



solutions and action

Interstate Power and Light Company

Lansing Generating Station
CCR Surface Impoundment Annual Inspection Report
154.018.017.002
Report issued: November 28, 2018

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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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Figure 1: LAN Upper Ash Pond Settling Areas

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 10th, 2018. 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). 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 for 2018 (January 27, 2018 through October 01, 2018). Reviewing the provided flow data, the maximum flow reading recorded through NPDES Outfall 002 was 4.12 million gallons per day (May 2018).

IPL also provided the measured height of water above the overflow weir for 2018 (January 27, 2018 through October 01, 2018). Reviewing the data, the maximum water height recorded was approximately 0.62 feet (May 2018).

Adding the maximum water height to the overflow weir elevation of 647.99 feet, which was the surveyed elevation at the time of the prior annual inspection in 2017, the maximum water surface elevation of settling area #5 was approximately 648.61 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. Note that the annual inspections that were previously completed in 2016 and 2017 included the collection of field data such as on-water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. Based on the information obtained during the prior annual inspections, it was determined that physical measurements of the LAN Upper Ash Pond would not be required on an annual basis due to the minimal changes that have been observed within the CCR surface impoundment. Therefore, on-water GPS depth measurement data collected during the 2017 annual inspection was used in conjunction with field data collected during the annual inspection as well as with information provided by IPL during the annual inspection to approximate minimum, maximum, and present depths and elevations of the impounded CCR and water in the LAN Upper Ash Pond.

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 653.34 feet, 3.66 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 prior annual inspection in 2017, the water depth that was measured within settling area #1 of the CCR surface impoundment varied between 9.9 feet and 14.9 feet.

The water surface elevation at the time of the annual inspection was approximately 0.02 feet higher than the water surface during the 2017 annual inspection, therefore, the water depths within the CCR surface impoundment would vary between 9.92 feet and 14.92 feet.

- From the water depth measurements that were collected at the time of the prior annual inspection in 2017, the elevation of the top of CCR/sediment that was measured varied between an elevation of 643.42 feet and 638.42 feet.

The elevation of the top of CCR in the southern/eastern portion of settling area #1 was observed to be filled in to the water surface which had an elevation of 653.34 feet. An area in the very southeastern corner of settling area #1 was observed to be filled in with CCR up to the surrounding grade which had an approximate elevation of 657 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. The depth of settling area #1 of the CCR surface impoundment varied between an elevation of 643.42 feet and 638.42 feet in the area where water was present. 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 19.42 feet and 14.42 feet.

Deposition thickness in the southern/eastern portion of settling area #1, where CCR was observed at the water surface, was approximately 29.35 feet. Deposition thickness in an area in the very southeastern corner, where CCR was observed at the surrounding grade elevation of 657 feet, was approximately 33 feet.

- LAN Upper Ash Pond - Settling Area #2
 - At the time of the annual inspection, the water surface elevation was 652.52 feet, approximately 0.02 feet higher in elevation than that observed during the 2017 annual inspection. The water surface elevation at the time of the annual inspection was approximately

3.48 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.

- o At the time of the prior annual inspection in 2017, the water depth that was measured within settling area #2 of the CCR surface impoundment varied between 9.45 feet and 12.3 feet.

The water surface elevation at the time of the annual inspection was approximately 0.02 feet higher than the water surface during the 2017 annual inspection, therefore, the water depths within the CCR surface impoundment would vary between 9.47 feet and 12.32 feet.

- o From the water depth measurements that were collected at the time of the prior annual inspection in 2017, the elevation of the top of CCR/sediment that was measured varied between an elevation of 643.05 feet and 640.2 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. The depth of settling area #2 of the CCR surface impoundment varied between an elevation of 643.05 feet and 640.2 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 19.05 feet and 16.2 feet.

- LAN Upper Ash Pond - Settling Area #3
 - At the time of the annual inspection, the water surface elevation was 651.76 feet, approximately 0.11 feet higher in elevation than that observed during the 2017 annual inspection. The water surface at the time of the annual inspection was approximately 3.24 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 prior annual inspection in 2017, the water depth that was measured within settling area #3 of the CCR surface impoundment varied between 6.9 feet and 7.3 feet.

The water surface elevation at the time of the annual inspection was approximately 0.11 feet higher than the water surface during the 2017 annual inspection, therefore, the water depths within the CCR surface impoundment would vary between 7.01 feet and 7.41 feet.

- From the water depth measurements that were collected at the time of the prior annual inspection in 2017, the elevation of the top of CCR/sediment that was measured varied between an elevation of 644.75 feet and 644.35 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. The depth of settling area #3 of the CCR surface impoundment varied between an elevation of 644.75 feet and 644.35 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 20.75 feet and 20.35 feet.

- LAN Upper Ash Pond - Settling Area #4
 - At the time of the annual inspection, the water surface elevation was 650.00 feet, approximately 0.05 feet higher in elevation than that observed during the 2017 annual inspection. The water surface at the time of the annual inspection was approximately 4.0 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 prior annual inspection in 2017, the water depth that was measured within settling area #4 of the CCR surface impoundment varied between 6.4 feet and 9 feet.

The water surface elevation at the time of the annual inspection was approximately 0.05 feet higher than the water surface during the 2017 annual inspection, therefore, the water depths within the CCR surface impoundment would vary between 6.45 feet and 9.05 feet.

- From the water depth measurements that were collected at the time of the prior annual inspection in 2017, the elevation of the top of CCR/sediment that was measured varied between an elevation of 643.55 feet and 640.95 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. The depth of settling area #4 of the CCR surface impoundment varied between an elevation of 643.55 feet and 640.95 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 19.55 feet and 16.95 feet.
- LAN Upper Ash Pond - Settling Area #5
 - At the time of the annual inspection, the water surface elevation was 648.39 feet, approximately 0.03 feet lower in elevation than that observed during the 2017 annual inspection. The water surface at the time of the annual inspection was approximately 4.61 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 prior annual inspection in 2017, the water depth that was measured within settling area #5 of the CCR surface impoundment varied between 4 feet to 12.2 feet.

The water surface elevation at the time of the annual inspection was approximately 0.03 feet lower than the water surface during the 2017 annual inspection, therefore, the water depths within the CCR surface impoundment would vary between 3.97 feet and 12.17 feet.

- From the water depth measurements that were collected at the time of the prior annual inspection in 2017, the elevation of the top of CCR/sediment that was measured varied between an elevation of 644.42 feet and 636.22 feet.
- From the flow monitoring equipment associated with NPDES Outfall 002, depth measurements of water flowing above the overflow weir was provided by IPL 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 0.62 feet. Adding the maximum water depth measurement to the overflow weir elevation of 647.99 feet, which was the surveyed elevation at the time of the prior annual inspection in 2017, the maximum water surface elevation of settling area #5 was approximately 648.61 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. The depth of settling area #5 of the CCR surface impoundment varied between an elevation of 644.42 feet and 636.22 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 20.42 feet and 12.22 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.

At the time of the annual inspection a survey was completed to determine the surface water elevations of the different settling areas of the CCR surface impoundment. Note that the annual inspections that were previously completed in 2016 and 2017 included the collection of field data such as on-water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. Based on the information obtained during the prior annual inspections, it was determined that physical measurements of the LAN Upper Ash Pond would not be required on an annual basis due to the minimal changes that have been observed within the CCR surface impoundment. Therefore, on-water GPS depth measurement data collected during the 2017 annual inspection was used in conjunction with field data collected during the annual inspection to approximate the storage capacity of the CCR surface impoundment. The approximate water depth measurements of the CCR surface impoundment at the time of the annual inspection were determined based on the difference in water elevation data at the time of the annual inspection and prior 2017 annual inspection. The water elevation data was then compared to the measured water depths collected at the time of the prior annual inspection in 2017.

From the most recent topographic and hydrographic surveys of the LAN Upper Ash Pond (2015), the difference in water elevation data at the time of the annual inspection and prior 2017 annual inspection, water depth data that was collected at the time of the prior annual inspection in 2017, as well as from observations during 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:

LAN Upper Ash Pond - Settling Area ID	Water Surface Area (Acres)	Average Water Depth (Feet)
Settling Area #1	0.75	13.15
Settling Area #2	0.84	10.53
Settling Area #3	0.78	7.21
Settling Area #4	0.78	7.75
Settling Area #5	7.27	7.67

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 139,000 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 and the prior annual inspection in 2017, information that was provided by IPL 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 surface water elevations of the different settling areas of the CCR surface impoundment. Note that the annual inspections that were previously completed in 2016 and 2017 included the collection of field data such as on-

water GPS depth measurements from the water surface to the top of CCR/sediment to determine depths/elevations. Based on the information obtained during the prior annual inspections, it was determined that physical measurements of the LAN Upper Ash Pond would not be required on an annual basis due to the minimal changes that have been observed within the CCR surface impoundment. Therefore, on-water GPS depth measurement data collected during the 2017 annual inspection was used in conjunction with field data collected during the annual inspection to approximate the volume of impounded CCR and water within the CCR surface impoundment.

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, as well as the areas where CCR maintenance dredging activities had not been completed within the CCR surface impoundment.

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 568,000 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 one identified change since the previous annual

inspection that has potentially affected the operation of the LAN Upper Ash Pond.

Maintenance dredging of the LAN Upper Ash Pond has ceased since the prior annual inspection in 2017 and 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.

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: Nov 28, 2018



Figures

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

DRAWING DESCRIPTION
SETTLING AREAS
CCR SURFACE IMPOUNDMENT
(EXISTING) - LAN UPPER ASH POND

JOB 154.018.017.002
SHT. FIGURE 1
DWG. 154.018.017.002-D1