

# DAM & DIKE INSPECTION REPORT

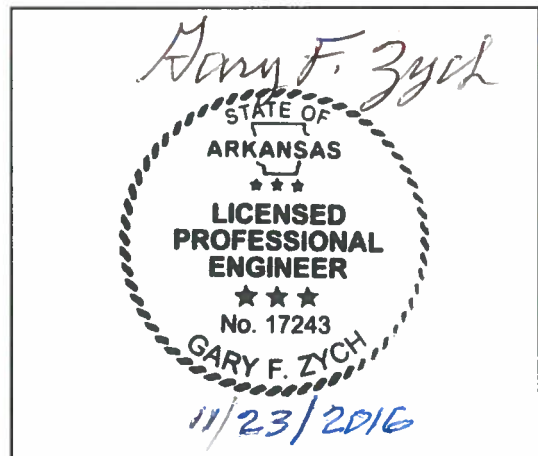
## Primary Ash Pond Dam Flint Creek Power Plant Gentry, AR

**INSPECTION DATE** November 3, 2016

**PREPARED BY** Gary F. Zych **DATE** 11/21/2016  
Gary F. Zych, P.E.

**REVIEWED BY** Daniel W. Pizzano **DATE** 11/23/2016  
Daniel W. Pizzano, P.E.

**APPROVED BY** Gary F. Zych **DATE** 11/23/2016  
Gary F. Zych, P.E.

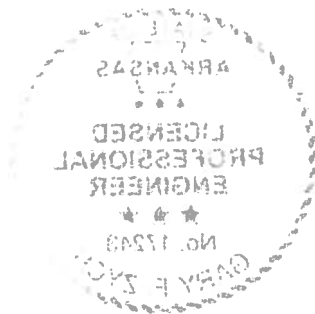


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## **INTRODUCTION**

AEPSC (American Electric Power Service Corporation) Civil Engineering administers the Dam Inspection and Maintenance Program (DIMP) at AEP facilities. As part of the DIMP, staff from the geotechnical engineering section conducts dam and dike inspections on a periodic basis. Dan Pizzino, P.E. and Gary Zych, P.E., performed the inspection of the primary ash pond dam at the Flint Creek Power Plant. This report is a summary of the inspection and an assessment of the general condition of the facility.

Mr. H.E. Rice, plant staff, also participated in the inspection. The inspection was performed on November 3, 2106. Weather conditions were clear and temperatures were in the lower 80s°F. Rainfall for the 7 days preceding the inspection was negligible per the plant records.

Figure 1 provides a plan view of the primary ash pond. The primary ash pond dam is an 820-foot long cross-valley dam on an unnamed tributary to Little Flint Creek. The primary ash pond is used for the settling and storage of bottom ash, and is considered a CCR surface impoundment. Periodically, the bottom ash is excavated/dredged for beneficial use. Flow from the reservoir discharges into the Secondary pond. The maximum depth of saturated ash noted in the table below does not fluctuate throughout the year.

## **GENERAL INFORMATION**

Dam or Reservoir:	Primary Ash Pond
Owner:	Southwestern Electric Power Co.
Type of Dam:	Earth-Fill Structure
Date of Construction:	1978
D/S Hazard:	Low

## **LOCATION**

County:	Benton County
General Location:	Approximately 4.5 miles north of Siloam Springs, AR
Stream and Basin:	Unnamed tributary to Little Flint Creek; Flint Creek Basin

## **SIZE – PRIMARY DAM**

Dam Crest Elevation:	1,155 feet
Maximum Water Elev/depth:	1,146.3/26.3 feet
Minimum Water Elev/depth:	1,143/23 feet
Current Water Elev/depth:	<1,145/25 feet
Dam Height: <sup>1</sup>	45 feet
Surface Area:	24 acres (current at el. 1145)
Reservoir Volume:	485 ac-ft (el. 1145)
Water/ash volume:	110/375 ac-ft
Ash depth (saturated):	20 ft

## **SUMMARY OF VISUAL OBSERVATIONS**

The following section is a summary of the visual inspection that was performed. Observation sheets and corresponding photographs are provided in Appendix A.

The summary of the visual observations presented herein uses terms to describe the general appearance or condition of an observed item, activity or structure. Their meaning is understood as follows:

### CONDITION OF DAM COMPONENT

- Good: A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
- Fair or Satisfactory: A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
- Poor: A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.

### SEVERITY OF CONDITION

- Minor: A reference to an observed condition (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
- Significant: A reference to an observed condition (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually these conditions have been identified in previous inspections, but have not been corrected.
- Excessive: A reference to an observed condition (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

**DEFICIENCY:** A “deficiency” is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. A fact sheet defining and describing a deficiency is included in this report after Figure 1.

## **PRIMARY ASH DAM (refer to Figure 1)**

**Changes in Geometry** – there have been no changes to the geometry of the dam since the last annual inspection.

### **Spillway Structures**

The principal spillway at the primary impoundment is a concrete drop-inlet structure with stop logs used to control the pool elevation. The spillway was in generally fair condition (photo 1).

The emergency spillway at the primary impoundment is an incised channel in natural ground with a concrete weir control section, 1 ft. in height, across the channel width. The spillway was in generally fair condition at the time of inspection (photo 2). The spillway appeared to be generally stable.

### **Upstream Slope**

The upstream slope of the primary dam was observed to be in satisfactory condition from the visual riprap up to the crest (photo 3). Since the pond is used for settling of solids, there is an accumulation of bottom ash over the upstream slope. This area has naturally revegetated but is not mowed (photo 4).

### **Crest**

The crest surface of the primary dam is composed of hard-packed earth topped with bottom ash (photo 5). Vehicular traffic is maintained across the crest for access for monitoring. The crest is in generally satisfactory condition with no evidence of misalignment, settlement, or cracking. The rutting and erosion rills noted in the 2015 inspection report have been repaired.

### **Downstream Slope**

The downstream slope of the primary dam was in satisfactory condition (photos 6, 8). Most of the slope is covered with riprap except for the top 3-5 feet which is grassed. The woody vegetation within the riprap noted in the 2015 report have been sprayed but not all removed. About half of the downstream slope is inundated by the normal pool of the Little Flint Creek dam cooling lake.

There are several remaining small diameters trees in the riprap as noted as in photo 7. There was one animal hole that was observed in the upper slope that is grassed – observation sheet #17.

## **MONITORING INSTRUMENTATION**

There are two piezometers that were installed in the primary ash dams some time prior to the first inspection (in March 2009) of this dam under the DIMP, two at the crest of the primary

dam, identified as A1 and A2. Construction data for these wells is not available. Recording of water level readings in these piezometers began during the March 2009 inspection.

In November 2009, two additional piezometers (A3 and A4) were installed at the crest of the dam. These piezometers were installed as part of a geotechnical investigation to evaluate the stability and seepage characteristics of the dam. Water levels in the new piezometers are monitored along with the original piezometers on a monthly basis by plant personnel. The locations of the piezometers, and their corresponding IDs, are shown on Figure 1.

There have been no recorded areas of seepage from this dam and therefore, there are no instrumentation/weirs related to seepage flow.

#### **Assessment Of Recent Instrumentation Data**

The phreatic surface in the dam appears to be in the normal range based on a review of the 2016 data. These levels are consistent with previous readings and used during the stability analyses of the dikes. The water level in piezometer A4 is generally 4 feet lower than the pond level. The water levels in piezometer A4 ranged from 1139.4 – 1142.7 since the last inspection.

Piezometers A1, A2 & A3 have water levels lower than A4. This is due to the head loss through the settled solids in this area.

#### **REVIEW OF AVAILABLE INFORMATION**

In addition to the visual inspection, the new data placed in the Operating Record during 2016 was reviewed. This includes the history of construction, structural stability assessment, inflow design flood control plan, 7-day inspection and the previous annual inspection report. There were no issues noted in these data to identified or highlight any deficiencies with the primary ash pond dam.

#### **CONCLUSIONS**

Based on our visual inspection and review of the instrumentation information available, it is concluded that the primary ash pond dam was generally in fair condition at the time of inspection.

There were no signs of distress that would indicate possible instability, excessive settlement, misalignment, sloughing, or cracking of the dams.

Control of vegetation on the slopes has greatly improved since the last inspection and is adequate for inspection

There were no deficiencies noted during the inspection.

#### **RECOMMENDATIONS**

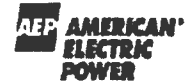
##### **Recommendations for Remedial Activities**

- none

### **Recommendations for General Maintenance and Monitoring Activities**

- Repair rodent holes flagged during the inspection and others as discovered during the 7-day inspections.
- Continue the vegetation control plan of mowing and spraying.
- Remove dead woody vegetation after spraying process.

# Coal Combustion Residual (CCR) Rule Definition of Deficiency



Geotechnical Engineering		
Prepared by: Daniel Pizzino		Rev. 2
Reviewed by: Gary Zych Pedro Amaya	Rev Date: July 25, 2016	Page 1 of 1

## 1. GENERAL

This document sets forth the definition of a “deficiency” as referenced in the CCR rule section §257.83(b)(5) Inspection Requirements for CCR Surface Impoundments and §257.84(b)(5) Inspection Requirements for CCR landfills. This definition has been assembled using the CCR rule Preamble as well as guidance from MSHA, “Qualifications for Impoundment Inspection” CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

## 2. DEFINITIONS

**DEFICIENCY** – A “deficiency” is some evidence that a dam has developed a problem that could impact the structural integrity of the dam. There are four general categories of deficiencies. These four categories are described below:

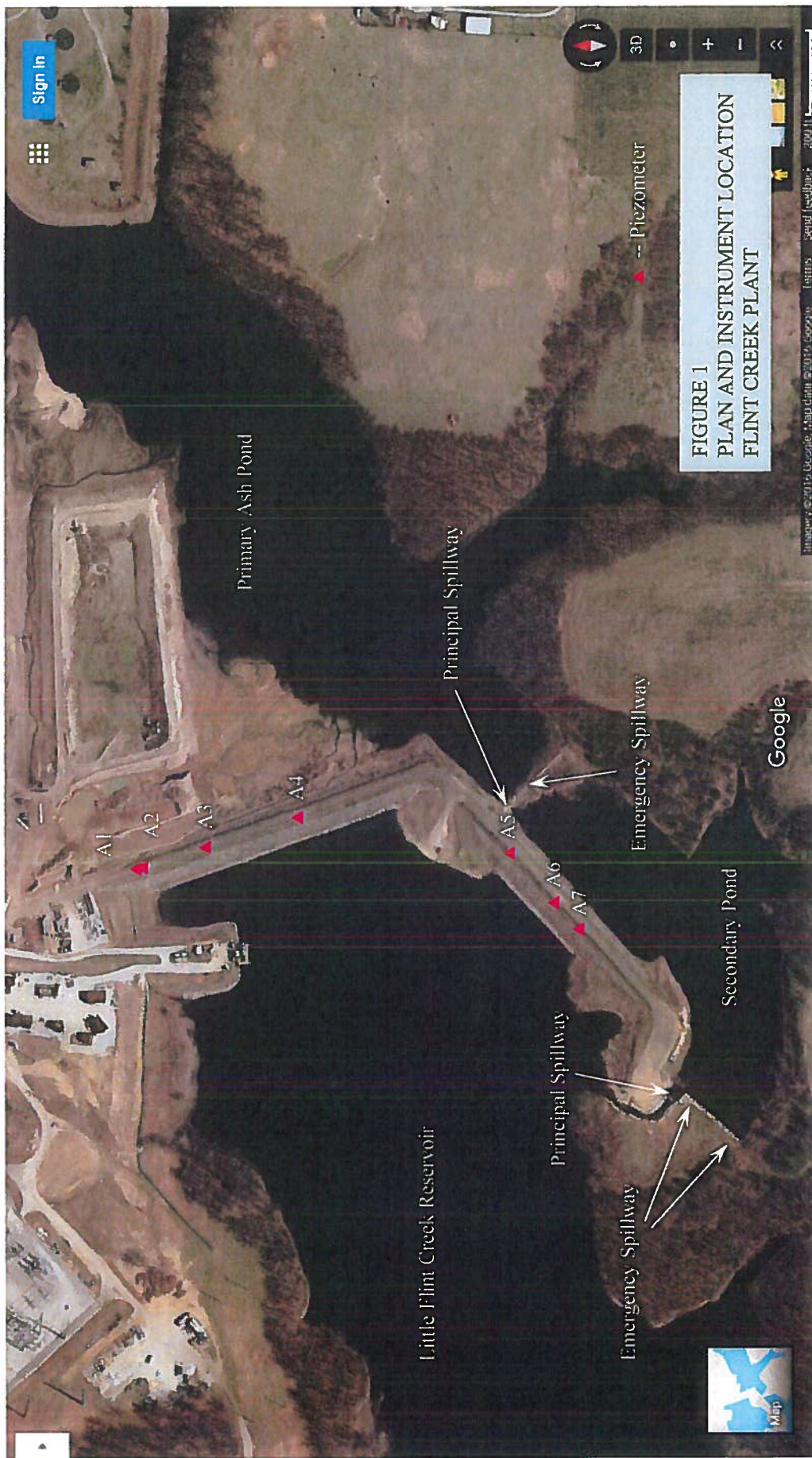
1. Uncontrolled Seepage
  - a. Uncontrolled seepage is seepage that is not behaving as the design engineer has intended. An example of uncontrolled seepage is seepage that comes through or around the embankment and is not picked up and safely carried off by a drain. Seepage that is collected by a drain can still be uncontrolled if it is not safely collected and transported, such as seepage that is not clear. Seepage that is unable to be measured and/or observe it is considered uncontrolled seepage. [Wet or soft areas are not considered as uncontrolled seepage, but can lead to this type of deficiency. These areas should be monitored frequently.]
2. Displacement of the Embankment
  - a. 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
  - a. Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.
4. Erosion
  - a. 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.

## 3. REFERENCES

Disposal of Coal Combustion Residuals from Electric Utilities, Final Rule, 40 C.F.R §257 & §261 17 April 2015.

“Qualifications for Impoundment Inspection CI-31”, U.S. Department of Labor, Mine Safety and Health Administration (MSHA), 2004.





**FIGURE 1**  
**PLAN AND INSTRUMENT LOCATION**  
**FLINT CREEK PLANT**



Photo 1 – principal spillway structure



Photo 2 – emergency spillway concrete weir



Photo 3 – upstream slope – riprap and grassed surface.



Photo 4 – upstream solids accumulation with natural vegetation



Photo 5 – crest – looking towards right abutment



Photo 6 – downstream slope – looking towards left abutment



Photo 7 – several dead woody vegetation to be removed on downstream slope.



Photo 8 – downstream slope – riprap and grassed surface

Plant Name:

Observation #:

Unit:

Date:

Observation:

Location: 

Photo #1



Photo #2



Recommendations: