

# STRUCTURAL STABILITY ASSESSMENT PERIODIC 5-YR REVIEW

**CFR 257.73(d)**

Bottom Ash Ponds

Mountaineer Plant

New Have, West Virginia

October, 2021

Prepared for: Appalachian Power Company – Mountaineer Plant

New Haven, West Virginia

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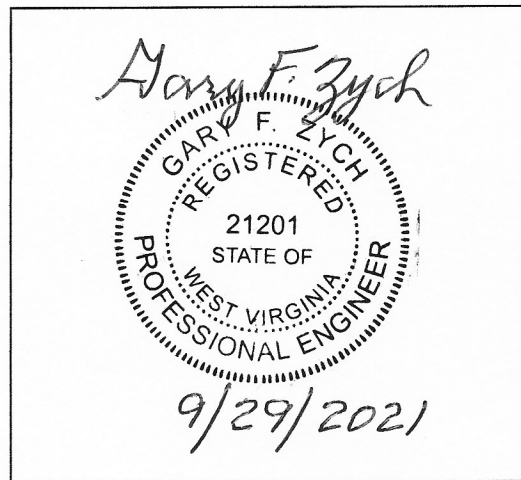
Document ID: GERS-21-032

Structural Stability Assessment  
Periodic 5-Yr Review  
CFR 257.73(d)  
MOUNTAINEER PLANT  
BOTTOM ASH COMPLEX

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I certify to the best of my knowledge, information and belief that the information contained in this structural stability assessment meets the requirements of 40 CFR 257.73(d)

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## **1.0 OBJECTIVE 257.73(d)**

This report was prepared by AEP- Geotechnical Engineering Services (GES) section to fulfill requirements of CFR 257.73(d) and document whether the design, construction, operations, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering practices. This is the first periodic 5-year review of the initial assessment as per the Rule.

Note: There has not been any change to the diking structures, discharge weir structures or the discharge pipes through the dike system since the initial assessment.

## **2.0 NAME AND DESCRIPTION OF CCR SURFACE IMPOUNDMENT**

The Mountaineer Power Plant is located near the City of New Haven, Mason County, West Virginia. It is owned and operated by Appalachian Power Company (APCo). The facility operates one surface impoundment for storing CCR called the Bottom Ash Complex.

The Bottom Ash Complex is comprised of diked embankments on the north, east, and west sides. The south side of the Bottom Ash Complex is incised. There are six main ponds within the Bottom Ash Complex as listed below. The Bottom Ash Ponds and Wastewater Ponds were designed in tandem; one Bottom Ash Pond and one Wastewater Pond are in service at a given time.

### List of Main Ponds within the Bottom Ash Complex

East Bottom Ash Pond  
West Bottom Ash Pond  
East Wastewater Pond  
West Wastewater Pond  
Reclaim Pond  
Clearwater Pond

## **3.0 STABLE FOUNDATION AND ABUTMENTS 257.73(d)(1)(i)**

***[Was the facility designed for and constructed on stable foundations and abutments? Describe any foundation improvements required as part of construction.]***

Based on the design drawings, the foundation was stripped and the subgrade was prepared prior to construction of the embankment. The dikes were constructed using soils excavated from within the pond area. Soil borings taken prior to construction indicate that most of the soils used for the dikes range from silty and clayey fine sand to fine medium sand. Based on recent subsurface investigations, the foundation materials of the Bottom Ash Pond Complex consist of Silty Sand / Sandy Silt – Very Loose to Loose (SM) materials overlaying Poorly Graded Sand/Gravel – Dense to Very Dense (SP or GP). The findings of the subsurface investigations the foundations materials are suitable for this CCR unit.

In 2006, the north and west embankments were modified to accommodate a gypsum conveyor system. There is no documentation of any foundation improvements due to this construction. Stability analysis of the perimeter dikes along the gypsum conveyors demonstrates the stability of the downstream slope of the dike has met West Virginia dam safety criteria prior to installation.

Operation of the impoundment is performed so as to not adversely affect the foundation and abutments. As required by the CCR rules the Bottom Ash Pond Complex is inspected at least every 7 days by a qualified person. Also as a requirement of the CCR rules, the impoundment is also inspected

annually by a professional engineer. Maintenance items are addressed as they are discovered as a part of those inspections.

Based on the subsurface information obtained from the investigation, the relative density and description of the foundation materials are adequate for this CCR unit.

#### **4.0 SLOPE PROTECTION 257.73(d)(1)(ii)**

*[Describe the slope protection measures on the upstream and downstream slopes.]*

The Bottom Ash Pond Complex was designed and constructed with compacted sand fill that was assembled at a 2.5H to 1V slope. For protection of the clay lining against damage, mine spoil was placed on the inside slopes. The outside slopes were covered with mine spoil and then covered with topsoil and seeded, except for the bottom 2 ft to permit free drainage at the downstream toe. The current condition of the grassed slopes is adequate. Grassed slopes are mowed regularly. Any erosion or slips that may occur are repaired within a timely period.

#### **5.0 EMBANKMENT CONSTRUCTION 257.73 (d)(1)(iii)**

*[Describe the specifications for compaction and/or recent boring to give a relative comparison of density.]*

The construction specifications indicate that the embankment was constructed with sand fill placed in lifts not exceeding 6-inches. The clay liner was compacted in thin lifts at water contents within +/- 2% of standard optimum.

Soil borings through the embankment indicate that the material is dense to very dense and representative of a compacted material.

#### **6.0 VEGETATION CONTROL 257.73 (d)(1)(iv)**

*[Describe the maintenance plan for vegetative cover.]*

The vegetative areas are mowed to facilitate inspections and maintain the growth of the vegetative layer; and prevent the growth of woody vegetation.

#### **7.0 SPILLWAY SYSTEM 257.73(d)(1)(v)**

*[Describe the spillway system and its capacity to pass the Inflow Design Flood as per its Hazard Classification.]*

The Bottom Ash Pond Complex has been determined to be a Significant Hazard potential CCR impoundment. Based on this hazard classification, the design flood was determined by section 257.82(a)(3) to be the 1000-year storm which corresponds to 7 inches in 24hours for this site. An analysis was performed for the 1000-year storm event. Results of this analysis show that the Bottom Ash Pond Complex has adequate hydrologic and hydraulic capacity to collect and control peak discharge resulting from the 1000-year inflow design.

The outlet works for the Bottom Ash Pond cells consists of a reinforced concrete drop inlet structure with weir openings on three sides which include slide stop logs approximately 3-feet wide. A wooded surface skimming structure is constructed around the weir box. The outlet works of the Wastewater

Pond cells consist of a 250-foot long concrete weir. The weir discharges into a concrete chute which transitions into a box structure leading to a junction chamber. The chamber controls flows from the Wastewater Ponds into the Reclaim Pond and/or Clearwater Pond. The outlet works for the Clearwater pond consists of a 185-foot long concrete weir. The weir discharges into a concrete structure and into a discharge pipe to the Ohio River. Drainage is diverted around the Bottom Ash Pond Complex by natural drainage channels and grass lined ditches.

Maintenance of the spillways is performed as needed based on periodic 7-day and annual inspections.

The outlet works for the Bottom Ash Pond Complex show no signs of excessive corrosion, deterioration or changes in geometry since the initial assessment.

### **8.0 BURIED HYDRAULIC STRUCTURES 257.73 (d)(1)(vi)**

***[Describe the condition of the sections of any hydraulic structure that is buried beneath and/or in the embankment.]***

There are no signs of settlement or sinkholes on the ground surface above the buried pipes. The discharge pipes have not shown signs of excessive corrosion or deterioration based on exterior visual inspections since the initial assessment.

### **9.0 SUDDEN DRAWDOWN 257.73 (d)(1)(vii)**

***[If the downstream slope is susceptible to inundation, discuss the stability due to a sudden drawdown.]***

The downstream slope of the Bottom Ash Pond Complex is not expected to be inundated from any adjacent water bodies.

There have not been any changes to the downstream slope areas of the Bottom Ash Pond complex since the initial assessment.