

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

Ottumwa Generating Station
Ottumwa, Iowa

Prepared for:

Alliant Energy



SCS ENGINEERS

25220083.00 | March 13, 2024

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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 the November 2020 Addendum No. 1 to the ACM resulting in a second, August 2022 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, the November 2020 ACM No.1, and the August 2022 ACM No. 2, and outlines planned future activities to complete the SOR process. This Semiannual Progress Report covers the 6-month period of September 2023 through February 2024.

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 closed Ash Pond, the Low Volume Wastewater Pond (LVWWP) (constructed in the 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.

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, and closure was certified in July 2023.

2.0 SUMMARY OF WORK COMPLETED

Work completed to support remedy selection for the Ash Pond and ZLD Pond is summarized in **Table 1**. The focus of the groundwater sampling and groundwater corrective action activities during this past reporting period has been expansion of the delineation network to further characterize the nature and extent of cobalt concentrations while pond closure activities were being completed. Work completed on the Ash Pond closure is summarized in previous semiannual progress reports 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

No significant changes in the monitoring network occurred during the period covered by this Semiannual Progress Report. The locations of the existing monitoring wells at OGS are shown on **Figure 2**.

2.2 GROUNDWATER MONITORING

Since the previous semiannual progress report, groundwater samples were collected during the following sampling events:

- The October 2023 monitoring event for the routine semiannual assessment monitoring program for the Ash Pond and ZLD Pond.
- Wells sampled during the October 2023 event for the Ash Pond included the background well MW-301; compliance wells MW-302, MW-303, MW-304, MW-305, and MW-306; and delineation wells MW-305A, MW-310, MW-310A, MW-311, MW-311A, MW-312, MW-313, MW-316, MW-316A, and MW-317. Note that samples were not collected from MW-302 and MW-303 because there was insufficient sampling volume. The low water levels are attributable to the emptying of surface water from the Ash Pond prior to the time of sampling. Groundwater level recovery will be assessed during the next semi-annual groundwater sampling event scheduled for April 2024.
- Wells sampled during the October 2023 event for the ZLD Pond included the background well MW-301 and downgradient wells MW-307, MW-308, MW-309, and 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 2023 semiannual sampling results during the period covered by this update are ongoing and will be discussed in the 2024 Annual Groundwater Monitoring and Corrective Action Reports and October 2023 Monitoring Results Letters for the Ash Pond and the ZLD Pond.

Initial statistical evaluations indicate cobalt exceeded the GPS and was an SSL in MW-305 for the October 2023 event for the Ash Pond. Cobalt also exceeded the GPS and was an SSL in MW-307 and MW-315 for the ZLD Pond.

2.4 SURFACE IMPOUNDMENT CLOSURE

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

The Main Ash Pond closure was completed in June 2023, and the notification and certification by a qualified professional engineer required by 40 CFR 257.102(f)(3) and 257.102(h) were issued on July 19, 2023. The Main Ash Pond Closure Construction Documentation Report was submitted to the state agency in August 2023, and the closure permit was issued final in October 2023. No additional closure activities were completed during this reporting period.

A summary of the CCR unit closure activities completed is summarized in previous semiannual progress reports 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, 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.

Installation of an extraction well and adjacent monitoring wells, and a pump test of the new extraction well are planned for the next semiannual period for support of the SOR to evaluate groundwater extraction and treatment as a potential remedy. The new SOR Report is currently being drafted and planned to be finalized in the next semiannual reporting period. 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:

- Continue semiannual assessment monitoring.
- Continue groundwater monitoring to document the completion of closure by removal of the ZLD Pond per 40 CFR 257.102(c).
- Install a 6-inch pumping test extraction well and an associated 2-inch observation well in the vicinity of existing compliance well MW-305 during winter or early spring of 2024.
- Conduct a pumping test to assist in the remedial design for a groundwater collection system during winter or early spring of 2024.

- Continued evaluation of groundwater flow and groundwater quality.
- Update the conceptual site model based on findings of the ongoing groundwater sampling of the new compliance well and additional delineation wells.
- Perform further evaluation of groundwater pump and treat and monitored natural attenuation alternatives.
- Hold an additional public meeting.
- Finalize evaluation of remedial options and issue a final SOR Report per 40 CFR 257.97(a).
- Establish and implement a corrective action monitoring program after completion of the SOR per 40 CFR 257.98(a)(1).

Tables

- 1 Timeline for Completed Groundwater Sampling and Corrective Action Work
- 2 CCR Rule Groundwater Samples Summary – Ash Pond – Events Since the ACM Submittal
- 3 CCR Rule Groundwater Samples Summary – ZLD Pond – Events Since the ACM Submittal

**Table 1. Timeline for Completed Groundwater Sampling and Corrective Action Work
Selection of Remedy
Ottumwa Generating Station / SCS Engineers Project #25220083.00**

| Date | Activity |
|---|--|
| Activities Completed During Previous Semiannual Progress Periods | |
| August 2019 | Additional monitoring wells installed to investigate nature and extent (MW-310 and MW-311). |
| September 2019 | Completed Assessment of Corrective Measures (ACM). |
| November 2019 | Completed Well Construction Documentation for new monitoring wells. |
| January 2020 | Completed Statistical Evaluation of October 2019 groundwater monitoring results. |
| January 2020 | Completed 2019 Annual Groundwater Monitoring and Corrective Action Report. |
| December 2019 to February 2020 | Planning, permitting, and access for three additional monitoring wells (piezometers) to investigate the vertical extent of impacts. |
| February 2020 | Collected second round of groundwater samples from the new monitoring wells (MW-310 and MW-311) and background well. |
| February 2020 to March 2020 | Completed the installations of three piezometers (MW-305A, MW-310A, and MW-311A). |
| March 2020 | Completed groundwater sampling for specific metals and MNA parameters from selected monitoring wells as well as the newly installed piezometers. |
| June 2020 | Conducted assessment monitoring resample for selected parameters and monitoring well. |
| June 2020 | Held public ACM meeting. |
| September 2020 | Completed Semiannual Progress Report for the Selection of Remedy. |
| September 2020 | Completed Well Documentation Report for additional piezometers (MW-305A, MW-310A, and MW-311A). |
| October 2020 | Conducted semiannual assessment monitoring event and additional MNA parameter samples for the selection of remedy process. |
| November 2020 | Submitted application to EPA for a site-specific alternative deadline to initiate closure of the Main Ash Pond. |
| November 2020 | Completed the ACM Addendum No. 1 |
| January 2021 | Completed Statistical Evaluation of October 2020 groundwater monitoring results. |
| January 2021 | Completed 2020 Annual Groundwater Monitoring and Corrective Action Report. |
| February 2021 | Held public ACM Addendum meeting on February 18, 2021. |
| February 2021 | Conduct additional assessment monitoring for selected parameters and monitoring wells. |
| March 2021 | Completed Semiannual Progress Report for the Selection of Remedy. |
| March 2021 - June 2021 | Planning, design, draft permit preparation, and access evaluation for two additional monitoring wells to evaluate MNA processes. |
| July 2021 | Submitted joint permit application to the United States Army Corps of Engineers (USACE) and Iowa Department of Natural Resources (IDNR). |
| July 2021 | Submitted Notification of Groundwater Protection Standard Exceedance for lithium at MW-310A and MW-311A. |
| July 2021 | Conducted assessment monitoring resample for selected parameters and monitoring wells. |

**Table 1. Timeline for Completed Groundwater Sampling and Corrective Action Work
Selection of Remedy
Ottumwa Generating Station / SCS Engineers Project #25220083.00**

| Date | Activity |
|-------------------------------|--|
| August 2021 | Received approval letters from USACE for installation of monitoring wells MW-312 and MW-313. |
| September 2021 | Completed Semiannual Progress Report for the Selection of Remedy. |
| October 2021 | Completion of an ASD for lithium SSLs at MW-310A and MW-311A. |
| November 2021 | Received approval letters from IDNR November 2021 for installation of monitoring wells MW-312 and MW-313. |
| December 2021 | Submitted well permit application for monitoring wells MW-312 and MW-313 to Wapello County and received approval of permit. |
| December 2021 | Performed utility clearances and Hydrovac clearance and installed additional monitoring wells MW-312 and MW-313 to characterize site conditions for the selection of remedy. |
| December 2021 | Completed 3 boreholes adjacent to existing monitoring wells MW-305, MW-307, and MW-310 to collect saturated soil samples for laboratory analyses of iron and cobalt coprecipitation. |
| December 2021 - February 2022 | Performed laboratory analysis of soil and groundwater samples as part of the cobalt treatability and attenuation study. |
| January 2022 | Completed 2021 Annual Groundwater Monitoring and Corrective Action Report. |
| January 2022 | Completed first round of groundwater monitoring sampling at MW-312 and MW-313. Samples analysis performed in support of cobalt treatability and attenuation study. |
| January 2022 | Measured water levels at all site monitoring wells. |
| February 2022 | Completed second round of groundwater monitoring sampling at MW-312 and MW-313 and obtained additional samples from monitoring wells MW-305, MW-306, and MW-307. |
| February 2022 | Measured water levels at all site monitoring wells. |
| March 2022 | Completed Semiannual Progress Report for the Selection of Remedy. |
| April 2022 | Conducted semiannual assessment monitoring event. |
| April 2022 - July 2022 | Completed Treatability Study for Natural Attenuation of Cobalt in Groundwater. |
| May 2022 | Completed Statistical Evaluation of January 2022 groundwater monitoring results. |
| May 2022 | Completed the installation of four additional water table wells (MW-302WT, MW-304WT, MW-306WT, and MW-314WT) and one additional piezometer (MW-314) around the Ash Pond. These water table wells are intended for groundwater elevation measurement only, and will not be sampled for water quality. |
| May 2022 | Completion of an ASD for Cobalt SSL at MW-307. |
| June 2022 | Completed Statistical Evaluation of February 2022 groundwater monitoring results. |
| July 2022 | Completed Statistical Evaluation of April 2022 groundwater monitoring results. |
| August 2022 | Conducted groundwater sampling at MW-307, MW-312, and MW-313. |
| August 2022 | Completed the ACM Addendum No. 2 for the OGS Ash Pond and Zero Liquid Discharge (ZLD) Pond. |
| September 2022 | Completed Semiannual Progress Report for the Selection of Remedy. |
| September 2022 | Submitted joint permit application to the USACE and IDNR for three proposed delineation monitoring wells along the banks of the Des Moines River. |

**Table 1. Timeline for Completed Groundwater Sampling and Corrective Action Work
Selection of Remedy
Ottumwa Generating Station / SCS Engineers Project #25220083.00**

| Date | Activity |
|------------------------------|--|
| October 2022 | Conducted semiannual assessment monitoring event and additional MNA parameter samples for the selection of remedy process. |
| October 2022 | Received confirmation that no county floodplain permit is required for the installation of ZLD Pond compliance well MW-315. |
| October 2022 | Received a letter from the USACE that an archeological and geomorphological survey will be required prior to the installation of three delineation wells along the banks of the Des Moines River. |
| October 2022 - November 2022 | Delays in accessing proposed delineation well locations to perform the archeological and geomorphological survey due to the need to wait for a corn crop harvest at the survey location. |
| November 2022 | Completed permitting for the installation of compliance well MW-315. |
| December 2022 | Received a letter from the IDNR approving the installation of three delineation monitoring wells along the banks of the Des Moines River. |
| December 2022 | Installed compliance monitoring well MW-315 downgradient of the ZLD Pond. |
| December 2022 | Completed fieldwork for the archeological and geomorphological survey. |
| December 2022 | Completed the August 2022 Groundwater Results Report. |
| January 2023 | Compliance well MW-315 was developed. |
| January 2023 | Received the archeological and geomorphological survey report. Nothing was discovered that would prevent the installation of the delineation monitoring wells. The report was submitted to the USACE and IDNR. |
| January 2023 | Received a letter from the USACE authorizing installation of the three delineation wells along the banks of the Des Moines River. |
| January 2023 | Received a letter from the USACE rescinding the authorization granted earlier in January 2023 for installation of the three delineation wells along the banks of the Des Moines River. The USACE was required to coordinate the archaeological survey with the State Historic Preservation Office. Communication from the USACE indicated the SHPO review period would be 30 days. |
| January 2023 | Completed 2022 Annual Groundwater Monitoring and Corrective Action Report for the Ash Pond. |
| February 2023 | Installed a dedicated low-flow pump in the ZLD Pond compliance well MW-315 and performed the initial groundwater sample collection. |
| February 2023 | Completed Statistical Evaluation of October 2022 groundwater monitoring results. |
| February 2023 | Completed the October 2022 Groundwater Results Report. |
| February 2023 | Completed a Financial Assurance Post-Closure Cost Estimate for the CCR Impoundment. |
| February 2023 | Completed 2022 AP CCR Federal Annual Report. |
| March 2023 | Second supplemental sampling event completed for cobalt in new ZLD Pond compliance well MW-315. |
| March 2023 | Completed Semiannual Progress Report for the Selection of Remedy. |
| March 2023 | Requested a flood plain permit waiver from the county engineer, which was waived. |
| March 2023 | Submitted Monitoring Well Construction Report for MW-312 and MW-313. |

**Table 1. Timeline for Completed Groundwater Sampling and Corrective Action Work
Selection of Remedy
Ottumwa Generating Station / SCS Engineers Project #25220083.00**

| Date | Activity |
|---|--|
| March 2023 | Submitted Monitoring Well Construction Report for MW-315. |
| March 2023 | Installed delineation wells MW-316, MW-316A, and MW-317. SCS conducted hydraulic conductivity testing on new wells. |
| March 2023 | Installed staff gauges SG-2 and SG-3 in Middle Avery Creek. |
| April 2023 | Conducted semiannual assessment monitoring event. |
| April 2023 | Joint Permit Notice of Completion filed. |
| July 2023 | Submitted MW-315 Groundwater Monitoring System Update Recertification for ZLD Pond MW-315 and submitted Update Certification Supporting Documentation. |
| July 2023 | Completed an Assessment Groundwater Monitoring results report for February and March 2023 sampling for ZLD Pond. |
| August 2023 | Completed April 2023 Assessment Groundwater Monitoring Results Letters for Ash Pond and ZLD Pond. |
| August 2023 | Completed 2022 ZLD Pond CCR Federal Annual Report. |
| August 2023 | Completed draft Monitoring Well Construction Report for MW-316, MW-316A, MW-317, SG-2, and SG-3. |
| Activities Completed During Current Semiannual Progress Period | |
| September 2023 | Completed a Semiannual SOR Progress Report. |
| October 2023 | Conducted a semiannual groundwater monitoring event. |
| October 2023 | Completed a proposal for remedy selection and design. |
| October 2023 - February 2024 | Continued work on the Selection of Remedy report. |
| December 2023 - January 2024 | Performed capture zone analysis for the design and installation of an extraction well to be used for a pumping test. |
| December 2023 - January 2024 | Designed a pumping test and an extraction well for the test. |
| January - February 2024 | Well, flood plain, and pump test water discharge permitting for the pumping test extraction well and pumping test observation well. |
| January 2024 | Completed the Annual Report for OGS Ash Pond. |
| February 2024 | Scheduled drilling for monitoring well and extraction well installations. |
| February 2024 | Completed the October 2023 results letter for OGS ZLD Pond. |

A-R = Resampling event under Assessment Monitoring Program

* = Resampling event completed in 2019 but analytical results will be used for evaluation for the October 2018 sampling event.

Created by: SCC Date: 2/17/2020
 Last revision by: NLB Date: 3/6/2024
 Checked by: TK Date: 3/12/2024

**Table 2. CCR Rule Groundwater Samples Summary - Events Since the ACM Submittal
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25220083.00**

| Sample Dates | Background Well | Compliance Wells | | | | | Delineation Well | Compliance Well | Delineation Wells | | | | | | | |
|---------------|-----------------|------------------|------------------|--------|--------|---------|------------------|-----------------|-------------------|---------------------|---------|--------|--------|--------|---------|--------|
| | MW-301 | MW-302 | MW-303 | MW-304 | MW-305 | MW-305A | MW-306 | MW-310 | MW-310A | MW-311 | MW-311A | MW-312 | MW-313 | MW-316 | MW-316A | MW-317 |
| 10/23-24/2019 | A | A | A | A | A | NI | A | A-NE | NI | A-NE | NI | NI | NI | NI | NI | NI |
| 2/5/2020 | A | -- | -- | -- | -- | NI | -- | A-NE | NI | A-NE | NI | NI | NI | NI | NI | NI |
| 3/12-13/2020 | Add. | -- | -- | -- | Add. | Add. | -- | Add. | Add. | Add. | Add. | NI | NI | NI | NI | NI |
| 4/13-14/2020 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | NI | NI | NI | NI | NI |
| 6/30/2020 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | A - R | NI | NI | NI | NI | NI |
| 10/8-12/2020 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | NI | NI | NI | NI | NI |
| 2/23/2021 | -- | -- | -- | -- | -- | -- | Add. | Add. | -- | -- | Add. | NI | NI | NI | NI | NI |
| 4/12-16/2021 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | NI | NI | NI | NI | NI |
| 7/6/2021 | -- | -- | -- | -- | -- | -- | Add. | Add. | -- | -- | Add. | NI | NI | NI | NI | NI |
| 10/6-8/2021 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE ⁽¹⁾ | A-NE | NI | NI | NI | NI | NI |
| 1/12/2022 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Add. | Add. | NI | NI | NI |
| 2/14/2022 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Add. | Add. | NI | NI | NI |
| 4/12/2022 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | NI | NI | NI |
| 8/25/2022 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | Add. | Add. | NI | NI | NI |
| 10/26-28/2022 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | NI | NI | NI |
| 4/4-6/2023 | A | A | A | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE |
| 10/10-13/2023 | A | A ⁽²⁾ | A ⁽²⁾ | A | A | A-NE | A | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE | A-NE |
| Total Samples | 11 | 9 | 9 | 9 | 10 | 9 | 11 | 13 | 9 | 11 | 12 | 7 | 7 | 2 | 2 | 2 |

Abbreviations:

A = Assessment Monitoring Program
-- = Not sampled

NI = Not Installed
A-R = Assessment Resample

Add. = Additional sampling event for selected parameters
A-NE = Assessment monitoring for nature and extent, well sampled for select Appendix IV and selection-of-remedy parameters

Notes:

- (1): MW-311 had insufficient water for sample collection during the October 2021 sampling event.
(2): MW-302 and MW-303 had insufficient water for sample collection during the October 2023 sampling event.

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Checked by: RM Date: 2/12/2024

**Table 3. CCR Rule ZLDP Groundwater Samples Summary
Ottumwa Generating Station / SCS Engineers Project #25220083.00**

| Sample Dates | Downgradient Wells | | | | Background Well |
|---------------|--------------------|--------|--------|--------|-----------------|
| | MW-307 | MW-308 | MW-309 | MW-315 | MW-301 |
| 4/26/2016 | NI | NI | NI | NI | B |
| 6/23/2016 | NI | NI | NI | NI | B |
| 8/9/2016 | NI | NI | NI | NI | B |
| 10/26/2016 | NI | NI | NI | NI | B |
| 1/18-19/2017 | B | B | B | NI | B |
| 4/19-20/2017 | B | B | B | NI | B |
| 6/20-21/2017 | B | B | B | NI | B |
| 8/21-23/2017 | B | B | B | NI | B |
| 11/8/2017 | B | B | B | NI | D |
| 4/16-18/2018 | B | B | B | NI | A |
| 5/30/2018 | B-R | B-R | B-R | NI | -- |
| 6/28/2018 | B | B | B | NI | -- |
| 7/18/2018 | B-R | B-R | B-R | NI | -- |
| 10/16/2018 | B | B | B | NI | A |
| 4/8/2019 | D | D | D | NI | D |
| 10/23-24/2019 | D | D | D | NI | D |
| 12/11/2019 | A | A | A | NI | A |
| 2/5/2020 | A | A | A | NI | A |
| 4/13-14/2020 | A | A | A | NI | A |
| 10/7-8/2020 | A | A | A | NI | A |
| 2/23/2021 | A-R | -- | -- | NI | -- |
| 4/14/2021 | A | A | A | NI | A |
| 7/6/2021 | A-R | -- | -- | NI | -- |
| 10/7/2021 | A | A | A | NI | A |
| 2/14/2022 | Add. | -- | -- | NI | -- |
| 4/11-14/2022 | A | A | A | NI | A |
| 8/25/2022 | Add. | -- | -- | NI | -- |
| 10/25-26/2022 | A | A | A | NI | A |
| 2/2/2023 | -- | -- | -- | Add. | -- |
| 3/6/2023 | -- | -- | -- | Add. | -- |
| 4/4-6/2023 | A | A | A | A | A |
| 10/10-13/2023 | A | A | A | A | A |
| Total Samples | 26 | 22 | 22 | 4 | 23 |

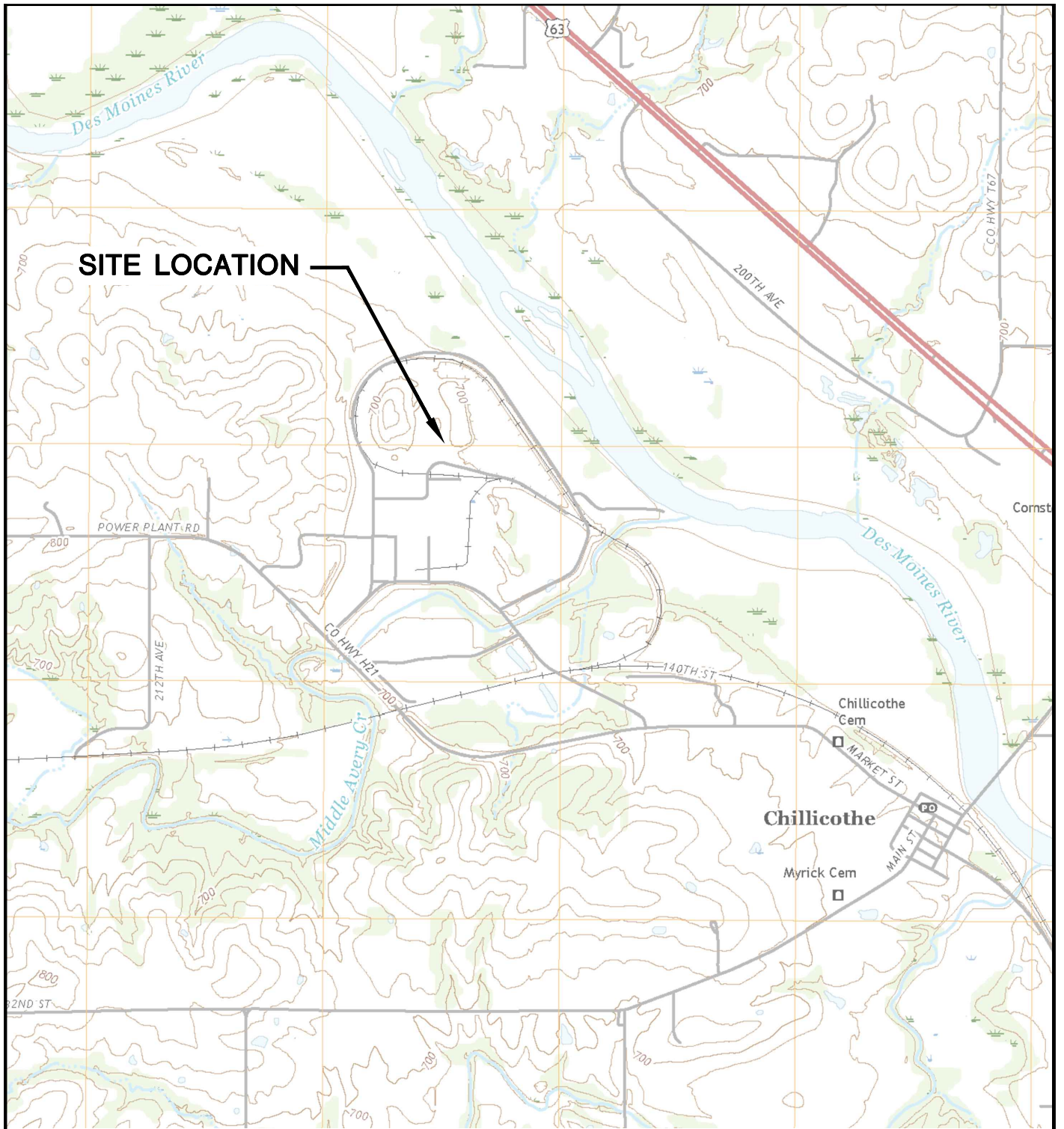
Abbreviations:

- B = Background Sample Event
- B-R = Background Resampling event
- D = Detection Monitoring Sampling Event
- A = Assessment Monitoring Event
- A-R = Assessment Monitoring Resampling Event
- Add. = Additional Assessment monitoring sampling event
- NI = Not Installed
- = Not Applicable

Created by: JAO Date: 7/8/2022
 Last revision by: NLB Date: 2/12/2024
 Checked by: RM Date: 2/12/2024

Figures

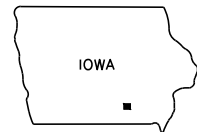
- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations



SITE LOCATION

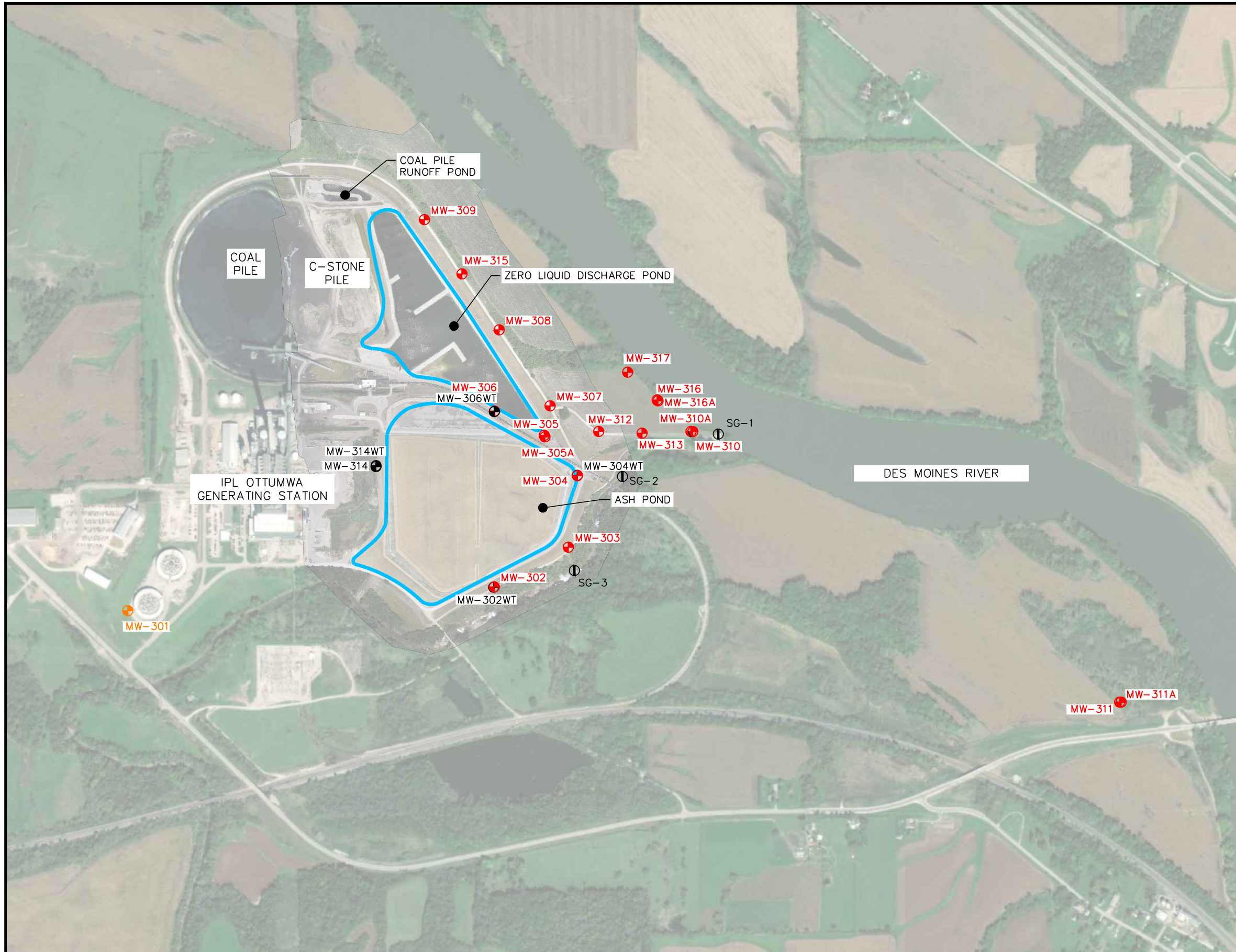


CHILlicothe QUADRANGLE
 IOWA—WAPELLO CO.
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 2018
 SCALE: 1" = 2,000'



| | | | | | | | | |
|----------|---|--------------|---------------|---|-----|----------|---|--------|
| CLIENT | INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501 | | SITE | ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA | | ENGINEER | SITE LOCATION MAP | |
| | PROJECT NO. | 25219072.00 | | DRAWN BY: | BSS | | SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 | FIGURE |
| | DRAWN: | 11/15/2019 | | CHECKED BY: | MDB | | | 1 |
| REVISED: | 01/10/2020 | APPROVED BY: | TK, 3/25/2022 | | | | | |

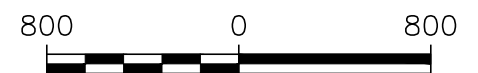
I:\25219072.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/15/2020 6:15:47 PM



| LEGEND | |
|--------|---|
| | CCR UNIT |
| | CCR ASH POND MONITORING WELL |
| | CCR BACKGROUND MONITORING WELL |
| | WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM) |
| | RIVER ELEVATION MEASUREMENT LOCATION |

NOTE:

1. AERIAL IMAGERY OBTAINED FROM ALLIANT ENERGY, DATED JUNE 19, 2023.



SCALE: 1" = 800'

| | | | | | |
|-------------------------|----------------------------|--|--|--|-------------|
| PROJECT NO. 25220083.00 | DRAWN BY: KP/SB | 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 | CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501 | SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA | FIGURE 2 |
| DRAWN: 12/05/2023 | CHECKED BY: NLB | | | | |
| REVISD: 02/27/2024 | APPROVED BY: TK 03/12/2024 | | | | |

I:\25220083.00\Drawings\Site Plan.dwg, 2/27/2024 8:05:26 AM