis and the data is analyzed for deformation.

In general, all horizontal movement is towards a downstream direction. Review of top of dam horizontal movement plots provided in TRC's September 18, 2024 report indicates small movements in a southerly direction (downslope), - southeast at the center of the dam, and southeast to east along the left abutment. Downstream face monuments show small movements generally in the downstream (south) direction. The least amount of movement is observed along the east end where the RCC is more fully supported by bedrock.

Twelve (12) tilt meters were installed at the MSW wall concrete panels (Figure 5o in Appendix A). The tiltmeters have measured between -0.04º to 0.71º of tilt recorded on the latest measurement date of September 20, 2024.

Slope Inclinometers

Three slope inclinometers, SI-1, SI-2 and SI-3 were installed at the dam site as part of the 1998 dam raising project. The slope indicators are located near the alignment of the Blockhouse creek valley. SI-1 was installed in November 1997, and it is believed SI-2 and SI-3 were installed at a later date (date not reported in logs). Two additional slope indicators, SI-4 and SI-5 were installed in 2006 further down slope from SI-1. The latest slope indicator SI-8 was installed in June 2015 and is located to the right abutment close to the southwest corner MSE wall. Copies of the SI plots are provided in TRC's Deformation Review Survey Report. Slope indicators measurements indicate movement generally towards the southeast with a good correlation with the surface deformation monuments.

Bathymetric Surveys

Bathymetric surveys for the Fly Ash Reservoir 2 (FAR 2) were not available due to the ongoing closure activities.

4.3.3 Impound Characteristics (257.83(b)(2)(iii, iv, v))

The approximate minimum, maximum, and present depth and elevation of the impounded water and CCR since the previous annual inspection of the FAR II CCR Surface Impoundment are provided in Table 3 below.

Table 3: Summary of Relevant Storage Information FAR 2

IMPOUNDMENT CHARACTERISTICS **Fly Ash Reservoir 2 (water pool elevation was approximately 937.9 ft msl)**	
Approximate Minimum depth (Elevation) of impounded water since last annual inspection	Not Applicable[1]
Approximate Maximum depth (Elevation) of impounded water since last annual inspection	Not Applicable[1]
Approximate Present depth (Elevation) of impounded water since last annual inspection	Not Applicable[1]
Approximate Minimum depth (Elevation) of CCR since last annual inspection	Not Applicable[1]
Approximate Maximum depth (Elevation) of CCR since last annual inspection	Not Applicable[1]
Approximate Present depth (Elevation) of CCR since last annual inspection	Not Applicable[1]
Storage capacity of impounding structure at the time of the inspection	Not Applicable[1]
Approximate volume of impounded water at the time of the inspection	Not Applicable[1]
Approximate volume of CCR at the time of the inspection	10,140 ac-ft.

1. Values are not applicable due to the changing conditions of the impoundment closure. No CCR/ waste streams have been added since July 2021 Closure.

4.3.4 Visual Inspection (257.83(b)(2)(i))

A visual inspection of FAD 2 was conducted to identify any signs of distress or malfunction of the impoundment and associated structures. The inspection also included hydraulic structures underlying the base of the dike. Specific items inspected included the structural elements of the dam such as upstream and downstream slopes, crest, and toe; emergency spillway, as well as the outlet structure at FAD 2 and pipe discharge structure.

Results of the visual inspection of FAD 2 performed on August 14, 2024, are provided below:

Downstream Slope of Dam and Groin Ditches

1) Overall, the downstream slope of the dam appeared to be in good condition with healthy vegetative growth. No significant signs of erosion, sloughing or bulging were observed at any location and the slopes appeared to be stable.
2) The downstream slope and buttress (lower berm) appeared to be in good condition with vegetative growth established. No flowing seepage or erosion at the historic seepage area was observed on the day of the inspection. The size and condition of this area has not worsened based on previous inspections and no remedial measures appear to be necessary at this time.
3) The left groin ditch and discharge pipe were in fair condition. There was no erosion or instability noted within the ditch, however, some localized areas of the groin ditch require additional riprap placed due to degradation of the rock. Drain pipe #8 had minimal flow and was clear.
4) The access road along the left groin was in poor to fair condition. The geotextile separation fabric under the gravel road was exposed, requiring additional rock placed.
5) The right groin ditch was observed to be in good condition along with the drainage blanket installed on the face of the dam to collect seepage. No significant bare, unprotected areas

were observed, and the channels appear to be clean and well maintained. There was some vegetation growth in the ditches that should be removed as part of routine maintenance. Drain pipes #16 and 17 were not flowing at the time of the inspection. Drain pipes #7 and 13 had minimal flow and were both clear.

Top of Dam – Emergency Spillway and Decant Structure

1) The emergency spillway is a bedrock channel that cuts through natural high ground. The channel abutment slopes, and floor area appeared stable with no visible signs of slumping or significant erosion. The channel's left slope continues to have bank seepage that is conveyed to a shallow ditch along the toe of the slope with subsequent discharge through Drain No. 12 at the mouth of the emergency spillway channel. The drain was not flowing at the time of the inspection.
2) The emergency spillway has a plain concrete overflow section at the crest that transitions along the downstream slope to the RCC steps between the concrete retaining walls. The concrete steps appeared to be in good condition. The spillway's 2-ft high RCC steps are in poor condition continue as they continue to weather. The concrete sidewalls of the spillway are in satisfactory condition.
3) The principal spillway structure appeared to be in good condition, with no obstructions at the stop-log structure and no signs of instability on the riser or staircase. The stop logs have been previously removed as part of the dewatering activities for the FAR II closure project. There was no visual evidence of significant differential movement of the structure/skimmer chute or steps. The principal spillway access walkway, stairways, and other metal structures were in good condition.
4) The inundated RCC wall appeared to be in good condition and did not show any wave cut erosion.

Top of Dam – Mechanically Stabilized Earth Walls

1) The main longitudinal MSE wall and return walls at both left and right ends of the dam were in good condition. There are no signs of significant differential settlement (no displaced panels, open joints, cracking, etc.) across the length of the wall. The drains at the base of the wall on the downstream side are open and do not appear to be clogged.
2) There are relatively small separations at both the southwest and northeast corners of the wall, at the junction of the main longitudinal wall and the orthogonal return wall sections. The separations are most pronounced at coping beams at the top of the walls. These separations do not appear to have any adverse effect on serviceability, and it is noted that relative movement at MSE wall corners is a relatively common occurrence. The separations observed in 2024 do not appear to have worsened relative to previous inspections.
3) The concrete retaining sidewalls are observed to be in fair condition. Cracking was observed away from the wall joints. Cracking has not seemed to increase when compared to the 2023 photos with a minor amount of spalling continuing to be observed along the cracks. No displacement of the concrete along the crack was observed and at the present time does not appear to adversely affect the function of the wall.

Seepage Collection Drains & Hydraulic Structures

1) Drain #1, the chimney/toe drain, was observed to be in satisfactory condition. The discharge was observed to be visually clear.
2) Drain #2 discharges from the right abutment drainage blanket and was observed to be visually clear. Drain #3 (slag buttress / right abutment) and Drain #4 (slag buttress /trench in center) typically exhibit little to no discernable discharge. Flow measurements are taken from the drains that pool at the toe and are measured by a V-notched weir. Additional V-notched weirs were constructed downstream and are also functioning as intended.
3) Another V-notched weir Drain #15 is used to measure flow emanating from the Morgantown Sandstone along the right abutment and is also referred to as the Right Hillside Jules Verne (discharge) near 770' elevation. The discharge was observed to be visually clear, but the pool was overgrown with vegetation. Additional discharge from the Morgantown Sandstone was observed along its outcrop downstream of the dissipator structure and discharges into the main channel.
4) Drain #7 (West bedrock abutment 900' elevation) discharges to the right groin ditch and was observed to be visually clear. There was no observed scouring or sediment build up within the groin ditch at the point of discharge. The flow appeared to be clear.
5) Drain #8, (East Tributary valley abutment 905"elevation) discharges to the left groin ditch and was discharging visually clear.
6) At the base of the dam, the energy dissipator/stilling basin structure was observed to be in good condition. A minor amount of flow into the dissipator was observed within the chamber. Flow into the second distilling basin chamber is discharged to the downstream channel. The water appeared to be clear at the time of the inspection.
7) Drains #5 and 6 (West side and East side of the stilling basin) and East discharge along the energy dissipator/stilling basin structure into the downstream channel. Drain #5 was not flowing at the time of the inspection. Drain #6 had minimal flow and was visually clear at the time of the inspection.
8) Flow from the energy dissipator structure discharges into a channel that flows through a concrete flume (NPDES Permit Outfall # 019). The condition of these features was essentially the same as was observed in previous inspections.

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

Based on discussions with plant personnel and field observations from the inspection, there were no significant changes to FAD 2 since the last annual inspection that would negatively affect the stability or operation of the impounding structure. The pond's pool stage (estimated 920' elevation at the time of the inspection) is being lowered in response to construction activities designed to close fly ash reservoir (FAR) 2.

Overall, FAD 2 is in good condition. The impoundment is functioning as intended, with no signs of potential structural issues that would affect its stability or safe operation.

4.4 Retrofitted Bottom Ash Pond and Low Volume Waste Pond

As previously discussed, the rBAP is the only pond within the BAP complex that is subject to 40 CFR 257 Subpart D. The LVWP is subject to the Clean Water Act. Both rBAP and the LVWP is subject to the ODNR Dam Safety Program.

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

No modifications have been made to the rBAP since the 2023 Inspection. Bottom ash is sluiced to the South Pond which has been retrofitted with a synthetic liner. The geometry of the impoundment, however, has remained unchanged over the past year. Since the 2023 Inspection, the North Pond (LVWP) has been excavated and lined with a geomembrane liner.

4.4.2 Instrumentation (257.83(b)(2)(ii))

Instrumentation at the rBAP and LVWP consists of a network of three (3) piezometers drilled to various depths whose locations are depicted in Figure 3A of Appendix A. Piezometer 3-S is located on the east perimeter road of the rBAP. Piezometers B-0904 and B-0905 are located on the upstream and downstream slope of the east perimeter road of the LVWP along the Ohio River, respectively. Piezometers 2-N and B-0902 were removed as part of construction activities. The maximum operating elevation of the Retrofit Bottom Ash Pond and Low Volume Waste Pond is El. 665. The maximum recorded readings of each instrument since the previous annual inspection is shown in Table 4 below.

Table 4: rBAP Maximum Recorded Instruments Reading Since the Previous Annual Inspection

Instrumentation Data rBAP		
Instrument	**Type**	**Maximum Reading Since Last Annual Inspection (September 2023)**
3-S	Piezometer	656.22
B-0904	Piezometer	646.38
B-0905	Piezometer	645.05

The piezometers are measured monthly by Cardinal Operating Company and showed very little to no change in average piezometric head or trends relative earlier historical readings indicating no significant changes have occurred to the subsurface water levels since the previous annual inspection.

4.4.3 Impound Characteristics (257.83(b)(2)(iii, iv, v))

Table 5 summarizes information for the rBAP. Table 5 presents the minimum, maximum, and present depth and elevation of the impounded water and 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 5: Summary of Relevant Storage Information rBAP

IMPOUNDMENT CHARACTERISTICS: rBAP (rBAP Elevation = 665 ft.)	
Approximate Minimum depth (Elevation) of impounded water since last annual inspection	0 ft. (654) ft.
Approximate Maximum depth (Elevation) of impounded water since last annual inspection	12 ft. (665) ft.
Approximate Present depth (Elevation) of impounded water since last annual inspection	11.0 ft. (664.0) ft.
Approximate Minimum depth (Elevation) of CCR since last annual inspection	0 ft. (654) ft.
Approximate Maximum depth (Elevation) of CCR since last annual inspection	1 ft. (655) ft.
Approximate Present depth (Elevation) of CCR since last annual inspection	1 ft. (655) ft.
Storage capacity of impounding structure at the time of the inspection from crest, elev. 670 ft msl	108.3 ac-ft.
Approximate volume of impounded water at the time of the inspection	62.1 ac-ft.
Approximate volume of CCR at the time of the inspection*	17.7 ac-ft.

The volume of CCR includes the volume used to construct the base bottom ash island for decanting of 21,513 CY and approximately 7,000 CY of CCR placed above the island waiting to be decanted and hauled to the LF, for a total of 28,513 CY (17.7 ac-ft).

4.4.4 Visual Inspection (257.83(b)(2)(i))

A visual inspection of the rBAP and LVWP was conducted to identify any signs of distress or malfunction of the impoundment and associated structures. Specific items inspected included all structural elements of the dikes such as inboard and outboard slopes, crest, and toe, as well as the outlet structure at the LVWP and pipe discharge structure. Results of the visual inspection of the Ponds performed on August 14, 2024 are provided below:

1) The LVWP's crest and embankment along the Ohio River was observed to be in good condition, with no signs of significant erosion, rutting, or misalignment.
2) The rBAP crest was observed to be in good condition, with no signs of significant erosion, rutting, or misalignment.
3) Due to ongoing construction activities, some localized potholes have developed along the dike of the rBAP and the western berm of the LVWP.
4) The east slope of the rBAP along the Ohio River appears to be in good condition with no signs of erosion. A majority of the slope is protected with riprap. The slope appeared to be uniform with no slumping or bulges indicative of movement. The two apparent seep areas observed in 2018, 2019 and 2020 were not observed to be present during the current inspection. The mature trees along the riverbank have been kept in place to mitigate bank erosion potentially caused by the Ohio River.
5) Outfall 023 along the Ohio River appears to be in good condition and was protected by riprap, the slopes are in good condition, with no signs of instability.
6) The splitter dike was observed to be in good condition. No signs of wave cut action, erosion, or slope instabilities on either inboard of the pond slopes were observed.
7) The interior slopes of the rBAP were observed to be in good condition and show that the Pond's liner is protected by either riprap or concrete fabriform cover.

8) The interior slopes of the LVWP were observed to be in good condition. These slopes were designed to be non-vegetated.
9) Several locations along the exterior west slope of the LVWP are experiencing minor erosion.
10) Condition of the piezometers appear to be in good condition. They are being protected by a protective casing, concrete pad and protective bollards.

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

Based on discussions with plant personnel and field observations there were no changes to the rBAP since the last annual inspection that would affect the stability or operation of the impounding structure.

Overall, the rBAP is in good condition. The South Pond is functioning as intended, with no signs of potential structural issues that would affect the stability or safe operation of the impoundment.

5.0 Summary of Findings

5.1 Maintenance Items

The following maintenance items were identified during the visual inspection:

Fly Ash Dam 1

1. Repair the erosion rills and the washout/erosion areas beneath the sluice pipes.
2. Remove the shrubby vegetation and saplings that are present on the downstream slope and both groin ditches.

Fly Ash Dam 2

1. Repair erosion rills on the left groin access road.
2. Place additional riprap within the left groin ditch where the rock has degraded.
3. Remove vegetation that is growing in east groin ditch.
4. Remove the debris at Drain #1 to prevent blockage of flow.
5. Remove vegetation in Drain #15 to prevent blockage of flow.
6. Continue with regularly scheduled mowing and reseeding minor barren areas, as needed.

Retrofitted Bottom Ash Pond and Low Volume Waste Pond

1. Due to ongoing construction activities, some localized potholes have developed along the dike of the rBAP and the western berm of the LVWP. The crest of the dikes should continue to be filled as they are observed.
2. Repair erosion rills on the exterior slope of the LVWP.
3. Continue with regularly scheduled mowing and reseeding minor barren areas, as needed.

5.2 Items to Monitor

Fly Ash Dam 1

1. Continue to monitor erosion rills that are intermittently located along the downstream slope. Correct any features that are observed to grow in size or depth, as part of regular maintenance.
2. Continue to monitor historic seep in the right groin until the seep can be collected during the upcoming FAR II closure activities.

Fly Ash Dam 2

1. Continue to monitor the condition of the RCC section of the emergency spillway for signs of additional erosion or deterioration.
2. Continue to monitor the small separations that have developed at both the southwest and northeast corners of the MSE wall.
3. Continue to monitor the cracking and spalling observed on the concrete retaining sidewalls along the spillway.

Retrofitted Bottom Ash Pond and Low Volume Waste Pond

1. Continue to monitor erosion rills that have formed on the bare slopes on the western berms of the LVWP.

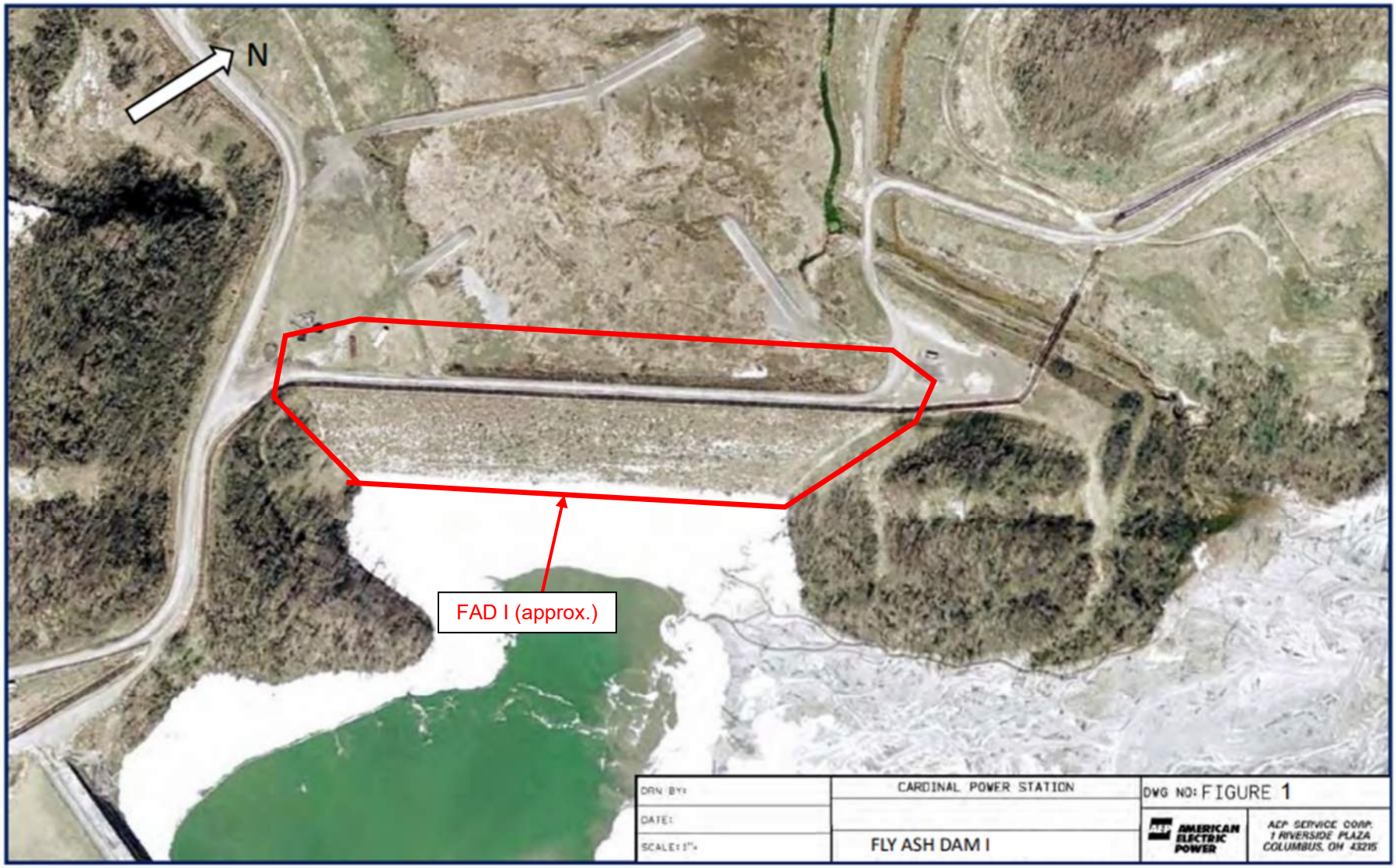
5.3 Deficiencies

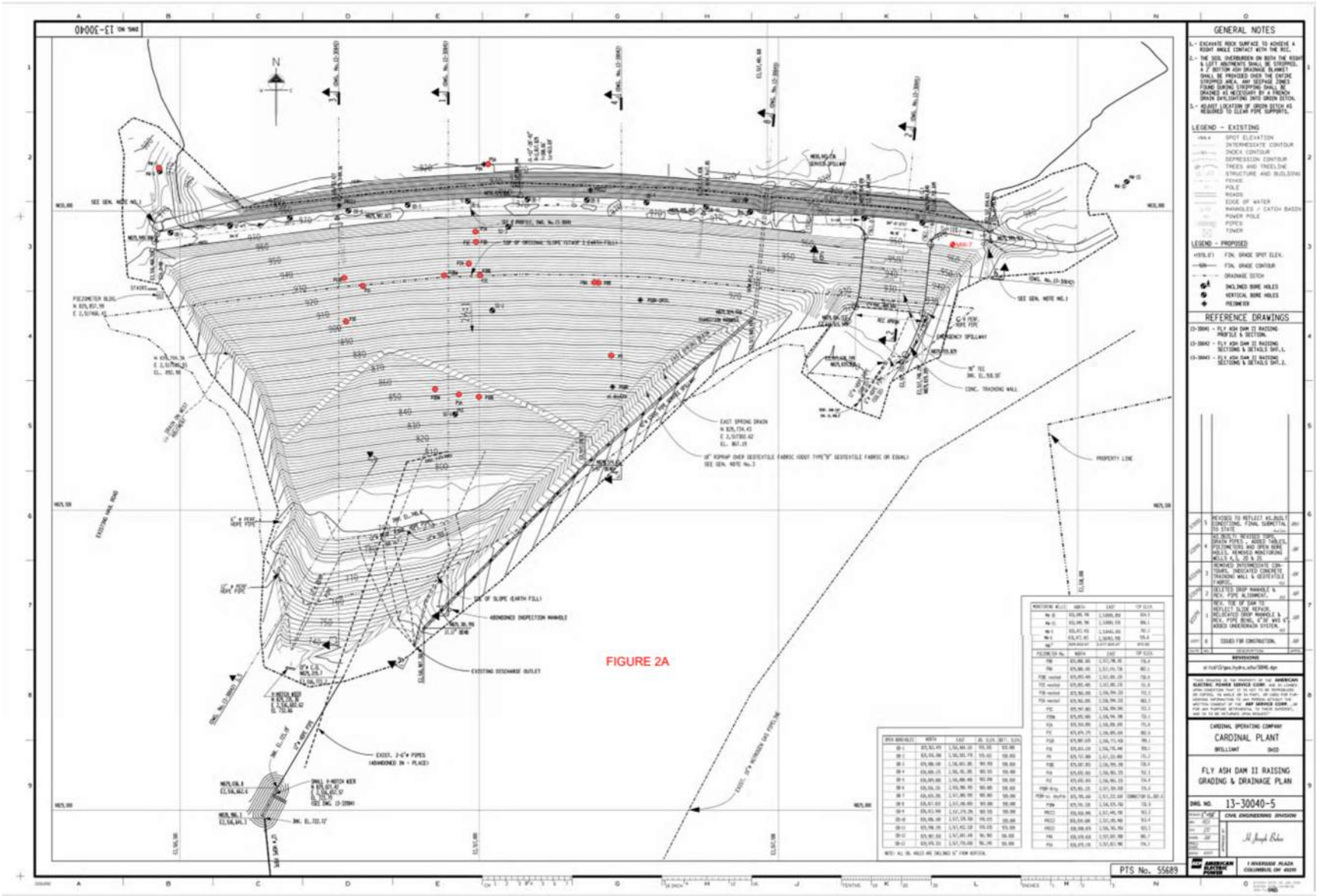
There were no deficiencies, signs of structural weakness, or signs of disruptive conditions observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during any of the periodic 7-day or 30-day inspections or indicated by a review of the dam's instrumentation.

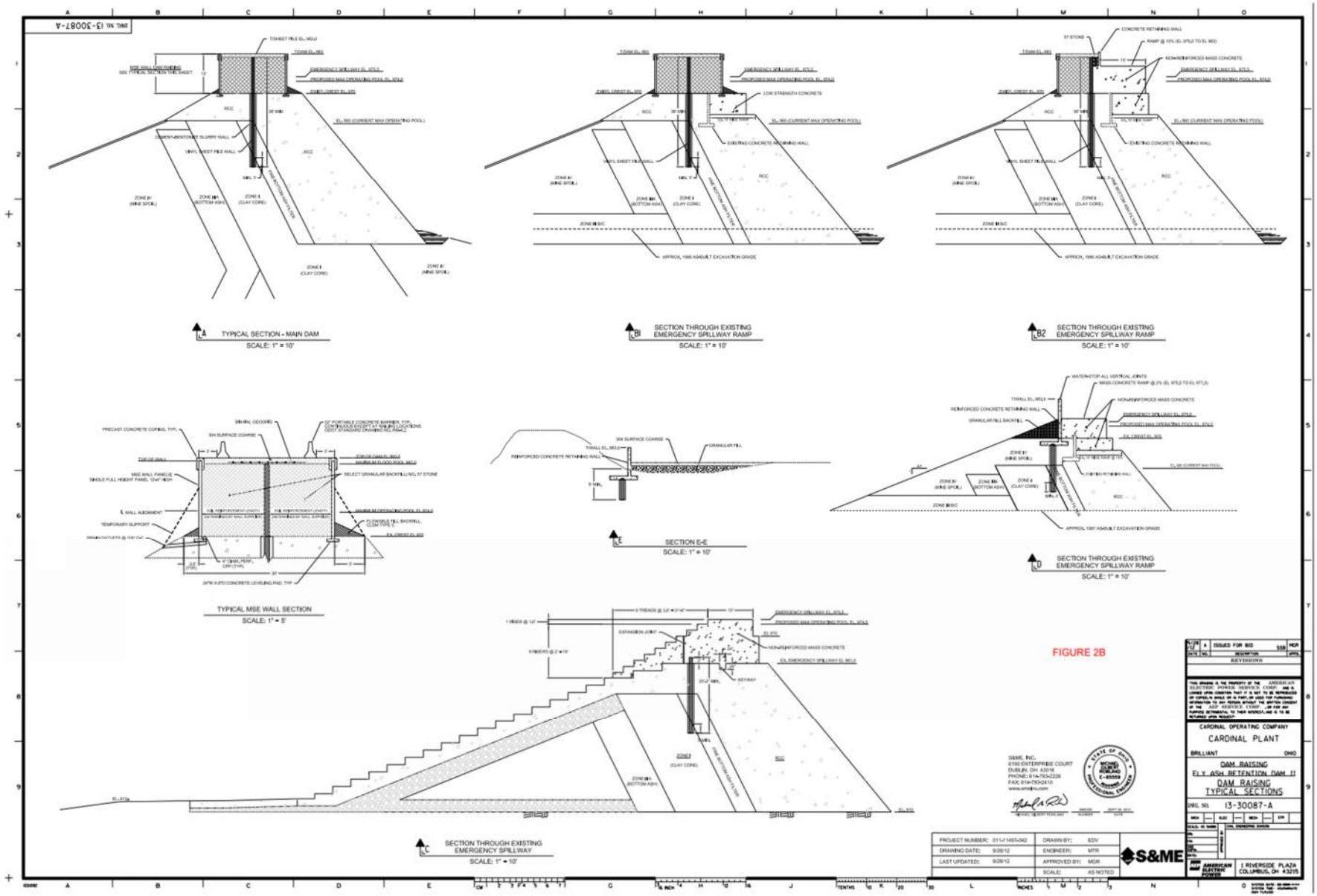
6.0 Limitations

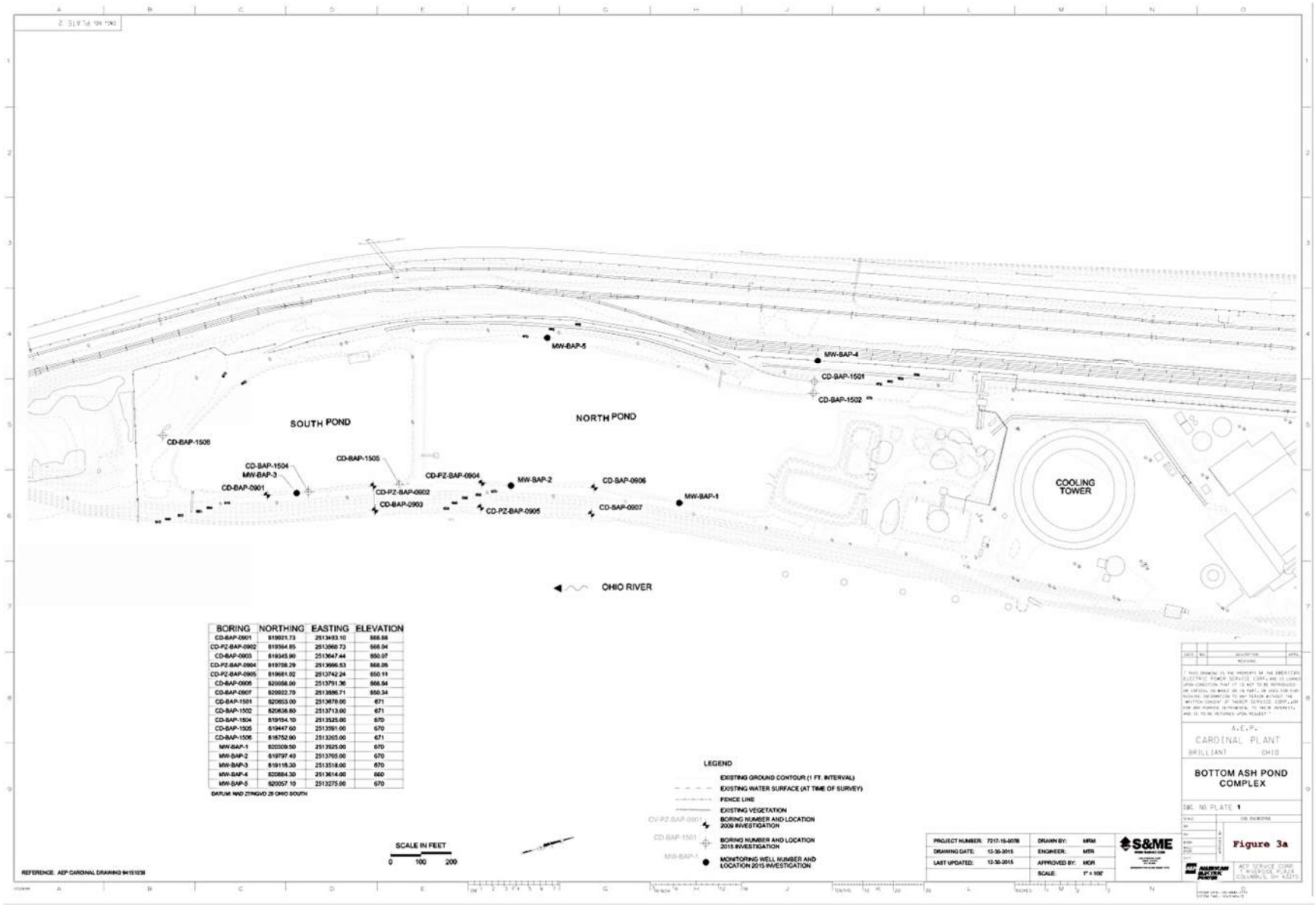
This work has been done in accordance with our authorized scope of work and in accordance with generally accepted practice in the fields of geotechnical and dam engineering. This warranty is in lieu of all other warranties either expressed or implied. Our conclusions and recommendations are based on the data reviewed and the observations from our visual inspection. We are not responsible for any conclusions or opinions drawn from the data included herein, other than those specifically stated, nor are the recommendations presented in this report intended for direct use in final design or as construction specifications. This report is intended for use with regard to the specific project discussed herein and any changes in the conditions of the CCR surface impoundments should be brought to our attention so that we may determine how they may affect our conclusions. An attempt has been made to provide for normal contingencies, but the possibility remains that unexpected conditions may be encountered during construction. If this should occur, or if additional or contradictory data are revealed in the future, we should be notified so that modifications to this report can be made, if necessary. If we do not review the relevant construction documents and witness the relevant construction operations, then we cannot be responsible for any problem, which may arise, from the misunderstanding or misinterpretation of this report or failure to comply with our recommendations.

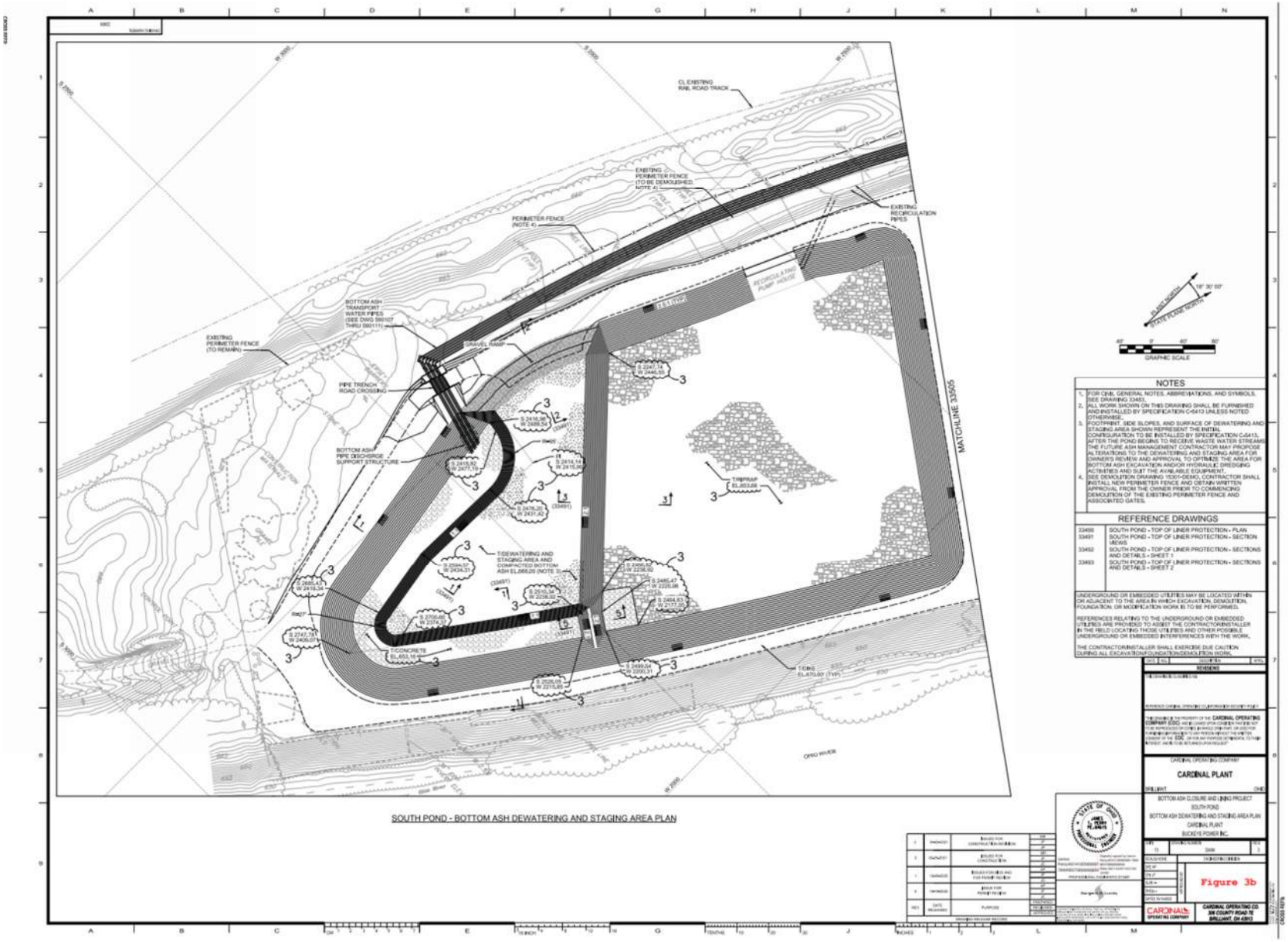
Appendix A: Figures and Drawings

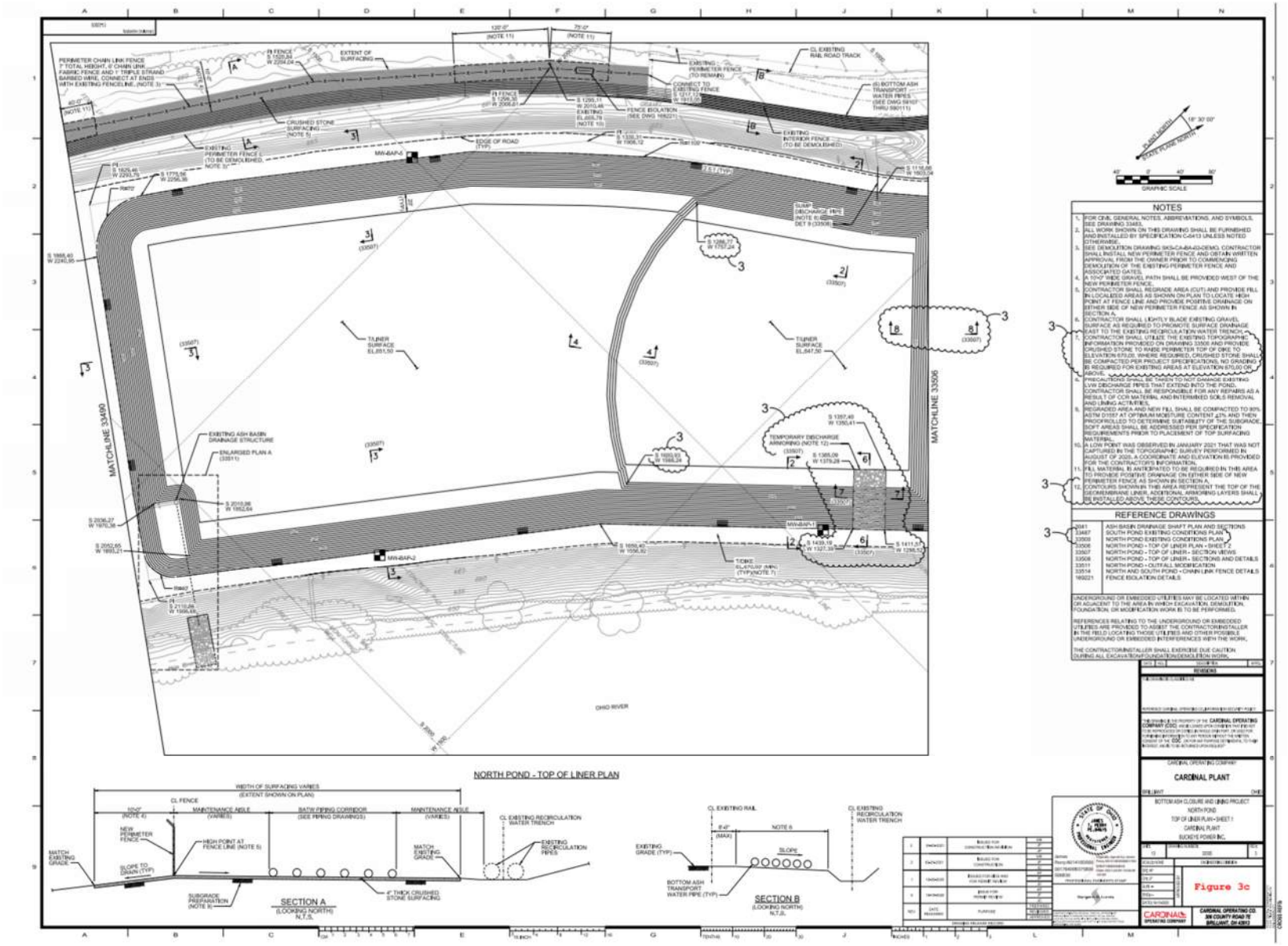

N
FAD I (approx.)
DRN BY:
DATE:
SCALE: 1"=
CARDINAL POWER STATION
FLY ASH DAM I
DWG NO: FIGURE 1
AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

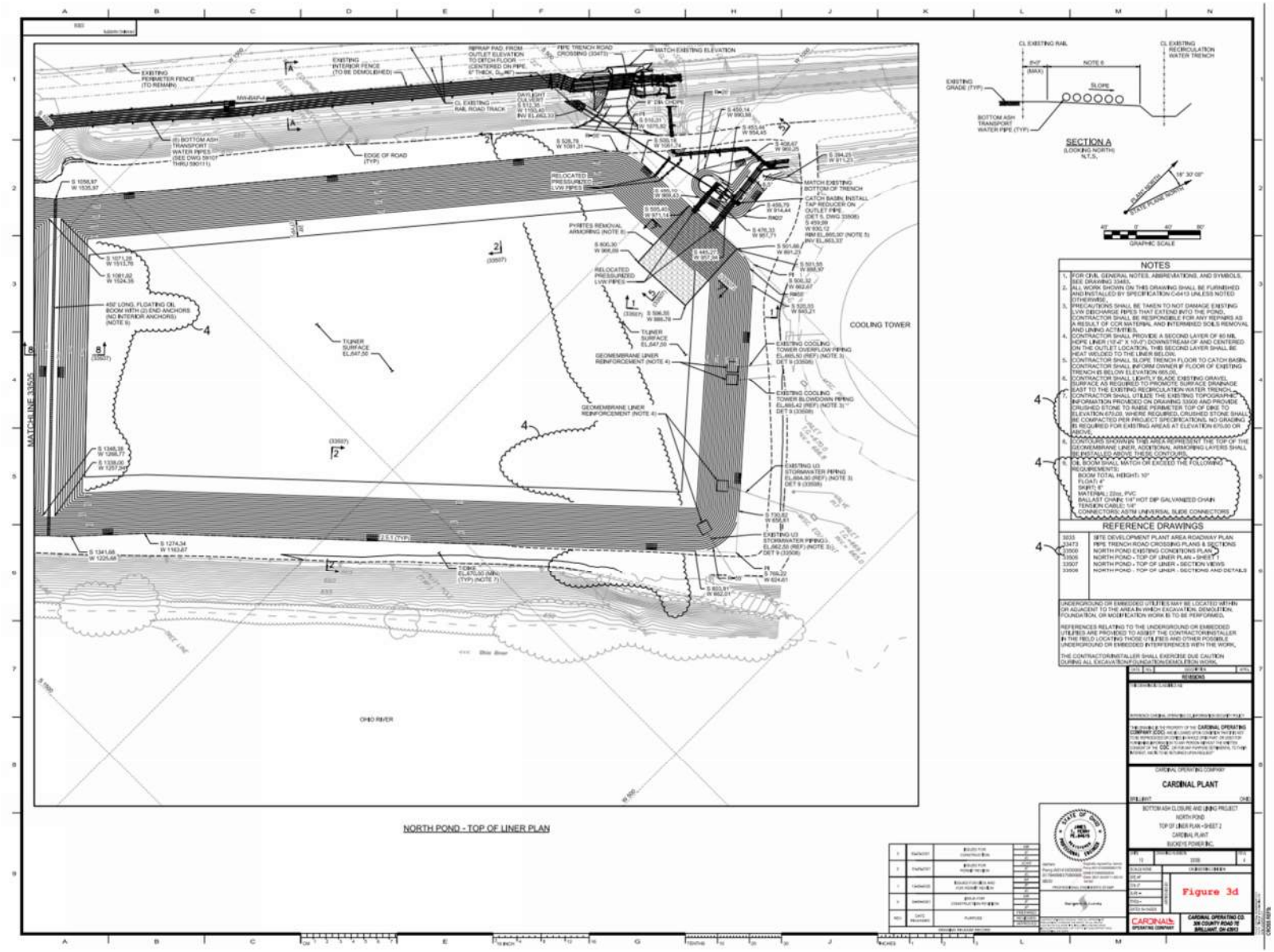

GENERAL NOTES
REFERENCE DRAWINGS
FIGURE 2A
CARDINAL PLANT
FLY ASH DAM II RAISING GRADING & DRAINAGE PLAN
PTS No. 55689

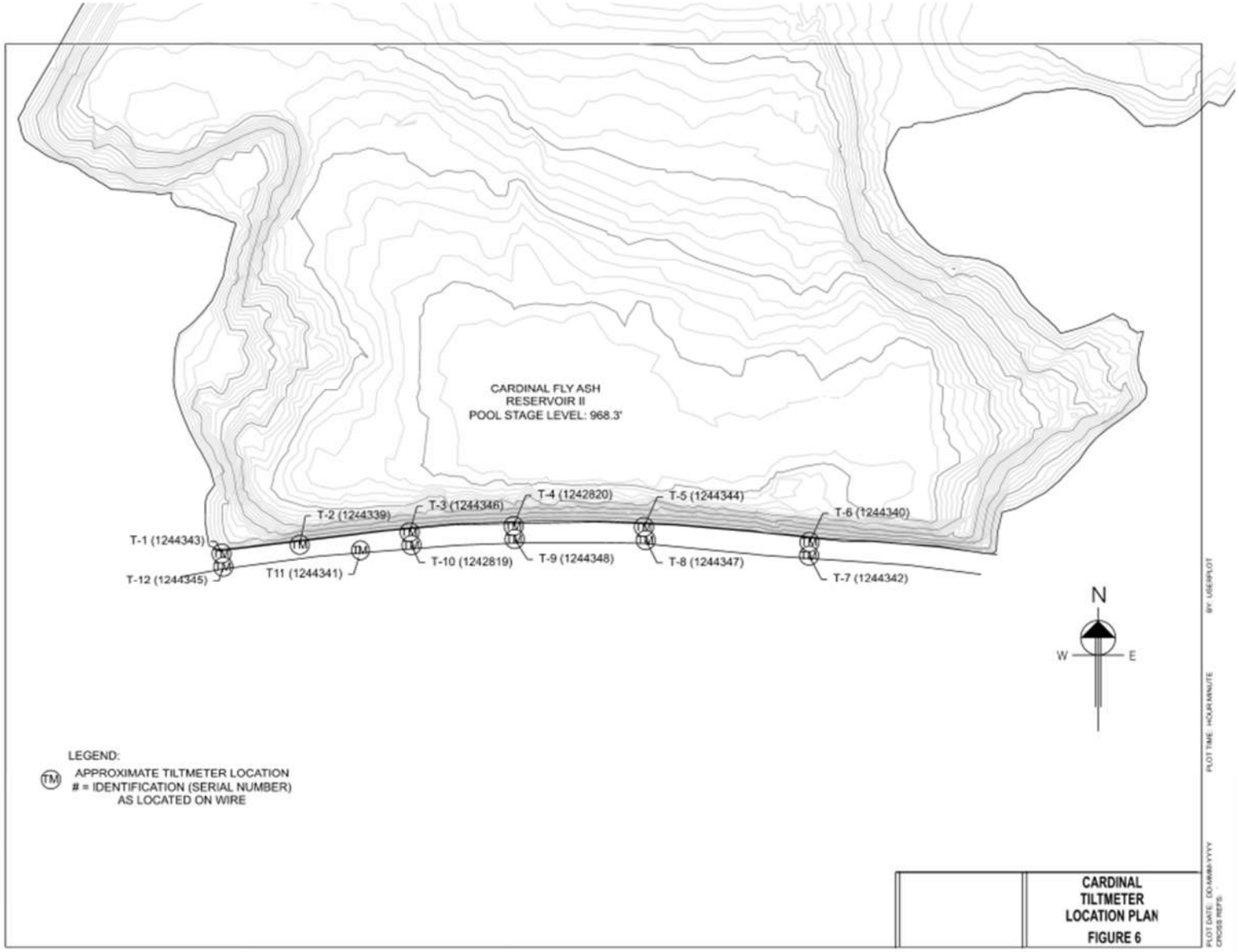

TYPICAL SECTION - MAIN DAM
SCALE: 1" = 10'
SECTION THROUGH EXISTING EMERGENCY SPILLWAY RAMP
SCALE: 1" = 10'
SECTION THROUGH EXISTING EMERGENCY SPILLWAY RAMP
SCALE: 1" = 10'
TYPICAL MSE WALL SECTION
SCALE: 1" = 5'
SECTION E-E
SCALE: 1" = 10'
SECTION THROUGH EXISTING EMERGENCY SPILLWAY RAMP
SCALE: 1" = 10'
SECTION THROUGH EXISTING EMERGENCY SPILLWAY
SCALE: 1" = 10'
FIGURE 2B
CARDINAL OPERATING COMPANY
CARDINAL PLANT
BRILLIANT OHIO
DAM RAISING
FLY ASH RETENTION DAM II
DAM RAISING
TYPICAL SECTIONS
DWG. NO. 13-30087-A
S&ME
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

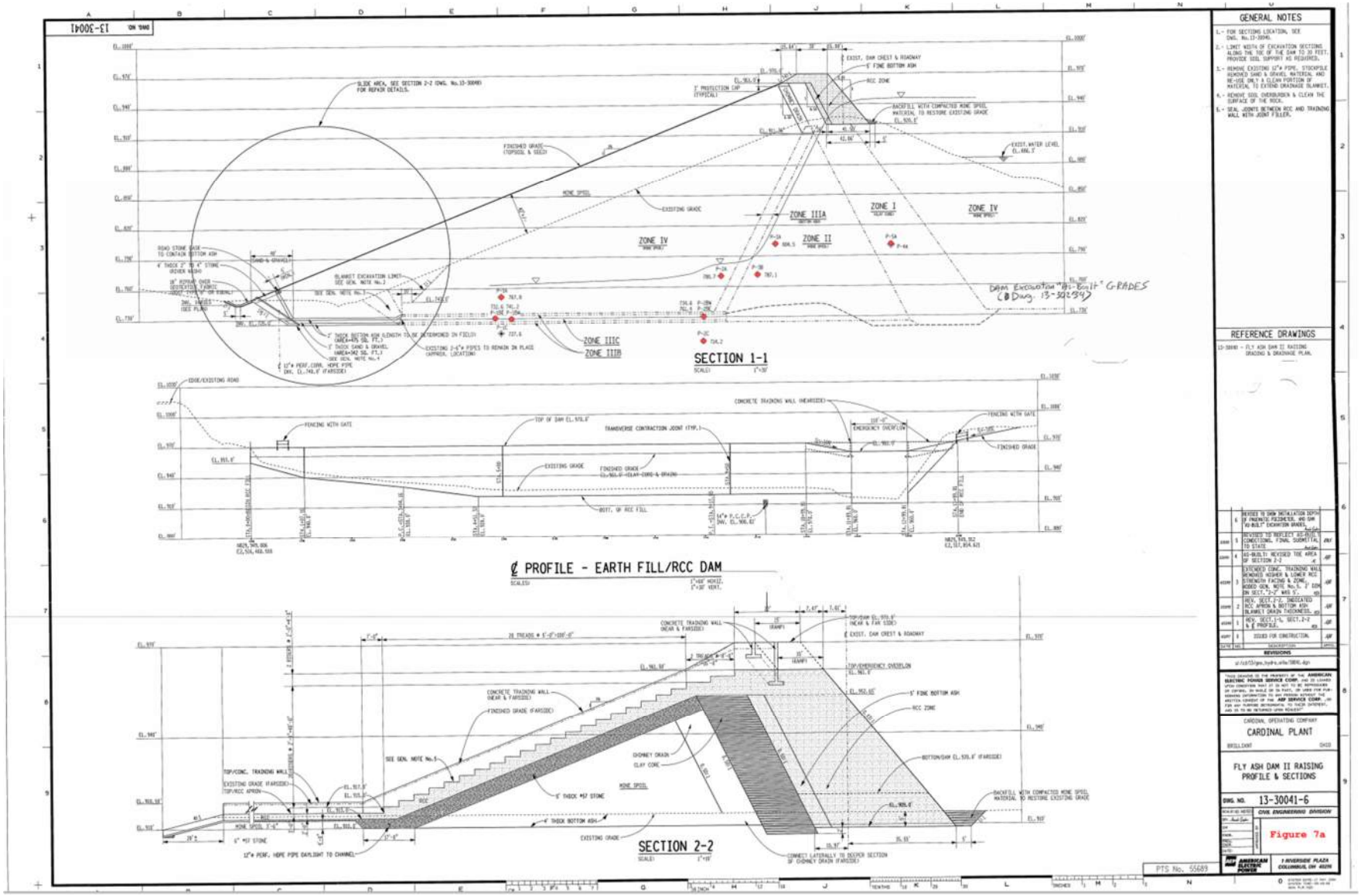

SOUTH POND
NORTH POND
COOLING TOWER
OHIO RIVER
MW-BAP-5
MW-BAP-4
CD-BAP-1501
CD-BAP-1502
CD-BAP-1506
CD-BAP-1504
MW-BAP-3
CD-BAP-0901
CD-BAP-1505
CD-PZ-BAP-0902
CD-BAP-0903
CD-PZ-BAP-0904
MW-BAP-2
CD-PZ-BAP-0905
CD-BAP-0906
CD-BAP-0907
MW-BAP-1
BORING NORTHING EASTING ELEVATION
CD-BAP-0901 819021.73 2513493.10 668.68
CD-PZ-BAP-0902 819364.85 2513568.73 668.04
CD-BAP-0903 819345.90 2513647.44 650.07
CD-PZ-BAP-0904 819708.29 2513666.53 668.05
CD-PZ-BAP-0905 819681.02 2513742.24 650.11
CD-BAP-0905 820058.99 2513791.36 668.84
CD-BAP-0907 820022.79 2513886.71 650.34
CD-BAP-1501 820653.00 2513678.00 671
CD-BAP-1502 820636.80 2513713.00 671
CD-BAP-1504 819154.10 2513525.00 670
CD-BAP-1505 819447.60 2513591.00 670
CD-BAP-1506 818752.90 2513265.00 671
MW-BAP-1 820209.50 2513525.00 670
MW-BAP-2 819797.40 2513705.00 670
MW-BAP-3 819116.30 2513518.00 670
MW-BAP-4 820684.30 2513614.00 660
MW-BAP-5 820057.10 2513275.00 670
DATUM: NAD 27/NGVD 29 OHIO SOUTH
SCALE IN FEET
0 100 200
REFERENCE: AEP CARDINAL DRAWING 94151038
LEGEND
EXISTING GROUND CONTOUR (1 FT. INTERVAL)
EXISTING WATER SURFACE (AT TIME OF SURVEY)
FENCE LINE
EXISTING VEGETATION
BORING NUMBER AND LOCATION 2009 INVESTIGATION
BORING NUMBER AND LOCATION 2015 INVESTIGATION
MONITORING WELL NUMBER AND LOCATION 2015 INVESTIGATION
PROJECT NUMBER: 7217-15-0078
DRAWING DATE: 12-30-2015
LAST UPDATED: 12-30-2015
DRAWN BY: MRM
ENGINEER: MTR
APPROVED BY: MDR
SCALE: 1" = 100'
S&ME
A.E.P.
CARDINAL PLANT
BRILLIANT OHIO
BOTTOM ASH POND COMPLEX
DWG. NO. PLATE 1
Figure 3a
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

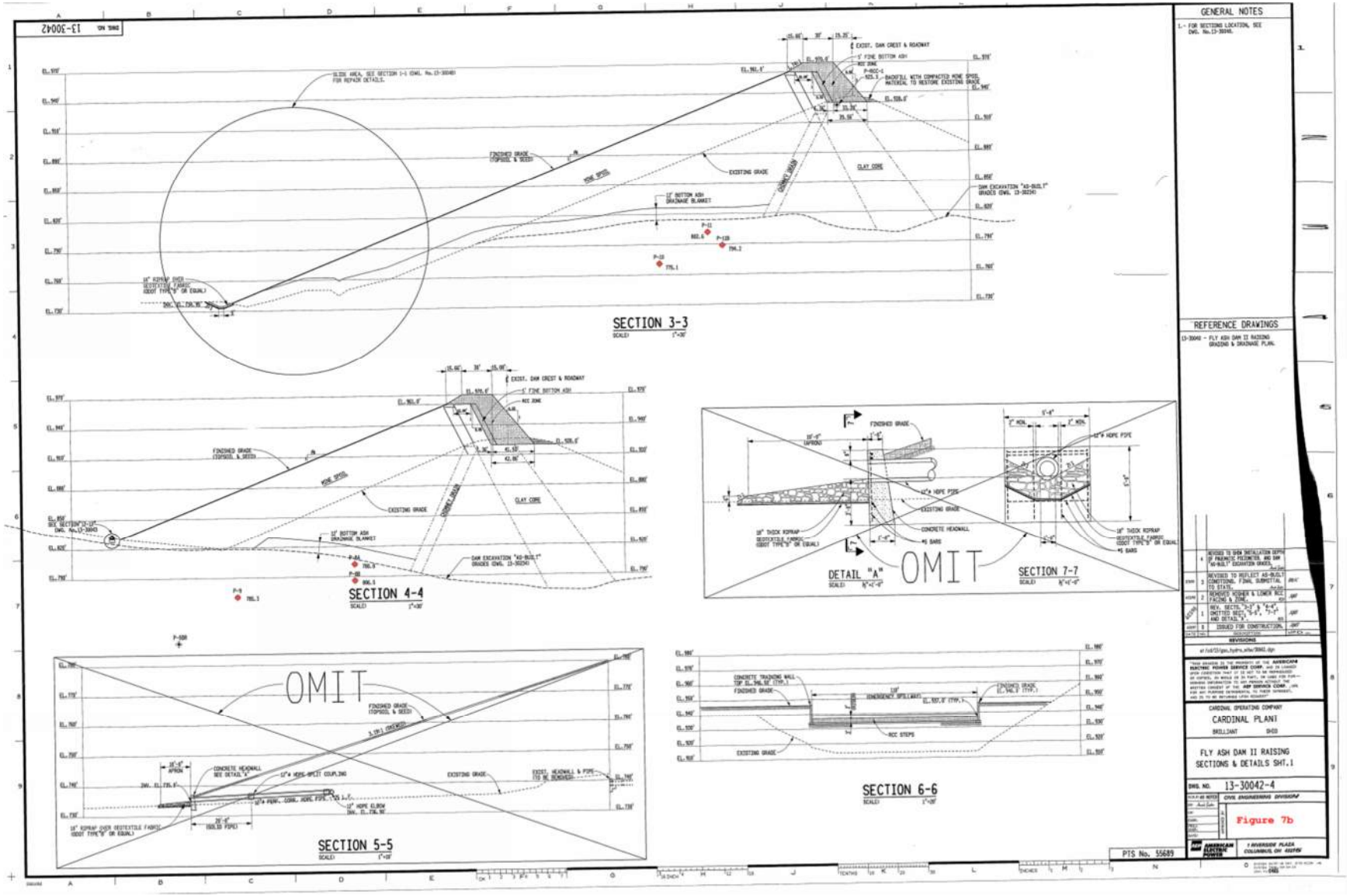

SOUTH POND - BOTTOM ASH DEWATERING AND STAGING AREA PLAN
NOTES
REFERENCE DRAWINGS
CARDINAL PLANT
Figure 3b

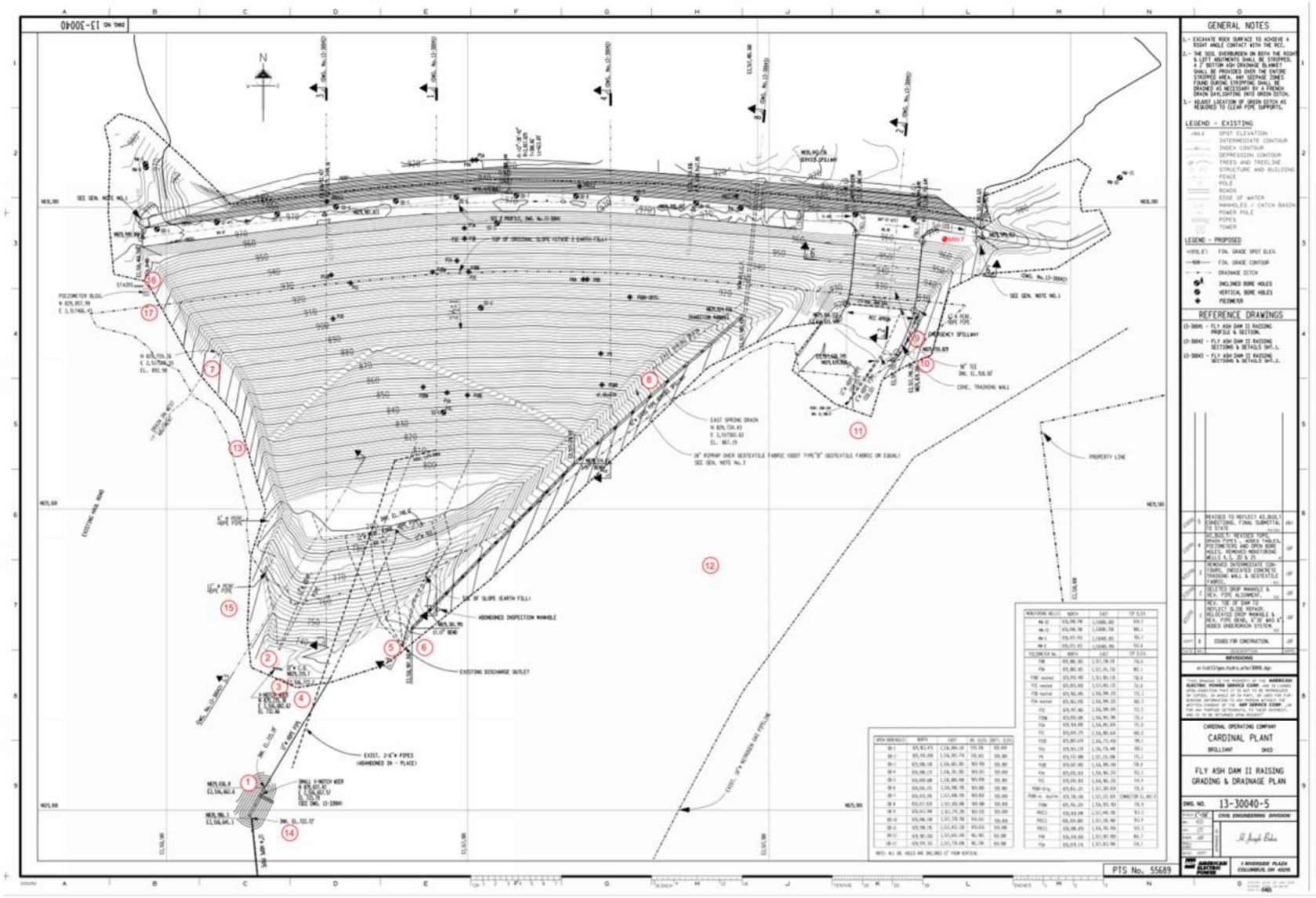

NORTH POND - TOP OF LINER PLAN
SECTION A
(LOOKING NORTH)
N.T.S.
SECTION B
(LOOKING NORTH)
N.T.S.
NOTES
REFERENCE DRAWINGS
CARDINAL PLANT
Figure 3c


NORTH POND - TOP OF LINER PLAN
SECTION A
NOTES
REFERENCE DRAWINGS
CARDINAL PLANT
Figure 3d


CARDINAL FLY ASH
RESERVOIR II
POOL STAGE LEVEL: 968.3'
T-1 (1244343)
T-2 (1244339)
T-3 (1244346)
T-4 (1242820)
T-5 (1244344)
T-6 (1244340)
T-7 (1244342)
T-8 (1244347)
T-9 (1244348)
T-10 (1242819)
T11 (1244341)
T-12 (1244345)
N
W
E
LEGEND:
TM APPROXIMATE TILTMETER LOCATION
= IDENTIFICATION (SERIAL NUMBER)
AS LOCATED ON WIRE
CARDINAL
TILTMETER
LOCATION PLAN
FIGURE 6


GENERAL NOTES
REFERENCE DRAWINGS
SECTION 1-1
SECTION 2-2
℄ PROFILE - EARTH FILL/RCC DAM
CARDINAL PLANT
FLY ASH DAM II RAISING
PROFILE & SECTIONS
DWG. NO. 13-30041-6
Figure 7a


GENERAL NOTES
REFERENCE DRAWINGS
SECTION 3-3
SECTION 4-4
SECTION 5-5
SECTION 6-6
SECTION 7-7
DETAIL "A"
OMIT
OMIT
CARDINAL PLANT
FLY ASH DAM II RAISING
SECTIONS & DETAILS SHT.1
DWG. NO. 13-30042-4
Figure 7b


GENERAL NOTES
LEGEND - EXISTING
LEGEND - PROPOSED
REFERENCE DRAWINGS
CARDINAL PLANT
FLY ASH DAM II RAISING
GRADING & DRAINAGE PLAN
DWG. NO. 13-30040-5
PTS No. 55689