

**2016**

**J.M. Stuart Station  
Ash Pond 6 Annual Inspection**

ODNR File No.: 8535-013

The Dayton Power & Light Company



**Prepared by:  
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The Dayton Power & Light Company**

**Date: December 21, 2016**

## **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 OAC 1501-21.

## **Statement of Qualifications**

I am a practicing Civil/Geotechnical Engineer registered with the State of Ohio employed by the Dayton Power & Light Company. 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**

Pond 6 is a partially-incised, upland reservoir that was constructed in 1973 as an ash sluice pond. The pond was partially re-excavated in c1983 to elevation 523.0 (indicated on drawing 300-46-1101 as 6A) and now serves as a collection pond for ash sluicing water from Ponds 3A, 7 and 10, coal storage area drainage, and Landfill 11 storm water, contact water and leachate. The original pond has an area of 36.7 acres at the crest, is 31-feet deep (the re-excavated depth is 10.5 feet) and has a volume of 1,390 acre-feet to the crest. 18.6 acres of this pond are permanently filled leaving an operating area of 18.1 acres and volume of 308 acre-feet to the crest. The Maximum Operating Level of this pond is three feet below the crest.

The outlet is a concrete structure with adjustable weirs which discharges through the pH treatment building into the 7A portion of Pond 7. A standpipe with a sluice gate is located along the east dam which discharges to NPDES Outfall 013. The elevation of this standpipe is 530.32 feet per the 2013 survey. (Drawing 300-46-1315 sheet 1 indicates that the elevation of this standpipe is 530.50 feet.)

The east dam (the only exposed dam) was rehabilitated and re-graded in 2010.

### **Periodic Inspections**

A thorough review of weekly facility inspections since the previous report was conducted. These periodic inspections do not indicate any structural weakness or concerns.

### **Previous Structural Assessments**

Structural assessments from previous years reviewed were Ponds 3A, 5, 6 & 7 Slope Stability Investigation, BBC&M, 2010, and Pond 5 Initial Periodic Structural Stability Assessment prepared by Haley & Aldrich, 2016.

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

The Pond 6 dam is in good structural condition based on the visual inspection. No maintenance items are noted for this impoundment.

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

There were no changes to the upstream face of the dam. Rock/concrete rubble erosion protection is in place and in good condition on the west interior slope and bottom ash fill on the south and west sides. The south dam of the pond is shared with Pond 7 which was full at the time of inspection preventing inspection of the majority of the slope. The top of the dam is showing some wave erosion which is discussed in the Pond 7 Report. The east dam is in very good condition and is very well maintained. 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.

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

Pond 7 is equipped with a staff gauge near the pH building. This gauge is in good condition. Three ground water monitoring wells were added for this impoundment. One well was added at the south end of the east dam and two in the south dam.

**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)]**

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 structures for this pond consist of a concrete flume with adjustable underflow/overflow gates to control exit flow. This flume directs water through the pH building and is then carried to Pond 7A through a four-foot diameter corrugated metal pipe. The concrete and gates are in good conditions showing no signs of deterioration. The corrugated metal pipe was inspected in 2015 by Consulting Services Incorporated using a robotic video camera and was determined to be in good condition. No indication of deterioration of the conduit was discovered in this inspection.

This pond also has an emergency overflow structure which discharges into the Pond 7A outlet structure. The outlet structure is a metal riser with an underflow baffle. The baffle is showing indications of corrosion but is still in serviceable condition.

**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 <sup>1</sup>	6	Feet
Min. depth of water <sup>1</sup>	4.5	Feet
Max. depth of water <sup>1</sup>	7.5	Feet
Elevation of water	527.50	Feet (review of weekly inspection reports show normal fluctuation of the depth/water level)
Storage Capacity	2,240,000	Cubic Yards ,Crest Full Volume
Volume of water	410,000	Cubic Yards
Volume of CCR	1,750,000	Cubic Yards

<sup>1</sup>to re-excavated bottom of pond

# Appendix A

## CCR Rule Requirements for Impoundment Annual Inspections

### §257.83 Inspection requirements for CCR surface impoundments.

(a) *Inspections by a qualified person.*

- (1) All CCR surface impoundments and any lateral expansion of a CCR surface impoundment must be examined by a qualified person as follows:
  - (i) At intervals not exceeding seven days, inspect 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;
  - (ii) At intervals not exceeding seven days, inspect the discharge of all outlets of hydraulic structures which pass underneath the base of the surface impoundment or through the dike of the CCR unit for abnormal discoloration, flow or discharge of debris or sediment; and
  - (iii) At intervals not exceeding 30 days, monitor all CCR unit instrumentation.
- (2) The results of the inspection by a qualified person must be recorded in the facility's operating record as required by §257.105(g)(5).
  - (i) *(2) Timeframes for inspections by a qualified person—(i) Existing CCR surface impoundments.* The owner or operator of the CCR unit must initiate the inspections required under paragraph (a) of this section no later than October 19, 2015.
  - (ii) *New CCR surface impoundments and any lateral expansion of a CCR surface impoundment.* The owner or operator of the CCR unit must initiate the inspections required under paragraph (a) of this section upon initial receipt of CCR by the CCR unit.

(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.
- (3) *Timeframes for conducting the initial inspection—*

- (i) *Existing CCR surface impoundments.* The owner or operator of the CCR unit must complete the initial inspection required by paragraphs (b)(1) and (2) of this section no later than January 19, 2016.
  - (ii) *New CCR surface impoundments and any lateral expansion of a CCR surface impoundment.* The owner or operator of the CCR unit must complete the initial annual inspection required by paragraphs (b)(1) and (2) of this section is completed no later than 14 months following the date of initial receipt of CCR in the CCR unit.
- (4) *Frequency of inspections.*
- (i) Except as provided for in paragraph (b)(4)(ii) of this section, the owner or operator of the CCR unit must conduct the inspection required by paragraphs (b)(1) and (2) of this section on an annual basis. The date of completing the initial inspection report is the basis for establishing the deadline to complete the first subsequent inspection. Any required inspection may be conducted prior to the required deadline provided the owner or operator places the completed inspection report into the facility's operating record within a reasonable amount of time. In all cases, the deadline for completing subsequent inspection reports is based on the date of completing the previous inspection report. For purposes of this section, the owner or operator has completed an inspection when the inspection report has been placed in the facility's operating record as required by §257.105(g)(6).
  - (ii) (ii) In any calendar year in which both the periodic inspection by a qualified professional engineer and the quinquennial (occurring every five years) structural stability assessment by a qualified professional engineer required by §§257.73(d) and 257.74(d) are required to be completed, the annual inspection is not required, provided the structural stability assessment is completed during the calendar year. If the annual inspection is not conducted in a year as provided by this paragraph (b)(4)(ii), the deadline for completing the next annual inspection is one year from the date of completing the quinquennial structural stability assessment.
- (5) If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.
- (c) The owner or operator of the CCR unit must comply with the recordkeeping requirements specified in §257.105(g), the notification requirements specified in §257.106(g), and the internet requirements specified in §257.107(g).

[80 FR 21468, Apr. 17, 2015, as amended at 80 FR 37992, July 2, 2015]

## **Appendix B**

### **Reference Documents Reviewed**

- ❖ Operation Maintenance and Inspection Manual
- ❖ Emergency Action Plan
- ❖ Ponds 3A, 5, 6 & 7 Slope Stability Investigation, BBC&M, 2010
- ❖ Pond 6 Initial Periodic Structural Stability Assessment, Haley & Aldrich, 2016
- ❖ Previous inspections reports
  - CEC 2009
  - ODNR 2009, 2013
  - CHA 2010
  - DP&L 2015
- ❖ Drawings
  - 300-12-1020B
  - 300-12-1020C
  - 300-12-1315 sh 1
  - 300-12-1315 sh 2
  - 300-12-1316 sh 1
  - 300-12-1315 sh 2
  - 300-12-1317
  - 300-12-1318 sh 1
  - 300-12-1318 sh 2
  - 300-12-1319
  - 300-12-7147 sh 1
  - 300-12-7147 sh 2
  - 300-12-7147 sh 3
  - 300-46-1104
  - 300-46-1105
  - 300-46-1106

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

# Dam Field Inspection Report

**DAM/IMPOUNDMENT ANNUAL FIELD INSPECTION FORM**

Unit Name: Pond 6

Facility Name: J.M. Stuart Station

ODNR File No.: 8535-013

CCR Unit

ACTION

ODNR Hazard Classification:  I  II  III  IV  N/A

Impoundment Type:  Incised  Upland  Lake

Description: Partially incised - upland impoundment constructed with an earthen dam. This pond was originally a fly ash sluice pond which was closed. A portion of the pond was re-excavated c1983 to be used as a secondary settling pond fly ash sluice water.

Inspection Date(s): December 2016

Weather/Surface Conditions During Inspection: mostly cool and dry.

Freeboard: 5.3'

NONE  
MONITOR  
MAINTENANCE  
ENGINEER

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

**VEGETATION**

Trees:

DESCRIPTION AND LOCATION:

Brush:

DESCRIPTION AND LOCATION:

Ground Cover:

DESCRIPTION: Concrete rubble/riprap/bottom ash

CONDITION: good

**SLOPE PROTECTION**

TYPE or NONE: Concrete rubble/riprap/bottom ash

DESCRIPTION: The east slope is protected with a combination of concrete rubble and riprap. The south slope is protected with bottom ash (approximately 40 in width). West and north shores are incised.

CONDITION: Good. On the east slope on the stone/concrete is stable and not beaching. Some beaching occurs on the south side in the bottom ash fill but is too far removed to affect the dam.

**EROSION:**

DESCRIPTION AND LOCATION:

**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: 3,985    Width: 16' design, 40 ft effective    (est. meas.)

**GROUND COVER:**

DESCRIPTION: Dense graded stone (ODOT 304)

CONDITION: Good

**EROSION**

DESCRIPTION AND LOCATION:

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
INSTABILITIES: (SLIDES, CRACKS, BULGES, etc.)				
CRACKS:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION AND LOCATION:				
RUTS	<input checked="" type="checkbox"/>	<input 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, two monitoring wells in the south dam.				
CONDITION: good condition				
ALIGNMENT:				
CONDITION: Alignment of dam 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: 2.75    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: Grass cover is dense and well maintained on the east slope. The south dam is shared with Pond 7 and will be addressed in the Pond 7 inspection,				
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:				
CONDITION:				
MONITORING INSTRUMENTATION:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: One monitoring well added at the toe of the east dam near the south end.				
CONDITION: good condition				

	ACTION			
	NONE	MONITOR	MAINTENANCE	ENGINEER
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>HYDRAULIC STRUCTURES</b>				
STRUCTURE:				
DESCRIPTION: Principle/Emergency Spillway, added c1980				
INLET	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Reinforced concrete channel with underflow/overflow gates.				
CONDITION: Structure and gates are in good condition.				
OBSTRUCTION NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				
CONDUIT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: 48 inch bituminous coated corrugated metal pipe.				
CONDITION: An internal inspection was conducted int 2015 with a robotic video camera and found to be in good condition. There are no indications from the surface or water flow indicating any degradation.				
SEEPAGE NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				
OUTLET	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Concrete headwall with sluice gate.				
CONDITION: Headwall in good condition. Sluice gate permanently fixed in open position				
EROSION NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				
STRUCTURE:				
DESCRIPTION: Emergency Overflow - penetrates the dam between Ponds 6 and 7A and outlets into the pond 7A outlet, inlet structure.				
INLET	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Metal riser with metal skimmer				
CONDITION: Good condition.				
OBSTRUCTION NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				
CONDUIT	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: 48 inch bituminous coated corrugated metal pipe				
CONDITION: Pipe could not be inspected internally but is not leaking.				
SEEPAGE NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				
OUTLET	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DESCRIPTION: Outlets into the reinforced concrete inlet structure of the Pond 7A outlet. A sluice gate is located at the end of the pipe which is locked open.				
CONDITION: Good condition with no spalling or exposed reinforcing.				
EROSION NOTED: ( <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO) DESCRIBE IF YES:				

## **Appendix D**

### **CCR Unit Maintenance Recommendations**

1. No maintenance recommendations are noted for this impoundment.

### **Continued Monitoring**

1. No monitoring issues were noted for this impoundment.