

Semiannual Progress Report Selection of Remedy – Lansing Generating Station

Lansing Generating Station
Lansing, Iowa

Prepared for:

Alliant Energy



SCS ENGINEERS

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Table of Contents

| Section | Page |
|---|----------|
| 1.0 Introduction and Purpose..... | 1 |
| 1.1 Background..... | 1 |
| 1.2 Site Information and Maps | 1 |
| 2.0 Summary of Work Completed | 1 |
| 2.1 Monitoring Network Changes | 2 |
| 2.2 Groundwater Monitoring..... | 2 |
| 2.3 Statistical Evaluation..... | 2 |
| 2.4 Landfill and Ash Pond Closure..... | 2 |
| 2.5 Evaluation of Corrective Measure Alternatives | 4 |
| 3.0 Planned Activities | 5 |

Tables

| | |
|----------|---|
| Table 1. | Timeline for Completed Work – Selection of Remedy |
| Table 2. | CCR Rule Groundwater Samples Summary |

Figures

| | |
|-----------|---|
| Figure 1. | Site Location Map |
| Figure 2. | Site Plan and Monitoring Well Locations |

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1.0 INTRODUCTION AND PURPOSE

The Semiannual Progress Report for remedy selection at the Interstate Power and Light Company (IPL) Lansing Generating Station (LAN) was prepared to comply with U.S. Environmental Protection Agency (USEPA) regulations regarding the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities [40 CFR 257.50-107], or the “CCR Rule” (Rule). Specifically, the selection of remedy process was initiated to fulfill the requirements of 40 CFR 257.97.

1.1 BACKGROUND

The Assessment of Corrective Measures (ACM) for the LAN Landfill and Upper Ash Pond was completed on September 12, 2019. The ACM was completed in response to the detection of arsenic at a statistically significant level (SSL) above the Groundwater Protection Standard (GPS) in groundwater samples from downgradient monitoring well MW-302. An ACM Addendum was completed on November 25, 2020.

This Semiannual Progress Report summarizes data collected and remedy evaluation progress made since the September 2019 ACM and November 2020 ACM Addendum, and outlines planned future activities. This semiannual progress report covers the 6-month period of March 2022 through August 2022.

IPL has continued to evaluate the source of the arsenic GPS exceedance since the November 2020 ACM was submitted and it appears that it is not associated with the CCR units. A Selection of Remedy report (or modified Alternate Source Demonstration [ASD]) is being prepared as a continuation of the ACM process, although the CCR units may not be the source as it was originally believed. An evaluation of the arsenic GPS exceedances that triggered the ACM is ongoing.

1.2 SITE INFORMATION AND MAPS

LAN is located along the west bank of the Mississippi River, south of the City of Lansing, in Allamakee County, Iowa. The address of the generating station is 2320 Power Plant Drive in Lansing, Iowa (**Figure 1**). The facility includes a coal-fired generating plant, a CCR landfill (LAN Landfill), a CCR surface impoundment (LAN Upper Ash Pond), and a coal stockpile. LAN will cease operations by the end of 2022 and the CCR units will be closed.

The two CCR units at the facility (LAN Landfill and LAN Upper Ash Pond) are monitored with a multi-unit groundwater monitoring system and are the subject of this Semiannual Progress Report. A map showing the CCR units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR groundwater monitoring program is provided as **Figure 2**.

Groundwater flow at the site is generally to the north-northwest, and the groundwater flow direction and water levels fluctuate seasonally due to the proximity to the river. Depth to groundwater as measured in the site monitoring wells varies from 1 to 75 feet below ground surface due to topographic variations across the facility and seasonal variations in water levels.

2.0 SUMMARY OF WORK COMPLETED

Work completed to support remedy selection for the LAN Landfill and LAN Upper Ash Pond is summarized in **Table 1**. Activities completed within the 6-month period covered by this Semiannual Progress Report are discussed in more detail below.

2.1 MONITORING NETWORK CHANGES

There were no changes to the LAN monitoring well network between March 2022 and August 2022. The monitoring well locations are shown on **Figure 2**.

2.2 GROUNDWATER MONITORING

Since confirmation of the arsenic exceedance in MW-302, multiple groundwater samples have been collected from the site to understand the nature and extent of any arsenic release. Prior to this reporting period, IPL continued with assessment monitoring and also collected samples from eight delineation wells on site for water quality parameters and supporting data that would either support the Selection of a Remedy (dissolved arsenic, total and dissolved iron, magnesium, total and dissolved manganese, dissolved molybdenum, potassium, sodium, total, carbonate and bicarbonate alkalinity) or indicate that a source other than the CCR units may be contributing to the exceedance, such as a change in the geochemistry immediately at or around monitoring well MW-302 due to the presence of organic carbon in the soil, or localized changes in the oxidation-reduction potential due to the lower ash pond closure. Samples have also been collected from an additional monitoring well installed at the downgradient waste boundary, an underground intercept drain along the waste boundary, and nearby surface waters. Additional information is presented in **Section 2.5**.

Since the March 2022 semiannual update, groundwater samples were collected during one event in April 2022. The one event included the following:

- The April monitoring event was part of the routine semiannual assessment monitoring program.
- The wells sampled and water levels measured included the wells in the original monitoring program (MW-6, MW-301, MW-302, and MW-303) and eight additional wells (MW-302A, MW-304, MW-304A, MW-305, MW-306, MW-306A, MW-307, and MW-307A).

A surface water sample was collected in conjunction with the April 2022 groundwater monitoring event. The sample was obtained from the combined outfall and stream water located immediately north of monitoring well MW-302. A full round of monitoring well and staff gauge measurements was also performed in April 2022. Both CCR Rule monitoring wells and state monitoring program wells were included.

A summary of groundwater samples collected since submittal of the ACM is provided in **Table 2**.

2.3 STATISTICAL EVALUATION

Statistical evaluation of sampling results during the period covered by this update will be discussed in the 2022 Annual Groundwater Monitoring and Corrective Action Report, dated January 31, 2023. Based on the April 2022 statistical evaluation, the only SSL above the GPS at a compliance well was arsenic at well MW-302. This SSL is consistent with previous results at LAN.

2.4 LANDFILL AND ASH POND CLOSURE

IPL will close the landfill by placing final cover over the remaining active area. IPL will close the Upper Ash Pond by a combination of CCR removal, consolidation within the CCR surface impoundment limits, and in-place closure with a cap. Closure by removal will be performed in the North Pond Closure Area (northern portion of the Upper Ash Pond) and consolidated to the South Pond Closure

Area (southern portion of the Upper Ash Pond). In-place CCR and consolidated CCR, coal, and coal-impacted soil relocated to the South Pond Closure Area during the planned decommissioning/closure activities at LAN will be capped with a low-permeability soil cover.

IPL completed the following landfill and ash pond closure activities during previous semiannual reporting periods.

- In August 2021, IPL performed test pits in and around the Upper Ash Pond to evaluate site conditions and CCR behavior during excavation, moisture conditioning, and placement.
- In August and September 2021, IPL performed test fills on the CCR in the Upper Ash Pond. Geotechnical monitoring instruments including settlement plates and vibrating wire piezometers were installed in the test fills and underlying CCR. Settlement plate monitoring was conducted through mid-December 2021. Monitoring of the vibrating wire piezometers is ongoing.
- In October 2021, IPL installed four groundwater dewatering pilot-test wells along the west side of the Upper Ash Pond and completed a pump test to evaluate the design of a groundwater dewatering system for the closure of the Upper Ash Pond.
- In October 2021, IPL also pilot-tested in-situ stabilization of CCR using portland cement grout within the Upper Ash Pond. The closure of the Upper Ash Pond will utilize in-situ stabilization to improve the shear strength of a select portion of the existing CCR within the pond. The shear strength improvements will facilitate the consolidation and capping of CCR within the Upper Ash Pond.
- In October and November 2021, IPL completed a small-scale test of CCR dredging and dewatering methods at the Upper Ash Pond. Approximately 1,000 cubic yards of CCR was dredged from the northern open water portion of the ash pond into geotextile tubes staged at the south end of the pond to evaluate the method for CCR removal and the CCR moisture conditions in the geotextile tubes over the month following the test dredging.
- In November 2021, IPL began incorporating the results of preconstruction testing into the closure design for the landfill and ash pond. Design activities included updating material volumes that will be managed during closure, grading design, geotechnical evaluations, dredging/excavation planning, and water management planning. The design effort is ongoing.
- In January 2022, IPL began developing permit applications for ash pond closure activities. The permitting effort is ongoing.
- In February 2022, IPL completed an evaluation of a nearby off-site fill source that will be used during the closure of the Upper Ash Pond. A significant volume of imported soil is required to backfill portions of the ash pond where CCR is removed for closure. The evaluation supports the procurement of a local source of material to support the pond closure.

- In February 2022, following receipt of pilot-test data from their preconstruction services contractor, IPL began evaluating discharge requirements for a full-scale groundwater dewatering system to support the ash pond closure.

IPL completed the following landfill and ash pond closure activities during the current semiannual reporting period.

- In March 2022, the remaining bridge lift platform construction across the LAN Upper Ash Pond was completed.
- In May 2022, monitoring well MW-20 was abandoned.
- In May 2022, the ash pond closure contractor mobilized. The preparation of gravel placement and grading of contractor laydown area in the Closed Lower Pond area was completed.
- In May through June 2022, the closure contractor dewatered the southern end of the Upper Ash Pond.
- In June and July 2022, scour protection grading preparation and installation began in the LAN Upper Ash Pond - South Pond Closure Area. Drainage trenches were constructed and the 40-mil geomembrane was installed. Some CCR from the LAN Upper Ash Pond was hauled up to the LAN Landfill, placed, and conditioned.
- In May through August 2022, the closure contractor installed submersible pumps in two previously installed dewatering wells and began pumping at the west end of the LAN Upper Ash Pond to supply water for In-Situ Stabilization (ISS) wall construction.
- In June through August 2022, the closure contractor installed the ISS wall through the middle of the bridge lift platform. Prior to late July, the water level in the North Pond Closure Area of the Upper Ash Pond was drawn down during ISS work.
- In August 2022, IPL and the closure contractor raised the North Pond water level to facilitate dredging. CCR dredging began in the LAN Upper Ash Pond North Pond Closure Area. The CCR was discharged into geotextile dewatering tubes in the prepared scour protection layer area in the South Pond Closure Area.

Landfill and ash pond closure activities are included in the summary provided in **Table 1**.

2.5 EVALUATION OF CORRECTIVE MEASURE ALTERNATIVES

A qualitative assessment of potential Corrective Measure Alternatives using the selection criteria in 40 CFR 257.97(b) and (c) was provided in the September 2019 ACM and revised in the November 2020 ACM Addendum #1.

The ACM Report and ACM Addendum were originally prepared based on the potential relationship of the arsenic impacts to the disposal of CCR. Based on continued assessment of the nature and extent of arsenic, it appears that the source of the arsenic is unrelated to the LAN Landfill and LAN Upper Ash Pond.

Several activities have been completed since the initial arsenic GPS exceedances to enhance IPL's understanding of arsenic concentrations downgradient of the CCR units:

- Installation and sampling of the monitoring well nest MW-307 and MW-307A directly between the arsenic impacted well MW-302 and the CCR units.
- Installation of water level wells MW-308 and MW-309 to the north of well MW-302.
- Four rounds of groundwater sampling at monitoring wells MW-307/MW-307A.
- Re-evaluation of horizontal and vertical groundwater flow conditions after the installation of the new MW-307/MW-307A wells and water level wells MW-308 and MW-309.
- Two rounds of surface water sampling results from the surface water outfall adjacent to impacted monitoring well MW-302.
- A review of the CCR well boring logs to identify variations in soil and presence of natural sources of organic carbon.
- Water sample analysis from the Upper Ash Pond.
- Evaluation of the interceptor drain located between the Upper Ash Pond and well MW-302.
- Evaluation of the construction and closure history of the Lower Ash Pond located between the CCR units and well MW-302.
- A geochemical assessment of arsenic in groundwater by ReSolution Partners LLC.

The site conceptual model has been revised to incorporate information from the activities listed above and will be updated again with information from future data collection.

The ACM Report originally presented closure and capping in-place with monitored natural attenuation as Alternative 2. Based on the apparent absence of relationship between the presence of arsenic in groundwater and the dry ash landfill and ponds, IPL revisited the proposed alternatives within the ACM and monitored natural attenuation is no longer a component of the remedy. This will be presented in further detail as IPL finalizes the Selection of Remedy report.

3.0 PLANNED ACTIVITIES

Planned activities within the next reporting period include the following:

- Continue semiannual assessment monitoring for the existing monitoring well network and new monitoring wells.
- Continue evaluation of groundwater flow and groundwater quality.
- Update conceptual site model based on findings of the ongoing groundwater sampling.
- Complete the Selection of Remedy report or a modified ASD.
- Complete ash pond closure permitting.
- Continue Upper Ash Pond closure construction.
- Advance landfill closure design and permitting.

Tables

- 1 Timeline for Completed Work – Selection of Remedy
- 2 CCR Rule Groundwater Samples Summary

Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations