Semiannual Progress Report Selection of Remedy – OGS Ash Pond and Zero Liquid Discharge Pond

Ottumwa Generating Station
Ottumwa, Iowa

Prepared for:

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1.0 INTRODUCTION AND PURPOSE

The Semiannual Progress Report for remedy selection at the Interstate Power and Light Company (IPL) Ottumwa Generating Station (OGS) was prepared to comply with U.S. Environmental Protection Agency (U.S. EPA) 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 Ash Pond was completed on September 12, 2019. The ACM was completed in response to the detection of cobalt at a statistically significant level (SSL) above the Groundwater Protection Standard (GPS) in groundwater samples from downgradient monitoring well MW-305.

IPL initially completed a Selection of Remedy (SOR) Report in September 2020, but a subsequent revision to the ACM, completed in November 2020, resulted in a retraction of the SOR Report. The initial SOR Report is now considered to be the September 2020 semiannual progress report because it discusses activities completed during the March 2020 through September 2020 reporting period.

Additional information was received following the issuance of Addendum No. 1 to the ACM resulting in a second addendum to the ACM (Addendum No. 2). Addendum No. 2 was prepared to expand the ACM to include the Zero Liquid Discharge (ZLD) Pond. Cobalt has been detected at SSLs in monitoring wells located downgradient from both ponds, and expanding the ACM to address both will support a holistic approach to addressing the cobalt concentrations in groundwater. IPL will hold an additional public meeting with interested and affected parties to discuss Addendum No. 2 and will issue a new SOR Report.

This Semiannual Progress Report covers the Ash Pond and the ZLD Pond. This report summarizes data collected and remedy evaluation progress made since the September 2019 ACM and November 2020 revised ACM, and outlines planned future activities to complete the SOR process. This semiannual progress report covers the 6-month period of September 2022 through February 2023.

1.2 SITE INFORMATION AND MAPS

OGS is located southwest of the Des Moines River, approximately 8 miles northwest of the City of Ottumwa in Wapello County, Iowa (**Figure 1**). The address of the plant is 20775 Power Plant Road, Ottumwa, Iowa. In addition to the coal-fired generating station, the property also contains the Ash Pond, the Low Volume Wastewater Pond (LVWTP) (constructed in location of the former ZLD Pond, which was completely excavated in 2021), the coal stockpile, and the hydrated fly ash stockpile.

The two CCR units at the facility (Ash Pond and ZLD Pond) are each monitored with single-unit groundwater monitoring systems. Both the Ash Pond and the ZLD Pond 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 on **Figure 2**.

Groundwater flow at the site is generally to the east-northeast, 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 25 feet below ground surface due to topographic variations across the facility and seasonal variations in water levels.

In September 2020, IPL discontinued the use of the existing wet bottom ash handling system at OGS and ceased the discharge of bottom ash transport water to the Ash Pond. A dry bottom ash handling system was installed and operating as of December 2020. The Ash Pond permanently ceased receipt of all CCR and non-CCR waste as of May 2, 2022.

2.0 SUMMARY OF WORK COMPLETED

Work completed to support remedy selection for the Ash Pond and ZLD Pond is summarized in Table 1A. Work completed on the Ash Pond closure is summarized in Table 1B. Activities completed within the 6-month period covered by this Semiannual Progress Report are discussed in more detail below.

2.1 MONITORING NETWORK CHANGES

An additional compliance well (MW-315) was installed in November 2022 between ZLD Pond wells MW-308 and MW-309 to provide additional groundwater quality and groundwater flow information.

Permits are currently being obtained for additional monitoring well installations. Three delineation wells will be installed adjacent the Des Moines River and north of existing delineation well nest MW-310/MW-310A to provide additional information on groundwater flow and groundwater quality downgradient of the cobalt-impacted wells MW-305 and MW-307. The locations of the future monitoring wells at OGS are shown on Figure 2.

2.2 GROUNDWATER MONITORING

Since September 2022, groundwater samples were collected during sampling events in October 2022 and January 2023:

- The October 2022 monitoring event was part of the routine semiannual assessment monitoring program for the Ash and ZLD Ponds.
- The January 2023 monitoring event was the initial sample round for the new ZLD Pond compliance well MW-315.

A summary of groundwater samples collected since the completion of the September 2019 ACM is provided in Table 2 and Table 3.

2.3 STATISTICAL EVALUATION

Statistical evaluation of October 2022 and January 2023 Ash Pond sampling results during the period covered by this update will be discussed in the 2023 Annual Groundwater Monitoring and Corrective Action Reports due on January 31, 2024, for the Ash Pond and on August 1, 2023, and August 1, 2024, for the ZLD Pond. Based on the October 2022 monitoring results, the only parameter at an SSL above the GPS at the compliance wells is cobalt at Ash Pond well MW-305 and ZLD Pond well MW-307.

2.4 SURFACE IMPOUNDMENT CLOSURE

Construction for the closure of the ZLD Pond and Ash Pond began in May 2021. Closure of the ZLD Pond enabled construction of the new lined LVWTP (a non-CCR surface impoundment), redirection of non-CCR wastewaters from the OGS Ash Pond, and initiation of closure of the Ash Pond.

Key activities completed during the reporting period included:

- The concrete forming and concrete placement in the Air Heater Wash Basin that began in August was completed in September 2022. Riprap was also placed in the Air Heater Wash Basin in September 2022. The Air Heater Wash Basin is a new concrete-lined feature constructed within the excavated footprint of the Ash Pond.

- From September to November 2022, CCR was removed down to native soil in the Ash Pond to remove CCR below the groundwater elevation measured in adjacent water-table monitoring wells. Clay was placed to replace the removed CCR.

- Grading of the Ash Pond CCR material and moisture conditioning was completed for the 2022 construction season in December 2022 and will continue in spring 2023. Additional grading was completed in January 2023 to cover exposed stabilization geosynthetics.

A summary of the CCR unit closure activities completed during the current reporting period is provided in Table 1B.

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, revised in the November 2020 Addendum No 1, and revised again in the August 2022 ACM Addendum No 2.

The results of the additional investigations completed in the previous reporting period indicated that precipitation of cobalt-containing mineral phases is occurring in the aquifer downgradient of wells MW-305 and MW-307. Also, laboratory desorption trials indicated that approximately 96 percent of the cobalt remained adsorbed to the aquifer media, supporting monitored natural attenuation (MNA) as a viable remedial alternative for cobalt.

In addition, IPL has initiated closure construction as discussed in Section 2.4.

Updates to the assessment discussed in the ACM and development of a new SOR Report will be completed in the future based on updates to the conceptual site model, delineation of the nature and extent of impacts, Ash Pond closure design and construction activities, and collection of additional data relevant to remedy selection. The specific planned activities are described in Section 3.0.

3.0 PLANNED ACTIVITIES

Planned activities related to the remedy selection process include the following:

- Update the groundwater monitoring network certification for the ZLD Pond to include new compliance well MW-315.
- Install three delineation monitoring wells adjacent the Des Moines River and north of existing delineation well nest MW-310/MW-310A.
- Continue semiannual assessment monitoring for the existing monitoring well network and new monitoring wells.
- Continued evaluation of groundwater flow and groundwater quality.
- Update the conceptual site model based on findings of the treatability study and ongoing groundwater sampling and data evaluation.
- Evaluate groundwater pumping and treating as an option for OGS based on new delineation monitoring well data and the updated conceptual site model.
- Hold an additional public meeting.
- Finalize evaluation of remedial options and issue a final SOR Report per 40 CFR 257.97(a).

The following planned activities related to the ongoing closure of the Ash Pond include:

- Continued moisture conditioning, stabilization, and grading of CCR to final cover subgrades.
- Placement of compacted soil cover (18 inches).
- Placement of topsoil (6 inches).
- Installation of 40-mil geomembrane and HydroTurf CS in drainage swales.
- Final restoration activities.

Tables

Figures