

**2019**

# **J. M. Stuart Station Pond 10 Annual Inspection**

ODNR File No.: 8535-011

Ohio EPA Permit No.: 06-5901



**Prepared by:  
John Hendrix, PE**



**Date: December 6, 2019**

## **Purpose**

I have conducted the following annual inspection in compliance of the Federal CCR Rule, 40 CFR Part 257 and Ohio Department of Natural Resources ORC 1501.062.

## **Statement of Qualifications**

I am a practicing Civil/Geotechnical Professional Engineer registered in the State of Ohio, employed by AES Ohio Generation, LLC. I am experienced in the design, maintenance and operation of earthen dams and impoundments.

## **Review of Impoundment Documentation [§ 257.83(b)(1)(i)]**

### **Design, History, and Operation of the Facility**

Ash pond 10 is a partially-incised, upland reservoir that was constructed in 2001 under ODNR Permit No. 00-291 and Ohio EPA permit 06-5901. This pond was used for settling wet sluiced fly ash produced from the combustion of coal in the station generating units. The pond has an area of 28.9 acres at the crest, is 40-feet deep and has a volume of 826 acre-feet to the crest. This pond is periodically drained and the settled fly ash excavated which is then sent to a dry ash landfill. The Maximum Operating Level of this pond is three feet below the crest. The outlet is a concrete structure with removable stop logs to control the level. At the time of inspection, the pond was dewatered and most of the ash excavated. J. M. Stuart Station stopped operating on May 24, 2018; therefore, this impoundment is not expected to receive any more ash or water.

In 2018 much of the ash sluiced to this impoundment was moved to on-site landfills 9 and 11. Remaining ash in the pond is planned to be removed during the following excavation season. Water from precipitation is periodically pumped to the operational treatment pond 6. Draft closure design is in review.

### **Periodic Inspections**

A thorough review of weekly facility inspections was conducted. These periodic inspections did not indicate any structural weakness or concerns.

### **Previous Structural Assessments**

The report on Initial Periodic Structural Stability Assessment Pond 10 J.M. Stuart Electric Generating Station by Haley & Aldrich in 2016 was reviewed as well as, annual inspections from previous years, a 2010 inspection from BBC&M, and the 2018 ODNR inspection.

## **Visual Inspection of Impoundment [§ 257.83(b)(1)(ii)]**

The Pond 10 dam is in good structural condition based on the visual inspection. No maintenance items are recommended for this impoundment rather continuation of the closure process.

### **Changes in Geometry [§ 257.83(b)(2)(i)]**

There were no changes to the upstream face of the dam. Rock erosion protection is in place and in good condition at select locations around the perimeter of the pond. There were no changes to the geometry of the downstream face of the dam pond or other indications of structural weakness. Slopes have no indication of deformation or other indicators of instability. Some deterioration of vegetative cover and rutting was observed on the southwest area of the dam.

### **Instrumentation [§ 257.83(b)(2)(ii)]**

These ponds are equipped with a staff gauge mounted on the primary outlet and settlement monuments. Review of data collected from settlement monuments does not indicate settlement or misalignment.

**Structural Weakness [§ 257.83(b)(2)(vi)]**

No indication was found of an actual or potential structural weakness of the CCR unit or any existing condition that was disrupting or had the potential to disrupt the operation and safety of the CCR unit and appurtenant structures.

**Other Changes [§ 257.83(b)(2)(vii)]**

This impoundment had been dewatered and most of the impounded fly ash had been removed. No changes were found to the CCR unit which could affect the stability or operation of the impounding structure since the previous annual inspection.

**Visual Inspection of Hydraulic Structures [§ 257.83(b)(1)(iii)]**

The Hydraulic structure for this impoundment is in good condition. Much of the outlet piping for this structure is above ground. As noted in previous inspections no further movement of the pond outlet pipe has occurred.

**Water and Material Depths and Volumes**

[§ 257.83(b)(2)(iii), § 257.83(b)(2)(iv), § 257.83(b)(2)(v)]

Physical Parameters of Impoundment		
Depth of water	0	Feet
Maximum Depth of water	37	Feet
Minimum Depth of Water	0	Feet
Elevation of water	N/A	Feet
Storage Capacity	1,330,000	Cubic Yards, Crest Full Volume
Volume of water	40,000	Cubic Yards
Volume of CCR	119,000	Cubic Yards

## Appendix A

# CCR Rule Requirements for Impoundment Annual Inspections

**257.83 (b)** Annual inspections by a qualified professional engineer.

(1) If the existing or new CCR surface impoundment or any lateral expansion of the CCR surface impoundment is subject to the periodic structural stability assessment requirements under § 257.73(d) or § 257.74(d), the CCR unit must additionally 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 inspection must, at a minimum, include:

- (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.

(2) *Inspection report.* The qualified professional engineer must prepare a report following each inspection that addresses the following:

- (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.

## **Appendix B**

### **Reference Documents Reviewed**

- ❖ Operation Maintenance and Inspection Manual
- ❖ Emergency Action Plan
- ❖ Pond Design Manual
- ❖ Previous inspection reports
  - Seven-day structural inspections
  - ODNR 2013, 2018
  - CHA 2010
  - CEC 2009
- ❖ Drawings
  - 300-46-1172 (20 sheets)

**Appendix C**  
**Inspection Check List**

# Dam Field Inspection Report

**DAM/IMPOUNDMENT ANNUAL FIELD INSPECTION FORM**

Unit Name: Pond 10

Facility Name: J.M. Stuart Station

ODNR File No.: 8535-011

CCR Unit

ACTION

ODNR Hazard Classification:  I  II  III  IV  N/A

Impoundment Type:  Incised  Upland  Lake

Description: Located on the west side of Landfill along the plant entrance road. This Pond was designed by URS. Embankments are bottom ash core with a clay liner.

Inspection Date(s): November 21, 2019

Weather/Surface Conditions During Inspection: Cloudy, with temperatures in the 40's. Ground surface is dry.

Freeboard: Pond is nearly empty of water

NONE  
 MONITOR  
 MAINTENANCE  
 ENGINEER

**UPSTREAM SLOPE**      Gradient: Horizontal: 2.5    Vertical: 1    (est. meas.)

**VEGETATION**

Trees:

DESCRIPTION AND LOCATION: Few trees along the incised bank and in the deposited ash. No trees in the pond dam.

Brush:

DESCRIPTION AND LOCATION:

Ground Cover:

DESCRIPTION: As the water and most of the ash has been removed from the impoundment the upstream slope below the former waterline is unvegetated.

CONDITION: Good condition on the upper portion of the slope. No cover on the lower portion of the slope.

**SLOPE PROTECTION**

TYPE or NONE: Riprap in select areas

DESCRIPTION: Riprap, 3"-12"

CONDITION: Good condition.

**EROSION:**

DESCRIPTION AND LOCATION: Significant erosion on the lower portion of the slope where it is not vegetated. The upper portion of the shoreline is stabilized with vegetation or stone.

**INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)**

SLIDES/SLOUGHS:

DESCRIPTION AND LOCATION:

CRACKS:

DESCRIPTION AND LOCATION:

BULGES

DESCRIPTION AND LOCATION:

OTHER

DESCRIPTION AND LOCATION:

**OTHER (rodent burrows, ruts, etc.)**

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

**CREST**      Length: 3,748'    Width: 15' design    (est. meas.)

**GROUND COVER:**

DESCRIPTION: Dense graded stone (ODOT 304)

CONDITION: Good

**EROSION**

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
RUTS: Some shallow rutting on the crest from vehicle traffic.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
POT HOLES:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
MONITORING INSTRUMENTATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Staff gauge at the outlet structure, settlement monuments, settlement monuments				
CONDITION: good condition				
ALIGNMENT:				
CONDITION: Review of settlement monument survey indicates no deflection horizontally or vertically.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OTHER (rodent burrows, ruts, etc.)				
DESCRIPTION AND LOCATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>DOWNSTREAM SLOPE</b> Gradient: Horizontal: 2.5 Vertical: 1 (est. meas.)				
VEGETATION				
Trees:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Brush:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
Ground Cover:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Grass				
CONDITION: Good condition.				
EROSION	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
SLIDES/SLOUGHS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
BULGES	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
OTHER	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
SEEPAGE/WET AREA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
EMBANKMENT DRAINS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Toe drains are provided to control pore pressure within the dam.				
CONDITION: Good, drains are clear.				
MONITORING INSTRUMENTATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: none				



ACTION

NONE  
MONITOR  
MAINTENANCE  
ENGINEER

CONDITION:

OTHER (rodent burrows, ruts, etc.)

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

DESCRIPTION AND LOCATION:

**HYDRAULIC STRUCTURES**

STRUCTURE:

DESCRIPTION: Principle/Emergency Spillway

INLET

DESCRIPTION: Concrete structure with removable steel channel stop logs used to maintain water level during operation.

CONDITION: Good condition.

OBSTRUCTION NOTED: ( YES  NO) DESCRIBE IF YES:

CONDUIT

DESCRIPTION: One 30 inch HDPE pipe running along the west, south and east sides of pond 3A

CONDITION: Good condition; however, there is some restriction in the pipe caused by ash deposits from pond dewatering.

SEEPAGE NOTED: ( YES  NO) DESCRIBE IF YES:

OUTLET

DESCRIPTION: Discharges into a pool area of Pond 6

CONDITION: Good condition.

EROSION NOTED: ( YES  NO) DESCRIBE IF YES:

## **Appendix D**

### **CCR Unit Maintenance Recommendations**

1. Repair erosion to the upstream slope and provide temporary seeding if the dam removal will not continue in 2020.

### **Continued Monitoring**

1. Monitor erosion on the lower portion of the upstream slope.
2. Monitor rutting in crest from vehicle traffic.