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**Interstate Power and Light Company**

Lansing Generating Station  
CCR Surface Impoundment Annual Inspection Report  
154.018.020.002  
Report issued: December 9, 2019

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## Executive Summary

This annual inspection report has been prepared in accordance with the requirements of the United States Environmental Protection Agency published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR) from Electric Utilities (40 CFR Parts 257 and 261, also known as CCR Rule) and Extension of Compliance Deadlines for Certain Inactive Surface Impoundments.

This annual inspection report has been prepared to assess the condition of existing CCR surface impoundments. Primarily, the annual inspection report is focused on the structural stability of the CCR surface impoundments and to ensure that the operation and maintenance of the CCR surface impoundments is in accordance with recognized and generally accepted good engineering standards.

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## 1. INTRODUCTION

This annual inspection report has been prepared in accordance with the requirements of §257.83(b) of the United States Environmental Protection Agency (USEPA) published Final Rule for Hazardous and Solid Waste Management System - Disposal of Coal Combustion Residual (CCR), herein referenced as the CCR Rule.

### 1.1 CCR Rule Applicability

The CCR Rule requires annual inspections by a qualified professional engineer (PE) for existing CCR surface impoundments with a height of 5 feet or more and a storage volume of 20 acre-feet or more or the CCR surface impoundment has a height of 20 feet or more (40 CFR §§ 257.73(b), 257.73(d) and 257.83(b)).

### 1.2 Annual Inspection Applicability

The Interstate Power and Light Company (IPL), Lansing Generating Station (LAN) in Lansing, Iowa has one existing CCR surface impoundment that meets the requirements of Section 1.1, identified as the LAN Upper Ash Pond. The LAN Upper Ash Pond consists of five interconnected settling areas separated by intermediate dikes. Settling Area #1 is located furthest south, while Settling Area #5 is located furthest north. Figure 1 identifies the location of each of the five interconnected settling areas of the LAN Upper Ash Pond.

The CCR surface impoundment has been assigned a state identification number by the Iowa Department of Natural Resources (IDNR), which is 03-UDP-01-15.

The annual inspection of the CCR surface impoundment at LAN was completed by a qualified PE on September 10<sup>th</sup>, 2019. The annual inspection was completed to ensure that the design, construction, operation, and maintenance

of the CCR surface impoundment at LAN is consistent with recognized and generally accepted good engineering standards.

The annual inspection of the CCR surface impoundment at LAN included a review of available information regarding the status and condition of the CCR surface impoundment. The information reviewed included all relevant files available in the operating record at the time of the annual inspection, as well as the Alliant Energy CCR Rule Compliance Data and Information website entries for LAN ([ccr.alliantenergy.com](http://ccr.alliantenergy.com)). These files for the CCR surface impoundments at LAN include, but is not limited to, CCR surface impoundment design and construction information (history of construction), hazard potential classification, structural stability assessment, safety factor assessment, hydrologic and hydraulic capacities (inflow flood control plan), results of 7-day inspections and instrumentation monitoring by a qualified person, and results of the previous annual inspection.

The annual inspection also included a visual inspection of the CCR surface impoundment to identify signs of distress or malfunction of the CCR surface impoundments and appurtenant structures. Additionally, the visual inspection included hydraulic structures underlying the base of the CCR surface impoundment or passing through the dikes of the CCR surface impoundment for structural integrity and continued safe and reliable operation.

## 2. ANNUAL INSPECTION REPORTING CRITERIA

The following sub-sections address the annual inspection reporting criteria per §257.83(b)(2) of the CCR Rule for the existing CCR surface impoundment located at LAN.

### 2.1 LAN Upper Ash Pond

#### 2.1.1 Changes in Geometry (§257.83(b)(2)(i))

After conducting the annual inspection, as well as review of available information provided by LAN pertaining to the status and condition of the existing CCR surface impoundment, and discussions with LAN facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there have been no identified changes in the geometry since the previous annual inspection.

#### 2.1.2 Existing Instrumentation (§257.83(b)(2)(ii))

Instrumentation that supports the operation of the LAN Upper Ash Pond includes flow monitoring equipment to measure the flow of the discharged water. The instrumentation is located at the north end of the LAN Upper Ash Pond at Weir Box #1 and is associated with the NPDES Outfall 002 at LAN.

The flow data associated with the NPDES Outfall 002 discharge (e.g. maximum flow rate) was provided by IPL from August 1, 2018 through July 31, 2019. Reviewing the provided flow data, the maximum flow reading recorded through NPDES Outfall 002 was 3.8 million gallons per day (March 9, 2019).

IPL also provided the measured height of water above the overflow weir from August 1, 2018 through July 31, 2019. Reviewing the data, the maximum water height recorded was approximately 0.61 feet (March 9, 2019). Adding the

maximum water height to the overflow weir elevation of 648.04 feet, which was the surveyed elevation at the time of the annual inspection, the maximum water surface elevation of settling area #5 was approximately 648.65 feet.

### **2.1.3 Depth and Elevation of Impounded CCR and Water (§257.83(b)(2)(iii))**

The approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the LAN Upper Ash Pond since the previous annual inspection were determined using information that was collected during the annual inspection, as well as from historical information that was previously provided from IPL.

At the time of the annual inspection a survey was completed to determine the present surface water elevation of the CCR surface impoundment. Additionally, depth measurements from the water surface to the top of CCR/sediment were obtained to determine present depths/elevations.

The historical information provided from IPL included flow monitoring equipment data since the previous annual inspection, original design drawing contours of the LAN Upper Ash Pond prepared by Sargent & Lundy (1974), the most recent topographic survey of the LAN Upper Ash Pond (2015), and the most recent hydrographic survey of the LAN Upper Ash Pond (2015). Reviewing the information provided within the above-mentioned documents, as well as the data collected during the annual inspection, the following minimum, maximum, and present depths and elevations were approximated for the impounded CCR and water:

- LAN Upper Ash Pond - Settling Area #1
  - At the time of the annual inspection, the water surface elevation was 652.12 feet, 4.88 feet below the crest of the west embankment

of the CCR surface impoundment, which had an elevation of approximately 657 feet at the lowest point of the embankment adjacent to settling area #1.

- At the time of the annual inspection, the water depth that was measured within settling area #1 of the CCR surface impoundment varied between 9.6 feet and 11.1 feet. Although the furthest south section of the impoundment was filled with bottom ash above the normal water line, which reduced the measurements locations.
- From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 642.52 feet and 641.02 feet.

From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 17.02 feet and 18.52 feet.

- LAN Upper Ash Pond - Settling Area #2
  - At the time of the annual inspection, the water surface elevation was 651.49 feet, 4.51 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 656 feet at the lowest point of the embankment adjacent to settling area #2.



- At the time of the annual inspection, the water depth that was measured within settling area #2 of the CCR surface impoundment varied between 8.8 feet and 11.3 feet.
- From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 642.69 feet and 640.19 feet.
- From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 18.69 feet and 16.19 feet.
- LAN Upper Ash Pond - Settling Area #3
  - At the time of the annual inspection, the water surface elevation was 650.73 feet, 4.27 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 655 feet at the lowest point of the embankment adjacent to settling area #3.
  - At the time of the annual inspection, the water depth that was measured within settling area #3 of the CCR surface impoundment varied between 4.0 feet and 6.7 feet.
  - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was

measured varied between an elevation of 646.73 feet and 644.03 feet.

- From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 22.73 feet and 20.03 feet.
- LAN Upper Ash Pond - Settling Area #4
  - At the time of the annual inspection, the water surface elevation was 649.07 feet, 4.93 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 654 feet at the lowest point of the embankment adjacent to settling area #4.
  - At the time of the annual inspection, the water depth that was measured within settling area #4 of the CCR surface impoundment varied between 5.4 feet and 8.0 feet.
  - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 643.67 feet and 641.07 feet.
  - From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet.

Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 19.67 feet and 17.07 feet.

- LAN Upper Ash Pond - Settling Area #5
  - At the time of the annual inspection, the water surface elevation was 647.98 feet, 5.02 feet below the crest of the west embankment of the CCR surface impoundment, which had an elevation of approximately 653 feet at the lowest point of the embankment adjacent to settling area #5.
  - At the time of the annual inspection, the water depth that was measured within settling area #5 of the CCR surface impoundment varied between 4.1 feet to 11.5 feet.
  - From the water depth measurements at the time of the annual inspection, the elevation of the top of CCR/sediment that was measured varied between an elevation of 643.88 feet and 636.48 feet.
  - From the flow monitoring equipment associated with NPDES Outfall 002, depth measurements of water flowing above the overflow weir was provided by WPL since the previous annual inspection. The maximum water depth observed flowing above the overflow weir, during a time when no stop logs were removed, was determined to be approximately .61 feet. Adding the maximum water depth measurement to the overflow weir elevation of 648.04 feet, which was the surveyed elevation at the time of the annual

inspection, the maximum water surface elevation of settling area #5 was approximately 648.65 feet.

- o From the 1974 original design drawing contours of the LAN Upper Ash Pond, the original design bottom contour elevation of the existing CCR surface impoundment was approximately 624 feet. Comparing the results from the water depth measurements at the time of the annual inspection to the 1974 original design drawing contours, the deposition thickness varied between 19.88 feet and 12.48 feet.

#### 2.1.4 Storage Capacity of Impounding Structure (§257.83(b)(2)(iv))

The storage capacity (i.e. water volume) of the CCR surface impoundment at the time of the annual inspection was calculated based on the acreage of the CCR surface impoundment in the areas where water was present, and the approximate depth of water within those areas of the CCR surface impoundment.

From the most recent topographic and hydrographic surveys of the LAN Upper Ash Pond (2015), as well as the water depth data that was collected within each of the settling areas at the time of the annual inspection, the water surface areas and average water depths of each settling area of the CCR surface impoundment were determined to be as follows:

<b>LAN Upper Ash Pond - Settling Area ID</b>	<b>Water Surface Area (Acres)</b>	<b>Average Water Depth (Feet)</b>
Settling Area #1	0.80	10.35
Settling Area #2	0.84	9.68

Settling Area #3	0.78	5.35
Settling Area #4	0.78	6.70
Settling Area #5	7.27	7.49

Maintenance dredging of the LAN Upper Ash Pond was ceased in May 2018, therefore the storage capacity (i.e. water volume), mainly within Settling Area #1 of the CCR surface impoundment, has reduced significantly due to deposition of the CCR.

Thus, from the water surface areas and average water depth data provided above, the total water volume within the LAN Upper Ash Pond at the time of the annual inspection was approximately 129,400 cubic yards.

### 2.1.5 Volume of Impounded CCR and Water (§257.83(b)(2)(v))

The volume of impounded CCR and water (i.e. total volume, not including freeboard) within the LAN Upper Ash Pond at the time of the annual inspection was determined using information that was collected during the annual inspection, as well as from historical information that was previously provided from IPL. Historical information provided from IPL included original design drawing contours of the LAN Upper Ash Pond prepared by Sargent & Lundy (1974), the most recent topographic survey of the LAN Upper Ash Pond (2015), and the most recent hydrographic survey of the LAN Upper Ash Pond (2015).

The surveyed elevation of the water surface within the LAN Upper Ash Pond at the time of the annual inspection varied between the five settling areas. Therefore, the volume of impounded CCR and water, where water was present, was determined individually for each of the five settling areas. In addition to

the volume of CCR and water in the areas where water was present, the volume of impounded CCR located outside the footprint of the water surface of the settling areas was determined. These additional areas included the intermediate dikes located between the five settling areas.

From the available information, the total volume, not including freeboard, of impounded CCR and water within the LAN Upper Ash Pond at the time of the annual inspection was approximately 558,300 cubic yards.

#### **2.1.6 Structural Weaknesses and Disruptive Conditions (§257.83(b)(2)(vi))**

After review of available information provided by LAN pertaining to the status and condition of the existing CCR surface impoundment, discussions with LAN facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, as well as conducting the on-site visual inspection of the existing CCR surface impoundment, there have been no identified appearances of an actual or potential structural weakness of the existing CCR surface impoundment. Additionally, there were no identified issues with the structural integrity of the hydraulic structure (NPDES Outfall 002) associated with the LAN Upper Ash Pond.


Regarding the existing conditions of the LAN Upper Ash Pond, there were no existing conditions identified along the upstream and downstream slopes of the embankments that were disrupting or have the potential to disrupt the operation and safety of the existing CCR surface impoundment.

### **2.1.7 Other Changes Affecting Stability or Operation of Impounding Structure (§257.83(b)(2)(vii))**

After review of available information provided by LAN pertaining to the status and condition of the existing CCR surface impoundment, as well as discussions with LAN facility personnel who oversee and maintain the operation, maintenance, and inspection activities of the existing CCR surface impoundment, there has been no identified changes since the previous annual inspection that have potentially affected the operation of the LAN Upper Ash Pond.

### 3. CERTIFICATION

To meet the requirements of 40 CFR 257.83(b), I Mark W. Loerop hereby certify that I am a licensed professional engineer in the State of Iowa; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in 40 CFR 257.83(b).

By:   
Name: MARK LOEROP  
Date: DECEMBER 9, 2019





## Figures

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*Figure 1: LAN Upper Ash Pond Settling Areas*

CCR Surface Impoundment  
Annual Inspection Report

LOWER POND  
CLOSED SEPTEMBER 2015



SETTLING AREA #5

SETTLING AREA #4

SETTLING AREA #3

SETTLING AREA #2

SETTLING AREA #1

LAN UPPER ASH POND  
AERIAL PHOTOGRAPH  
NOT TO SCALE

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REV	DATE	BY	DESCRIPTION



SCALE:	AS SHOWN
DATE:	11-19-18
DRAWN BY:	JFD
CHKD BY:	CTS
APRVD BY:	MWL

CLIENT / LOCATION	ALLIANT ENERGY-INTERSTATE POWER AND LIGHT COMPANY LANSING GENERATING STATION LANSING, IOWA
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DRAWING DESCRIPTION	SETTLING AREAS CCR SURFACE IMPOUNDMENT (EXISTING) - LAN UPPER ASH POND
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JOB	154.018.017.002
SHT.	FIGURE 1
DWG.	154.018.017.002-D1