2024 Annual Groundwater Monitoring and Corrective Action Report

Zero Liquid Discharge Pond
Ottumwa Generating Station
20775 Power Plant Road
Ottumwa, Iowa

Prepared for:

Interstate Power and Light Company
4902 N. Biltmore Lane
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SCS ENGINEERS

25225072.00 | August 1, 2025

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09/02/2025 - Classification: Internal - ECRM13574471

OVERVIEW OF CURRENT STATUS

Ottumwa Generating Station, Zero Liquid Discharge Pond
2024 Annual Report

In accordance with §257.90(e)(6), this section at the beginning of the annual report provides an overview of the current status of groundwater monitoring and corrective action programs for the coal combustion residual (CCR) unit. The groundwater monitoring system for the Zero Liquid Discharge Pond at the Ottumwa Generating Station (OGS) monitors a single existing CCR unit. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Statistically Significant	(iii) If it was determined that there was an SSI over background for one or more constituents listed in Appendix III to this part pursuant to §257.94(e):	

09/02/2025 - Classification: Internal - ECRM13574471

Category	Rule Requirement	Site Status
Increases (SSIs)	(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and	SSIs initially determined on July 15, 2019, based on April 2019 monitoring results. In 2024, SSIs for semiannual events for compliance wells at waste boundary included the following; see **Table 5** for complete results. <u>April 2024</u> Boron: MW-309, MW-315 Calcium: MW-307, MW-308, MW-309, MW-315 Chloride: MW-307 Field pH: MW-309, MW-315 Sulfate: MW-308, MW-309, MW-315 Total Dissolved Solids (TDS): MW-307, MW-308, MW-309, MW-315 <u>October 2024</u> Boron: MW-309, MW-315 Calcium: MW-307, MW-308, MW-309, MW-315 Chloride: MW-307 Field pH: MW-309, MW-315 Sulfate: MW-308, MW-309, MW-315 TDS: MW-307, MW-308, MW-309, MW-315
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	January 13, 2020
Statistically Significant Levels (SSL) Above	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in Appendix IV to this part pursuant to §257.95(g) include all of the following:	

09/02/2025 - Classification: Internal - ECRM13574471

Category	Rule Requirement	Site Status
Groundwater Protection Standard (GPS)	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	Cobalt: Initially determined to be at SSL above the GPS in July 2020 at compliance monitoring well MW-307. In 2024, concentrations determined to be at SSL above the GPS as follows: April 2024 MW-307, MW-315 October 2024 MW-307, MW-315
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	May 9, 2022
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	August 19, 2024
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	August 5, 2022
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Selection of remedy was in progress in 2024 (completed March 2025).
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Remedial activities not initiated in 2024.

09/02/2025 - Classification: Internal - ECRM13574471

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09/02/2025 - Classification: Internal - ECRM13574471

Table of Contents

Section Page

Tables

09/02/2025 - Classification: Internal - ECRM13574471

Figures

Appendices

I:\25225072.00\Deliverables\2024 - OGS ZLDP Federal CCR Annual Report\250801_2024_Federal Annual Report_OGS ZLDP_Final.docx

09/02/2025 - Classification: Internal - ECRM13574471

1.0 INTRODUCTION

This 2024 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (U.S. EPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities;* Final Rule, dated April 17, 2015 (U.S. EPA, 2015) and subsequent amendments. Specifically, this report was prepared to fulfill the requirements of 40 Code of Federal Regulations (CFR) 100 and 40 CFR 257.90(e) for inactive CCR surface impoundments. The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

This report covers the period of groundwater monitoring from January 1, 2024, through December 31, 2024.

The groundwater monitoring system for the Zero Liquid Discharge Pond (ZLD Pond) at the Ottumwa Generating Station (OGS) monitors a single inactive CCR unit:

- OGS ZLD Pond (inactive CCR surface impoundment)

The ZLD Pond is in the process of closure in accordance with 40 CFR 257.102(c). Removal of CCR from the ZLD Pond was completed in October 2021. Closure will be completed when groundwater monitoring concentrations do not exceed the groundwater protection standards established pursuant to § 257.95(h) for constituents listed in Appendix IV to Part 257.

The groundwater monitoring system is designed to detect monitored constituents at the former waste boundary of the OGS ZLD Pond as required by 40 CFR 257.91(d). The groundwater monitoring system consisted of one upgradient and four downgradient monitoring wells in 2024 (**Table 1**, **Figure 1**, and **Figure 2**). The fourth downgradient well, MW-315, was installed in November 2022 and the well was formally incorporated into the monitoring network when the network certification was updated in 2023.

The OGS Ash Pond is a separate CCR unit at the OGS facility. The annual groundwater monitoring and corrective action report for the Ash Pond CCR unit is submitted separately by January 31 of each year in accordance with 40 CFR 257.90(e). Closure of the Ash Pond was initiated in 2022 and was completed in July 2023.

2.0 BACKGROUND

To provide context for the annual report, the following background information is provided in this section of the report, prior to the annual report requirement sections:

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

09/02/2025 - Classification: Internal - ECRM13574471

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Geologic Information

The uppermost aquifer unit at the site, as defined under 40 CFR 257.53, is the Mississippian bedrock aquifer and hydraulically connected overlying unconsolidated deposits. Regionally, unconsolidated alluvial aquifers near the Des Moines River and deeper bedrock aquifers are both used for water supply. The thickness and water-producing capacity of the unconsolidated material in the area is variable. A summary of the regional hydrogeologic stratigraphy is included in **Appendix A**.

The bedrock surface elevation is highly variable due to erosion. A map showing regional bedrock surface topography is included in **Appendix A**.

Although not encountered in drilling at the OGS site, the uppermost bedrock unit in the surrounding region consists of Pennsylvanian shales with minor siltstone, sandstone, limestone, and coal intervals. The continuity of these minor beds is highly variable. The Pennsylvanian bedrock unit is considered a regional aquitard. The thickness of the Pennsylvanian shale is variable; in some areas of Wapello County it is over 100 feet thick, while in other areas it is absent. The variation in thickness is due to erosion of the bedrock surface. Based on the available boring logs from the OGS site, it appears that the Pennsylvanian shale is absent at the site.

Underlying the Pennsylvanian shales are Mississippian limestone and dolomite, with some shale and sandstone. A map showing the elevation of the top of the Mississippian limestone in Southeastern Iowa is included in **Appendix A**. The Mississippian unit is the shallowest regional bedrock aquifer.

The Devonian units underlying the Mississippian are composed of shale, dolomite, and limestone, and are in turn underlain by Silurian dolomite and Cambrian-Ordovician dolomite and sandstone. The Cambrian-Ordovician aquifer is commonly the source of municipal and industrial high-capacity wells in the region (Coble, 1971).

Groundwater flow within the Mississippian limestone is generally to the east. A map showing the regional potentiometric surface in the Mississippian limestone is included with the hydrogeologic background information presented in **Appendix A**.

2.1.2 Site Information

Site boring logs indicate that the unconsolidated material at the site is thin (approximately 7 to 20 feet in thickness) and consists of clay and sand. The unconsolidated material at these well locations is generally clay, silt, and sand, and the uppermost bedrock appears to be weathered. The total boring depths were between 15 and 28 feet, and weathered bedrock was encountered at depths between 19 and 21 feet below ground surface at the downgradient monitoring wells; bedrock was encountered at 7 feet below ground surface at the upgradient/background monitoring well MW-301. Boring logs, well construction, and development documentation for MW-301, MW-307, MW-308, MW-309, and MW-315 are included in **Appendix B**.

The shallow potentiometric surface and groundwater flow patterns based on April, August, and October 2024 water level measurements are shown on **Figures 3**, **4**, and **5**, respectively. These maps are based on water levels measured at all OGS monitoring wells, including the ZLD Pond compliance wells, Ash Pond compliance wells, and additional delineation wells installed for the Assessment of Corrective Measures (ACM) and selection of remedy for the Ash Pond and ZLD Pond

09/02/2025 - Classification: Internal - ECRM13574471

CCR units. The shallow potentiometric surface maps show groundwater flow moving to the east, following the same flow patterns observed in regional flow maps of the area.

The groundwater monitoring well network summary is provided in Table 1. The sampling event summary is provided in Table 2. The groundwater elevation data for the CCR monitoring wells is provided in Table 3. Estimated horizontal gradients and flow velocities for the shallow potentiometric surface in the area of the ZLD Pond are provided in Table 4.

2.2 CCR RULE MONITORING SYSTEM

In 2024, the groundwater monitoring system established in accordance with the CCR Rule consisted of one upgradient (background) monitoring well and four downgradient monitoring for the OGS ZLD Pond (Table 1 and Figure 2). The background well is MW-301, and the four downgradient compliance wells include MW-307, MW-308, MW-309, and MW-315. The CCR Rule wells are installed in the Mississippian aquifer and/or hydraulically connected overlying unconsolidated deposits, which comprise the uppermost aquifer unit at the site. Well depths range from approximately 15 to 28 feet.

The background well (MW-301) is located west of the ZLD Pond and is also used as a background well for the OGS Ash Pond CCR unit. The downgradient wells (MW-307 through MW-309 and MW-315) are located along the northeastern edge of the OGS ZLD Pond and in a line parallel to the Des Moines River.

While not part of the ZLD Pond monitoring system, delineation wells installed as part of the Ash Pond monitoring system are being used to evaluate the nature and extent of cobalt concentrations in groundwater as part of the ongoing joint selection of remedy process for both CCR units.

3.0 §257.100(E)(5) GROUNDWATER MONITORING AND CORRECTIVE ACTION FOR INACTIVE CCR SURFACE IMPOUNDMENTS

The owner or operator of the inactive CCR surface impoundment must: (i) No later than April 17, 2019, comply with groundwater monitoring requirements set forth in §§ 257.90(b) and 257.94(b); and (ii) No later than August 1, 2019, prepare the initial groundwater monitoring and corrective action report as set forth in § 257.90(e).

This report is submitted to fulfill the reporting requirement.

4.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:*

09/02/2025 - Classification: Internal - ECRM13574471

4.1 §257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A map showing the site location of the OGS site is provided as **Figure 1**. A map showing the site layout and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program for the OGS ZLD Pond is provided as **Figure 2**. The location of the OGS Ash Pond CCR unit, which is monitored by a separate network and is discussed in a separate groundwater monitoring report, is also shown on **Figure 2**.

4.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

There were no changes made to the monitoring system in 2024.The boring log and monitoring well construction documentation forms are included in **Appendix B**.

4.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Two semiannual assessment monitoring events occurred in 2024 (April and October).

The sampling results for Appendix III and Appendix IV parameters in 2024 are summarized in **Tables 5A** and **5B**. Field parameter results for the 2024 sampling events are provided in **Table 6**. The analytical laboratory reports for 2024 are provided in **Appendix C**. Historical results for each monitoring well are summarized in **Appendix D**.

An additional sample was collected by SCS from MW-307 for cobalt and field parameters on June 6, 2024. This sample was collected to provide additional information on the effects of an April 24, 2024, pumping test performed as part of the selection of remedy process. This sampling event was not required by the CCR program, but results of this event are included in **Table 5A** and the laboratory report is in **Appendix C**.

4.4 §257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels);

There was no monitoring program transition in 2024.

Assessment monitoring for the ZLD Pond was initiated in January 2020 and continued through 2024. An ACM was initiated for the ZLD Pond in May 2022 and completed in August 2022. The ACM for the ZLD Pond CCR Unit was combined with Addendum No. 2 to the ACM for the Ash Pond CCR Unit to support a holistic approach to addressing the cobalt concentrations in groundwater.

09/02/2025 - Classification: Internal - ECRM13574471

Assessment monitoring continued during the ACM and will continue during the selection of remedy and implementation of the corrective action program.

In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. EPA, 2009), the comparison of assessment monitoring results to the Groundwater Protection Standard (GPS) was based on the lower confidence limit (LCL) for the arithmetic mean. In 2024, LCL evaluations were completed for cobalt, which is the only Appendix IV parameter that has been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated. The LCLs were calculated with Sanitas™ using historical concentrations measured since assessment monitoring began in December 2019. The LCL evaluations completed for the April 2024 and October 2024 events are provided in **Appendix E**.

Consistent with previous determinations, cobalt was determined to be at a Statistically Significant Level (SSL) above the GPS at monitoring wells MW-307 and MW-315 in the evaluation of the April and October 2024 assessment monitoring results. The SSLs above the GPS at MW-307 and MW-315 will be addressed by the selection of remedy and corrective action efforts at the site.

In 2024, the monitoring results for April and October monitoring events were evaluated for statistically significant increases (SSIs) in detection and assessment monitoring parameters relative to background. The comparison to background was based on a prediction limit or tolerance limit approach, comparing the results to interwell upper prediction limits (UPLs) or upper tolerance limits (UTLs) based on background monitoring results from the upgradient well (MW-301). In July 2022, the interwell UPLs for Appendix III parameters were updated and interwell UTLs for Appendix IV parameters were calculated using the background data collected through April 2022. The UPL calculations for Appendix III parameters and UTL calculations for Appendix IV parameters. The UPLs calculated in July 2022 were applied to the evaluation of the 2024 monitoring results.

The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (U.S. EPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, the next background update is planned for 2025.

4.5 §257.90(E)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in *italics*, followed by applicable information relative to the 2024 Annual Groundwater Monitoring and Corrective Action Report for the CCR Unit.

4.5.1 §257.90(e) General Requirements

For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year.

09/02/2025 - Classification: Internal - ECRM13574471

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program remained in assessment monitoring in 2024.

Summary of Key Actions Completed.

Because cobalt has been detected at SSLs above the GPS in compliance monitoring wells located downgradient from both the ZLD Pond and the Ash Pond, the ongoing activities to support the selection of a remedy are intended to support a holistic approach for the site. Actions to support the selection of a remedy for cobalt in groundwater for both CCR units are included in the following lists of completed and planned actions.

- Completed capture zone analysis for the design and installation of an extraction well to be used for a pumping test (January 2024).
- Completed design of a pumping test and an extraction well for the test (January 2024).
- Performed well, flood plain, and pump test water discharge permitting for the pumping test extraction well and pumping test observation well (January-February 2024).
- Scheduled drilling for monitoring well and extraction well installations (February 2024).
- Completed Water Well Pollution Prevention Plan for the extraction well and piezometer installation (April 2024).
- Installed extraction well (PW-1) and observation well (OW-1) for aquifer pumping tests to support selection of remedy.
- Conducted a virtual public meeting on August 19, 2024.
- Completed aquifer pumping tests in support of selection of remedy and eventual corrective action design. Prepared a draft technical memorandum summarizing results and began incorporating results into planning for an extended pumping test.
- Completed statistical evaluation and results report for the October 2023 groundwater compliance monitoring results (February 2024, provided in previous Annual Report).
- Prepared semiannual progress reports for Selection of Remedy – OGS Ash Pond and Zero Liquid Discharge Pond (March and September 2024).
- Completed annual groundwater sampling and analysis event (April 2024).
- Completed statistical evaluation and results report for the April 2024 assessment monitoring event (August 2024).
- Completed 2023 Annual Groundwater Monitoring and Corrective Action Report (August 2024).
- Completed semiannual groundwater sampling and analysis event (October 2024).

Description of Any Problems Encountered: No problems were encountered in 2024.

09/02/2025 - Classification: Internal - ECRM13574471

Discussion of Actions to Resolve the Problems: No problems were encountered in 2024.

Projection of Key Activities for the Upcoming Year (2025):

- Complete statistical evaluation and determination of any SSLs exceeding the GPS for the October 2024 monitoring event (February 2025, provided in **Appendix E**).
- Complete two semiannual groundwater sampling events (April and October 2025).
- Complete statistical evaluation and determination of any SSLs exceeding the GPS for the April 2025 monitoring event (August 2025).
- Finalize evaluation of remedial options and issue a final SOR Report per 40 CFR 257.97(a) (completed March 2025).
- Conduct an extended pumping test for the design of a pump and treat system.
- Establish and implement a corrective action monitoring program.

4.5.2 §257.94(d) Alternative Detection Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. The ZLD Pond is no longer in the detection monitoring program.

4.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. The ZLD Pond is no longer in the detection monitoring program.

4.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable. Assessment monitoring has been initiated at the site, but no alternative assessment monitoring frequency is proposed at this time.

4.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

09/02/2025 - Classification: Internal - ECRM13574471

The 2024 assessment monitoring results, background UPLs, and GPSs established for the ZLD Pond are provided in **Tables 5A** and **5B**. The laboratory reports are provided in **Appendix C**. Historical monitoring results are summarized in **Appendix D**.

Supplemental groundwater quality parameters were included in the monitoring program in 2024 to support the selection of remedy process for the OGS Ash Pond and ZLD Pond CCR units. The results for the supplemental parameters are included in **Tables 5A** and **5B** and in the laboratory reports in **Appendix C**.

4.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

No alternative source demonstrations for assessment monitoring were completed for the ZLD Pond in 2024.

4.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. The ACM for the ZLD Pond CCR unit was initiated on May 9, 2022, and completed on August 5, 2022, within the 90-day allowable period without an extension. The ACM for the ZLD Pond CCR Unit was combined with Addendum No. 2 to the ACM for the Ash Pond CCR Unit to support a holistic approach to addressing the cobalt concentrations in groundwater.

5.0 §257.90(e)(6) Overview

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

The specific requirements for the overview under §257.90(e)(6) are listed and the information is provided at the beginning of this report, before the Table of Contents.

6.0 REFERENCES

Coble, R.W., 1971, The Water Resources of Southeast Iowa, Iowa Geological Survey Water Atlas Number 4, 1971.

U.S. Environmental Protection Agency (U.S. EPA), 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530-R-09-007, March 2009.

09/02/2025 - Classification: Internal - ECRM13574471

Tables

09/02/2025 - Classification: Internal - ECRM13574471

Table 1. Groundwater Monitoring Well Network
Ottumwa Generating Station Zero Liquid Discharge Pond
SCS Engineers Project #25225072.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
MW-301	Upgradient	Background
MW-307	Downgradient	Compliance
MW-308	Downgradient	Compliance
MW-309	Downgradient	Compliance
MW-315	Downgradient	Compliance

Created by:	RM	Date:	12/14/2020
Last revision by:	BLJ	Date:	4/2/2025
Checked by:	NLB	Date:	4/3/2025

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09/02/2025 - Classification: Internal - ECRM13574471

Table 2. Groundwater Samples Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond
SCS Engineers Project #25225072.00

Sample Dates	Background Well	Compliance Wells			
	MW-301	MW-307	MW-308	MW-309	MW-315
4/4/2024	A	A	A	A	A
10/10-11/2024	A	A	A	A	A
Total Samples	2	2	2	2	2

Abbreviations:
A = Required by Assessment Monitoring Program
A-S = Supplemental Monitoring Event for Select Parameters

Last revision by: BLJ Date: 4/1/2025
Checked by: NLB Date: 4/3/2025

I:\25225072.00\Deliverables\2024 - OGS ZLDP Federal CCR Annual Report\Tables\[Table 2 - GW Samples Summary.xlsx]GW Summary

09/02/2025 - Classification: Internal - ECRM13574471

Table 3. Groundwater Elevations - CCR Rule Monitoring Well Networks
IPL - Ottumwa Generating Station / SCS Engineers Project #25225072.00

Ground Water or Surface Water Elevation in feet above mean sea level (amsl)																												
Well Number	**MW-301**	**MW-302**	**MW-302WT**	**MW-303**	**MW-304**	**MW-304WT**	**MW-305**	**MW-305A**	**MW-306**	**MW-306WT**	**MW-307**	**MW-308**	**MW-309**	**MW-310**	**MW-310A**	**MW-311**	**MW-311A**	**MW-312**	**MW-313**	**MW-314**	**MW-314WT**	**MW-315**	**MW-316**	**MW-316A**	**MW-317**	**SG-1**	**SG-2**	**SG-3**
Top of Well Casing Elevation / Surface Water Reference Elevation (feet amsl)	686.47	673.90	674.53	661.07	682.84	682.20	683.91	684.03	683.47	684.05	657.56	655.39	654.94	658.63	657.93	654.18	653.54	655.36	655.84	684.71	684.61	655.65	657.30	657.74	656.33	656.31	642.84	643.50
Screen Length (ft)	10.0	5.0	10.0	5.0	5.0	10.0	5.0	5.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	10.0	5.0	10.0	5.0	10.0	NA	NA	NA
Total Depth (ft from top of casing)	17.0	25.8	19.23	17.5	52.3	37.7	51.5	81.91	36.6	24.05	28.0	25.0	27.5	25.9	55.55	17.9	47.68	29.87	23.82	33.24	24.81	26.6	24.94	54.81	27.91	NA	NA	NA
Top of Well Screen Elevation (ft)	679.47	653.10	665.3	648.57	635.54	654.5	637.41	607.12	651.87	670.00	634.56	635.39	632.44	637.76	607.38	641.24	610.86	630.49	637.02	656.47	669.80	634.06	642.36	607.93	638.42	NA	NA	NA
Measurement Date																												
April 26, 2016	682.80	655.63	NI	652.42	655.37	NI	661.67	NI	670.86	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 23, 2016	682.58	655.65	NI	652.89	656.53	NI	662.36	NI	670.64	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
August 9, 2016	682.27	655.52	NI	651.76	653.79	NI	660.78	NI	670.35	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 26-27, 2016	682.04	655.67	NI	652.17	655.03	NI	661.37	NI	670.21	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
May 17, 2022	681.75	654.56	655.69	652.47	653.60	648.16	657.78	650.77	663.45	<660	649.70	648.06	647.45	644.67	650.07	644.22	645.13	647.57	646.08	667.07	667.19	NI	NI	NI	NI	NM	NI	NI
May 20, 2022	NM	654.63	655.66	NM	653.50	648.68	NM	NM	663.49	<660	NM	NM	NM	NM	NM	NM	NM	NM	NM	667.44	667.46	NI	NI	NI	NI	NM	NI	NI
May 23, 2022	NM	NM	NM	NM	652.66	648.40	NM	NM	NM	<660	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NM	NI	NI
June 2, 2022	681.69	654.22	655.68	651.53	652.37	650.38	656.18	649.53	661.42	<660	648.33	646.68	646.38	644.61	645.23	643.36	644.93	646.43	645.48	666.15	666.21	NI	NI	NI	NI	NM	NI	NI
June 9, 2022	681.80	654.24	655.70	651.44	654.18	650.89	656.34	649.80	661.25	<660	648.90	647.05	647.32	648.23	646.20	644.14	644.61	647.78	648.65	665.82	665.91	NI	NI	NI	NI	NM	NI	NI
June 10, 2022	NM	NM	NM	NM	652.97	650.97	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NI	NM	NI	NI
June 21, 2022	681.60	654.29	655.69	651.35	652.89	651.48	656.25	650.52	660.87	<660	649.54	648.47	648.34	646.29	647.63	644.88	645.60	647.87	647.17	665.61	665.68	NI	NI	NI	NI	NM	NI	NI
June 27, 2022	681.60	654.06	655.68	651.14	652.16	651.55	656.15	649.70	661.41	<660	648.61	647.13	646.34	643.87	644.85	643.64	645.37	646.42	644.80	665.16	665.27	NI	NI	NI	NI	NM	NI	NI
July 5, 2022	681.47	653.92	655.68	650.70	651.03	651.73	655.33	648.51	660.86	<660	647.34	645.41	644.14	641.58	642.91	644.16	644.30	644.50	642.44	665.14	665.24	NI	NI	NI	NI	NM	NI	NI
July 12, 2022	681.46	653.78	655.66	651.39	650.62	651.68	655.03	647.95	660.62	660.77	646.83	644.85	644.17	641.75	642.89	644.26	641.00	644.17	642.65	664.69	664.85	NI	NI	NI	NI	NM	NI	NI
July 27, 2022	681.19	653.60	655.66	649.74	649.56	651.48	654.03	646.85	660.76	662.38	645.67	643.58	642.46	639.61	641.24	638.41	642.41	643.14	640.83	663.93	664.07	NI	NI	NI	NI	639.23	NI	NI
August 25, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	644.25	NM	NM	NM	NM	NM	NM	640.80	639.38	NM	NM	NI	NI	NI	NI	NM	NI	NI
October 26-28, 2022	680.68	652.95	655.65	648.22	647.26	650.81	651.48	644.38	657.11	672.92	643.46	641.13	640.43	638.55	639.49	638.46	640.27	639.64	639.16	661.58	661.64	NI	NI	NI	NI	638.41	NI	NI
February 2, 2023	NM	NM	655.72	NM	NM	651.25	NM	NM	NM	670.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	662.71	662.79	642.40	NI	NI	NI	NM	NI	NI
April 4-6, 2023	681.89	653.30	655.39	652.57	650.29	647.77	655.02	647.70	659.12	662.18	647.28	645.16	644.41	641.71	643.11	641.88	643.59	644.08	642.02	663.84	664.37	645.12	642.78	643.49	642.84	643.06	640.89	642.99
October 10-13, 2023	680.20	652.32	DRY	648.07	646.02	648.68	650.21	643.60	655.40	673.91	642.85	640.79	640.18	638.32	640.13	638.31	639.84	639.45	639.04	660.35	660.40	641.10	639.15	639.79	639.08	DRY	NM	NM
April 4-5, 2024	680.79	651.81	662.07	649.52	648.39	647.95	650.62	645.43	654.47	669.99	645.09	643.32	644.51	643.51	642.81	below pur	635.54	643.94	644.49	659.64	660.17	644.23	644.09	643.94	644.11	644.29	>642.836	>643.501
June 6, 2024	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	651.37	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
August 20, 2024	681.34	653.32	655.70	652.19	650.95	651.74	654.54	649.69	658.59	672.98	649.17	647.35	646.01	643.01	644.75	644.30	646.46	646.20	644.16	663.07	663.16	646.77	643.67	645.12	643.85	646.08	NM	NM
September 5, 2024	NM	NM-BP	NM	651.03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
October 8-11, 2024	680.49	NM-BP	655.65	649.42	646.30	650.16	650.11	644.16	655.30	673.67	643.26	641.21	640.25	637.99	639.39	DRY	641.01	640.17	638.87	660.28	660.30	641.37	DRY	639.96	638.82	641.49	Damaged	Damaged

Notes:
NM = not measured
NI = not installed
NM-BP = not measured; groundwater below well pump

Last rev. by: RM Date: 10/22/2024
Checked by: KMV Date: 10/22/2024

I:\25225072.00\Deliverables\2024 - OGS ZLDP Federal CCR Annual Report\Tables\[Table 3- Groundwater Elevation Summary_OGS.xls]levels

09/02/2025 - Classification: Internal - ECRM13574471

Table 4. Groundwater Gradients and Average Linear Velocity
Ottumwa Generating Station Zero Liquid Discharge Pond
SCS Engineers Project #25225072.00
January - December 2024

Sampling Dates	Flow Direction	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d) n 40%
April 4-5, 2024	northeast	655.00	644.23	1,040	0.010	0.3
August 20, 2024	northeast	655.00	646.77	721	0.011	0.3
October 8-11, 2024	northeast	650.00	641.37	663	0.013	0.3

Well	K Value (cm/sec)	K Value (ft/d)
MW-301	4.6E-03	13
MW-307	5.0E-04	1.4
MW-308	2.0E-03	5.8
MW-309	1.5E-03	4.4
MW-315	4.1E-03	12
Geometric Mean	1.6E-03	4.5

Assumed Porosity, n
0.18

Groundwater flow velocity equation: V = [K*(Δh/Δl)] / n

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity

h1, h2 = point interpreted groundwater elevation at locations 1
Δl = distance between locations 1 and 2
Δh/Δl = hydraulic gradient

Notes:

1. Hydraulic conductivity (K) is the geometric mean of the slug test results for water table monitoring wells MW-307, MW-308, MW-309 and MW-315.

2. Effective porosity value is estimated at the mid range of porosity values for sandstone in Freeze and Cherry, *Groundwater* , 1979, Table 2.4. The lithlogy of the screened interval for monitoring wells MW-307, MW-308 and MW-309 is sandstone and the lithology for MW-315 is poorly graded sand.

3. Flow paths for horizontal groundwater velocity calculation shown on Figures 3, 4 and 5.

Last revision by: NLB Date: 4/9/2025
Checked by: LH Date: 4/28/2025

I:\25225072.00\Deliverables\2024 - OGS ZLDP Federal CCR Annual Report\Tables\[Table 4 - Horizontal Gradients and Flow Velocity Table.xlsx]Sheet1

09/02/2025 - Classification: Internal - ECRM13574471

Table 5A. Groundwater Analytical Results Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond (ZLDP)
SCS Engineers Project #25224072.00

Parameter Name	UPL/UTL Method	UPL	GPS	Background Well	Compliance Wells				
				MW-301	MW-307		MW-308	MW-309	MW-315
				4/4/2024	4/4/2024	6/6/2024	4/4/2024	4/4/2024	4/4/2024
Groundwater elevation, ft amsl				680.79	645.09	651.37	643.32	644.51	644.23
Appendix III									
Boron, µg/L	P	821		410	220	--	350	1400	1200
Calcium, mg/L	P	101		85	240	--	220	160	130
Chloride, mg/L	P	195		87	260	--	150	65	63
Fluoride, mg/L	P	0.366		<0.38	<0.38	--	<0.38	<0.38	<0.38
Field pH, Std. Units	P	6.71		6.65	6.52	6.32	6.61	6.93	6.85
Sulfate, mg/L	P	204		240	140	--	300	470	470
Total Dissolved Solids, mg/L	P	684		550	1000	--	1000	1000	1000
Appendix IV		**UTL**							
Antimony, µg/L	NP	1.10	6	<1.0	<1.0	--	<1.0	<1.0	<1.0
Arsenic, µg/L	NP	0.880	10	<0.53	<0.53	--	<0.53	<0.53	1.5 J
Barium, µg/L	P	71.0	2,000	33	130	--	120	56	36
Beryllium, µg/L	NP	0.270	4	<0.33	<0.33	--	<0.33	<0.33	<0.33
Cadmium, µg/L	P	0.149	5	<0.10	<0.10	--	<0.10	<0.10	<0.10
Chromium, µg/L	NP	1.10	100	<1.2	<1.2	--	<1.2	<1.2	<1.2
Cobalt, µg/L	P	5.26	6	<0.17	38	63	<0.17	2.4	7.8
Fluoride, mg/L	P	0.417	4	<0.38	<0.38	--	<0.38	<0.38	<0.38
Lead, µg/L	NP	0.270	15	<0.26	<0.26	--	<0.26	<0.26	<0.26
Lithium, µg/L	P	31.8	40	21	13	--	16	9.5 J	6.0 J
Mercury, µg/L	DQ	DQ	2	<0.11	<0.11	--	<0.11	<0.11	<0.11
Molybdenum, µg/L	NP	1.3	100	<1.3	<1.3	--	<1.3	<1.3	1.6 J
Selenium, µg/L	P	9.01	50	5.1	<1.4	--	<1.4	<1.4	<1.4
Thallium, µg/L	NP	0.500	2	<0.57	<0.57	--	<0.57	<0.57	<0.57
Radium 226/228 Combined, pCi/L	P	1.71	5	0.616	2.55	--	1.94	1.50	1.23
Additional Parameters Collected for Selection of Remedy									
Cobalt - dissolved, µg/L	UPL and GPS not applicable			--	44	--	--	--	7.5
Iron, dissolved, µg/L				--	--	--	--	--	2300
Iron, µg/L				<36	3300	--	3400	800	2700
Magnesium µg/L				--	--	--	--	--	21000
Manganese, dissolved, µg/L				--	--	--	--	--	7400
Manganese, µg/L				--	--	--	--	--	7600
Potassium, µg/L				--	--	--	--	--	1600
Sodium, µg/L				--	--	--	--	--	210000
Bicarbonate Alkalinity, mg/L				--	--	--	--	--	280
Carbonate Alkalinity, mg/L				--	--	--	--	--	<2.5
Total Alkalinity, mg/L				--	--	--	--	--	280

4.4
30.8
17

Blue shaded cell indicates the compliance well result exceeds the UPL or UTL (background) and the LOQ.
Yellow highlighted cell indicates the compliance well result exceeds the GPS.
Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

09/02/2025 - Classification: Internal - ECRM13574471

Table 5A. Groundwater Analytical Results Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond (ZLDP)
SCS Engineers Project #25224072.00

Abbreviations:

UPL = Upper Prediction Limit
UTL = Upper Tolerance Limit
-- = Not Analyzed
P = Parametric
GPS = Groundwater Protection Standard
mg/L = milligrams per liter
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric
LOD = Limit of Detection
LOQ = Limit of Quantitation
µg/L = micrograms per liter

Lab Notes:

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Notes:

1. An individual result above the UPL, UTL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level (SSL) above the GPS. See the accompanying report text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (U.S. EPA) Maximum Contamination Level (MCL), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs and UTLs are calculated based on results from background well MW-301. UPLs and UTLs were updated in 2022 using data collected through April 2022 at MW-301.
4. The additional sampling event on June 6, 2024 for cobalt and field parameters was performed in support of selection of remedy.

Created by:	NDK	Date:	5/21/2021
Last revision by:	RM	Date:	7/18/2024
Checked by:	TK	Date:	7/18/2024
Sci./PM QA/QC:	TK	Date:	7/18/2024

09/02/2025 - Classification: Internal - ECRM13574471

Table 5B. Groundwater Analytical Results Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond (ZLDP)
SCS Engineers Project #25224072.00

Parameter Name	UPL/UTL Method	UPL	GPS	Background Well	Compliance Wells			
				MW-301	MW-307	MW-308	MW-309	MW-315
				10/11/2024	10/10/2024	10/10/2024	10/10/2024	10/10/2024
Groundwater elevation, ft amsl				680.49	643.26	641.21	640.25	641.37
Appendix III								
Boron, µg/L	P	821		520	180	230	1300	1200
Calcium, mg/L	P	101		71	210	220	150	130
Chloride, mg/L	P	195		93	250	150	64	61
Fluoride, mg/L	P	0.366		<0.38	<0.38	<0.38	<0.38	<0.38
Field pH, Std. Units	P	6.71		6.11	6.53	6.65	6.97	6.89
Sulfate, mg/L	P	204		150	130	290	480	460
Total Dissolved Solids, mg/L	P	684		530	1100	1100	1100	1100
Appendix IV		**UTL**						
Antimony, µg/L	NP	1.10	6	<1.0 ^3+	<1.0	<1.0	<1.0	<1.0
Arsenic, µg/L	NP	0.880	10	<0.53	<0.53	<0.53	<0.53	1.4 J
Barium, µg/L	P	71.0	2,000	36	110	120	56	37
Beryllium, µg/L	NP	0.270	4	<0.33	<0.33	<0.33	<0.33	<0.33
Cadmium, µg/L	P	0.149	5	<0.10	<0.10	<0.10	<0.10	<0.10
Chromium, µg/L	NP	1.10	100	<1.2	<1.2	<1.2	<1.2	<1.2
Cobalt, µg/L	P	5.26	6	0.22 J	34	0.18 J	2.2	7.4
Fluoride, mg/L	P	0.417	4	<0.38	<0.38	<0.38	<0.38	<0.38
Lead, µg/L	NP	0.270	15	<0.26	<0.26	<0.26	<0.26	<0.26
Lithium, µg/L	P	31.8	40	20 B	10	15	8.2 J	5.6 J
Mercury, µg/L	DQ	DQ	2	<0.11 H	<0.11	<0.11	<0.11	<0.11
Molybdenum, µg/L	NP	1.3	100	<1.3	<1.3	<1.3	<1.3	1.6 J
Selenium, µg/L	P	9.01	50	3.9 J	<1.4	<1.4	<1.4	<1.4
Thallium, µg/L	NP	0.500	2	<0.57	<0.57	<0.57	<0.57	<0.57
Radium 226/228 Combined, pCi/L	P	1.71	5	0.371	2.15	1.54	1.47	1.85
Additional Parameters Collected for Selection of Remedy								
Cobalt - dissolved, µg/L	UPL and GPS not applicable			--	39	--	--	7.0
Iron, dissolved, µg/L				--	--	--	--	2500
Iron, µg/L				<36	2800	3600	680	2600
Magnesium µg/L				--	--	--	--	21000
Manganese, dissolved, µg/L				--	--	--	--	7600
Manganese, µg/L				--	--	--	--	7900
Potassium, µg/L				--	--	--	--	1900
Sodium, µg/L				--	--	--	--	200000
Bicarbonate Alkalinity, mg/L				--	--	--	--	280
Carbonate Alkalinity, mg/L				--	--	--	--	<2.5
Total Alkalinity, mg/L				--	--	--	--	280

4.4
30.8
17

Blue shaded cell indicates the compliance well result exceeds the UPL or UTL (background) and the LOQ.
Yellow highlighted cell indicates the compliance well result exceeds the GPS.
Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of Monitored Natural Attenuation.

09/02/2025 - Classification: Internal - ECRM13574471

Table 5B. Groundwater Analytical Results Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond (ZLDP)
SCS Engineers Project #25224072.00

Abbreviations:

UPL = Upper Prediction Limit
UTL = Upper Tolerance Limit
-- = Not Analyzed
P = Parametric
GPS = Groundwater Protection Standard
mg/L = milligrams per liter
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric
LOD = Limit of Detection
LOQ = Limit of Quantitation
µg/L = micrograms per liter
amsl = above mean sea level

Lab Notes:

J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B = Compound was found in the blank and sample.
H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
^3+ = Reporting Limit Check Standard is outside acceptance limits, high biased

Notes:

1. An individual result above the UPL, UTL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level (SSL) above the GPS. See the accompanying report text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (U.S. EPA) Maximum Contamination Level (MCL), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs and UTLs are calculated based on results from background well MW-301. UPLs and UTLs were updated in 2022 using data collected through April 2022 at MW-301.
4. The additional sampling event on June 6, 2024 for cobalt and field parameters was performed in support of selection of remedy.

Created by:	NDK	Date:	5/21/2021
Last revision by:	RM	Date:	11/19/2024
Checked by:	CG	Date:	11/20/2024
Sci./PM QA/QC:	TK	Date:	1/29/2025

09/02/2025 - Classification: Internal - ECRM13574471

Table 6. 2024 Groundwater Field Data Summary
Ottumwa Generating Station - Zero Liquid Discharge Pond
SCS Engineers Project #25224072.00

Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	4/4/2024	680.79	8.5	6.65	9.81	868	92.0	5,63
	10/11/2024	680.49	17.6	6.11	3.06	1,017	204.5	3.02
MW-307	4/4/2024	645.09	12.4	6.52	0.75	1,693	-31.8	3.69
	10/10/2024	643.26	15.0	6.53	0.26	2,271	19.0	3.43
MW-308	4/4/2024	643.32	12.0	6.61	0.79	1,524	-44.0	4.04
	10/10/2024	641.21	14.4	6.65	1.50	2,081	24.1	6.99
MW-309	4/4/2024	644.51	12.2	6.93	0.56	1,459	-48.0	3.68
	10/10/2024	640.25	13.5	6.97	0.66	1,997	31.7	19.38
MW-315	4/4/2024	644.23	12.3	6.85	0.34	1,479	-74.3	4.47
	10/10/2024	641.37	13.9	6.89	1.26	2,008	2.7	9.56

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

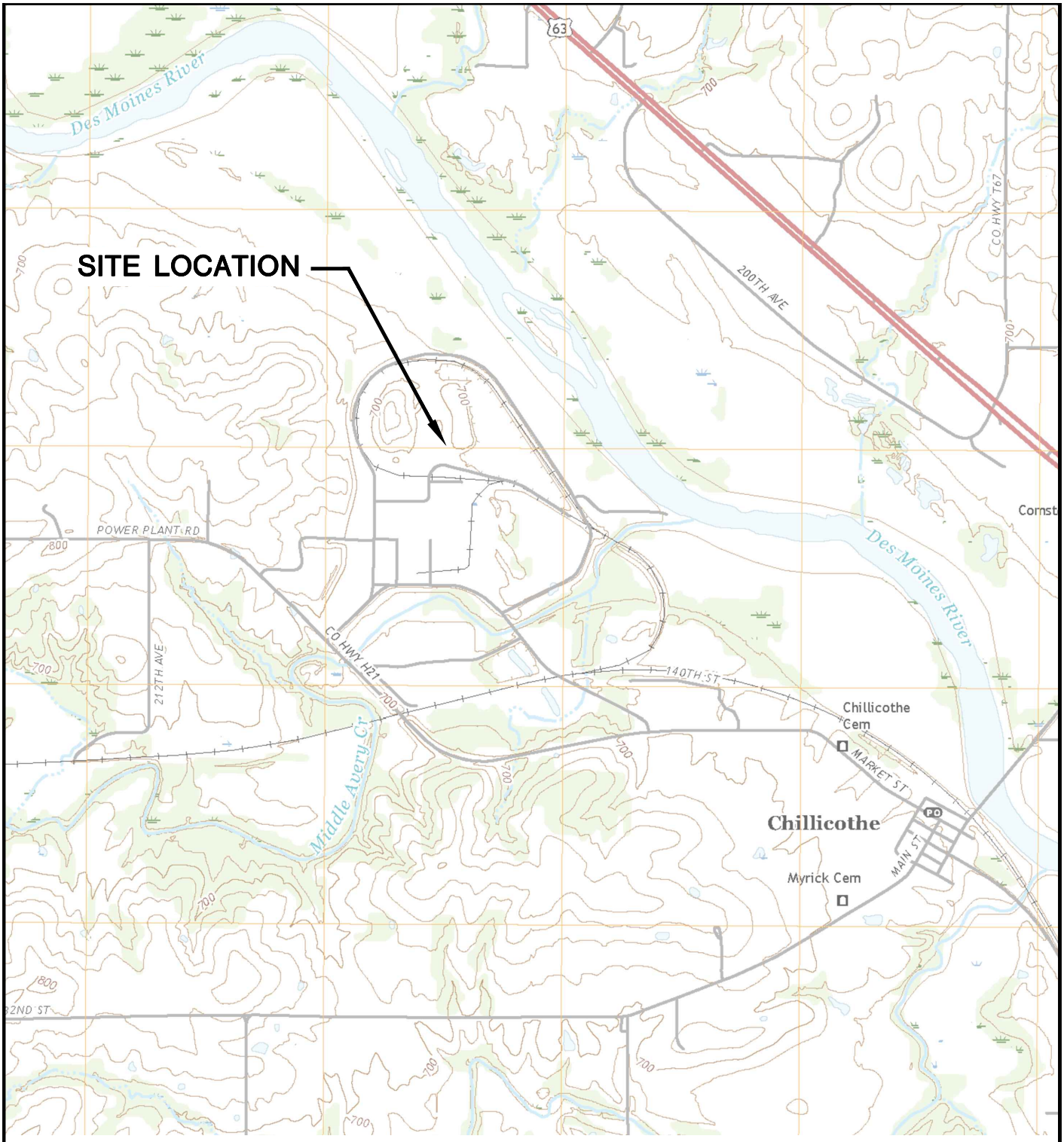
Last revision by: BLJ Date: 4/3/2025
Checked by: NLB Date: 4/3/2025

I:\25225072.00\Deliverables\2024 - OGS ZLDP Federal CCR Annual Report\Tables\[Table 6 - Field Parameters_OGS ZLDP.xlsx]Table 6

09/02/2025 - Classification: Internal - ECRM13574471

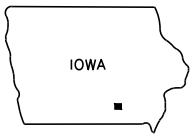
Figures

09/02/2025 - Classification: Internal - ECRM13574471



N

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

SITE LOCATION MAP

PROJECT NO.	25219072.00	DRAWN BY:	BSS
DRAWN:	11/15/2019	CHECKED BY:	MDB
REVISED:	01/10/2020	APPROVED BY:	TK 01/30/2020

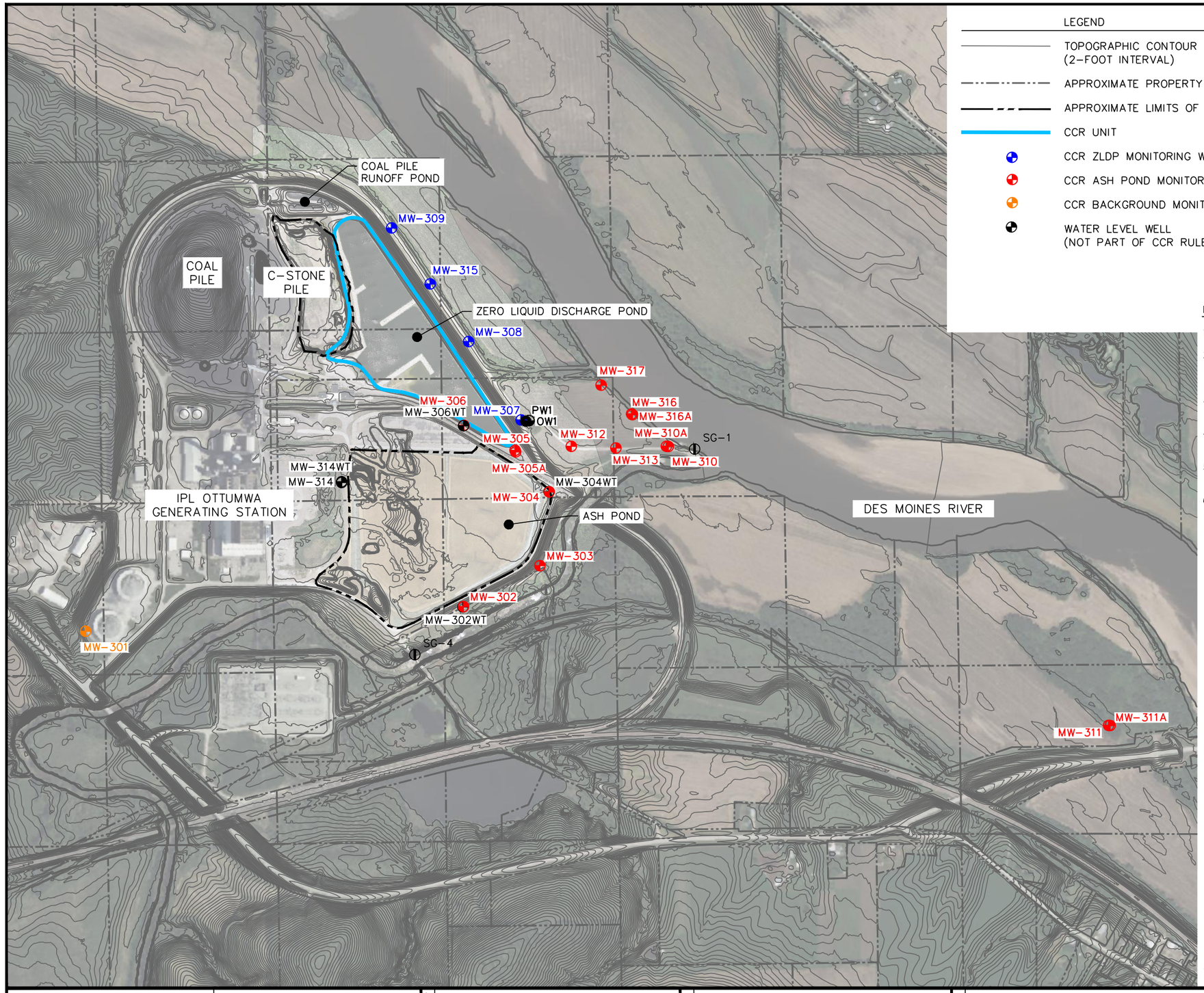
ENGINEER

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

FIGURE 1

I:\25219072.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:51:43 PM

09/02/2025 - Classification: Internal - ECRM13574471



LEGEND

- TOPOGRAPHIC CONTOUR (2-FOOT INTERVAL)
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMITS OF ASH DISPOSAL
- CCR UNIT
- CCR ZLDP MONITORING WELL
- CCR ASH POND MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- OBSERVATION WELL
- SURFACE WATER ELEVATION MEASUREMENT LOCATION
- EXTRACTION WELL
- ABANDONED STAFF GAUGE

N

800 0 800

SCALE: 1" = 800'

NOTES:

1. MONITORING WELL AND OTHER SAMPLE LOCATIONS ARE APPROXIMATE.
2. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF AN AERIAL PHOTOGRAPH IMPORTED FROM BING MAPS USING AUTOCAD GEOLOCATION MAP TOOL AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19th, 2023.
3. PROPERTY LINE INFORMATION FROM WAPELLO COUNTY, IOWA. LOCATION ARE APPROXIMATE.
4. COORDINATE SYSTEM IS NAD83 IOWA STATE PLANE, SOUTH ZONE, US SURVEY FEET.
5. LIDAR DERIVED 2-FT CONTOUR DATA FROM 2020, WAPELO COUNTY, IOWA. SOURCED FROM THE IOWA GEOSPATIAL DATA CLEARINGHOUSE.
6. MONITORING WELL INSTALLATION SUMMARY:
   - 6.1. MONITORING WELLS MW-301, MW-302, AND MW-304 WERE INSTALLED BY CASCADE DRILLING, LLP UNDER THE SUPERVISION OF SCS ENGINEERS FROM NOVEMBER 11-12, 2015.
   - 6.2. MONITORING WELLS MW-303 AND MW-305 WERE INSTALLED BY CASCADE DRILLING LLP UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 708, 2015.
   - 6.3. MW-301 THROUGH MW-306 WERE SURVEYED BY FRENCH-RENEKER-ASSOCIATES OF FRANKLIN, IA ON DECEMBER 1-2, 2015, AND FEBRUARY 11, 2016.
   - 6.4. MONITORING WELLS MW-307, MW-308, AND MW-309 WERE INSTALLED BY CASCADE DRILLING LLP UNDER THE SUPERVISION OF SCS ENGINEERS FROM OCTOBER 25-27, 2016, AND WERE SURVEYED BY SCS ENGINEERS ON JANUARY 18, 2017.
   - 6.5. MONITORING WELLS MW-310 AND MW-311 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING ON AUGUST 27, 2019, AND WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES OF FAIRFIELD, IA ON SEPTEMBER 24, 2019.
   - 6.6. MONITORING WELLS MW-305A, MW-310A AND MW-311A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING BETWEEN FEBRUARY 27, 2020, AND MARCH 3, 2020, AND WERE SURVEYED BY FRENCH-RENEKER OF FAIRFIELD, IA ON MAY 8, 2020.
   - 6.7. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY CASCADE DRILLING ON DECEMBER 14, 2021, AND WERE SURVEYED BY ABACI CONSULTING OF GRIMES, IA ON FEBRUARY 8, 2022.
   - 6.8. MONITORING WELLS MW-302WT, MW-304WT, MW-306WT, MW-314 AND MW-314WR WERE INSTALLED BY DIRECT PUSH ANALYTICAL ON APRIL 27-28, 2022, AND WERE SURVEYED BY CLAPSADDLE-GARBER ASSOCIATES, INC. OF AMES, IA ON MAY 4, 2022.
   - 6.9. MONITORING WELL MW-315 WAS INSTALLED BY DIRECT PUSH ANALYTICAL UNDER THE SUPERVISION OF SCS ENGINEERS ON NOVEMBER 29, 2022, AND WAS SURVEYED BY ABACI CONSULTING OF GRIMES, IA ON DECEMBER 29, 2022.
   - 6.10. STAFF GAUGES SG-2 AND SG-3 WERE INSTALLED ON MARCH 27, 2023, AND WERE SUBSEQUENTLY LOST IN 2024. THEY WERE SURVEYED BY ABACI CONSULTING OF GRIMES, IA ON JUNE 20, 2023.
   - 6.11. MONITORING WELLS MW-316, MW-316A AND MW-317 WERE INSTALLED BY CASCADE DRILLING LLP UNDER THE SUPERVISION OF SCS ENGINEERS, ON MARCH 28-29, 2023, AND WERE SURVEYED BY ABACI CONSULTING OF GRIMES, IA ON APRIL 10, 2023.
   - 6.12. PUMPING TEST WELLS PW-1 AND OW-1 WERE INSTALLED FOR AQUIFER PUMPING TESTS BY CASCADE DRILLING LLP ON APRIL 9TH, 2024.
7. EXISTING LIMITS OF ASH DISPOSAL ARE APPROXIMATE.

PROJECT NO.	25225072.00	DRAWN BY:	SB
DRAWN:	06/09/2025	CHECKED BY:	NLB 07/16/2025
REVISED:	07/16/2025	APPROVED BY:	TK 08/01/2025

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT CO.
20775 POWER PLANT ROAD
OTTUMWA, IA 52501

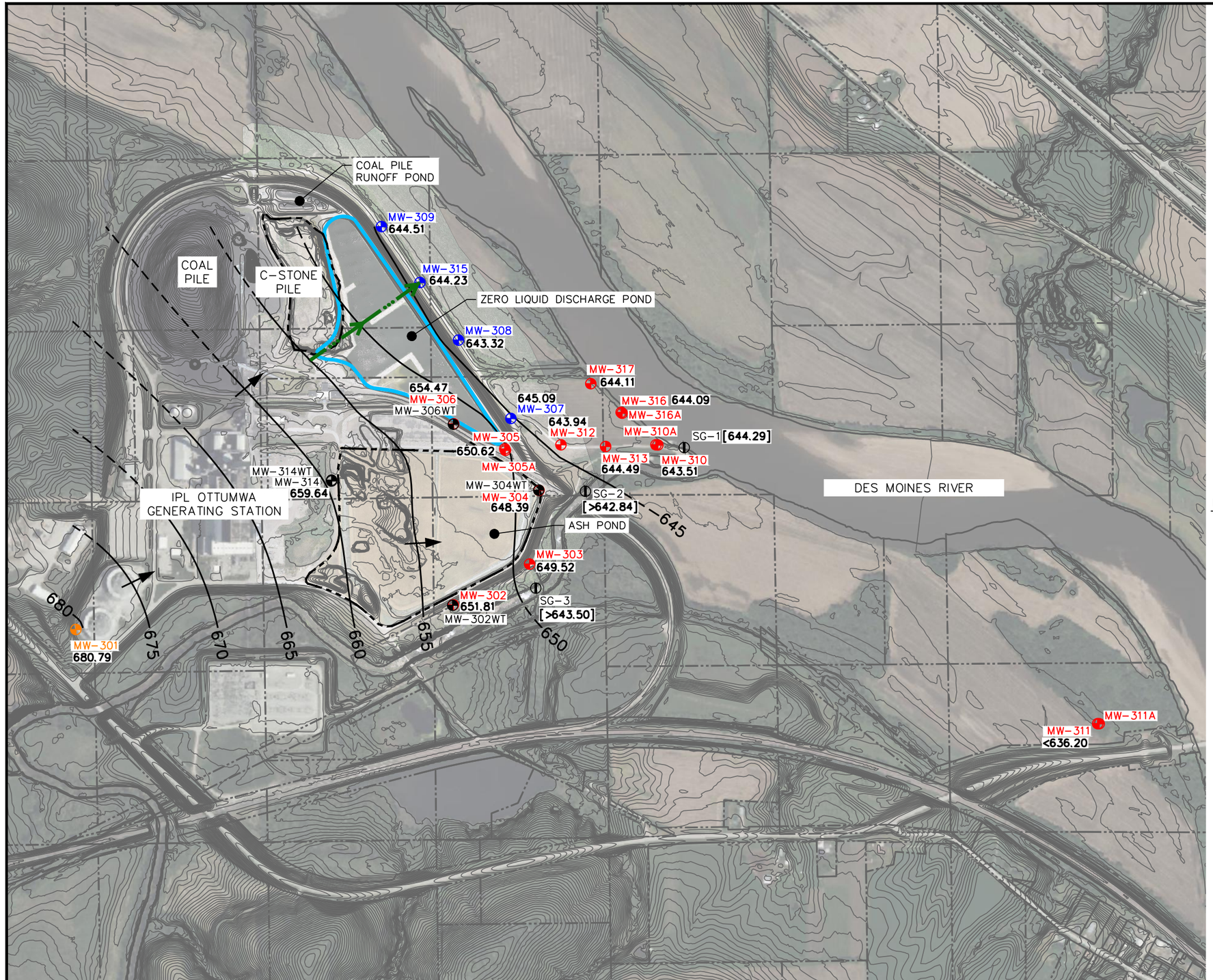
SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

I:\25225072.00\Drawings\2024 Annual CCR Report\02_Site Plan.dwg, 7/16/2025 3:02:09 PM

09/02/2025 - Classification: Internal - ECRM13574471



LEGEND

- CCR UNIT
- CCR ZLDP MONITORING WELL
- CCR ASH POND MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [644.29] SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (APRIL 2024)
- 644.09 SHALLOW POTENTIOMETRIC ELEVATION CONTOUR AT WELL (APRIL 2024)
- SHALLOW POTENTIOMETRIC ELEVATION CONTOUR (5-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- TOPOGRAPHIC CONTOUR (2-FOOT INTERVAL)
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMITS OF ASH DISPOSAL

NOTES:

1. WATER LEVELS WERE MEASURED ON APRIL 4-5, 2024.
2. WELL INSTALLATION AND SURVEY INFORMATION: SEE SITE PLAN FIGURE 2 NOTES.
3. STATE MONITORING WELLS: NOT APPLICABLE.
4. CCR BACKGROUND MONITORING WELLS ARE: MW-301 FOR BOTH THE ASH POND AND ZLD POND CCR UNITS.
5. CCR MONITORING WELLS: MW-302, MW-303, MW-304, MW-305, MW-305A, MW-306, MW-307, MW-308, MW-309, MW-310, MW-310A, MW-311, MW-311A, MW-312, MW-313, MW-314, MW-315, MW-316, MW-316A, AND MW-317.
6. SURFACE WATER MONITORING POINTS: SG-1.
7. OTHER MONITORING POINTS: MW-302WT, MW-304WT, MW-306WT AND MW-314WT.
8. THERE WERE NO DRY MONITORING WELLS OR LEACHATE HEADWELLS IN APRIL, 2024.
9. VERTICAL DATUM IS REFERENCED TO THE USGS MEAN SEA LEVEL (MSL).
10. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF AN AERIAL PHOTOGRAPH IMPORTED FROM BING MAPS USING AUTOCAD GEOLOCATION MAP TOOL AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19th, 2023.

N

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SCALE: 1" = 800'

PROJECT NO.	25225072.00	DRAWN BY:	SB
DRAWN:	06/09/2025	CHECKED BY:	NLB (07/16/2025)
REVISED:	07/16/2025	APPROVED BY:	TK (08/01/2025)

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT CO.
20775 POWER PLANT ROAD
OTTUMWA, IA 52501

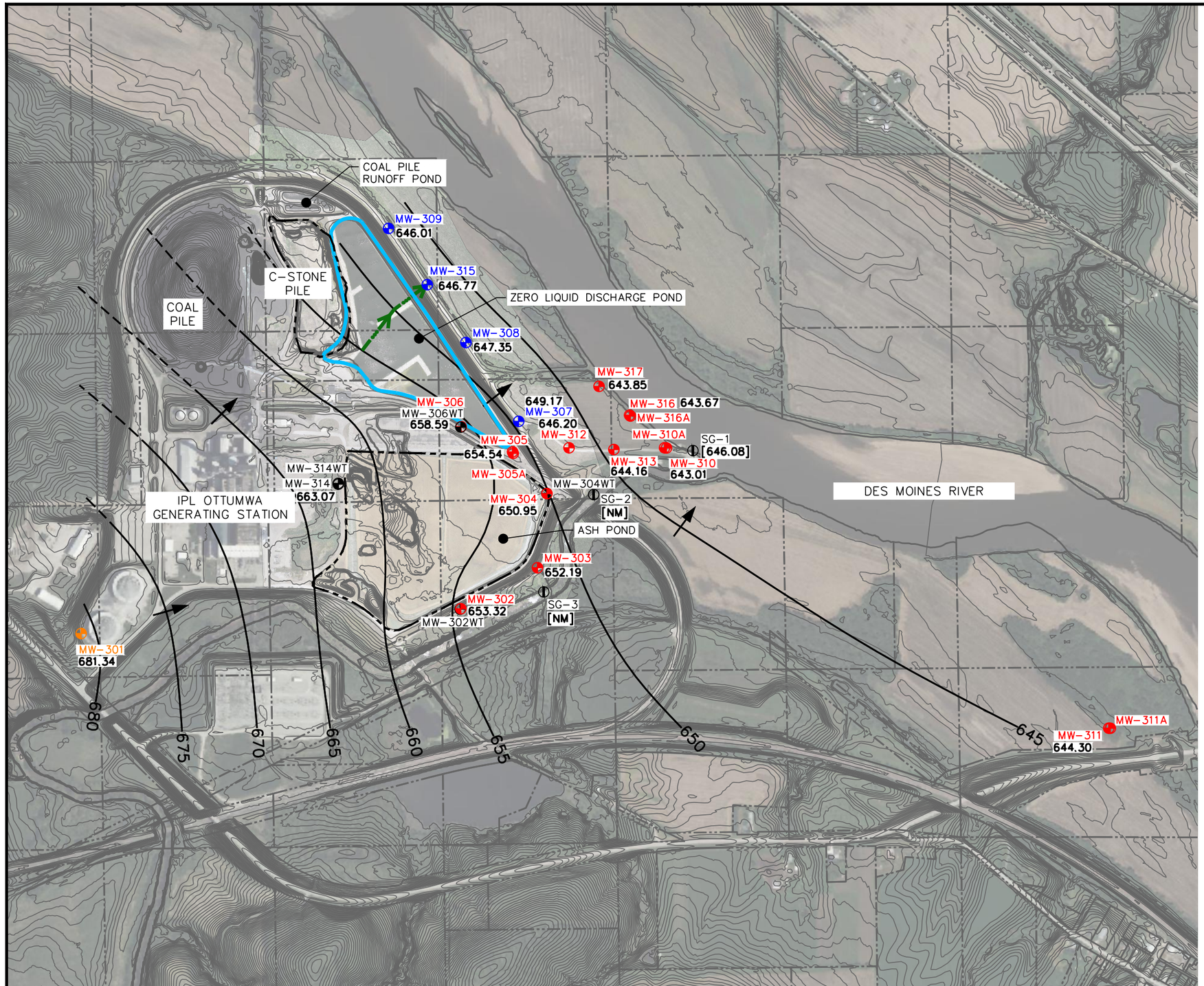
SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP
APRIL 2024

FIGURE 3

I:\25225072.00\Drawings\2024 Annual CCR Report\03_April 2024 Shallow.dwg, 7/16/2025 3:13:15 PM

09/02/2025 - Classification: Internal - ECRM13574471



LEGEND

- CCR UNIT
- CCR ZLDP MONITORING WELL
- CCR ASH POND MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [646.08] SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (AUGUST 2024)
- 681.34 SHALLOW POTENTIOMETRIC ELEVATION CONTOUR AT WELL (AUGUST 2024)
- SHALLOW POTENTIOMETRIC ELEVATION CONTOUR (5-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4) TOPOGRAPHIC CONTOUR (2-FOOT INTERVAL)
- TOPOGRAPHIC CONTOUR (2-FOOT INTERVAL)
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMITS OF ASH DISPOSAL

NOTES:

1. WATER LEVELS WERE MEASURED ON AUGUST 20, 2024.
2. WELL INSTALLATION AND SURVEY INFORMATION: SEE SITE PLAN FIGURE 2 NOTES.
3. STATE MONITORING WELLS: NOT APPLICABLE.
4. CCR BACKGROUND MONITORING WELLS ARE: MW-301 FOR BOTH THE ASH POND AND ZLD POND CCR UNITS.
5. CCR MONITORING WELLS: MW-302, MW-303, MW-304, MW-305, MW-305A, MW-306, MW-307, MW-308, MW-309, MW-310, MW-310A, MW-311, MW-311A, MW-312, MW-313, MW-314, MW-315, MW-316, MW-316A, AND MW-317.
6. SURFACE WATER MONITORING POINTS: SG-1.
7. OTHER MONITORING POINTS: MW-302WT, MW-304WT, MW-306WT AND MW-314WT.
8. THERE WERE NO DRY MONITORING WELLS OR LEACHATE HEADWELLS IN APRIL, 2024.
9. VERTICAL DATUM IS REFERENCED TO THE USGS MEAN SEA LEVEL (MSL).
10. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF AN AERIAL PHOTOGRAPH IMPORTED FROM BING MAPS USING AUTOCAD GEOLOCATION MAP TOOL AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19th, 2023.

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SCALE: 1" = 800'

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PROJECT NO.	25225072.00	DRAWN BY:	SB
DRAWN:	06/09/2025	CHECKED BY:	NLB (07/16/2025)
REVISED:	07/16/2025	APPROVED BY:	TK (08/01/2025)

ENGINEER: SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

CLIENT: INTERSTATE POWER AND LIGHT CO.
20775 POWER PLANT ROAD
OTTUMWA, IA 52501

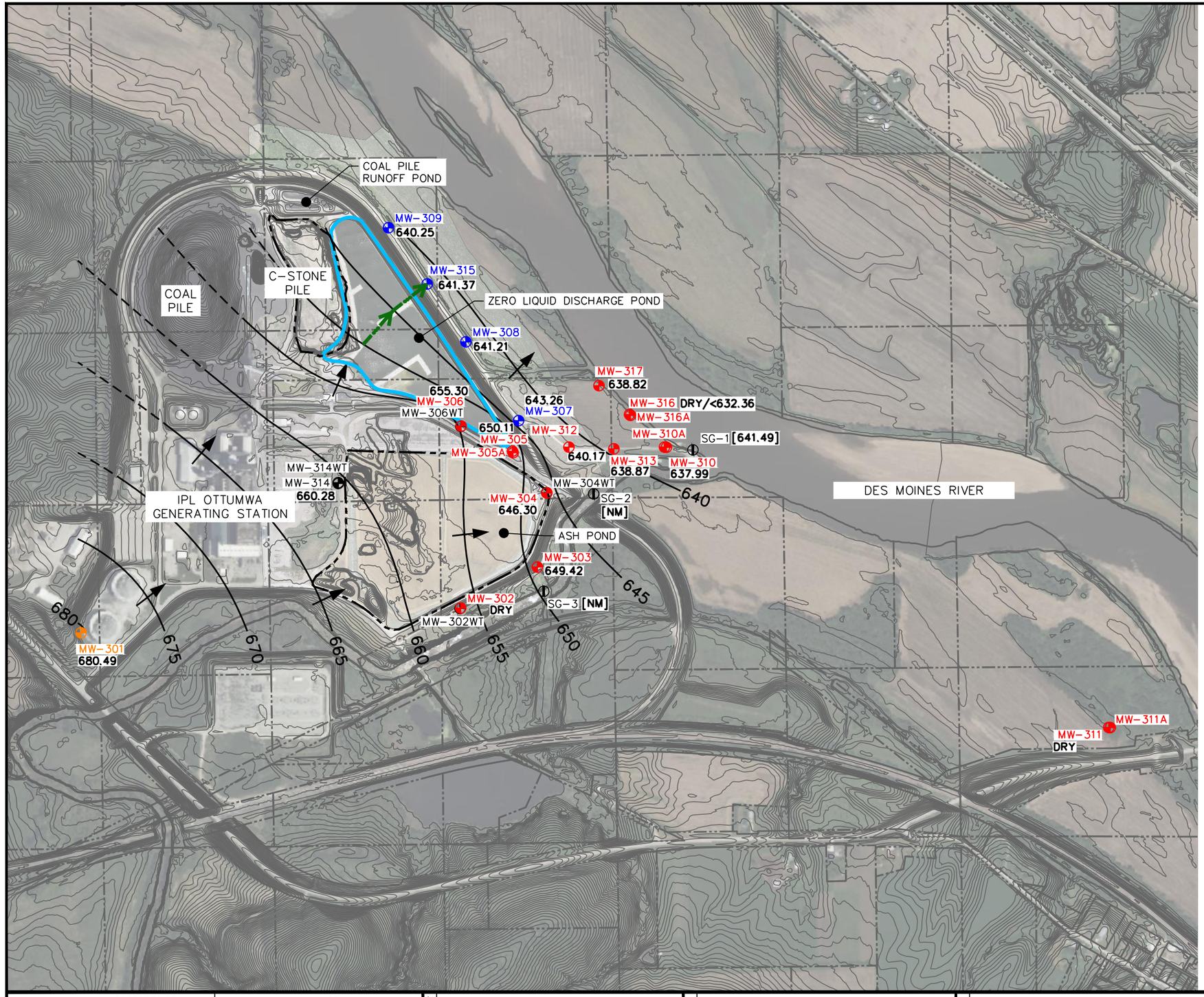
SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP
AUGUST 2024

FIGURE 4

I:\25225072.00\Drawings\2024 Annual CCR Report\04_Augst 2024 Shallow GW Map.dwg, 7/16/2025 3:05:30 PM

09/02/2025 - Classification: Internal - ECRM13574471



LEGEND

- CCR UNIT
- CCR ZLDP MONITORING WELL
- CCR ASH POND MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [641.49] SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (OCTOBER 2024)
- 680.49 SHALLOW POTENTIOMETRIC ELEVATION CONTOUR AT WELL (OCTOBER 2024)
- SHALLOW POTENTIOMETRIC ELEVATION CONTOUR (5-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- TOPOGRAPHIC CONTOUR (2-FOOT INTERVAL)
- APPROXIMATE PROPERTY LINE
- APPROXIMATE LIMITS OF ASH DISPOSAL

NOTES:

1. WATER LEVELS WERE MEASURED ON OCTOBER 8-11, 2024.
2. WELL INSTALLATION AND SURVEY INFORMATION: SEE SITE PLAN FIGURE 2 NOTES.
3. STATE MONITORING WELLS: NOT APPLICABLE.
4. CCR BACKGROUND MONITORING WELLS ARE: MW-301 FOR BOTH THE ASH POND AND ZLD POND CCR UNITS.
5. CCR MONITORING WELLS: MW-302, MW-303, MW-304, MW-305, MW-305A, MW-306, MW-307, MW-308, MW-309, MW-310, MW-310A, MW-311, MW-311A, MW-312, MW-313, MW-314, MW-315, MW-316, MW-316A, AND MW-317.
6. SURFACE WATER MONITORING POINTS: SG-1.
7. OTHER MONITORING POINTS: MW-302WT, MW-304WT, MW-306WT AND MW-314WT.
8. THERE WERE NO DRY MONITORING WELLS OR LEACHATE HEADWELLS IN APRIL, 2024.
9. VERTICAL DATUM IS REFERENCED TO THE USGS MEAN SEA LEVEL (MSL).
10. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF AN AERIAL PHOTOGRAPH IMPORTED FROM BING MAPS USING AUTOCAD GEOLOCATION MAP TOOL AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19th, 2023.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25225072.00	DRAWN BY:	SB
DRAWN:	06/09/2025	CHECKED BY:	NLB (07/17/2025)
REVISED:	07/17/2025	APPROVED BY:	TK (08/01/2025)

ENGINEER: SCS ENGINEERS
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

SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP
OCTOBER 2024

FIGURE 5

I:\25225072.00\Drawings\2024 Annual CCR Report\05_October 2024 Shallow GW Maps.dwg, 7/17/2025 12:51:49 PM

09/02/2025 - Classification: Internal - ECRM13574471

Appendix A

Summary of Regional Hydrogeologic Stratigraphy

Table OGS-2. Regional Hydrogeologic Stratigraphy
Ottumwa Midland Landfill / SCS Engineers Project #25215053.01

Age of Rocks	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Type of Rock
Quaternary (0-1 million years old)	Surficial Aquifers • Alluvial • Buried-Channel • Drift	0 to 320	Undifferentiated	• Sand, gravel, silt, and clay • Sand, gravel, silt, and clay • Till (sandy, pebbly clay), sand, and silt
Pennsylvanian (180 to 310 million years old)	Aquiclude	0 to 370	Undifferentiated	• Shale, sandstone, limestone, and coal
Mississippian (310 to 345 million years old	Mississippian Aquifer • Upper	0 to 600	St. Louis Spergen	• Limestone and sandstone • Limestone
	• Lower		Warsaw Keokuk Burlington Hampton Starrs Cave	• Shale and dolomite • Dolomite, limestone, and shale • Dolomite and limestone • Limestone and dolomite • Limestone
	Aquiclude	0 to 425	Prospect Hill McCraney	• Siltstone • Limestone
Devonian (345 to 400 million years old)			Yellow Spring Lime Creek	• Shale, dolomite, and siltstone • Dolomite and shale
	Devonian Aquifer	110 to 420	Cedar Valley Wapsipinicon	• Limestone and dolomite • Dolomite, limestone, shale, and gypsum
Silurian (400 to 425 million years old)		0 to 105	Undifferentiated	• Dolomite
Ordovician (425 to 500 million years old)	Aquiclude	150 to 600	Maquoketa Galena Decorah Platteville	• Dolomite and shale • Dolomite and chert • Limestone and shale • Limestone, shale, and sandstone
	Cambrian-Ordovician aquifer	750 to 1,110	St. Peter Prairie du Chien	• Sandstone • Dolomite and sandstone
Cambrian (500 to 600 million years old)			Jordan St. Lawrence	• Sandstone • Dolomite
	Not considered an aquifer in southeast Iowa	450 to 750+	Franconia Galesville Eau Claire Mt. Simon	• Shale, siltstone, and sandstone • Sandstone • Sandstone, shale, and dolomite • Sandstone
Precambrian (600 million to 2 billion + years old)				• Sandstone, igneous rocks, and metamorphic rocks

*This nomenclature and classification of rock units in this report are those of the Iowa Geological Survey and do not necessarily coincide with those accepted by the U.S. Geological Survey.

Source: "Water Resources of Southeast Iowa," Iowa Geologic Survey Water Atlas No. 4.

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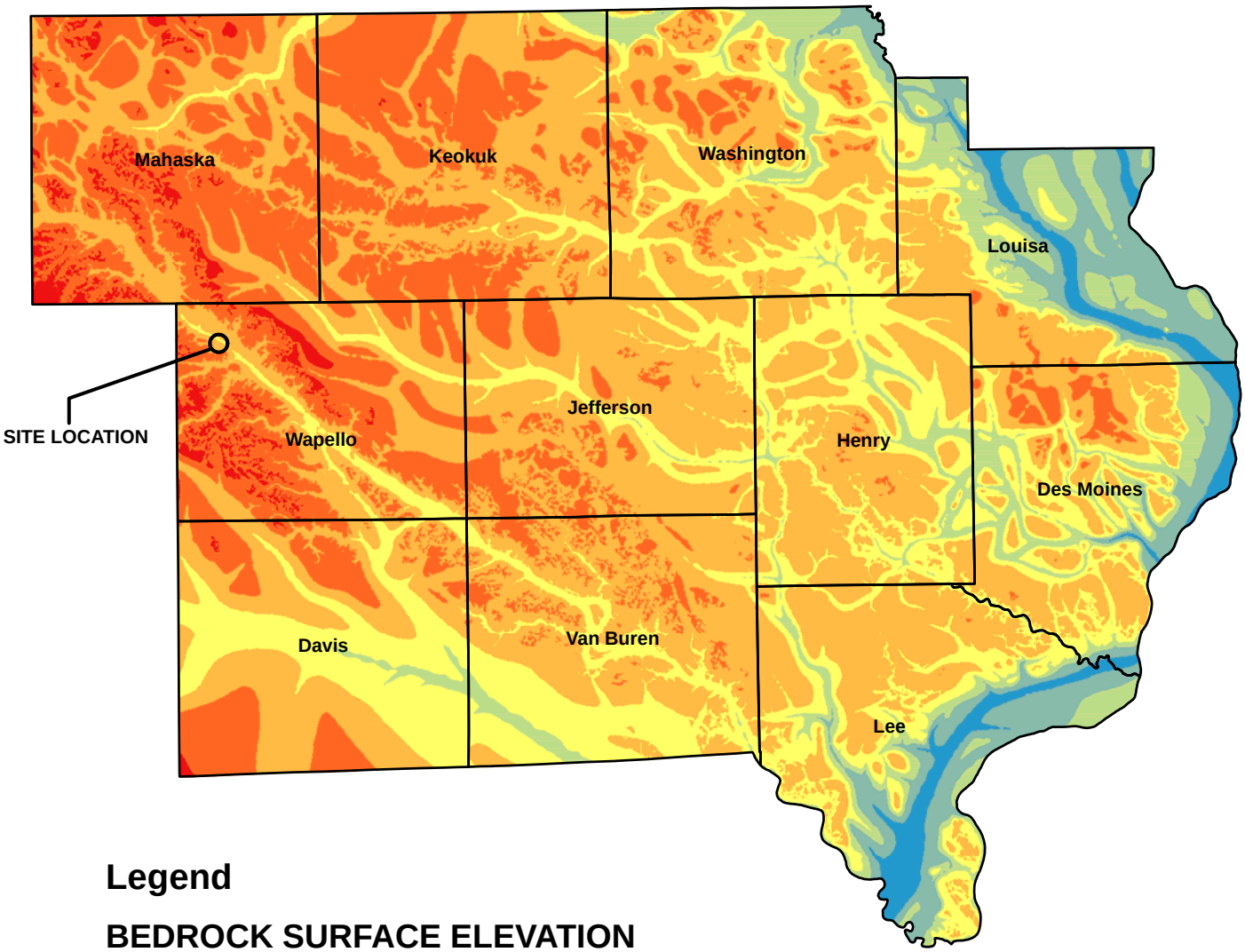
09/02/2025 - Classification: Internal - ECRM13574471



Legend

BEDROCK SURFACE ELEVATION

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- BELOW 300
- 300 TO 400
- 400 TO 500
- 500 TO 600
- 600 TO 700
- 700 TO 800
- 800 TO 900

N

0 5 10 20 Miles

MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY
IOWA BEDROCK SURFACE ELEVATION AS OBTAINED
FROM IOWA NATURAL RESOURCES
GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

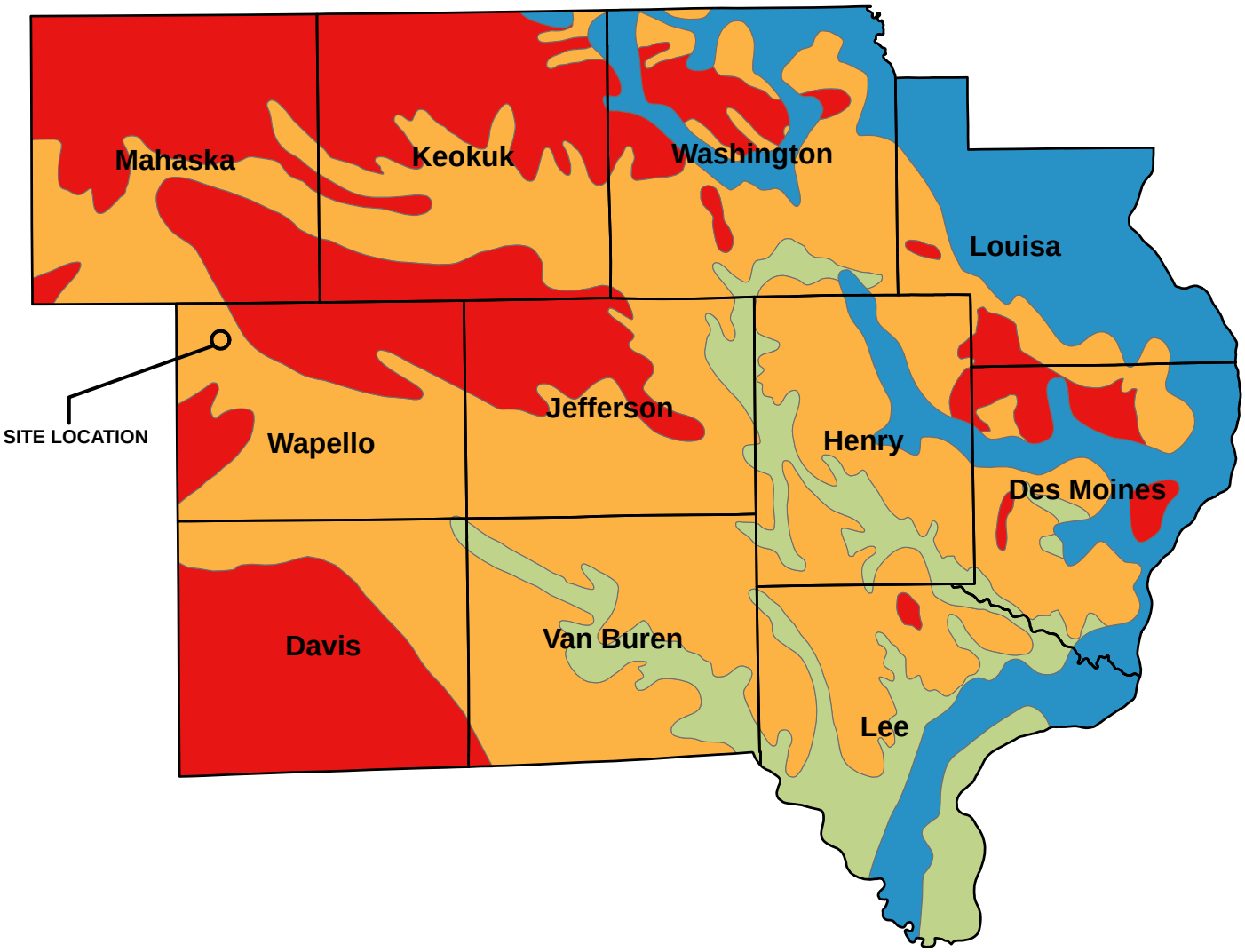
CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	OTTUMWA GENERATING STATION OTTUMWA, IOWA	SE IOWA REGIONAL BEDROCK SURFACE ELEVATION

PROJECT NO.	25215053.03	DRAWN BY:	JB	ENGINEER	FIGURE
DRAWN:	07/29/13	CHECKED BY:	MDB		
REVISED:	05/29/15	APPROVED BY:			

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830 FAX: (608) 224-2839

I:\25215053\Drawings\OGS\ArcMAP\OML-BEDROCK TOPO 8.5X11 portrait.mxd

09/02/2025 - Classification: Internal - ECRM13574471



Legend

MISSISSIPIAN AQUIFER POTENTIOMETRIC SURFACE

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 550
- 650
- 750

N

0 5 10 20 Miles

MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY
MISSISSIPIAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION AS OBTAINED
FROM IOWA NATURAL RESOURCES
GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	OTTUMWA GENERATING STATION OTTUMWA, IOWA
	SE IOWA REGIONAL MISSISSIPIAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION		

PROJECT NO.	25215053.03	DRAWN BY:	JB	ENGINEER	FIGURE
DRAWN:	07/29/13	CHECKED BY:	MDB		
REVISED:	05/29/15	APPROVED BY:			

SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830 FAX: (608) 224-2839

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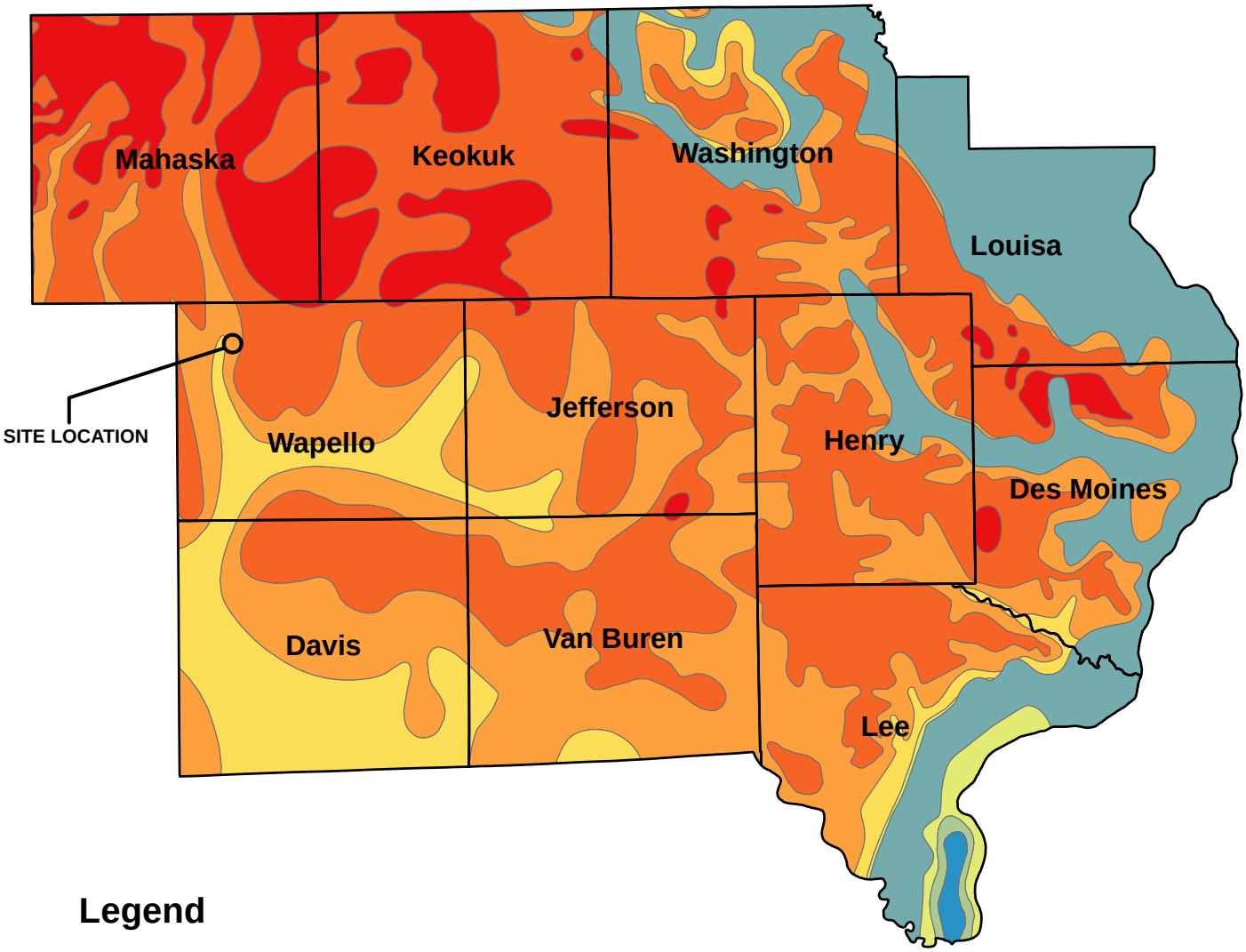
09/02/2025 - Classification: Internal - ECRM13574471



Legend

MISSISSIPIAN AQUIFER ELEVATION

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 150
- 250
- 350
- 450
- 550
- 650
- 750

N

0 5 10 20 Miles

MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY
MISSISSIPPIAN AQUIFER SURFACE ELEVATION AS OBTAINED
FROM IOWA NATURAL RESOURCES
GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	OTTUMWA GENERATING STATION OTTUMWA, IOWA	SE IOWA REGIONAL MISSISSIPIAN AQUIFER SURFACE ELEVATION

PROJECT NO. 25215053.03	DRAWN BY: JB	ENGINEER	SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 FAX: (608) 224-2839	FIGURE
DRAWN: 07/29/13	CHECKED BY: MDB			
REVISED: 05/29/15	APPROVED BY:			

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09/02/2025 - Classification: Internal - ECRM13574471

Appendix B

Boring Logs and Well Construction Documentation

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-301

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Todd Schmalfeld Cascade Drilling	11/10/2015	11/10/2015	4-1/4 hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-301	Feet	684.3 Feet	8.5 in

Local Grid Origin ☐ (cstimatcd: ☐) or Boring Location ☒
State Plane 400,077 N, 1,899,709 E S/C/N
NW 1/4 of SW 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL.	TOPSOIL									
			2	SANDY SILT WITH GRAVEL, gray (7.5YR 6/1), gravel is fine.										
			3											
			4		ML									
S1	10	woh 1 3 9	5							W				
			6											
			7	WEATHERED SANDSTONE, very weak, light gray matrix (10YR 7/1), scondary color very dark gray 910YR 3/1), massive.										
S2	13	24 50	8							W				
			9											
			10											
S3	5	50	11		SANDSTONE					W				
			12											
S4	6	50	13							W				
			14											
S5	4	50	15							W				
				Endo of Boring at 15 feet bgs.										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature for Kyle Kramer
Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718
Tel: (608) 224-2830
Fax:

09/02/2025 - Classification: Internal - ECRM13574471

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25216148.00		MW-307

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	10/25/2016	10/25/2016	HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-307	Feet	655.1 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,707 N, 1,903,070 E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	POORLY GRADED SAND WITH GRAVEL, tan, fine to coarse sand and gravel, (construction fill sand to fill in hydrovac hole cleared to 8.5 ft bgs).	SP									
			2											
			3											
			4											
			5											
			6											
			7											water level 6.5 ft bgs.
			8											
			9											
S1	24	2 2 3 2	10							W				
			11	LEAN CLAY, dark yellowish brown (10YR 4/4), slightly dense.	CL									
			12											
			13											
S2	14	4 1 4 4	14							W				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
Tel: (608) 224-2830
Fax:

09/02/2025 - Classification: Internal - ECRM13574471

Boring Number MW-307 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	LEAN CLAY, dark yellowish brown (10YR 4/4), slightly dense. *(continued)*	CL									
S3	24	1 2 2 4	17	SILT, dark yellowish brown (10YR 3/4), fine to medium sand.						W				
			18		ML									
S4	17	3 3 3	19							W				Bedrock @19.5 ft bgs.
			20	SANDSTONE, dark brown (10YR 3/3),										
S5	5	50/0.5	21							W				More competent @20.5' -24.5' bgs.
			22											
			23											
			24											
			25	more weathered.										
			26											
			27											
S6	1	100	28	Same as above except, gray (10YR 6/1).										
				End of boring at 28 ft bgs.										

09/02/2025 - Classification: Internal - ECRM13574471

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25216148.00		MW-308

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	10/25/2016	10/25/2016	HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-308	Feet	652.9 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 402,312 N, 1,902,665 E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–9	POORLY GRADED SAND WITH GRAVEL, tan, fine to coarse sand and gravel, (construction fill sand to fill in hydrovac hole cleared to 9.5 ft bgs).	SP									water @ 6.5 ft bgs.
S1	24	19 4 2 2	10–12	LEAN CLAY, brown (10YR 4/3), dense.	CL					W				
S2	13	1 2 2 2	13–14	SILT, brown (10YR 4/3), some clay.	ML					W				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711
Tel: (608) 224-2830
Fax:

09/02/2025 - Classification: Internal - ECRM13574471

Boring Number MW-308 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	SILT, brown (10YR 4/3), some clay. *(continued)*	ML									
S3	18	1 2 1 3		SILTY SAND, brown (10YR 4/3).	SM					W				
			17	POORLY GRADED SAND, brown (10YR 4/3), fine grained.	SP									
			18											
S4	13	4 12 13 3		WELL GRADED SAND AND GRAVEL, dark grayish brown (10YR 3/2), fine to coarse grained, (weathered bedrock).	SW					W				
			19	SANDSTONE, dark grayish brown (10YR 4/2), weathered bedrock.										
S5	6	12 26 50/0.4	20	Same as above except, brown (10YR 4/3).						W				
			21											
			22											
			23											
			24	Same as above except, dark grayish brown (10YR 4/2).										
S6	4	50/0.4	25							W				
				End of boring at 25 ft bgs.										

09/02/2025 - Classification: Internal - ECRM13574471

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25216148.00		MW-309

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	10/27/2016	10/27/2016	HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-309	Feet	652.5 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 403,189 N, 1,902,070 E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovac borehole to 10 ft bgs.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	LEAN CLAY, very dark grayish brown (10YR 3/2), trace sand.										
S1		3 3 6 7	11							W				
			12		CL									
			13											
S2		2 2 2 2	14							W				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53711

Tel: (608) 224-2830
Fax:

09/02/2025 - Classification: Internal - ECRM13574471

Boring Number MW-309 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S3		1 1 1 1	16	SILTY SAND, very dark grayish brown (10YR 3/2), fine to medium grained.						W				
			17		SM									
			18											
S4		3 5 4 6	19							W				
			20	POORLY GRADED SAND, yellowish brown (10YR 5/4), coarse grained.										
					SP									
S5		2 3 7 50	21							W				
			22	WEATHERED SANDSTONE.										
			23											
			24											
			25											
S6										W				
			26											
			27											
				End of boring at 27.5 ft bgs.										

09/02/2025 - Classification: Internal - ECRM13574471

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25216148.00		B-309X

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	10/26/2016	10/26/2016	HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			Feet	Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane N, E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	POORLY GRADED SAND WITH GRAVEL, tan, fine to coarse sand and gravel, (construction fill sand to fill in hydrovac hole cleared to 9 ft bgs).	SP									
			2											
			3											
			4											
			5											
			6											
			7											Water at 6.5 ft bgs
			8											
			9	LEAN CLAY, dark brown (10YR 3/3), medium dense.	CL									
			10											
S1	12	1 3 3 4	11							W				
			12											
			13	SILT, dark brown (10YR 3/3), some clay.	ML									
S2	18	3 3 3 3	14							W				
			15											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm	Tel:
	SCS Engineers 2830 Dairy Drive Madison, WI 53711	(608) 224-2830 Fax:

09/02/2025 - Classification: Internal - ECRM13574471

Boring Number B-309X

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SILT, dark brown (10YR 3/3), some clay. *(continued)*	ML									
S3	20	3 3 3 2	17	POORLY GRADED SAND, very dark grayish brown (10YR 3/2), fine grained.	SP					W				
			18	SILT, dark brown (10YR 3/3).	ML									
S4	15	1 17 50/0.2	19	POORLY GRADED SAND, brown (10YR 4/3).	SP					W				Bedrock at18.5 ft bgs
S5	6	50/0.3	20	WEATHERED SANDSTONE, grayish brown (10YR 5/2).						W				
			21											
			22											
			23											
			24											
			25											
			26											
				End of boring at 26.5 ft bgs.										

09/02/2025 - Classification: Internal - ECRM13574471

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

Route To: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☐ Other ☐

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25221162.00		MW-315

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Bryan Kinzer Direct Push Analytical	11/29/2022	11/29/2022	Geoprbe/HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-315	Feet MSL	Feet MSL	8.25" in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 402757.793 N 1902367.433 E S / C / N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat 41° 06 ' 05.558 "
Long -92° 32 ' 58.170 "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

Facility ID	County	Civil Town/City/ or Village
	Wapello	Ottumwa

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			1	Hydrovaced to 8' below ground surface (bgs) through sandy rocky clay, then backfilled with fine to medium grained brown sand.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	POORLY GRADED SAND, fine to medium grained, brown (backfill).	FILL									
			9	LEAN CLAY, dark brown with trace dark reddish brown mottling, medium stiff.										
S1	27		10						1.0	M				
			11		CL									
			12	Same as above but with dark grayish bown with trace roots and wood.										
			13											
S2	32		14						0.75	M/W				Measured water at 14' bgs.
			15		ML				0.25 - 0.5					

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718

Tel:
Fax:

09/02/2025 - Classification: Internal - ECRM13574471

Boring Number MW-315 Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SANDY SILT, dark gray and trace reddish brown with trace roots and wood, sand is fine grained, gray. *(continued)*	ML									
S3	40		17 18 19	POORLY GRADED SAND, fine to course grained, gray to dark gray with trace lenses of clay and 1" piece of weathered rock at the bottom of the sample.	SP					W				
S4	26		20 21 22	POORLY GRADED SAND, fine grained, orange-brown (weathered bedrock). Same as above but orangish tan, transitioning to olive green to white,	SP					W				Refusal at 22' bgs with Geoprobe, tripped out of boring and continued drilling with hollow stem augers to 25' bgs.
			23 24 25	End of boring at 25' below ground surface.										

09/02/2025 - Classification: Internal - ECRM13574471

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.:

Well or Piezometer No: MW-301

Dates Started: 11/10/15 Date Completed: 11/10/15

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SE of Parcel 003052640340000

Distance & direction along boundary: 106' W

Distance & direction from boundary to wall: 306' N

Elevations (± 0.01 ft MSL):

Ground Surface: 684.28

Top of protective casing: 687.12

Top of well casing: 686.63

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling, LP
301 Alderson St
Schofield, WI 54476

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 15 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 4 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 10 ft

Depth of well: 14 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 4 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8 inch bentonite chips

Placement method: Gravity

Volume: 8 cu. ft.

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

Vented: ☐ Yes ☐ No Locking: ☑ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 3.09 ft Stabilization Time: <5 minutes

Well development method: Surged with block and pumped to reduce turbidity. 435 gallons pumped.

Average depth of frostline: 3.5'

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

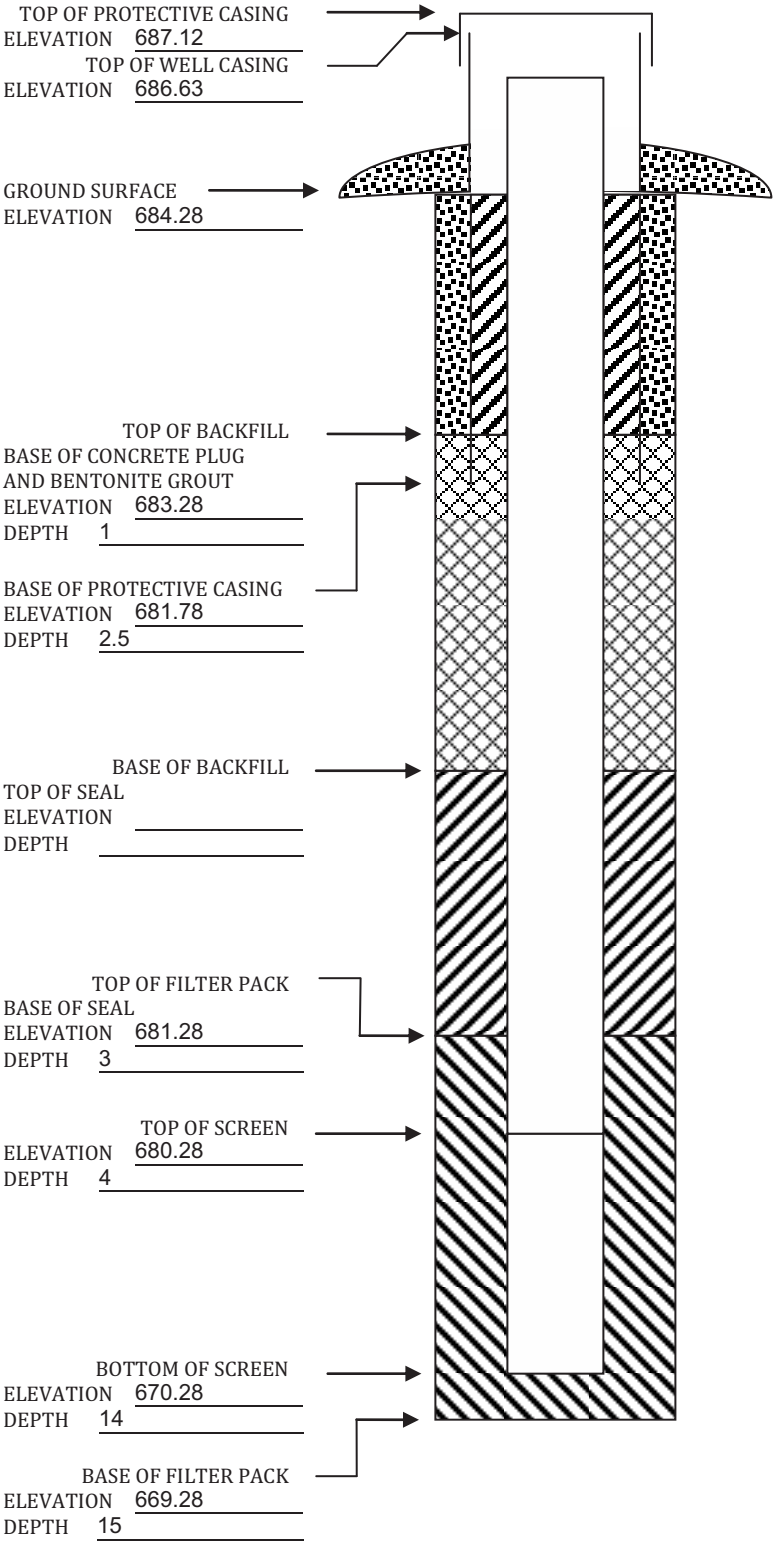
Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

09/02/2025 - Classification: Internal - ECRM13574471

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



09/02/2025 - Classification: Internal - ECRM13574471

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.:

Well or Piezometer No: MW-307

Dates Started: 10/25/16 Date Completed: 10/25/16

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NE of Parcel 003052620200000

Distance & direction along boundary: 683' W

Distance & direction from boundary to wall: 296' S

Elevations (± 0.01 ft MSL):

Ground Surface: 655.08

Top of protective casing: 657.58

Top of well casing: 657.56

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling, LP
301 Alderson St
Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 28 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 22 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 5 ft

Depth of well: 27 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 200 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8 inch bentonite chips

Placement method: Gravity

Volume: 250 lbs

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

Vented: ☑ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 8.12 Stabilization Time: 5 minutes

Well development method: surged with bailer and pumped

Average depth of frostline: 3.5'

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

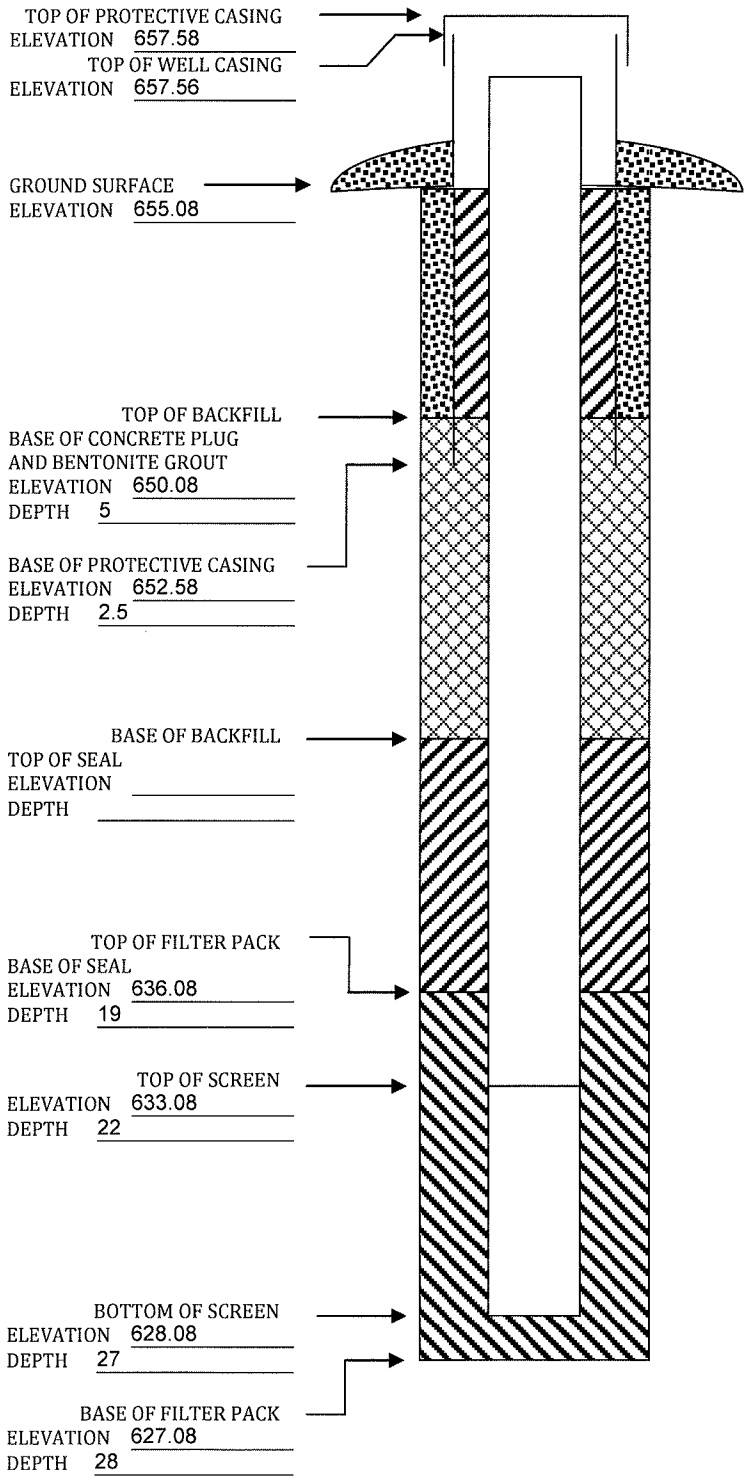
Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

09/02/2025 - Classification: Internal - ECRM13574471

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



09/02/2025 - Classification: Internal - ECRM13574471

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.:

Well or Piezometer No: MW-308

Dates Started: 10/26/16 Date Completed: 10/26/16

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SW of Parcel 0030502620203000

Distance & direction along boundary: 158' E

Distance & direction from boundary to wall: 417' N

Elevations (± 0.01 ft MSL):

Ground Surface: 652.87

Top of protective casing: 655.23

Top of well casing: 655.39

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling, LP
301 Alderson St
Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 25 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 19 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 5 ft

Depth of well: 24 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 200 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8 inch bentonite chips

Placement method: Gravity

Volume: 200 lbs

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

Vented: ☑ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 9.85 Stabilization Time: 5 minutes

Well development method: surged with bailer and pumped

Average depth of frostline: 3.5'

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

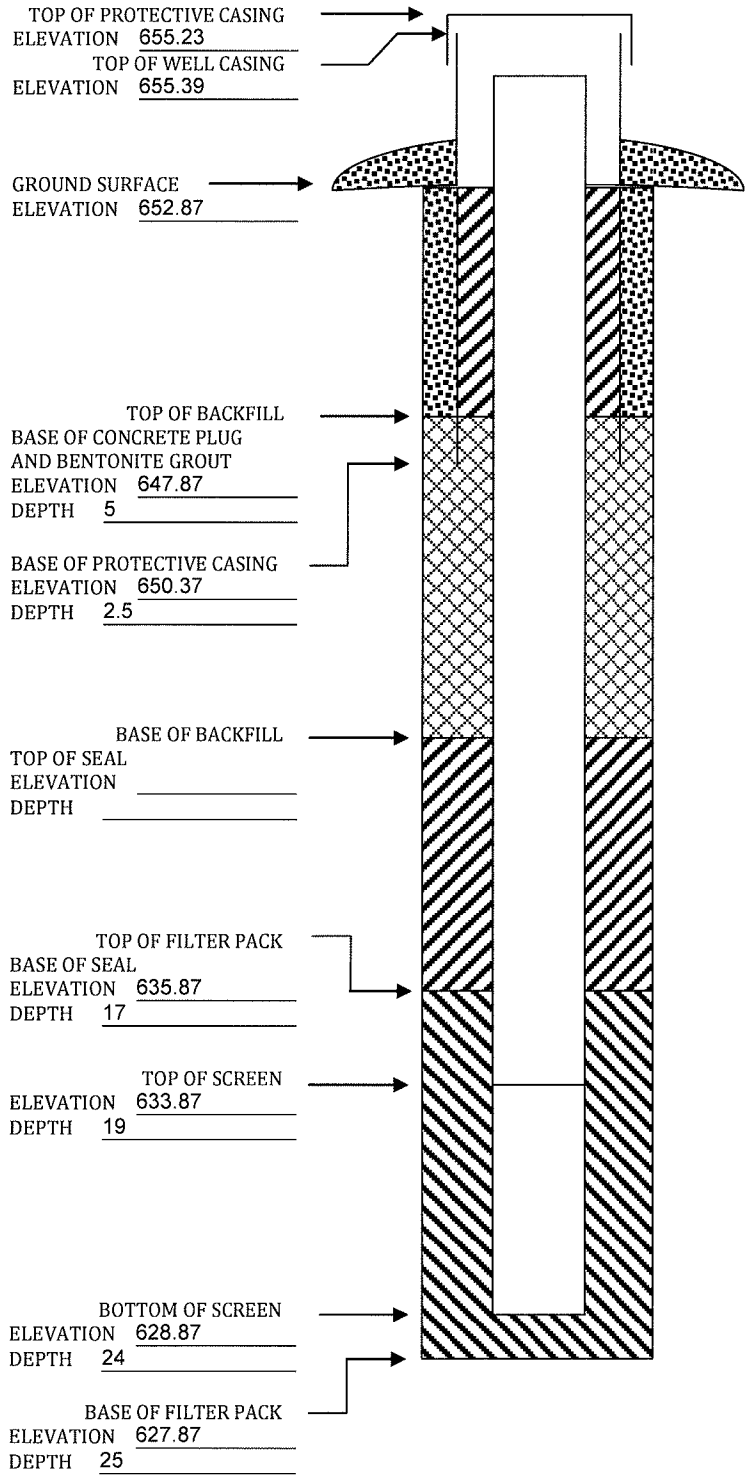
Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

09/02/2025 - Classification: Internal - ECRM13574471

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



09/02/2025 - Classification: Internal - ECRM13574471

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.:

Well or Piezometer No: MW-309

Dates Started: 10/27/16 Date Completed: 10/27/16

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NE of Parcel 003052620204000

Distance & direction along boundary: 480' W

Distance & direction from boundary to wall: 438' S

Elevations (± 0.01 ft MSL):

Ground Surface: 652.45

Top of protective casing: 654.97

Top of well casing: 654.94

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

Name & Address of Construction Company:
Cascade Drilling, LP
301 Alderson St
Schofield, WI 54476

Name of Driller: Mike Mueller

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 27.5 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 21.5 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 5 ft

Depth of well: 26.5 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 200 lbs

Seal (minimum 3 ft length above filter pack):

Material: 3/8 inch bentonite chips

Placement method: Gravity

Volume: 600 lbs

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

Vented: ☑ Yes ☐ No Locking: ☐ Yes ☐ No

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

D. GROUNDWATER MEASURMENT (± 0.01 ft below top of inner well casing)

Water level: 9.87 Stabilization Time: 5 minutes

Well development method: surged with bailer and pumped

Average depth of frostline: 3.5'

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

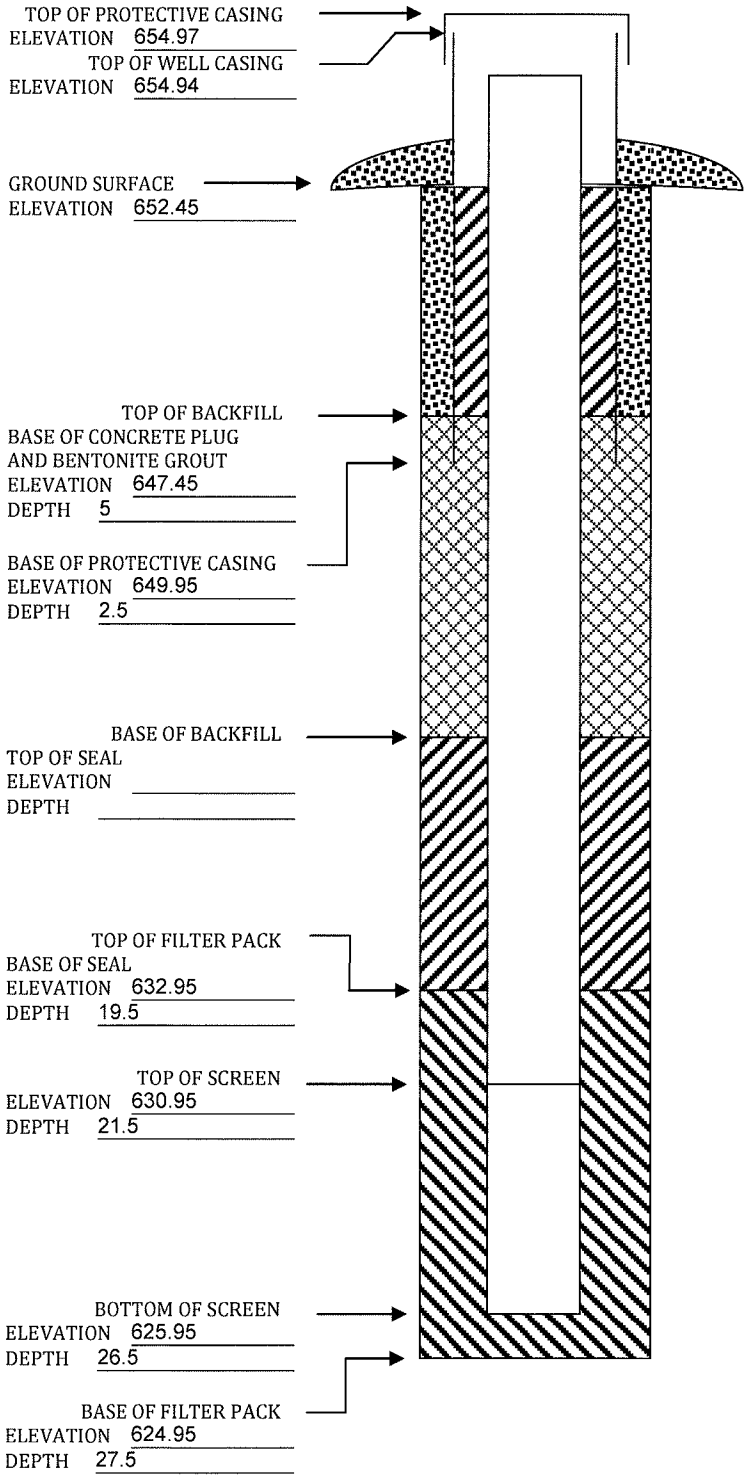
Please mail completed for to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319-0034.

Questions? Call or Email: Nina Koger, Environmental Engineer Sr., 515-281-8986, Nina.Koger@dnr.iowa.gov

09/02/2025 - Classification: Internal - ECRM13574471

ELEVATIONS: ± 0.01 ft MSL
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



09/02/2025 - Classification: Internal - ECRM13574471

MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: 60288

Well or Piezometer No.: MW-315 Dates Started: 11/29/2022 Date Completed: 11/29/2022

A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site: SE parcel 3052620204000 Distance and direction along boundary: 346' north

Distance and direction from boundary to surface monitoring well: 77' west

Elevation (+0.01 ft. MSL)

Ground Surface: 653.06' Top of protective casing: 655.92'

Top of well casing: 655.65' Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

Construction Company Name: Direct Push Analytical

Address: 4N99 Old Ladox Rd. Unit E. City, State, Zip Code: Saint Charles IL. 60175

Name of driller: Bryan Kinzer

Drilling method: Geoprobe/HSA Drilling fluid: None Bore Hole diameter: 8.25"

Soil sampling method: Geoprobed/bagged Depth of boring: 25

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 22.59'

Outside casing diameter: 2.4"

Inside casing diameter: 2.04"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 5'

Depth of Well: 24' below ground surface

Filter Pack:

Material: R.W. Sidley filter sand

Grain Size: #5

Volume: 3.5 bags/1.75 Ft^3

Seal (minimum 3 ft. length above filter pack):

Material: 3/8" Bentonite Chips

Placement method: Poured

Volume: 4 cu. ft.

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Bentonite chips and sand

Protective cap:

Material: Steel

Vented?: ☒ Y ☐ N Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☐ Y ☒ N

D. GROUNDWATER MEASUREMENT (±0.01 foot below top of inner well casing)

Water level: 14.25' **Stabilization time:** 65 minutes

Well development method: Surged and pumped

Average depth of frost line: 4.5'

DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature: **Certification #:** 5498 **Date:** 2-6-2023

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

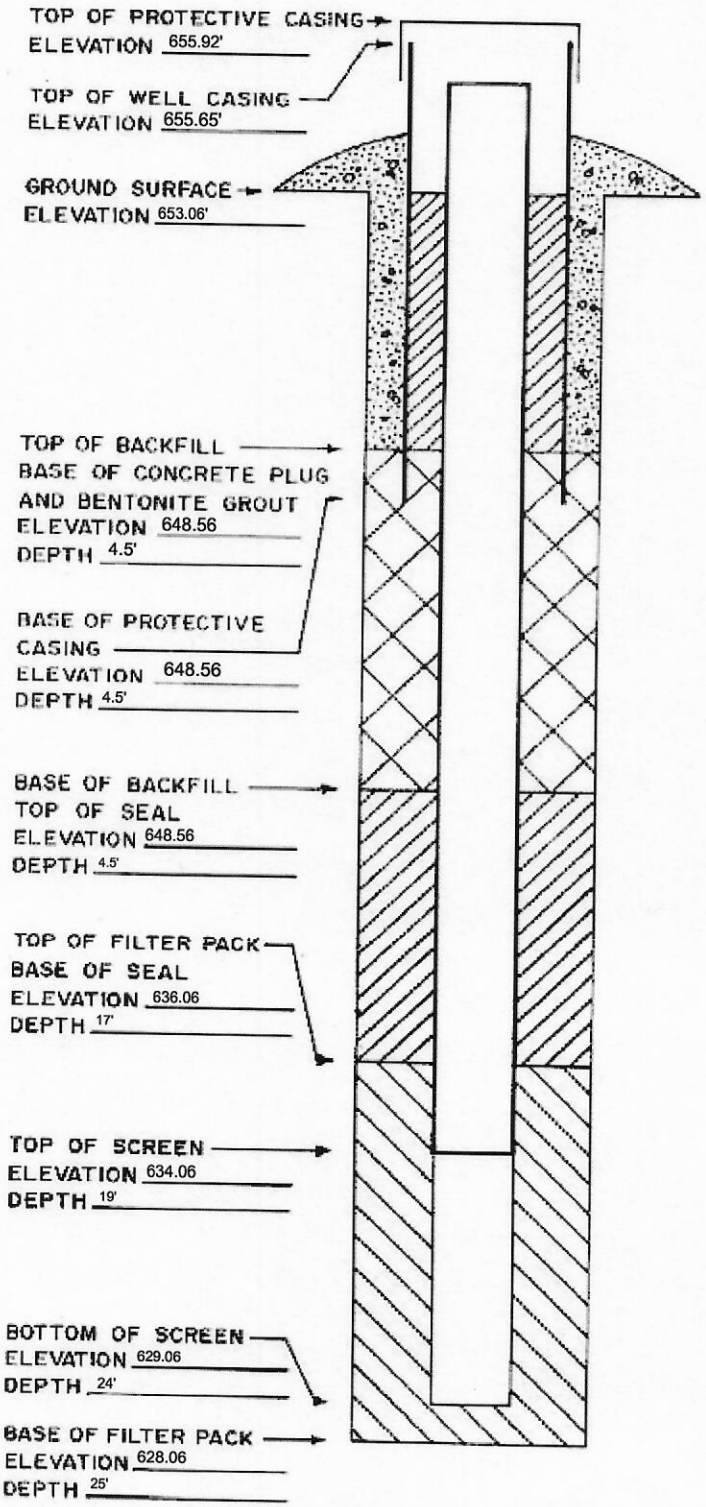
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

09/02/2025 - Classification: Internal - ECRM13574471

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL).



09/02/2025 - Classification: Internal - ECRM13574471

Appendix C

Analytical Laboratory Reports

C1 April 2024 Assessment Monitoring

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 5/7/2024 8:49:05 PM

JOB DESCRIPTION

Ottumwa Generating Station 25224072.00

JOB NUMBER

310-278395-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job ID: 310-278395-1 Eurofins Cedar Falls

Job Narrative
310-278395-1

Receipt
The samples were received on 4/5/2024 4:40 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.9º C.

HPLC/IC
Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-278395-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RAD
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278395-1	MW-301	Water	04/04/24 08:40	04/05/24 16:40
310-278395-2	Field Blank	Water	04/04/24 16:45	04/05/24 16:40

Detection Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-301
Lab Sample ID: 310-278395-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	87		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	240		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	33		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	410		100	76	ug/L	1		6020B	Total/NA
Calcium	85		0.50	0.19	mg/L	1		6020B	Total/NA
Lithium	21		10	2.5	ug/L	1		6020B	Total/NA
Selenium	5.1		5.0	1.4	ug/L	1		6020B	Total/NA
Total Dissolved Solids	550		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.4	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	680.79				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	92.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	9.81				mg/L	1		Field Sampling	Total/NA
Field pH	6.65				SU	1		Field Sampling	Total/NA
Field Conductivity	868				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	8.5				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	5.63				NTU	1		Field Sampling	Total/NA

Client Sample ID: Field Blank
Lab Sample ID: 310-278395-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	6.3	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-301
Lab Sample ID: 310-278395-1
Date Collected: 04/04/24 08:40
Matrix: Water
Date Received: 04/05/24 16:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**87**		5.0	2.3	mg/L			04/12/24 14:03	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 14:03	5
Sulfate	**240**		5.0	2.1	mg/L			04/12/24 14:03	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/12/24 17:05	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/12/24 17:05	1
Barium	**33**		2.0	0.66	ug/L		04/09/24 09:00	04/12/24 17:05	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/12/24 17:05	1
Boron	**410**		100	76	ug/L		04/09/24 09:00	04/15/24 14:42	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/12/24 17:05	1
Calcium	**85**		0.50	0.19	mg/L		04/09/24 09:00	04/12/24 17:05	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/12/24 17:05	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/12/24 17:05	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/12/24 17:05	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/12/24 17:05	1
Lithium	**21**		10	2.5	ug/L		04/09/24 09:00	04/12/24 17:05	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/12/24 17:05	1
Selenium	**5.1**		5.0	1.4	ug/L		04/09/24 09:00	04/12/24 17:05	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/12/24 17:05	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:21	04/22/24 16:30	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**550**		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.4**	**HF**	1.0	1.0	SU			04/05/24 17:44	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.0723	U	0.0745	0.0747	1.00	0.116	pCi/L	04/10/24 10:16	05/05/24 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*98.2*		*30 - 110*	*04/10/24 10:16*	*05/05/24 12:26*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.380	U	0.313	0.315	1.00	0.485	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*98.2*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*83.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-301
Lab Sample ID: 310-278395-1
Date Collected: 04/04/24 08:40
Matrix: Water
Date Received: 04/05/24 16:40

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.452	U	0.322	0.324	5.00	0.485	pCi/L		05/07/24 14:23	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	680.79				ft			04/04/24 08:40	1
Oxidation Reduction Potential	92.0				mV			04/04/24 08:40	1
Oxygen, Dissolved	9.81				mg/L			04/04/24 08:40	1
Field pH	6.65				SU			04/04/24 08:40	1
Field Conductivity	868				umhos/cm			04/04/24 08:40	1
Field Temperature	8.5				Degrees C			04/04/24 08:40	1
Field Turbidity	5.63				NTU			04/04/24 08:40	1

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: Field Blank
Lab Sample ID: 310-278395-2
Date Collected: 04/04/24 16:45
Matrix: Water
Date Received: 04/05/24 16:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/12/24 14:15	1
Fluoride	<0.075		0.20	0.075	mg/L			04/12/24 14:15	1
Sulfate	<0.42		1.0	0.42	mg/L			04/12/24 14:15	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/12/24 17:08	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/12/24 17:08	1
Barium	<0.66		2.0	0.66	ug/L		04/09/24 09:00	04/12/24 17:08	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/12/24 17:08	1
Boron	<76		100	76	ug/L		04/09/24 09:00	04/15/24 14:44	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/12/24 17:08	1
Calcium	<0.19		0.50	0.19	mg/L		04/09/24 09:00	04/12/24 17:08	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/12/24 17:08	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/12/24 17:08	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/12/24 17:08	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/12/24 17:08	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/12/24 17:08	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/12/24 17:08	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/12/24 17:08	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/12/24 17:08	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:21	04/22/24 16:32	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<34		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.3**	**HF**	1.0	1.0	SU			04/05/24 18:55	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.00280	U	0.0554	0.0554	1.00	0.121	pCi/L	04/10/24 10:16	05/05/24 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:16*	*05/05/24 12:27*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.616	U	0.470	0.473	1.00	0.716	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*55.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: Field Blank
Lab Sample ID: 310-278395-2
Date Collected: 04/04/24 16:45
Matrix: Water
Date Received: 04/05/24 16:40

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.616	U	0.473	0.476	5.00	0.716	pCi/L		05/07/24 14:23	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-418758/3
Matrix: Water
Analysis Batch: 418758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/12/24 11:05	1
Fluoride	<0.075		0.20	0.075	mg/L			04/12/24 11:05	1
Sulfate	<0.42		1.0	0.42	mg/L			04/12/24 11:05	1

Lab Sample ID: LCS 310-418758/4
Matrix: Water
Analysis Batch: 418758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.1		mg/L		101	90 - 110
Fluoride	2.00	2.20		mg/L		110	90 - 110
Sulfate	10.0	10.6		mg/L		106	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-418157/1-A
Matrix: Water
Analysis Batch: 418695

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418157

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/12/24 16:06	1
Arsenic	0.617	J	2.0	0.53	ug/L		04/09/24 09:00	04/12/24 16:06	1
Barium	<0.66		2.0	0.66	ug/L		04/09/24 09:00	04/12/24 16:06	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/12/24 16:06	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/12/24 16:06	1
Calcium	<0.19		0.50	0.19	mg/L		04/09/24 09:00	04/12/24 16:06	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/12/24 16:06	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/12/24 16:06	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/12/24 16:06	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/12/24 16:06	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/12/24 16:06	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/12/24 16:06	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/12/24 16:06	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/12/24 16:06	1

Lab Sample ID: MB 310-418157/1-A
Matrix: Water
Analysis Batch: 418822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418157

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<76		100	76	ug/L		04/09/24 09:00	04/15/24 14:09	1

Lab Sample ID: LCS 310-418157/2-A
Matrix: Water
Analysis Batch: 418695

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418157

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	212		ug/L		106	80 - 120
Arsenic	200	214		ug/L		107	80 - 120
Barium	100	110		ug/L		110	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-418157/2-A
Matrix: Water
Analysis Batch: 418695

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418157

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	100	107		ug/L		107	80 - 120
Cadmium	100	102		ug/L		102	80 - 120
Calcium	2.00	1.81		mg/L		91	80 - 120
Chromium	100	106		ug/L		106	80 - 120
Cobalt	100	107		ug/L		107	80 - 120
Iron	200	207		ug/L		103	80 - 120
Lead	200	214		ug/L		107	80 - 120
Lithium	200	221		ug/L		110	80 - 120
Molybdenum	200	206		ug/L		103	80 - 120
Selenium	400	383		ug/L		96	80 - 120
Thallium	100	103		ug/L		103	80 - 120

Lab Sample ID: LCS 310-418157/2-A
Matrix: Water
Analysis Batch: 418822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418157

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	205		ug/L		103	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-418622/1-A
Matrix: Water
Analysis Batch: 419490

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418622

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:21	04/22/24 15:34	1

Lab Sample ID: LCS 310-418622/2-A
Matrix: Water
Analysis Batch: 419490

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418622

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.53		ug/L		92	80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-418249/1
Matrix: Water
Analysis Batch: 418249

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<34		50	34	mg/L			04/09/24 11:50	1

Lab Sample ID: LCS 310-418249/2
Matrix: Water
Analysis Batch: 418249

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	920		mg/L		92	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-418046/1
Matrix: Water
Analysis Batch: 418046

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: LCS 310-418076/1
Matrix: Water
Analysis Batch: 418076

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-656131/1-A
Matrix: Water
Analysis Batch: 660046

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656131

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.02006	U	0.0595	0.0595	1.00	0.115	pCi/L	04/10/24 10:16	05/05/24 09:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:16*	*05/05/24 09:03*	*1*

Lab Sample ID: LCS 160-656131/2-A
Matrix: Water
Analysis Batch: 660048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656131

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium 226	11.3	9.631		1.06	1.00	0.127	pCi/L	85	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*98.5*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-656132/1-A
Matrix: Water
Analysis Batch: 659455

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656132

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.8995		0.420	0.428	1.00	0.585	pCi/L	04/10/24 10:27	05/01/24 12:08	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:08*	*1*
Y Carrier	*85.6*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:08*	*1*

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-656132/2-A
Matrix: Water
Analysis Batch: 659455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656132

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.98	10.44		1.37	1.00	0.495	pCi/L	116	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*98.5*		*30 - 110*
Y Carrier	*82.2*		*30 - 110*

HPLC/IC

Analysis Batch: 418758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	9056A	
310-278395-2	Field Blank	Total/NA	Water	9056A	
MB 310-418758/3	Method Blank	Total/NA	Water	9056A	
LCS 310-418758/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 418157

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	3005A	
310-278395-2	Field Blank	Total/NA	Water	3005A	
MB 310-418157/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418157/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 418622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	7470A	
310-278395-2	Field Blank	Total/NA	Water	7470A	
MB 310-418622/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-418622/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 418695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	6020B	418157
310-278395-2	Field Blank	Total/NA	Water	6020B	418157
MB 310-418157/1-A	Method Blank	Total/NA	Water	6020B	418157
LCS 310-418157/2-A	Lab Control Sample	Total/NA	Water	6020B	418157

Analysis Batch: 418822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	6020B	418157
310-278395-2	Field Blank	Total/NA	Water	6020B	418157
MB 310-418157/1-A	Method Blank	Total/NA	Water	6020B	418157
LCS 310-418157/2-A	Lab Control Sample	Total/NA	Water	6020B	418157

Analysis Batch: 419490

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	7470A	418622
310-278395-2	Field Blank	Total/NA	Water	7470A	418622
MB 310-418622/1-A	Method Blank	Total/NA	Water	7470A	418622
LCS 310-418622/2-A	Lab Control Sample	Total/NA	Water	7470A	418622

General Chemistry

Analysis Batch: 418046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	SM 4500 H+ B	
LCS 310-418046/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 418076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-2	Field Blank	Total/NA	Water	SM 4500 H+ B	

QC Association Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

General Chemistry (Continued)

Analysis Batch: 418076 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-418076/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 418249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	SM 2540C	
310-278395-2	Field Blank	Total/NA	Water	SM 2540C	
MB 310-418249/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-418249/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 656131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	PrecSep-21	
310-278395-2	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-656131/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-656131/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 656132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	PrecSep_0	
310-278395-2	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-656132/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-656132/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Field Service / Mobile Lab

Analysis Batch: 418836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278395-1	MW-301	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-301
Lab Sample ID: 310-278395-1
Date Collected: 04/04/24 08:40
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418758	QTZ5	EET CF	04/12/24 14:03
Total/NA	Prep	3005A			418157	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 17:05
Total/NA	Prep	3005A			418157	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418822	NFT2	EET CF	04/15/24 14:42
Total/NA	Prep	7470A			418622	A6US	EET CF	04/12/24 13:21
Total/NA	Analysis	7470A		1	419490	A6US	EET CF	04/22/24 16:30
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418046	A3GU	EET CF	04/05/24 17:44
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660046	SCB	EET SL	05/05/24 12:26
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 08:40

Client Sample ID: Field Blank
Lab Sample ID: 310-278395-2
Date Collected: 04/04/24 16:45
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	418758	QTZ5	EET CF	04/12/24 14:15
Total/NA	Prep	3005A			418157	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 17:08
Total/NA	Prep	3005A			418157	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418822	NFT2	EET CF	04/15/24 14:44
Total/NA	Prep	7470A			418622	A6US	EET CF	04/12/24 13:21
Total/NA	Analysis	7470A		1	419490	A6US	EET CF	04/22/24 16:32
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418076	D7CP	EET CF	04/05/24 18:55
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660046	SCB	EET SL	05/05/24 12:27
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23

Laboratory References:
EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Pos Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

eurofins | Environment Testing America

310-276395 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4-5-24 | TIME 1640 | Received By: MC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # _____ of _____
Cooler Custody Seals Present?	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: T | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.9 | Corrected Temp (°C): 1.9

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

09/02/2025 - Classification: Internal - ECRM13574471

5/7/2024

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-240 Phone (319) 277-2425

Chain of Custody Record

eurofins

Client Information	Sampler	Lab PM: Sandie Fredrick	Carrier Tracking No	COC No
Client Contac: Meghan Blodgett	Phone	E-Mail: Sandra.Fredrick@eurofinsus.com	State of Origin	Page: Page 1 of 1
Company: SCS Engineers	P SID			Job #

Address: 2830 Dairy Drive	Due Date Requested	Analysis Requested	Preservation Codes
City: Madison	TAT Requested (days)		A HCL M Hexane B NaOH N None C Zn Acetate O AsNaO2 D Nitric Acid P Na2O4S E NaHSO4 Q Na2SO F MeOH R Na2S2O G Amchlo S H2SO4 H Ascorbic Acid T TSP Dodecahydrate I Ice U Acetone DI Water V MCAA K EDTA W pH 4-5 L EDA Z other (specify) Other:
State Zip: WI 53718	Compliance Project Yes No		
Phone: 608-224-2830	PO #: 25223072		
Email: mblodgett@scsengineers.com	WO #:		
Project Name: Ottumwa Generating Station 25223072	Project #: 25223072		
Site: Ottumwa IA	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 Metals total (Sb As Ba Be B Ca Cd Cr Co Fe Pb Li Mo Se Tl and Hg)	TDS and pH	Chloride Fluoride Sulfate	EPA 90.1/9004 Radium 226 228	Bicarbonate & carbonate alkalinity	6020 Metals total (Fe Mg Mn K Na)	6020 Metals dissolved (Co Fe Mn)	6020 Metals dissolved (Fe Mn)	Total Number of containers	Special Instructions/Note
			Preservation Code				D					D	D	D		
MW-301	4-4-24	8 40	G	W	N		X	X	X	X						
Field Blank	4-4-24	16 45	G	W	N		X	X	X	X						

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment

Relinquished by: Sam Mayerle	Date/Time: 4-5-24 14 00	Company: SCS	Received by: MC	Date/Time: 4-5-24 1640	Company
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature( ) C and Other Remark

Ver 01 16 2019

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-71058.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-278395-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 4/18/2024			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station 25224072.00	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-301 (310-278395-1)	4/4/24	08:40 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
Field Blank (310-278395-2)	4/4/24	16:45 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	4/4/24 1110		Sara Washington	APR 09 2024 0835	ETAS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

5/7/2024

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278395-1

Login Number: 278395
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278395-1

Login Number: 278395
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 04/09/24 11:47 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-278395-1
Project/Site: Ottumwa Generating Station 25224072.00

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-278395-1	MW-301	98.2
310-278395-2	Field Blank	97.0
LCS 160-656131/2-A	Lab Control Sample	98.5
MB 160-656131/1-A	Method Blank	97.0

Tracer/Carrier Legend

Ba = Barium

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-278395-1	MW-301	98.2	83.0
310-278395-2	Field Blank	97.0	55.0
LCS 160-656132/2-A	Lab Control Sample	98.5	82.2
MB 160-656132/1-A	Method Blank	97.0	85.6

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25224072.00
April 2024

	Sample	Date	Groundwater Elevation (ft amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	4/4/2024	680.79	8.5	6.65	9.81	868	92.0	5.63
Ash Pond	MW-302	4/4/2024	651.81	--	--	--	--	--	--
	MW-303	4/4/2024	649.52	8.6	6.82	3	1456	78.4	34.31
	MW-304	4/4/2024	648.39	12.7	6.88	1.71	1744	-32.0	6.08
	MW-305	4/4/2024	650.62	12.2	6.90	6.11	1708	47.3	6.22
	MW-305A	4/5/2024	645.43	12.0	6.95	4.31	1169	71.8	6.28
	MW-306	4/4/2024	654.47	12.5	6.64	1.51	1724	69.9	5.98
	MW-310	4/4/2024	643.51	11.3	7.05	7.89	1363	71.6	5.97
	MW-310A	4/5/2024	628.24	11.7	7.43	7.75	3020	50.2	7.57
	MW-311	4/5/2024	--	10.4	6.78	0.29	834	42.6	8.69
	MW-311A	4/5/2024	635.54	11.5	7.64	2.18	3244	61.3	7.40
	MW-312	4/4/2024	643.94	12.3	6.89	0.29	1512	-11.7	8.53
	MW-313	4/4/2024	644.49	11.8	6.90	0.21	1395	-27.9	7.45
	MW-316	4/5/2024	644.09	9.2	7.04	5.20	763	81.3	3.95
	MW-316A	4/5/2024	643.94	10.6	7.36	3.57	2189	40.1	4.46
	MW-317	4/5/2024	644.11	9.9	6.68	4.85	898	93.4	3.98
ZLDP	MW-307	4/4/2024	645.09	12.4	6.52	0.75	1693	-31.8	3.69
	MW-308	4/4/2024	643.32	12.0	6.61	0.79	1524	-44.0	4.04
	MW-309	4/4/2024	644.51	12.2	6.93	0.56	1459	-48.0	3.68
	MW-315	4/4/2024	644.23	12.3	6.85	0.34	1479	-74.3	4.47

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

Created by: RM Date: 10/25/2023
Last revision by: RM Date: 4/12/2024
Checked by: REO Date: 4/15/2024

C:\Users\hld0\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\USG3GGGC\[2404_OGS combined_CCR_Field Data.xlsx]GW Field Parameters

09/02/2025 - Classification: Internal - ECRM13574471

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 5/7/2024 8:48:10 PM

JOB DESCRIPTION

Ottumwa Generating Station 25224072.00

JOB NUMBER

310-278393-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job ID: 310-278393-1 Eurofins Cedar Falls

Job Narrative
310-278393-1

Receipt
The samples were received on 4/5/2024 4:40 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.3º C.

Receipt Exceptions
The reference method requires samples to be preserved to a pH of less than 2. The following sample was received with insufficient preservation at a pH of 7: MW-309 (310-278393-3). The sample was preserved to the appropriate pH in the laboratory. Affected container: D-3

HPLC/IC
Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-307 (310-278393-1), MW-308 (310-278393-2) and MW-309 (310-278393-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RAD
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278393-1	MW-307	Water	04/04/24 14:05	04/05/24 16:40
310-278393-2	MW-308	Water	04/04/24 12:55	04/05/24 16:40
310-278393-3	MW-309	Water	04/04/24 10:55	04/05/24 16:40
310-278393-4	MW-315	Water	04/04/24 12:00	04/05/24 16:40

Detection Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-307 — Lab Sample ID: 310-278393-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	260		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	140		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	130		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	220		100	76	ug/L	1		6020B	Total/NA
Calcium	240		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	38		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3300		100	36	ug/L	1		6020B	Total/NA
Lithium	13		10	2.5	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	44		0.50	0.17	ug/L	1		6020B	Dissolved
Total Dissolved Solids	1000		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.5	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	645.09				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-31.8				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.75				mg/L	1		Field Sampling	Total/NA
Field pH	6.52				SU	1		Field Sampling	Total/NA
Field Conductivity	1693				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.4				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.69				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-308 — Lab Sample ID: 310-278393-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	300		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	120		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	350		100	76	ug/L	1		6020B	Total/NA
Calcium	220		0.50	0.19	mg/L	1		6020B	Total/NA
Iron	3400		100	36	ug/L	1		6020B	Total/NA
Lithium	16		10	2.5	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1000		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	643.32				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-44.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.79				mg/L	1		Field Sampling	Total/NA
Field pH	6.61				SU	1		Field Sampling	Total/NA
Field Conductivity	1524				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.0				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	4.04				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-309 — Lab Sample ID: 310-278393-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	65		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	470		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	56		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1400		100	76	ug/L	1		6020B	Total/NA
Calcium	160		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	2.4		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	800		100	36	ug/L	1		6020B	Total/NA
Lithium	9.5	J	10	2.5	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1000		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample ID: MW-309 (Continued)
Lab Sample ID: 310-278393-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Groundwater Elevation	644.51				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-48.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.56				mg/L	1		Field Sampling	Total/NA
Field pH	6.93				SU	1		Field Sampling	Total/NA
Field Conductivity	1459				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.2				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.68				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-315
Lab Sample ID: 310-278393-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	63		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	470		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	1.5	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	36		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1200		100	76	ug/L	1		6020B	Total/NA
Calcium	130		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	7.8		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	2700		100	36	ug/L	1		6020B	Total/NA
Lithium	6.0	J	10	2.5	ug/L	1		6020B	Total/NA
Magnesium	21000		500	150	ug/L	1		6020B	Total/NA
Manganese	7600		10	3.6	ug/L	1		6020B	Total/NA
Molybdenum	1.6	J	2.0	1.3	ug/L	1		6020B	Total/NA
Potassium	1600		500	150	ug/L	1		6020B	Total/NA
Sodium	210000		1000	480	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	7.5		0.50	0.17	ug/L	1		6020B	Dissolved
Iron, Dissolved	2300		100	36	ug/L	1		6020B	Dissolved
Manganese, Dissolved	7400		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	280		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	280		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1000		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	644.23				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-74.3				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.34				mg/L	1		Field Sampling	Total/NA
Field pH	6.85				SU	1		Field Sampling	Total/NA
Field Conductivity	1479				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.3				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	4.47				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-307
Date Collected: 04/04/24 14:05
Date Received: 04/05/24 16:40

Lab Sample ID: 310-278393-1
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**260**		5.0	2.3	mg/L			04/12/24 12:53	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 12:53	5
Sulfate	**140**		5.0	2.1	mg/L			04/12/24 12:53	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/10/24 21:33	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/10/24 21:33	1
Barium	**130**		2.0	0.66	ug/L		04/09/24 09:00	04/10/24 21:33	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/10/24 21:33	1
Boron	**220**		100	76	ug/L		04/09/24 09:00	04/10/24 21:33	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/10/24 21:33	1
Calcium	**240**		0.50	0.19	mg/L		04/09/24 09:00	04/10/24 21:33	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/10/24 21:33	1
Cobalt	**38**		0.50	0.17	ug/L		04/09/24 09:00	04/10/24 21:33	1
Iron	**3300**		100	36	ug/L		04/09/24 09:00	04/10/24 21:33	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/10/24 21:33	1
Lithium	**13**		10	2.5	ug/L		04/09/24 09:00	04/10/24 21:33	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/10/24 21:33	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/10/24 21:33	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/10/24 21:33	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	**44**		0.50	0.17	ug/L		04/09/24 09:00	04/15/24 22:51	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:16	04/15/24 11:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1000**		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.5**	**HF**	1.0	1.0	SU			04/05/24 17:44	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**1.43**		0.245	0.277	1.00	0.131	pCi/L	04/10/24 10:16	05/05/24 11:02	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.4*		*30 - 110*	*04/10/24 10:16*	*05/05/24 11:02*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**1.11**		0.435	0.447	1.00	0.565	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Client Sample ID: MW-307
Lab Sample ID: 310-278393-1

Date Collected: 04/04/24 14:05
Matrix: Water

Date Received: 04/05/24 16:40

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.4*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*84.5*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	**2.55**		0.499	0.526	5.00	0.565	pCi/L		05/07/24 14:23	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**645.09**				ft			04/04/24 14:05	1
Oxidation Reduction Potential	**-31.8**				mV			04/04/24 14:05	1
Oxygen, Dissolved	**0.75**				mg/L			04/04/24 14:05	1
Field pH	**6.52**				SU			04/04/24 14:05	1
Field Conductivity	**1693**				umhos/cm			04/04/24 14:05	1
Field Temperature	**12.4**				Degrees C			04/04/24 14:05	1
Field Turbidity	**3.69**				NTU			04/04/24 14:05	1

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-308
Date Collected: 04/04/24 12:55
Date Received: 04/05/24 16:40

Lab Sample ID: 310-278393-2
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		5.0	2.3	mg/L			04/12/24 13:39	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 13:39	5
Sulfate	**300**		5.0	2.1	mg/L			04/12/24 13:39	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/10/24 21:36	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/10/24 21:36	1
Barium	**120**		2.0	0.66	ug/L		04/09/24 09:00	04/10/24 21:36	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/10/24 21:36	1
Boron	**350**		100	76	ug/L		04/09/24 09:00	04/10/24 21:36	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/10/24 21:36	1
Calcium	**220**		0.50	0.19	mg/L		04/09/24 09:00	04/10/24 21:36	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/10/24 21:36	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/10/24 21:36	1
Iron	**3400**		100	36	ug/L		04/09/24 09:00	04/10/24 21:36	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/10/24 21:36	1
Lithium	**16**		10	2.5	ug/L		04/09/24 09:00	04/10/24 21:36	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/10/24 21:36	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/10/24 21:36	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/10/24 21:36	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:16	04/15/24 11:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1000**		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.6**	**HF**	1.0	1.0	SU			04/05/24 17:44	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**0.945**		0.195	0.213	1.00	0.113	pCi/L	04/10/24 10:16	05/05/24 12:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.2*		*30 - 110*	*04/10/24 10:16*	*05/05/24 12:25*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**0.996**		0.399	0.409	1.00	0.506	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.2*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*81.9*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-308
Lab Sample ID: 310-278393-2
Date Collected: 04/04/24 12:55
Matrix: Water
Date Received: 04/05/24 16:40

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.94		0.444	0.461	5.00	0.506	pCi/L		05/07/24 14:23	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	643.32				ft			04/04/24 12:55	1
Oxidation Reduction Potential	-44.0				mV			04/04/24 12:55	1
Oxygen, Dissolved	0.79				mg/L			04/04/24 12:55	1
Field pH	6.61				SU			04/04/24 12:55	1
Field Conductivity	1524				umhos/cm			04/04/24 12:55	1
Field Temperature	12.0				Degrees C			04/04/24 12:55	1
Field Turbidity	4.04				NTU			04/04/24 12:55	1

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-309
Date Collected: 04/04/24 10:55
Date Received: 04/05/24 16:40

Lab Sample ID: 310-278393-3
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**65**		5.0	2.3	mg/L			04/12/24 13:51	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 13:51	5
Sulfate	**470**		5.0	2.1	mg/L			04/12/24 13:51	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/10/24 21:38	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/10/24 21:38	1
Barium	**56**		2.0	0.66	ug/L		04/09/24 09:00	04/10/24 21:38	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/10/24 21:38	1
Boron	**1400**		100	76	ug/L		04/09/24 09:00	04/10/24 21:38	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/10/24 21:38	1
Calcium	**160**		0.50	0.19	mg/L		04/09/24 09:00	04/10/24 21:38	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/10/24 21:38	1
Cobalt	**2.4**		0.50	0.17	ug/L		04/09/24 09:00	04/10/24 21:38	1
Iron	**800**		100	36	ug/L		04/09/24 09:00	04/10/24 21:38	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/10/24 21:38	1
Lithium	**9.5**	**J**	10	2.5	ug/L		04/09/24 09:00	04/10/24 21:38	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/10/24 21:38	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/10/24 21:38	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/10/24 21:38	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:16	04/15/24 11:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1000**		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.9**	**HF**	1.0	1.0	SU			04/05/24 17:44	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**0.656**		0.168	0.178	1.00	0.119	pCi/L	04/10/24 10:16	05/05/24 12:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*95.2*		*30 - 110*	*04/10/24 10:16*	*05/05/24 12:25*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**0.843**		0.382	0.390	1.00	0.508	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*95.2*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*82.2*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-309
Lab Sample ID: 310-278393-3
Date Collected: 04/04/24 10:55
Matrix: Water
Date Received: 04/05/24 16:40

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.50		0.417	0.429	5.00	0.508	pCi/L		05/07/24 14:23	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	644.51				ft			04/04/24 10:55	1
Oxidation Reduction Potential	-48.0				mV			04/04/24 10:55	1
Oxygen, Dissolved	0.56				mg/L			04/04/24 10:55	1
Field pH	6.93				SU			04/04/24 10:55	1
Field Conductivity	1459				umhos/cm			04/04/24 10:55	1
Field Temperature	12.2				Degrees C			04/04/24 10:55	1
Field Turbidity	3.68				NTU			04/04/24 10:55	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-315
Date Collected: 04/04/24 12:00
Date Received: 04/05/24 16:40

Lab Sample ID: 310-278393-4
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**63**		5.0	2.3	mg/L			04/16/24 18:02	5
Fluoride	<0.38		1.0	0.38	mg/L			04/16/24 18:02	5
Sulfate	**470**		5.0	2.1	mg/L			04/16/24 18:02	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/10/24 21:40	1
Arsenic	**1.5**	**J**	2.0	0.53	ug/L		04/09/24 09:00	04/10/24 21:40	1
Barium	**36**		2.0	0.66	ug/L		04/09/24 09:00	04/10/24 21:40	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/10/24 21:40	1
Boron	**1200**		100	76	ug/L		04/09/24 09:00	04/10/24 21:40	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/10/24 21:40	1
Calcium	**130**		0.50	0.19	mg/L		04/09/24 09:00	04/10/24 21:40	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/10/24 21:40	1
Cobalt	**7.8**		0.50	0.17	ug/L		04/09/24 09:00	04/10/24 21:40	1
Iron	**2700**		100	36	ug/L		04/09/24 09:00	04/10/24 21:40	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/10/24 21:40	1
Lithium	**6.0**	**J**	10	2.5	ug/L		04/09/24 09:00	04/10/24 21:40	1
Magnesium	**21000**		500	150	ug/L		04/09/24 09:00	04/10/24 21:40	1
Manganese	**7600**		10	3.6	ug/L		04/09/24 09:00	04/10/24 21:40	1
Molybdenum	**1.6**	**J**	2.0	1.3	ug/L		04/09/24 09:00	04/10/24 21:40	1
Potassium	**1600**		500	150	ug/L		04/09/24 09:00	04/11/24 13:38	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/10/24 21:40	1
Sodium	**210000**		1000	480	ug/L		04/09/24 09:00	04/10/24 21:40	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/10/24 21:40	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	**7.5**		0.50	0.17	ug/L		04/09/24 09:00	04/15/24 22:53	1
Iron, Dissolved	**2300**		100	36	ug/L		04/09/24 09:00	04/15/24 22:53	1
Manganese, Dissolved	**7400**		10	3.6	ug/L		04/09/24 09:00	04/15/24 22:53	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:16	04/15/24 11:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**280**		5.0	2.5	mg/L			04/11/24 11:43	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/11/24 11:43	1
Total Alkalinity as CaCO3 (SM 2320B)	**280**		5.0	2.5	mg/L			04/11/24 11:43	1
Total Dissolved Solids (SM 2540C)	**1000**		50	34	mg/L			04/09/24 11:50	1
pH (SM 4500 H+ B)	**6.9**	**HF**	1.0	1.0	SU			04/05/24 17:44	1

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-315
Date Collected: 04/04/24 12:00
Date Received: 04/05/24 16:40

Lab Sample ID: 310-278393-4
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.555		0.151	0.159	1.00	0.106	pCi/L	04/10/24 10:16	05/05/24 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:16*	*05/05/24 12:26*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.672		0.371	0.376	1.00	0.527	pCi/L	04/10/24 10:27	05/01/24 12:09	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*
Y Carrier	*83.4*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:09*	*1*

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.23		0.401	0.408	5.00	0.527	pCi/L		05/07/24 14:23	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	644.23				ft			04/04/24 12:00	1
Oxidation Reduction Potential	-74.3				mV			04/04/24 12:00	1
Oxygen, Dissolved	0.34				mg/L			04/04/24 12:00	1
Field pH	6.85				SU			04/04/24 12:00	1
Field Conductivity	1479				umhos/cm			04/04/24 12:00	1
Field Temperature	12.3				Degrees C			04/04/24 12:00	1
Field Turbidity	4.47				NTU			04/04/24 12:00	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Qualifiers

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-418758/3
Matrix: Water
Analysis Batch: 418758

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/12/24 11:05	1
Fluoride	<0.075		0.20	0.075	mg/L			04/12/24 11:05	1
Sulfate	<0.42		1.0	0.42	mg/L			04/12/24 11:05	1

Lab Sample ID: LCS 310-418758/4
Matrix: Water
Analysis Batch: 418758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.1		mg/L		101	90 - 110
Fluoride	2.00	2.20		mg/L		110	90 - 110
Sulfate	10.0	10.6		mg/L		106	90 - 110

Lab Sample ID: MB 310-419008/3
Matrix: Water
Analysis Batch: 419008

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/16/24 14:28	1
Fluoride	<0.075		0.20	0.075	mg/L			04/16/24 14:28	1
Sulfate	<0.42		1.0	0.42	mg/L			04/16/24 14:28	1

Lab Sample ID: LCS 310-419008/4
Matrix: Water
Analysis Batch: 419008

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.95		mg/L		99	90 - 110
Fluoride	2.00	2.09		mg/L		105	90 - 110
Sulfate	10.0	10.8		mg/L		108	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-418155/1-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418155

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		04/09/24 09:00	04/10/24 20:32	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/10/24 20:32	1
Barium	<0.66		2.0	0.66	ug/L		04/09/24 09:00	04/10/24 20:32	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/10/24 20:32	1
Boron	<76		100	76	ug/L		04/09/24 09:00	04/10/24 20:32	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/10/24 20:32	1
Calcium	<0.19		0.50	0.19	mg/L		04/09/24 09:00	04/10/24 20:32	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/10/24 20:32	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/10/24 20:32	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/10/24 20:32	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/10/24 20:32	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/10/24 20:32	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-418155/1-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418155

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	<150		500	150	ug/L		04/09/24 09:00	04/10/24 20:32	1
Manganese	<3.6		10	3.6	ug/L		04/09/24 09:00	04/10/24 20:32	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/10/24 20:32	1
Potassium	<150		500	150	ug/L		04/09/24 09:00	04/10/24 20:32	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/10/24 20:32	1
Sodium	<480		1000	480	ug/L		04/09/24 09:00	04/10/24 20:32	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/10/24 20:32	1

Lab Sample ID: LCS 310-418155/2-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418155

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	211		ug/L		105	80 - 120
Arsenic	200	212		ug/L		106	80 - 120
Barium	100	104		ug/L		104	80 - 120
Beryllium	100	97.4		ug/L		97	80 - 120
Boron	200	173		ug/L		86	80 - 120
Cadmium	100	104		ug/L		104	80 - 120
Calcium	2.00	1.70		mg/L		85	80 - 120
Chromium	100	106		ug/L		106	80 - 120
Cobalt	100	107		ug/L		107	80 - 120
Iron	200	199		ug/L		99	80 - 120
Lead	200	215		ug/L		108	80 - 120
Lithium	200	200		ug/L		100	80 - 120
Magnesium	2000	1900		ug/L		95	80 - 120
Manganese	100	97.6		ug/L		98	80 - 120
Molybdenum	200	206		ug/L		103	80 - 120
Potassium	2000	1800		ug/L		90	80 - 120
Selenium	400	400		ug/L		100	80 - 120
Sodium	2000	2020		ug/L		101	80 - 120
Thallium	100	99.1		ug/L		99	80 - 120

Lab Sample ID: MB 310-418162/1-A
Matrix: Water
Analysis Batch: 418822

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418162

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/15/24 21:41	1
Iron, Dissolved	<36		100	36	ug/L		04/09/24 09:00	04/15/24 21:41	1
Manganese, Dissolved	<3.6		10	3.6	ug/L		04/09/24 09:00	04/15/24 21:41	1

Lab Sample ID: LCS 310-418162/2-A
Matrix: Water
Analysis Batch: 418822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418162

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt, Dissolved	100	112		ug/L		112	80 - 120
Iron, Dissolved	200	170		ug/L		85	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-418162/2-A
Matrix: Water
Analysis Batch: 418822

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418162

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese, Dissolved	100	96.6		ug/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-418621/1-A
Matrix: Water
Analysis Batch: 418782

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418621

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/12/24 13:16	04/15/24 11:22	1

Lab Sample ID: LCS 310-418621/2-A
Matrix: Water
Analysis Batch: 418782

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418621

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.56		ug/L		94	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-418552/2
Matrix: Water
Analysis Batch: 418552

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Alkalinity as CaCO3	1000	928		mg/L		93	90 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-418249/1
Matrix: Water
Analysis Batch: 418249

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<34		50	34	mg/L			04/09/24 11:50	1

Lab Sample ID: LCS 310-418249/2
Matrix: Water
Analysis Batch: 418249

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	920		mg/L		92	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-418046/1
Matrix: Water
Analysis Batch: 418046

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-656131/1-A
Matrix: Water
Analysis Batch: 660046

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656131

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.02006	U	0.0595	0.0595	1.00	0.115	pCi/L	04/10/24 10:16	05/05/24 09:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:16*	*05/05/24 09:03*	*1*

Lab Sample ID: LCS 160-656131/2-A
Matrix: Water
Analysis Batch: 660048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656131

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			11.3	9.631		1.06	1.00	0.127	pCi/L	85	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*98.5*		*30 - 110*

Lab Sample ID: 310-278393-1 DU
Matrix: Water
Analysis Batch: 660048

Client Sample ID: MW-307
Prep Type: Total/NA
Prep Batch: 656131

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 226	1.43			1.566		0.302	1.00	0.176	pCi/L			0.23	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Barium	*98.0*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-656132/1-A
Matrix: Water
Analysis Batch: 659455

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656132

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.8995		0.420	0.428	1.00	0.585	pCi/L	04/10/24 10:27	05/01/24 12:08	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.0*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:08*	*1*
Y Carrier	*85.6*		*30 - 110*	*04/10/24 10:27*	*05/01/24 12:08*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-656132/2-A
Matrix: Water
Analysis Batch: 659455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656132

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.98	10.44		1.37	1.00	0.495	pCi/L	116	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*98.5*		*30 - 110*
Y Carrier	*82.2*		*30 - 110*

Lab Sample ID: 310-278393-1 DU
Matrix: Water
Analysis Batch: 659455

Client Sample ID: MW-307
Prep Type: Total/NA
Prep Batch: 656132

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 228	1.11			0.7564		0.352	1.00	0.451	pCi/L			0.45	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Barium	*98.0*		*30 - 110*
Y Carrier	*83.7*		*30 - 110*

HPLC/IC

Analysis Batch: 418758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	9056A	
310-278393-2	MW-308	Total/NA	Water	9056A	
310-278393-3	MW-309	Total/NA	Water	9056A	
MB 310-418758/3	Method Blank	Total/NA	Water	9056A	
LCS 310-418758/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 419008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-4	MW-315	Total/NA	Water	9056A	
MB 310-419008/3	Method Blank	Total/NA	Water	9056A	
LCS 310-419008/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 418155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	3005A	
310-278393-2	MW-308	Total/NA	Water	3005A	
310-278393-3	MW-309	Total/NA	Water	3005A	
310-278393-4	MW-315	Total/NA	Water	3005A	
MB 310-418155/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418155/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 418162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Dissolved	Water	3005A	
310-278393-4	MW-315	Dissolved	Water	3005A	
MB 310-418162/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418162/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 418441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	6020B	418155
310-278393-2	MW-308	Total/NA	Water	6020B	418155
310-278393-3	MW-309	Total/NA	Water	6020B	418155
310-278393-4	MW-315	Total/NA	Water	6020B	418155
MB 310-418155/1-A	Method Blank	Total/NA	Water	6020B	418155
LCS 310-418155/2-A	Lab Control Sample	Total/NA	Water	6020B	418155

Analysis Batch: 418555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-4	MW-315	Total/NA	Water	6020B	418155

Prep Batch: 418621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	7470A	
310-278393-2	MW-308	Total/NA	Water	7470A	
310-278393-3	MW-309	Total/NA	Water	7470A	
310-278393-4	MW-315	Total/NA	Water	7470A	
MB 310-418621/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-418621/2-A	Lab Control Sample	Total/NA	Water	7470A	

QC Association Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Metals

Analysis Batch: 418782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	7470A	418621
310-278393-2	MW-308	Total/NA	Water	7470A	418621
310-278393-3	MW-309	Total/NA	Water	7470A	418621
310-278393-4	MW-315	Total/NA	Water	7470A	418621
MB 310-418621/1-A	Method Blank	Total/NA	Water	7470A	418621
LCS 310-418621/2-A	Lab Control Sample	Total/NA	Water	7470A	418621

Analysis Batch: 418822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Dissolved	Water	6020B	418162
310-278393-4	MW-315	Dissolved	Water	6020B	418162
MB 310-418162/1-A	Method Blank	Total/NA	Water	6020B	418162
LCS 310-418162/2-A	Lab Control Sample	Total/NA	Water	6020B	418162

General Chemistry

Analysis Batch: 418046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	SM 4500 H+ B	
310-278393-2	MW-308	Total/NA	Water	SM 4500 H+ B	
310-278393-3	MW-309	Total/NA	Water	SM 4500 H+ B	
310-278393-4	MW-315	Total/NA	Water	SM 4500 H+ B	
LCS 310-418046/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 418249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	SM 2540C	
310-278393-2	MW-308	Total/NA	Water	SM 2540C	
310-278393-3	MW-309	Total/NA	Water	SM 2540C	
310-278393-4	MW-315	Total/NA	Water	SM 2540C	
MB 310-418249/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-418249/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 418552

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-4	MW-315	Total/NA	Water	SM 2320B	
LCS 310-418552/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Rad

Prep Batch: 656131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	PrecSep-21	
310-278393-2	MW-308	Total/NA	Water	PrecSep-21	
310-278393-3	MW-309	Total/NA	Water	PrecSep-21	
310-278393-4	MW-315	Total/NA	Water	PrecSep-21	
MB 160-656131/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-656131/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
310-278393-1 DU	MW-307	Total/NA	Water	PrecSep-21	

QC Association Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Rad

Prep Batch: 656132

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	PrecSep_0	
310-278393-2	MW-308	Total/NA	Water	PrecSep_0	
310-278393-3	MW-309	Total/NA	Water	PrecSep_0	
310-278393-4	MW-315	Total/NA	Water	PrecSep_0	
MB 160-656132/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-656132/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
310-278393-1 DU	MW-307	Total/NA	Water	PrecSep_0	

Field Service / Mobile Lab

Analysis Batch: 418836

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278393-1	MW-307	Total/NA	Water	Field Sampling	
310-278393-2	MW-308	Total/NA	Water	Field Sampling	
310-278393-3	MW-309	Total/NA	Water	Field Sampling	
310-278393-4	MW-315	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-307
Lab Sample ID: 310-278393-1
Date Collected: 04/04/24 14:05
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418758	QTZ5	EET CF	04/12/24 12:53
Dissolved	Prep	3005A			418162	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418822	NFT2	EET CF	04/15/24 22:51
Total/NA	Prep	3005A			418155	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 21:33
Total/NA	Prep	7470A			418621	A6US	EET CF	04/12/24 13:16
Total/NA	Analysis	7470A		1	418782	A6US	EET CF	04/15/24 11:52
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418046	A3GU	EET CF	04/05/24 17:44
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660048	SCB	EET SL	05/05/24 11:02
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 14:05

Client Sample ID: MW-308
Lab Sample ID: 310-278393-2
Date Collected: 04/04/24 12:55
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418758	QTZ5	EET CF	04/12/24 13:39
Total/NA	Prep	3005A			418155	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 21:36
Total/NA	Prep	7470A			418621	A6US	EET CF	04/12/24 13:16
Total/NA	Analysis	7470A		1	418782	A6US	EET CF	04/15/24 11:54
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418046	A3GU	EET CF	04/05/24 17:44
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660046	SCB	EET SL	05/05/24 12:25
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 12:55

Client Sample ID: MW-309
Lab Sample ID: 310-278393-3
Date Collected: 04/04/24 10:55
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418758	QTZ5	EET CF	04/12/24 13:51
Total/NA	Prep	3005A			418155	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 21:38

Lab Chronicle

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Client Sample ID: MW-309
Lab Sample ID: 310-278393-3
Date Collected: 04/04/24 10:55
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	7470A			418621	A6US	EET CF	04/12/24 13:16
Total/NA	Analysis	7470A		1	418782	A6US	EET CF	04/15/24 11:56
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418046	A3GU	EET CF	04/05/24 17:44
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660046	SCB	EET SL	05/05/24 12:25
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 10:55

Client Sample ID: MW-315
Lab Sample ID: 310-278393-4
Date Collected: 04/04/24 12:00
Matrix: Water
Date Received: 04/05/24 16:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	419008	QTZ5	EET CF	04/16/24 18:02
Dissolved	Prep	3005A			418162	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418822	NFT2	EET CF	04/15/24 22:53
Total/NA	Prep	3005A			418155	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 21:40
Total/NA	Prep	3005A			418155	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 13:38
Total/NA	Prep	7470A			418621	A6US	EET CF	04/12/24 13:16
Total/NA	Analysis	7470A		1	418782	A6US	EET CF	04/15/24 11:58
Total/NA	Analysis	SM 2320B		1	418552	MAQ3	EET CF	04/11/24 11:43
Total/NA	Analysis	SM 2540C		1	418249	DGU1	EET CF	04/09/24 11:50
Total/NA	Analysis	SM 4500 H+ B		1	418046	A3GU	EET CF	04/05/24 17:44
Total/NA	Prep	PrecSep-21			656131	KAK	EET SL	04/10/24 10:16
Total/NA	Analysis	903.0		1	660046	SCB	EET SL	05/05/24 12:26
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659455	SCB	EET SL	05/01/24 12:09
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 12:00

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2320B	Alkalinity	SM	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-278393 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4-5-24 | TIME 1640 | Received By: MU

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # ____ of ____
Cooler Custody Seals Present?	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present?	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: T | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.3 | Corrected Temp (°C): 2.3

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins

Client Information	Sample	Lab PM: Sandie Fredrick	Carrier Tracking No(s)	COC No
Client Contact: Meghan Blodgett	Phone	E-Mail: Sandie.Fredrick@et.eurofinsus.com	State of Origin	Page: Page 1 of 1
Company: SCS Engineers	PWSID			Job #
Address: 2830 Dairy Drive	Due Date Requested			
City: Madison	TAT Requested (days)			
State, Zip: WI 53718	Compliance Project: Yes No			
Phone: 608-224-2830	PO #: 25223072			
Email: [illegible]@scsengineers.com	WO #			
Project Name: Ottumwa Generating Station 25223072	Project #: 25223072			
Site: Ottumwa IA	SSOW#			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 Metals total (Sb As Ba Be B Ca Cd Cr Co Fe Pb Li Mo Se Tl and Hg)	TDS and pH	Chloride Fluoride Sulfate	EPA 903 904 Radium 226 228	Bicarbonate & carbonate alkalinity	6020 Metals total (Mg Mn K Na)	6020 Metals dissolved (Co Fe Mn)	6020 Metals dissolved (Co)	Total Number of containers	Special Instructions/Note
			Preservation Code				D	I	I	D	I	D	D	D		
MW-307	4-4-24	14 05	G	W	N/Y		X	X	X	X				X		
MW-308	4-4-24	12:55	G	W	N		X	X	X	X						
MW 309	4-4-24	10 55	G	W	N		X	X	X	X						
MW-315	4-4-24	12.00	G	W	N/Y		X	X	X	X	X	X	X			

Preservation Codes
A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlor; H Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Acetone; V MCAA; W pH 4-5; Z other (specify); Other

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ______ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by	Date		Time		Method of Shipment
Relinquished by: [signature]	Date/Time: 4-5-24 14 00	Company: SCS	Received by: MC	Date/Time: 4-5-24 1640	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No		Cooler Temperature(s) °C and Other Remarks		

Ver 01 16 2 19

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-71058.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-278393-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 4/18/2024			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station 25224072.00	Project #: 31011020			
Site:	SSOW#:			

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-307 (310-278393-1)	4/4/24	14:05 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-308 (310-278393-2)	4/4/24	12:55 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-309 (310-278393-3)	4/4/24	10:55 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-315 (310-278393-4)	4/4/24	12:00 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification *Unconfirmed*		***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For ____ Months*	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 2	Special Instructions/QC Requirements:	
Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
T. [signature]	4-8-24 1110		[signature] Worthington	APR 0 9 2024 0835	ETASTL

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278393-1

Login Number: 278393
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278393-1

Login Number: 278393
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 04/09/24 11:47 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	Preserved upon arrival
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-278393-1
Project/Site: Ottumwa Generating Station 25224072.00

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-278393-1	MW-307	94.4
310-278393-1 DU	MW-307	98.0
310-278393-2	MW-308	97.2
310-278393-3	MW-309	95.2
310-278393-4	MW-315	97.0
LCS 160-656131/2-A	Lab Control Sample	98.5
MB 160-656131/1-A	Method Blank	97.0

Tracer/Carrier Legend

Ba = Barium

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-278393-1	MW-307	94.4	84.5
310-278393-1 DU	MW-307	98.0	83.7
310-278393-2	MW-308	97.2	81.9
310-278393-3	MW-309	95.2	82.2
310-278393-4	MW-315	97.0	83.4
LCS 160-656132/2-A	Lab Control Sample	98.5	82.2
MB 160-656132/1-A	Method Blank	97.0	85.6

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25224072.00
April 2024

	Sample	Date	Groundwater Elevation (ft amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	4/4/2024	680.79	8.5	6.65	9.81	868	92.0	5.63
Ash Pond	MW-302	4/4/2024	651.81	--	--	--	--	--	--
	MW-303	4/4/2024	649.52	8.6	6.82	3	1456	78.4	34.31
	MW-304	4/4/2024	648.39	12.7	6.88	1.71	1744	-32.0	6.08
	MW-305	4/4/2024	650.62	12.2	6.90	6.11	1708	47.3	6.22
	MW-305A	4/5/2024	645.43	12.0	6.95	4.31	1169	71.8	6.28
	MW-306	4/4/2024	654.47	12.5	6.64	1.51	1724	69.9	5.98
	MW-310	4/4/2024	643.51	11.3	7.05	7.89	1363	71.6	5.97
	MW-310A	4/5/2024	628.24	11.7	7.43	7.75	3020	50.2	7.57
	MW-311	4/5/2024	--	10.4	6.78	0.29	834	42.6	8.69
	MW-311A	4/5/2024	635.54	11.5	7.64	2.18	3244	61.3	7.40
	MW-312	4/4/2024	643.94	12.3	6.89	0.29	1512	-11.7	8.53
	MW-313	4/4/2024	644.49	11.8	6.90	0.21	1395	-27.9	7.45
	MW-316	4/5/2024	644.09	9.2	7.04	5.20	763	81.3	3.95
	MW-316A	4/5/2024	643.94	10.6	7.36	3.57	2189	40.1	4.46
	MW-317	4/5/2024	644.11	9.9	6.68	4.85	898	93.4	3.98
ZLDP	MW-307	4/4/2024	645.09	12.4	6.52	0.75	1693	-31.8	3.69
	MW-308	4/4/2024	643.32	12.0	6.61	0.79	1524	-44.0	4.04
	MW-309	4/4/2024	644.51	12.2	6.93	0.56	1459	-48.0	3.68
	MW-315	4/4/2024	644.23	12.3	6.85	0.34	1479	-74.3	4.47

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

Created by: RM Date: 10/25/2023
Last revision by: RM Date: 4/12/2024
Checked by: REO Date: 4/15/2024

C:\Users\hld0\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\USG3GGGC\[2404_OGS combined_CCR_Field Data.xlsx]GW Field Parameters

09/02/2025 - Classification: Internal - ECRM13574471

C2 June 2024 Supplemental Monitoring

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 6/24/2024 6:19:20 AM

JOB DESCRIPTION

Ottumwa Generating Station 25224072

JOB NUMBER

310-283146-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Eurofins Cedar Falls

Job Notes

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The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
6/24/2024 6:19:20 AM

Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job ID: 310-283146-1 Eurofins Cedar Falls

Job Narrative
310-283146-1

Receipt
The sample was received on 6/7/2024 4:50 PM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.3º C.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-283146-1	MW-307	Water	06/06/24 15:45	06/07/24 16:50

Detection Summary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Client Sample ID: MW-307
Lab Sample ID: 310-283146-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	63		0.50	0.17	ug/L	1		6020B	Total/NA
Groundwater Elevation	651.37				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-26.8				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.35				mg/L	1		Field Sampling	Total/NA
Field pH	6.32				SU	1		Field Sampling	Total/NA
Field Conductivity	2009				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.9				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	23.65				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Client Sample ID: MW-307
Lab Sample ID: 310-283146-1
Date Collected: 06/06/24 15:45
Matrix: Water
Date Received: 06/07/24 16:50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	63		0.50	0.17	ug/L		06/11/24 09:00	06/19/24 16:54	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	651.37				ft			06/06/24 15:45	1
Oxidation Reduction Potential	-26.8				mV			06/06/24 15:45	1
Oxygen, Dissolved	0.35				mg/L			06/06/24 15:45	1
Field pH	6.32				SU			06/06/24 15:45	1
Field Conductivity	2009				umhos/cm			06/06/24 15:45	1
Field Temperature	12.9				Degrees C			06/06/24 15:45	1
Field Turbidity	23.65				NTU			06/06/24 15:45	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

QC Sample Results

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-424099/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 424922
Prep Batch: 424099

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.17		0.50	0.17	ug/L		06/11/24 09:00	06/18/24 14:18	1

Lab Sample ID: LCS 310-424099/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 424922
Prep Batch: 424099

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	100	102		ug/L		102	80 - 120

QC Association Summary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Metals

Prep Batch: 424099

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-283146-1	MW-307	Total/NA	Water	3005A	
MB 310-424099/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-424099/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 424922

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-424099/1-A	Method Blank	Total/NA	Water	6020B	424099
LCS 310-424099/2-A	Lab Control Sample	Total/NA	Water	6020B	424099

Analysis Batch: 425115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-283146-1	MW-307	Total/NA	Water	6020B	424099

Field Service / Mobile Lab

Analysis Batch: 424360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-283146-1	MW-307	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Client Sample ID: MW-307
Date Collected: 06/06/24 15:45
Date Received: 06/07/24 16:50

Lab Sample ID: 310-283146-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			424099	KM3E	EET CF	06/11/24 09:00
Total/NA	Analysis	6020B		1	425115	NFT2	EET CF	06/19/24 16:54
Total/NA	Analysis	Field Sampling		1	424360	BJ0R	EET CF	06/06/24 15:45

Laboratory References:
EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Method Summary

Client: SCS Engineers
Job ID: 310-283146-1
Project/Site: Ottumwa Generating Station 25224072

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET CF
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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310-283146 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 6-7-24 | TIME 1650 | Received By: CC

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☒ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☐ Yes ☒ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: X | Correction Factor (°C): 0.0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.3 | Corrected Temp (°C): 1.3

Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins

Client Information	Sampler: Tyler Stirling	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No:
Client Contact: Meghan Blodgett	Phone: 515-505-2716	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: IA	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25224072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25224072	Project #: 25224072			
Site: Ottumwa IA	SSOW#:			

Analysis Requested

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 Metals total (Co)	Total Number of containers	Special Instructions/Note
			Preservation Code:				D		
MW-307	6/6/24	1545	G	W	N		X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Tyler S	6/7/24 1400	SCS			
2						
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

6/24/2024

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-283146-1

Login Number: 283146
List Number: 1
Creator: Bennett, Samantha

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25224072.00
June 2024

Sample	Date	Groundwater Elevation (ft amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-307	6/6/2024	651.37	12.9	6.32	0.35	2009	-26.8	23.65

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

Created by: RM Date: 10/25/2023
Last revision by: RM Date: 6/10/2024
Checked by: NLB Date: 6/12/2024

#REF!

09/02/2025 - Classification: Internal - ECRM13574471

C3 October 2024 Assessment Monitoring

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 11/14/2024 4:52:40 PM

JOB DESCRIPTION

Ottumwa Generating Station 25223072

JOB NUMBER

310-292670-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Job Notes

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Authorization

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11/14/2024 4:52:40 PM

Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job ID: 310-292670-1 Eurofins Cedar Falls

Job Narrative
310-292670-1

Receipt
The samples were received on 10/11/2024 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1º C.

HPLC/IC
Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-292670-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RAD
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method 6020B: The initial calibration verification (ICV) result for batch 310-436887 was above the upper control limit. The affected analytes are: Antimony. Sample results were non-detects, and have been reported as qualified data.

Mercury - analyzed outside of hold due to non-typical intial results in hold.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-292670-1	MW-301	Water	10/11/24 07:40	10/11/24 17:10
310-292670-2	Field Blank	Water	10/09/24 18:15	10/11/24 17:10

Detection Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-301
Lab Sample ID: 310-292670-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	93		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	150		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	36		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	520		100	76	ug/L	1		6020B	Total/NA
Calcium	71		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.22	J	0.50	0.17	ug/L	1		6020B	Total/NA
Lithium	20	B	10	2.5	ug/L	1		6020B	Total/NA
Selenium	3.9	J	5.0	1.4	ug/L	1		6020B	Total/NA
Total Dissolved Solids	530		50	42	mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	680.49				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	204.5				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3.06				mg/L	1		Field Sampling	Total/NA
Field pH	6.11				SU	1		Field Sampling	Total/NA
Field Conductivity	1017				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	17.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.02				NTU	1		Field Sampling	Total/NA

Client Sample ID: Field Blank
Lab Sample ID: 310-292670-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	6.1	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292670-1

Client Sample ID: MW-301
Date Collected: 10/11/24 07:40
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292670-1
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**93**		5.0	2.3	mg/L			10/23/24 14:29	5
Fluoride	<0.38		1.0	0.38	mg/L			10/23/24 14:29	5
Sulfate	**150**		5.0	2.1	mg/L			10/23/24 14:29	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0	^3+	2.0	1.0	ug/L		10/17/24 09:30	10/18/24 18:49	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/24 09:30	10/18/24 18:49	1
Barium	**36**		2.0	0.66	ug/L		10/17/24 09:30	10/21/24 14:18	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/24 09:30	10/18/24 18:49	1
Boron	**520**		100	76	ug/L		10/17/24 09:30	10/21/24 14:18	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/24 09:30	10/21/24 14:18	1
Calcium	**71**		0.50	0.19	mg/L		10/17/24 09:30	10/21/24 14:18	1
Chromium	<1.2		5.0	1.2	ug/L		10/17/24 09:30	10/18/24 18:49	1
Cobalt	**0.22**	**J**	0.50	0.17	ug/L		10/17/24 09:30	10/18/24 18:49	1
Iron	<36		100	36	ug/L		10/17/24 09:30	10/18/24 18:49	1
Lead	<0.26		0.50	0.26	ug/L		10/17/24 09:30	10/18/24 18:49	1
Lithium	**20**	**B**	10	2.5	ug/L		10/17/24 09:30	10/18/24 18:49	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/17/24 09:30	10/18/24 18:49	1
Selenium	**3.9**	**J**	5.0	1.4	ug/L		10/17/24 09:30	10/18/24 18:49	1
Thallium	<0.57		1.0	0.57	ug/L		10/17/24 09:30	10/21/24 14:18	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11	H	0.20	0.11	ug/L		11/13/24 13:50	11/14/24 11:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**530**		50	42	mg/L			10/16/24 22:49	1
pH (SM 4500 H+ B)	**6.6**	**HF**	1.0	1.0	SU			10/11/24 23:26	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**0.202**		0.0830	0.0850	1.00	0.0778	pCi/L	10/16/24 08:09	11/07/24 10:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.7*		*30 - 110*	*10/16/24 08:09*	*11/07/24 10:08*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.169	U	0.318	0.319	1.00	0.550	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*97.7*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-301
Lab Sample ID: 310-292670-1
Date Collected: 10/11/24 07:40
Matrix: Water
Date Received: 10/11/24 17:10

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.371	U	0.329	0.330	5.00	0.550	pCi/L		11/08/24 14:01	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	680.49				ft			10/11/24 07:40	1
Oxidation Reduction Potential	204.5				mV			10/11/24 07:40	1
Oxygen, Dissolved	3.06				mg/L			10/11/24 07:40	1
Field pH	6.11				SU			10/11/24 07:40	1
Field Conductivity	1017				umhos/cm			10/11/24 07:40	1
Field Temperature	17.6				Degrees C			10/11/24 07:40	1
Field Turbidity	3.02				NTU			10/11/24 07:40	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292670-1

Client Sample ID: Field Blank

Date Collected: 10/09/24 18:15
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292670-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			10/23/24 14:41	1
Fluoride	<0.075		0.20	0.075	mg/L			10/23/24 14:41	1
Sulfate	<0.42		1.0	0.42	mg/L			10/23/24 14:41	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0	^3+	2.0	1.0	ug/L		10/17/24 09:30	10/18/24 18:53	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/24 09:30	10/18/24 18:53	1
Barium	<0.66		2.0	0.66	ug/L		10/17/24 09:30	10/21/24 14:20	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/24 09:30	10/18/24 18:53	1
Boron	<76		100	76	ug/L		10/17/24 09:30	10/21/24 14:20	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/24 09:30	10/21/24 14:20	1
Calcium	<0.19		0.50	0.19	mg/L		10/17/24 09:30	10/21/24 14:20	1
Chromium	<1.2		5.0	1.2	ug/L		10/17/24 09:30	10/18/24 18:53	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/24 09:30	10/18/24 18:53	1
Iron	<36		100	36	ug/L		10/17/24 09:30	10/18/24 18:53	1
Lead	<0.26		0.50	0.26	ug/L		10/17/24 09:30	10/18/24 18:53	1
Lithium	<2.5		10	2.5	ug/L		10/17/24 09:30	10/18/24 18:53	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/17/24 09:30	10/18/24 18:53	1
Selenium	<1.4		5.0	1.4	ug/L		10/17/24 09:30	10/18/24 18:53	1
Thallium	<0.57		1.0	0.57	ug/L		10/17/24 09:30	10/21/24 14:20	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11	H	0.20	0.11	ug/L		11/13/24 13:50	11/14/24 11:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<42		50	42	mg/L			10/15/24 17:46	1
pH (SM 4500 H+ B)	**6.1**	**HF**	1.0	1.0	SU			10/11/24 23:23	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.0244	U	0.0433	0.0433	1.00	0.107	pCi/L	10/16/24 08:09	11/07/24 10:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.9*		*30 - 110*	*10/16/24 08:09*	*11/07/24 10:08*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	-0.156	U	0.319	0.319	1.00	0.638	pCi/L	10/16/24 08:13	10/30/24 14:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*91.9*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:37*	*1*
Y Carrier	*79.3*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:37*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: Field Blank
Lab Sample ID: 310-292670-2
Date Collected: 10/09/24 18:15
Matrix: Water
Date Received: 10/11/24 17:10

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.000	U	0.322	0.322	5.00	0.638	pCi/L		11/08/24 14:01	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^3+	Reporting Limit Check Standard is outside acceptance limits, high biased
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-437467/3
Matrix: Water
Analysis Batch: 437467

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			10/23/24 10:27	1
Fluoride	<0.075		0.20	0.075	mg/L			10/23/24 10:27	1
Sulfate	<0.42		1.0	0.42	mg/L			10/23/24 10:27	1

Lab Sample ID: LCS 310-437467/4
Matrix: Water
Analysis Batch: 437467

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.76		mg/L		98	90 - 110
Fluoride	2.00	1.90		mg/L		95	90 - 110
Sulfate	10.0	9.97		mg/L		100	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-436497/1-A
Matrix: Water
Analysis Batch: 436887

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 436497

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0	^3+	2.0	1.0	ug/L		10/17/24 09:30	10/18/24 16:37	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/24 09:30	10/18/24 16:37	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/24 09:30	10/18/24 16:37	1
Boron	<76	^+	100	76	ug/L		10/17/24 09:30	10/18/24 16:37	1
Calcium	<0.19		0.50	0.19	mg/L		10/17/24 09:30	10/18/24 16:37	1
Chromium	<1.2		5.0	1.2	ug/L		10/17/24 09:30	10/18/24 16:37	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/24 09:30	10/18/24 16:37	1
Iron	<36		100	36	ug/L		10/17/24 09:30	10/18/24 16:37	1
Lead	<0.26		0.50	0.26	ug/L		10/17/24 09:30	10/18/24 16:37	1
Lithium	4.18	J	10	2.5	ug/L		10/17/24 09:30	10/18/24 16:37	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/17/24 09:30	10/18/24 16:37	1
Selenium	<1.4		5.0	1.4	ug/L		10/17/24 09:30	10/18/24 16:37	1

Lab Sample ID: MB 310-436497/1-A
Matrix: Water
Analysis Batch: 437043

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 436497

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.66		2.0	0.66	ug/L		10/17/24 09:30	10/21/24 13:12	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/24 09:30	10/21/24 13:12	1
Thallium	<0.57		1.0	0.57	ug/L		10/17/24 09:30	10/21/24 13:12	1

Lab Sample ID: LCS 310-436497/2-A
Matrix: Water
Analysis Batch: 436887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436497

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	200		ug/L		100	80 - 120
Beryllium	100	90.8		ug/L		91	80 - 120
Chromium	100	90.8		ug/L		91	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-436497/2-A
Matrix: Water
Analysis Batch: 436887

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436497

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	100	90.9		ug/L		91	80 - 120
Iron	200	178		ug/L		89	80 - 120
Lead	200	184		ug/L		92	80 - 120
Lithium	200	183		ug/L		91	80 - 120
Molybdenum	200	177		ug/L		88	80 - 120
Selenium	400	345		ug/L		86	80 - 120

Lab Sample ID: LCS 310-436497/2-A
Matrix: Water
Analysis Batch: 437043

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436497

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	222		ug/L		111	80 - 120
Barium	100	105		ug/L		105	80 - 120
Boron	200	206		ug/L		103	80 - 120
Cadmium	100	104		ug/L		104	80 - 120
Calcium	2.00	1.82		mg/L		91	80 - 120
Thallium	100	84.9		ug/L		85	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-439539/1-A
Matrix: Water
Analysis Batch: 439780

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 439539

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		11/13/24 13:50	11/14/24 10:38	1

Lab Sample ID: LCS 310-439539/2-A
Matrix: Water
Analysis Batch: 439780

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 439539

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.67		ug/L		100	80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-436360/1
Matrix: Water
Analysis Batch: 436360

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<42		50	42	mg/L			10/15/24 17:46	1

Lab Sample ID: LCS 310-436360/2
Matrix: Water
Analysis Batch: 436360

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	984		mg/L		98	88 - 110

Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

Lab Sample ID: MB 310-436511/1
Matrix: Water
Analysis Batch: 436511

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<42		50	42	mg/L			10/16/24 22:49	1

Lab Sample ID: LCS 310-436511/2
Matrix: Water
Analysis Batch: 436511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1010		mg/L		101	88 - 110		

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-436035/1
Matrix: Water
Analysis Batch: 436035

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	98 - 102		

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-683830/1-A
Matrix: Water
Analysis Batch: 687288

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 683830

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.04843	U	0.0520	0.0521	1.00	0.0808	pCi/L	10/16/24 08:09	11/07/24 08:20	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.7*		*30 - 110*	*10/16/24 08:09*	*11/07/24 08:20*	*1*

Lab Sample ID: LCS 160-683830/2-A
Matrix: Water
Analysis Batch: 687288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 683830

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			9.58	9.186		0.984	1.00	0.108	pCi/L	96	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*91.9*		*30 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-683831/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 685958
Prep Batch: 683831

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.5042	U	0.436	0.438	1.00	0.691	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.7*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*80.4*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Lab Sample ID: LCS 160-683831/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 685958
Prep Batch: 683831

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.39	9.837		1.36	1.00	0.530	pCi/L	117	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*91.9*		*30 - 110*
Y Carrier	*81.9*		*30 - 110*

HPLC/IC

Analysis Batch: 437467

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	9056A	
310-292670-2	Field Blank	Total/NA	Water	9056A	
MB 310-437467/3	Method Blank	Total/NA	Water	9056A	
LCS 310-437467/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 436497

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	3005A	
310-292670-2	Field Blank	Total/NA	Water	3005A	
MB 310-436497/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-436497/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 436887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	6020B	436497
310-292670-2	Field Blank	Total/NA	Water	6020B	436497
MB 310-436497/1-A	Method Blank	Total/NA	Water	6020B	436497
LCS 310-436497/2-A	Lab Control Sample	Total/NA	Water	6020B	436497

Analysis Batch: 437043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	6020B	436497
310-292670-2	Field Blank	Total/NA	Water	6020B	436497
MB 310-436497/1-A	Method Blank	Total/NA	Water	6020B	436497
LCS 310-436497/2-A	Lab Control Sample	Total/NA	Water	6020B	436497

Prep Batch: 439539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	7470A	
310-292670-2	Field Blank	Total/NA	Water	7470A	
MB 310-439539/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-439539/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 439780

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	7470A	439539
310-292670-2	Field Blank	Total/NA	Water	7470A	439539
MB 310-439539/1-A	Method Blank	Total/NA	Water	7470A	439539
LCS 310-439539/2-A	Lab Control Sample	Total/NA	Water	7470A	439539

General Chemistry

Analysis Batch: 436035

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	SM 4500 H+ B	
310-292670-2	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-436035/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

QC Association Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

General Chemistry

Analysis Batch: 436360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-2	Field Blank	Total/NA	Water	SM 2540C	
MB 310-436360/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-436360/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 436511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	SM 2540C	
MB 310-436511/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-436511/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 683830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	PrecSep-21	
310-292670-2	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-683830/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-683830/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 683831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	PrecSep_0	
310-292670-2	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-683831/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-683831/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Field Service / Mobile Lab

Analysis Batch: 437225

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292670-1	MW-301	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-301
Date Collected: 10/11/24 07:40
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292670-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	437467	HE7K	EET CF	10/23/24 14:29
Total/NA	Prep	3005A			436497	F5MW	EET CF	10/17/24 09:30
Total/NA	Analysis	6020B		1	436887	A6US	EET CF	10/18/24 18:49
Total/NA	Prep	3005A			436497	F5MW	EET CF	10/17/24 09:30
Total/NA	Analysis	6020B		1	437043	NFT2	EET CF	10/21/24 14:18
Total/NA	Prep	7470A			439539	QTZ5	EET CF	11/13/24 13:50
Total/NA	Analysis	7470A		1	439780	QTZ5	EET CF	11/14/24 11:34
Total/NA	Analysis	SM 2540C		1	436511	MDU9	EET CF	10/16/24 22:49
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:26
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687288	SWS	EET SL	11/07/24 10:08
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685959	FLC	EET SL	10/30/24 14:36
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01
Total/NA	Analysis	Field Sampling		1	437225	BJ0R	EET CF	10/11/24 07:40

Client Sample ID: Field Blank
Date Collected: 10/09/24 18:15
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292670-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	437467	HE7K	EET CF	10/23/24 14:41
Total/NA	Prep	3005A			436497	F5MW	EET CF	10/17/24 09:30
Total/NA	Analysis	6020B		1	436887	A6US	EET CF	10/18/24 18:53
Total/NA	Prep	3005A			436497	F5MW	EET CF	10/17/24 09:30
Total/NA	Analysis	6020B		1	437043	NFT2	EET CF	10/21/24 14:20
Total/NA	Prep	7470A			439539	QTZ5	EET CF	11/13/24 13:50
Total/NA	Analysis	7470A		1	439780	QTZ5	EET CF	11/14/24 11:36
Total/NA	Analysis	SM 2540C		1	436360	MDU9	EET CF	10/15/24 17:46
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:23
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687288	SWS	EET SL	11/07/24 10:08
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685959	FLC	EET SL	10/30/24 14:37
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-25
Connecticut	State	PH-0241	11-10-24
Florida	NELAP	E87689	06-30-25
HI - RadChem Recognition	State	n/a	06-30-25
Illinois	NELAP	200023	11-30-25
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-25
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-25
Massachusetts	State	M-MO054	06-30-25
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-25
New Jersey	NELAP	MO002	11-12-24
New Mexico	State	MO00054	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-25
North Dakota	State	R-207	12-31-24
Oregon	NELAP	4157	09-01-25
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-25
Texas	NELAP	T104704193	07-31-25
US Fish & Wildlife	US Federal Programs	058448	07-31-25
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-25
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-25
West Virginia DEP	State	381	10-31-25

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Pos Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-292670 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: ScS

City/State: CITY Madison | STATE Wi | Project:

Receipt Information

Date/Time Received: DATE 10/11/24 | TIME 1710 | Received By. PH

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☑ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other: _____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☑ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☑ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☐ Yes ☑ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☑ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☑ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other: _____ ☐ NONE

Thermometer ID: R | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.1 | Corrected Temp (°C): 1.1

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding If no, proceed with login

Additional Comments

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Michael Morgan	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No
Client Contact: Meghan Blodgett	Phone: 515-631-0778	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25223072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25223072	Project #: 25223072			
Site: Ottumwa IA	SSOW#:			

Analysis Requested

Preservation Codes

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 Metals total (Sb As Ba Be B Ca Cd Cr Co Fe Pb Li Mo Se Tl and Hg)	TDS and pH	Chloride Fluoride Sulfate	EPA 903/904 Radium 226 + 228	Bicarbonate & carbonate alkalinity	6020 Metals total (Fe Mg Mn K, Na)	6020 Metals dissolved (Co Fe Mn)	6020 Metals dissolved (Fe Mn)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	I	I	D	I	D	D	D		
MW-301	09/12/24	07:40	G	W	N		X	X	X	X						
Field Blank	09/12/24	19:15	G	W	N		X	X	X	X						

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time	Company	Received by:	Date/Time:	Company
Michael Morgan	[illegible]	SCS	CGC	10.11.24 1710	Eurofins
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

11/14/2024

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-77316.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-292670-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/21/2024			Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station 25223072	Project #: 31011020			
Site:	SSOW#:			Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-301 (310-292670-1)	10/11/24	07:40 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
Field Blank (310-292670-2)	10/9/24	18:15 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: M Pinetta	Date/Time: OCT 15 2024 0930	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

11/14/2024

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-292670-1

Login Number: 292670
List Number: 1
Creator: Collins, Charlotte G

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-292670-1

Login Number: 292670
List Number: 2
Creator: Pinette, Meadow L

List Source: Eurofins St. Louis
List Creation: 10/15/24 01:03 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-292670-1
Project/Site: Ottumwa Generating Station 25223072

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-292670-1	MW-301	97.7
310-292670-2	Field Blank	91.9
LCS 160-683830/2-A	Lab Control Sample	91.9
MB 160-683830/1-A	Method Blank	94.7

Tracer/Carrier Legend

Ba = Barium

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-292670-1	MW-301	97.7	81.9
310-292670-2	Field Blank	91.9	79.3
LCS 160-683831/2-A	Lab Control Sample	91.9	81.9
MB 160-683831/1-A	Method Blank	94.7	80.4

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25224072.00
October 2024

	Sample	Date	Groundwater Elevation (ft amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	10/11/2024	680.49	17.6	6.11	3.06	1017	204.5	3.02
Ash Pond	MW-302	10/10/2024	--	16.2	6.49	3.88	2556	143.3	5.65
	MW-303	10/10/2024	649.42	--	--	--	--	--	--
	MW-304	10/10/2024	646.30	14.5	6.86	0.37	2294	-48.8	2.96
	MW-305	10/11/2024	650.11	14.5	6.79	0.42	2176	151.4	3.55
	MW-305A	10/11/2024	644.16	19.9	7.09	6.50	1668	148.7	4.04
	MW-306	10/9/2024	655.30	14.8	6.54	0.36	2291	116.4	2.83
	MW-310	10/9/2024	637.99	14.3	6.74	0.41	1780	152.5	4.96
	MW-310A	10/9/2024	639.39	17.9	7.53	5.82	3791	150.2	4.20
	MW-311	--	--	--	--	--	--	--	--
	MW-311A	10/11/2024	641.01	18.2	7.84	6.42	4134	135.7	3.74
	MW-312	10/9/2024	640.17	13.9	6.86	0.25	1842	46.8	44.37
	MW-313	10/9/2024	638.87	16.0	6.94	0.39	2027	-10.3	188.31
	MW-316	--	--	--	--	--	--	--	--
	MW-316A	10/9/2024	639.96	22.2	7.32	2.09	2838	107.3	28.77
	MW-317	10/9/2024	638.82	14.5	6.53	1.36	2137	68.0	8.38
ZLDP	MW-307	10/10/2024	643.26	15.0	6.53	0.26	2271	19.0	3.43
	MW-308	10/10/2024	641.21	14.4	6.65	1.50	2081	24.1	6.99
	MW-309	10/10/2024	640.25	13.5	6.97	0.66	1997	31.7	19.38
	MW-315	10/10/2024	641.37	13.9	6.89	1.26	2008	2.7	9.56

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

Created by: RM Date: 10/25/2023
Last revision by: RM Date: 10/18/2024
Checked by: KMV Date: 10/22/2024

C:\Users\hld0\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\KHXCPYNH\[2410_OGS combined_CCR_Field Data.xlsx]GW Field Parameters

09/02/2025 - Classification: Internal - ECRM13574471

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 11/18/2024 9:37:49 AM Revision 1

JOB DESCRIPTION

Ottumwa Generating Station 25223072

JOB NUMBER

310-292665-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
11/18/2024 9:37:49 AM
Revision 1

Authorized for release by
Sandie Fredrick, Senior Project Manager
Sandra.Fredrick@et.eurofinsus.com
(920)261-1660

Table of Contents

Job Narrative
310-292665-1

Revision
The report being provided is a revision of the original report sent on 11/11/2024. The report (revision 1) is being revised due to: Client asking for review/rerun of ICPMS.

Receipt
The samples were received on 10/11/2024 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6º C.

HPLC/IC
Methods 300.0, 9056A: The following samples were diluted due to the nature of the sample matrix: MW-307 (310-292665-1), MW-308 (310-292665-2), MW-309 (310-292665-3) and MW-315 (310-292665-4). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RAD
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method 6020B: MW-307 (310-292665-1), MW-308 (310-292665-2), MW-309 (310-292665-3) and MW-315 (310-292665-4). The following samples were reanalyzed based on historical data. The new data has all been reported at a lower dilution.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-292665-1	MW-307	Water	10/10/24 13:04	10/11/24 17:10
310-292665-2	MW-308	Water	10/10/24 11:57	10/11/24 17:10
310-292665-3	MW-309	Water	10/10/24 09:46	10/11/24 17:10
310-292665-4	MW-315	Water	10/10/24 10:56	10/11/24 17:10

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-307 — Lab Sample ID: 310-292665-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	250		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	130		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	110		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	180		100	76	ug/L	1		6020B	Total/NA
Calcium	210		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	34		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	2800		100	36	ug/L	1		6020B	Total/NA
Lithium	10		10	2.5	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	39		0.50	0.17	ug/L	1		6020B	Dissolved
Total Dissolved Solids	1100		50	42	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	643.26				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	19.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.26				mg/L	1		Field Sampling	Total/NA
Field pH	6.53				SU	1		Field Sampling	Total/NA
Field Conductivity	2271				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	15.0				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.43				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-308 — Lab Sample ID: 310-292665-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	290		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	120		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	230		100	76	ug/L	1		6020B	Total/NA
Calcium	220		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.18	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3600		100	36	ug/L	1		6020B	Total/NA
Lithium	15		10	2.5	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1100		50	42	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	641.21				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	24.1				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	1.50				mg/L	1		Field Sampling	Total/NA
Field pH	6.65				SU	1		Field Sampling	Total/NA
Field Conductivity	2081				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	14.4				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.99				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-309 — Lab Sample ID: 310-292665-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	64		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	480		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	56		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1300		100	76	ug/L	1		6020B	Total/NA
Calcium	150		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	2.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	680		100	36	ug/L	1		6020B	Total/NA
Lithium	8.2	J	10	2.5	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1100		50	42	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Detection Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-309 (Continued) — Lab Sample ID: 310-292665-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.4	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	640.25				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	31.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.66				mg/L	1		Field Sampling	Total/NA
Field pH	6.97				SU	1		Field Sampling	Total/NA
Field Conductivity	1997				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.5				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	19.38				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-315 — Lab Sample ID: 310-292665-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	61		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	460		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	1.4	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	37		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	1200		100	76	ug/L	1		6020B	Total/NA
Calcium	130		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	7.4		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	2600		100	36	ug/L	1		6020B	Total/NA
Lithium	5.6	J	10	2.5	ug/L	1		6020B	Total/NA
Magnesium	21000		500	150	ug/L	1		6020B	Total/NA
Manganese	7900		10	3.6	ug/L	1		6020B	Total/NA
Molybdenum	1.6	J	2.0	1.3	ug/L	1		6020B	Total/NA
Potassium	1900		500	150	ug/L	1		6020B	Total/NA
Sodium	200000		1000	480	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	7.0		0.50	0.17	ug/L	1		6020B	Dissolved
Iron, Dissolved	2500		100	36	ug/L	1		6020B	Dissolved
Manganese, Dissolved	7600		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	280		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	280		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Dissolved Solids	1100		50	42	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	641.37				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	2.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	1.26				mg/L	1		Field Sampling	Total/NA
Field pH	6.89				SU	1		Field Sampling	Total/NA
Field Conductivity	2008				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.9				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	9.56				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-307

Date Collected: 10/10/24 13:04
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**250**		5.0	2.3	mg/L			10/22/24 18:10	5
Fluoride	<0.38		1.0	0.38	mg/L			10/22/24 18:10	5
Sulfate	**130**		5.0	2.1	mg/L			10/22/24 18:10	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/15/24 09:30	11/15/24 12:29	1
Arsenic	<0.53		2.0	0.53	ug/L		10/15/24 09:30	11/15/24 12:29	1
Barium	**110**		2.0	0.66	ug/L		10/15/24 09:30	11/15/24 12:29	1
Beryllium	<0.33		1.0	0.33	ug/L		10/15/24 09:30	11/15/24 12:29	1
Boron	**180**		100	76	ug/L		10/15/24 09:30	11/15/24 12:29	1
Cadmium	<0.10		0.20	0.10	ug/L		10/15/24 09:30	11/15/24 12:29	1
Calcium	**210**		0.50	0.19	mg/L		10/15/24 09:30	11/15/24 12:29	1
Chromium	<1.2		5.0	1.2	ug/L		10/15/24 09:30	11/15/24 12:29	1
Cobalt	**34**		0.50	0.17	ug/L		10/15/24 09:30	11/15/24 12:29	1
Iron	**2800**		100	36	ug/L		10/15/24 09:30	11/15/24 12:29	1
Lead	<0.26		0.50	0.26	ug/L		10/15/24 09:30	11/15/24 12:29	1
Lithium	**10**		10	2.5	ug/L		10/15/24 09:30	11/15/24 12:29	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/15/24 09:30	11/15/24 12:29	1
Selenium	<1.4		5.0	1.4	ug/L		10/15/24 09:30	11/15/24 12:29	1
Thallium	<0.57		1.0	0.57	ug/L		10/15/24 09:30	11/15/24 12:29	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	**39**		0.50	0.17	ug/L		10/17/24 09:30	10/23/24 16:48	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		10/17/24 15:15	10/18/24 16:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1100**		50	42	mg/L			10/16/24 22:49	1
pH (SM 4500 H+ B)	**6.9**	**HF**	1.0	1.0	SU			10/11/24 23:02	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**1.65**		0.227	0.271	1.00	0.0961	pCi/L	10/16/24 08:09	11/07/24 08:20	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*93.9*		*30 - 110*	*10/16/24 08:09*	*11/07/24 08:20*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.500	U	0.447	0.450	1.00	0.714	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Client Sample ID: MW-307
Date Collected: 10/10/24 13:04
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-1
Matrix: Water

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*93.9*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*81.1*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	**2.15**		0.501	0.525	5.00	0.714	pCi/L		11/08/24 14:01	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	**643.26**				ft			10/10/24 13:04	1
Oxidation Reduction Potential	**19.0**				mV			10/10/24 13:04	1
Oxygen, Dissolved	**0.26**				mg/L			10/10/24 13:04	1
Field pH	**6.53**				SU			10/10/24 13:04	1
Field Conductivity	**2271**				umhos/cm			10/10/24 13:04	1
Field Temperature	**15.0**				Degrees C			10/10/24 13:04	1
Field Turbidity	**3.43**				NTU			10/10/24 13:04	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-308

Date Collected: 10/10/24 11:57
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		5.0	2.3	mg/L			10/22/24 18:26	5
Fluoride	<0.38		1.0	0.38	mg/L			10/22/24 18:26	5
Sulfate	**290**		5.0	2.1	mg/L			10/22/24 18:26	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/15/24 09:30	11/15/24 12:37	1
Arsenic	<0.53		2.0	0.53	ug/L		10/15/24 09:30	11/15/24 12:37	1
Barium	**120**		2.0	0.66	ug/L		10/15/24 09:30	11/15/24 12:37	1
Beryllium	<0.33		1.0	0.33	ug/L		10/15/24 09:30	11/15/24 12:37	1
Boron	**230**		100	76	ug/L		10/15/24 09:30	11/15/24 12:37	1
Cadmium	<0.10		0.20	0.10	ug/L		10/15/24 09:30	11/15/24 12:37	1
Calcium	**220**		0.50	0.19	mg/L		10/15/24 09:30	11/15/24 12:37	1
Chromium	<1.2		5.0	1.2	ug/L		10/15/24 09:30	11/15/24 12:37	1
Cobalt	**0.18**	**J**	0.50	0.17	ug/L		10/15/24 09:30	11/15/24 12:37	1
Iron	**3600**		100	36	ug/L		10/15/24 09:30	11/15/24 12:37	1
Lead	<0.26		0.50	0.26	ug/L		10/15/24 09:30	11/15/24 12:37	1
Lithium	**15**		10	2.5	ug/L		10/15/24 09:30	11/15/24 12:37	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/15/24 09:30	11/15/24 12:37	1
Selenium	<1.4		5.0	1.4	ug/L		10/15/24 09:30	11/15/24 12:37	1
Thallium	<0.57		1.0	0.57	ug/L		10/15/24 09:30	11/15/24 12:37	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		10/17/24 15:15	10/18/24 16:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**1100**		50	42	mg/L			10/16/24 22:49	1
pH (SM 4500 H+ B)	**7.0**	**HF**	1.0	1.0	SU			10/11/24 23:01	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**1.15**		0.192	0.218	1.00	0.102	pCi/L	10/16/24 08:09	11/07/24 08:20	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.7*		*30 - 110*	*10/16/24 08:09*	*11/07/24 08:20*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.388	U	0.366	0.368	1.00	0.586	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*94.7*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*82.6*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-308
Lab Sample ID: 310-292665-2
Date Collected: 10/10/24 11:57
Matrix: Water
Date Received: 10/11/24 17:10

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.54		0.413	0.428	5.00	0.586	pCi/L		11/08/24 14:01	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	641.21				ft			10/10/24 11:57	1
Oxidation Reduction Potential	24.1				mV			10/10/24 11:57	1
Oxygen, Dissolved	1.50				mg/L			10/10/24 11:57	1
Field pH	6.65				SU			10/10/24 11:57	1
Field Conductivity	2081				umhos/cm			10/10/24 11:57	1
Field Temperature	14.4				Degrees C			10/10/24 11:57	1
Field Turbidity	6.99				NTU			10/10/24 11:57	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-309
Date Collected: 10/10/24 09:46
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-3
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	64		5.0	2.3	mg/L			10/22/24 18:41	5
Fluoride	<0.38		1.0	0.38	mg/L			10/22/24 18:41	5
Sulfate	480		5.0	2.1	mg/L			10/22/24 18:41	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/15/24 09:30	11/15/24 12:39	1
Arsenic	<0.53		2.0	0.53	ug/L		10/15/24 09:30	11/15/24 12:39	1
Barium	56		2.0	0.66	ug/L		10/15/24 09:30	11/15/24 12:39	1
Beryllium	<0.33		1.0	0.33	ug/L		10/15/24 09:30	11/15/24 12:39	1
Boron	1300		100	76	ug/L		10/15/24 09:30	11/15/24 12:39	1
Cadmium	<0.10		0.20	0.10	ug/L		10/15/24 09:30	11/15/24 12:39	1
Calcium	150		0.50	0.19	mg/L		10/15/24 09:30	11/15/24 12:39	1
Chromium	<1.2		5.0	1.2	ug/L		10/15/24 09:30	11/15/24 12:39	1
Cobalt	2.2		0.50	0.17	ug/L		10/15/24 09:30	11/15/24 12:39	1
Iron	680		100	36	ug/L		10/15/24 09:30	11/15/24 12:39	1
Lead	<0.26		0.50	0.26	ug/L		10/15/24 09:30	11/15/24 12:39	1
Lithium	8.2	J	10	2.5	ug/L		10/15/24 09:30	11/15/24 12:39	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/15/24 09:30	11/15/24 12:39	1
Selenium	<1.4		5.0	1.4	ug/L		10/15/24 09:30	11/15/24 12:39	1
Thallium	<0.57		1.0	0.57	ug/L		10/15/24 09:30	11/15/24 12:39	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		10/17/24 15:15	10/18/24 16:06	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1100		50	42	mg/L			10/16/24 22:49	1
pH (SM 4500 H+ B)	7.4	HF	1.0	1.0	SU			10/11/24 23:03	1

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.778		0.164	0.179	1.00	0.0999	pCi/L	10/16/24 08:09	11/07/24 08:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*90.6*		*30 - 110*	*10/16/24 08:09*	*11/07/24 08:21*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.688		0.405	0.410	1.00	0.589	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*90.6*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*83.0*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Client Sample Results

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-309
Lab Sample ID: 310-292665-3
Date Collected: 10/10/24 09:46
Matrix: Water
Date Received: 10/11/24 17:10

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.47		0.437	0.447	5.00	0.589	pCi/L		11/08/24 14:01	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	640.25				ft			10/10/24 09:46	1
Oxidation Reduction Potential	31.7				mV			10/10/24 09:46	1
Oxygen, Dissolved	0.66				mg/L			10/10/24 09:46	1
Field pH	6.97				SU			10/10/24 09:46	1
Field Conductivity	1997				umhos/cm			10/10/24 09:46	1
Field Temperature	13.5				Degrees C			10/10/24 09:46	1
Field Turbidity	19.38				NTU			10/10/24 09:46	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-315

Date Collected: 10/10/24 10:56
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**61**		5.0	2.3	mg/L			10/22/24 18:57	5
Fluoride	<0.38		1.0	0.38	mg/L			10/22/24 18:57	5
Sulfate	**460**		5.0	2.1	mg/L			10/22/24 18:57	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/15/24 09:30	11/15/24 12:42	1
Arsenic	**1.4**	**J**	2.0	0.53	ug/L		10/15/24 09:30	11/15/24 12:42	1
Barium	**37**		2.0	0.66	ug/L		10/15/24 09:30	11/15/24 12:42	1
Beryllium	<0.33		1.0	0.33	ug/L		10/15/24 09:30	11/15/24 12:42	1
Boron	**1200**		100	76	ug/L		10/15/24 09:30	11/15/24 12:42	1
Cadmium	<0.10		0.20	0.10	ug/L		10/15/24 09:30	11/15/24 12:42	1
Calcium	**130**		0.50	0.19	mg/L		10/15/24 09:30	11/15/24 12:42	1
Chromium	<1.2		5.0	1.2	ug/L		10/15/24 09:30	11/15/24 12:42	1
Cobalt	**7.4**		0.50	0.17	ug/L		10/15/24 09:30	11/15/24 12:42	1
Iron	**2600**		100	36	ug/L		10/15/24 09:30	11/15/24 12:42	1
Lead	<0.26		0.50	0.26	ug/L		10/15/24 09:30	11/15/24 12:42	1
Lithium	**5.6**	**J**	10	2.5	ug/L		10/15/24 09:30	11/15/24 12:42	1
Magnesium	**21000**		500	150	ug/L		10/15/24 09:30	11/15/24 12:42	1
Manganese	**7900**		10	3.6	ug/L		10/15/24 09:30	11/15/24 12:42	1
Molybdenum	**1.6**	**J**	2.0	1.3	ug/L		10/15/24 09:30	11/15/24 12:42	1
Potassium	**1900**		500	150	ug/L		10/15/24 09:30	11/15/24 12:42	1
Selenium	<1.4		5.0	1.4	ug/L		10/15/24 09:30	11/15/24 12:42	1
Sodium	**200000**		1000	480	ug/L		10/15/24 09:30	11/15/24 12:42	1
Thallium	<0.57		1.0	0.57	ug/L		10/15/24 09:30	11/15/24 12:42	1

Method: SW846 6020B - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	**7.0**		0.50	0.17	ug/L		10/17/24 09:30	10/23/24 16:51	1
Iron, Dissolved	**2500**		100	36	ug/L		10/17/24 09:30	10/23/24 16:51	1
Manganese, Dissolved	**7600**		10	3.6	ug/L		10/17/24 09:30	10/23/24 16:51	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		10/17/24 15:15	10/18/24 16:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**280**		5.0	2.5	mg/L			10/19/24 01:46	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/19/24 01:46	1
Total Alkalinity as CaCO3 (SM 2320B)	**280**		5.0	2.5	mg/L			10/19/24 01:46	1
Total Dissolved Solids (SM 2540C)	**1100**		50	42	mg/L			10/16/24 22:49	1
pH (SM 4500 H+ B)	**7.1**	**HF**	1.0	1.0	SU			10/11/24 23:15	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-292665-1

Client Sample ID: MW-315

Date Collected: 10/10/24 10:56
Date Received: 10/11/24 17:10

Lab Sample ID: 310-292665-4

Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.873		0.176	0.193	1.00	0.123	pCi/L	10/16/24 08:09	11/07/24 08:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*92.2*		*30 - 110*	*10/16/24 08:09*	*11/07/24 08:25*	*1*

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.975		0.455	0.464	1.00	0.626	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*92.2*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/16/24 08:13*	*10/30/24 14:36*	*1*

Method: TAL-STL Ra226_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.85		0.488	0.503	5.00	0.626	pCi/L		11/08/24 14:01	1

Method: EPA Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	641.37				ft			10/10/24 10:56	1
Oxidation Reduction Potential	2.7				mV			10/10/24 10:56	1
Oxygen, Dissolved	1.26				mg/L			10/10/24 10:56	1
Field pH	6.89				SU			10/10/24 10:56	1
Field Conductivity	2008				umhos/cm			10/10/24 10:56	1
Field Temperature	13.9				Degrees C			10/10/24 10:56	1
Field Turbidity	9.56				NTU			10/10/24 10:56	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-437303/3
Matrix: Water
Analysis Batch: 437303

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			10/22/24 13:30	1
Fluoride	<0.075		0.20	0.075	mg/L			10/22/24 13:30	1
Sulfate	<0.42		1.0	0.42	mg/L			10/22/24 13:30	1

Lab Sample ID: LCS 310-437303/4
Matrix: Water
Analysis Batch: 437303

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.71		mg/L		97	90 - 110
Fluoride	2.00	1.99		mg/L		100	90 - 110
Sulfate	10.0	10.0		mg/L		100	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-436194/1-A
Matrix: Water
Analysis Batch: 439907

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 436194

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/15/24 09:30	11/15/24 12:24	1
Arsenic	<0.53		2.0	0.53	ug/L		10/15/24 09:30	11/15/24 12:24	1
Barium	<0.66		2.0	0.66	ug/L		10/15/24 09:30	11/15/24 12:24	1
Beryllium	<0.33		1.0	0.33	ug/L		10/15/24 09:30	11/15/24 12:24	1
Boron	<76		100	76	ug/L		10/15/24 09:30	11/15/24 12:24	1
Cadmium	<0.10		0.20	0.10	ug/L		10/15/24 09:30	11/15/24 12:24	1
Calcium	<0.19		0.50	0.19	mg/L		10/15/24 09:30	11/15/24 12:24	1
Chromium	<1.2		5.0	1.2	ug/L		10/15/24 09:30	11/15/24 12:24	1
Cobalt	<0.17		0.50	0.17	ug/L		10/15/24 09:30	11/15/24 12:24	1
Iron	<36		100	36	ug/L		10/15/24 09:30	11/15/24 12:24	1
Lead	<0.26		0.50	0.26	ug/L		10/15/24 09:30	11/15/24 12:24	1
Lithium	<2.5		10	2.5	ug/L		10/15/24 09:30	11/15/24 12:24	1
Magnesium	<150		500	150	ug/L		10/15/24 09:30	11/15/24 12:24	1
Manganese	<3.6		10	3.6	ug/L		10/15/24 09:30	11/15/24 12:24	1
Molybdenum	<1.3		2.0	1.3	ug/L		10/15/24 09:30	11/15/24 12:24	1
Potassium	<150		500	150	ug/L		10/15/24 09:30	11/15/24 12:24	1
Selenium	<1.4		5.0	1.4	ug/L		10/15/24 09:30	11/15/24 12:24	1
Sodium	<480		1000	480	ug/L		10/15/24 09:30	11/15/24 12:24	1
Thallium	<0.57		1.0	0.57	ug/L		10/15/24 09:30	11/15/24 12:24	1

Lab Sample ID: LCS 310-436194/2-A
Matrix: Water
Analysis Batch: 439907

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	211		ug/L		105	80 - 120
Arsenic	200	202		ug/L		101	80 - 120
Barium	100	105		ug/L		105	80 - 120
Beryllium	100	98.4		ug/L		98	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-436194/2-A
Matrix: Water
Analysis Batch: 439907

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436194

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	199		ug/L		100	80 - 120
Cadmium	100	101		ug/L		101	80 - 120
Calcium	2.00	2.01		mg/L		101	80 - 120
Chromium	100	102		ug/L		102	80 - 120
Cobalt	100	102		ug/L		102	80 - 120
Iron	200	213		ug/L		107	80 - 120
Lead	200	200		ug/L		100	80 - 120
Lithium	200	207		ug/L		103	80 - 120
Magnesium	2000	2050		ug/L		103	80 - 120
Manganese	100	103		ug/L		103	80 - 120
Molybdenum	200	197		ug/L		98	80 - 120
Potassium	2000	2100		ug/L		105	80 - 120
Selenium	400	392		ug/L		98	80 - 120
Sodium	2000	1970		ug/L		99	80 - 120
Thallium	100	91.2		ug/L		91	80 - 120

Lab Sample ID: 310-292665-1 MS
Matrix: Water
Analysis Batch: 439907

Client Sample ID: MW-307
Prep Type: Total/NA
Prep Batch: 436194

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<1.0		200	209		ug/L		105	75 - 125
Arsenic	<0.53		200	209		ug/L		104	75 - 125
Barium	110		100	231		ug/L		121	75 - 125
Beryllium	<0.33		100	100		ug/L		100	75 - 125
Boron	180		200	402		ug/L		111	75 - 125
Cadmium	<0.10		100	98.5		ug/L		98	75 - 125
Calcium	210		2.00	241	4	mg/L		1449	75 - 125
Chromium	<1.2		100	101		ug/L		101	75 - 125
Cobalt	34		100	143		ug/L		109	75 - 125
Iron	2800		200	3460	4	ug/L		351	75 - 125
Lead	<0.26		200	197		ug/L		98	75 - 125
Lithium	10		200	217		ug/L		103	75 - 125
Magnesium	26000		2000	32400	4	ug/L		316	75 - 125
Manganese	280	F1	100	430	F1	ug/L		154	75 - 125
Molybdenum	<1.3		200	207		ug/L		103	75 - 125
Potassium	2000		2000	4370		ug/L		119	75 - 125
Selenium	<1.4		400	406		ug/L		101	75 - 125
Sodium	96000		2000	110000	4	ug/L		692	75 - 125
Thallium	<0.57		100	87.1		ug/L		87	75 - 125

Lab Sample ID: 310-292665-1 MSD
Matrix: Water
Analysis Batch: 439907

Client Sample ID: MW-307
Prep Type: Total/NA
Prep Batch: 436194

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<1.0		200	213		ug/L		106	75 - 125	2	20
Arsenic	<0.53		200	209		ug/L		105	75 - 125	0	20
Barium	110		100	229		ug/L		119	75 - 125	1	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-292665-1 MSD — **Client Sample ID: MW-307**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 439907 — **Prep Batch: 436194**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Beryllium	<0.33		100	100		ug/L		100	75 - 125	0	20
Boron	180		200	406		ug/L		113	75 - 125	1	20
Cadmium	<0.10		100	99.5		ug/L		100	75 - 125	1	20
Calcium	210		2.00	242	4	mg/L		1481	75 - 125	0	20
Chromium	<1.2		100	101		ug/L		101	75 - 125	0	20
Cobalt	34		100	143		ug/L		109	75 - 125	0	20
Iron	2800		200	3380	4	ug/L		309	75 - 125	2	20
Lead	<0.26		200	198		ug/L		99	75 - 125	1	20
Lithium	10		200	217		ug/L		103	75 - 125	0	20
Magnesium	26000		2000	31500	4	ug/L		274	75 - 125	3	20
Manganese	280	F1	100	418	F1	ug/L		142	75 - 125	3	20
Molybdenum	<1.3		200	204		ug/L		102	75 - 125	1	20
Potassium	2000		2000	4250		ug/L		113	75 - 125	3	20
Selenium	<1.4		400	407		ug/L		102	75 - 125	0	20
Sodium	96000		2000	107000	4	ug/L		559	75 - 125	2	20
Thallium	<0.57		100	84.3		ug/L		84	75 - 125	3	20

Lab Sample ID: MB 310-436499/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 437341 — **Prep Batch: 436499**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	<0.17		0.50	0.17	ug/L		10/17/24 09:30	10/23/24 15:51	1
Iron, Dissolved	<36		100	36	ug/L		10/17/24 09:30	10/23/24 15:51	1
Manganese, Dissolved	<3.6		10	3.6	ug/L		10/17/24 09:30	10/23/24 15:51	1

Lab Sample ID: LCS 310-436499/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 437341 — **Prep Batch: 436499**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt, Dissolved	100	90.9		ug/L		91	80 - 120
Iron, Dissolved	200	180		ug/L		90	80 - 120
Manganese, Dissolved	100	92.8		ug/L		93	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-436573/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436829 — **Prep Batch: 436573**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		10/17/24 15:15	10/18/24 15:32	1

Lab Sample ID: LCS 310-436573/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 436829 — **Prep Batch: 436573**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.36		ug/L		82	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-436913/2
Matrix: Water
Analysis Batch: 436913

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Alkalinity as CaCO3			1000	958		mg/L		96	86 - 111		

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-436511/1
Matrix: Water
Analysis Batch: 436511

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<42		50	42	mg/L			10/16/24 22:49	1

Lab Sample ID: LCS 310-436511/2
Matrix: Water
Analysis Batch: 436511

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	1010		mg/L		101	88 - 110		

Lab Sample ID: 310-292665-3 DU
Matrix: Water
Analysis Batch: 436511

Client Sample ID: MW-309
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	1100			1130		mg/L				0.7	16

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-436035/1
Matrix: Water
Analysis Batch: 436035

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	98 - 102		

Lab Sample ID: 310-292665-4 DU
Matrix: Water
Analysis Batch: 436035

Client Sample ID: MW-315
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.1	HF		7.1		SU				0.4	20

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-683830/1-A
Matrix: Water
Analysis Batch: 687288

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 683830

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.04843	U	0.0520	0.0521	1.00	0.0808	pCi/L	10/16/24 08:09	11/07/24 08:20	1

Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: MB 160-683830/1-A
Matrix: Water
Analysis Batch: 687288

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 683830

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	94.7		30 - 110	10/16/24 08:09	11/07/24 08:20	1

Lab Sample ID: LCS 160-683830/2-A
Matrix: Water
Analysis Batch: 687288

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 683830

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			9.58	9.186		0.984	1.00	0.108	pCi/L	96	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Barium	91.9		30 - 110

Lab Sample ID: 310-292665-4 DU
Matrix: Water
Analysis Batch: 687312

Client Sample ID: MW-315
Prep Type: Total/NA
Prep Batch: 683830

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 226	0.873			0.7025		0.173	1.00	0.128	pCi/L			0.47	1

Carrier	DU %Yield	DU Qualifier	Limits
Barium	93.4		30 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-683831/1-A
Matrix: Water
Analysis Batch: 685958

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 683831

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.5042	U	0.436	0.438	1.00	0.691	pCi/L	10/16/24 08:13	10/30/24 14:36	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	94.7		30 - 110	10/16/24 08:13	10/30/24 14:36	1
Y Carrier	80.4		30 - 110	10/16/24 08:13	10/30/24 14:36	1

Lab Sample ID: LCS 160-683831/2-A
Matrix: Water
Analysis Batch: 685958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 683831

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.39	9.837		1.36	1.00	0.530	pCi/L	117	75 - 125		

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-683831/2-A
Matrix: Water
Analysis Batch: 685958

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 683831

Carrier	LCS %Yield	LCS Qualifier	Limits
Barium	91.9		30 - 110
Y Carrier	81.9		30 - 110

Lab Sample ID: 310-292665-4 DU
Matrix: Water
Analysis Batch: 685959

Client Sample ID: MW-315
Prep Type: Total/NA
Prep Batch: 683831

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium 228	0.975			0.2381	U	0.343	1.00	0.578	pCi/L			0.91	1

Carrier	DU %Yield	DU Qualifier	Limits
Barium	93.4		30 - 110
Y Carrier	81.1		30 - 110

QC Association Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

HPLC/IC

Analysis Batch: 437303

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	9056A	
310-292665-2	MW-308	Total/NA	Water	9056A	
310-292665-3	MW-309	Total/NA	Water	9056A	
310-292665-4	MW-315	Total/NA	Water	9056A	
MB 310-437303/3	Method Blank	Total/NA	Water	9056A	
LCS 310-437303/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 436194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	3005A	
310-292665-2	MW-308	Total/NA	Water	3005A	
310-292665-3	MW-309	Total/NA	Water	3005A	
310-292665-4	MW-315	Total/NA	Water	3005A	
MB 310-436194/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-436194/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-292665-1 MS	MW-307	Total/NA	Water	3005A	
310-292665-1 MSD	MW-307	Total/NA	Water	3005A	

Prep Batch: 436499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Dissolved	Water	3005A	
310-292665-4	MW-315	Dissolved	Water	3005A	
MB 310-436499/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-436499/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 436573

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	7470A	
310-292665-2	MW-308	Total/NA	Water	7470A	
310-292665-3	MW-309	Total/NA	Water	7470A	
310-292665-4	MW-315	Total/NA	Water	7470A	
MB 310-436573/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-436573/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 436829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	7470A	436573
310-292665-2	MW-308	Total/NA	Water	7470A	436573
310-292665-3	MW-309	Total/NA	Water	7470A	436573
310-292665-4	MW-315	Total/NA	Water	7470A	436573
MB 310-436573/1-A	Method Blank	Total/NA	Water	7470A	436573
LCS 310-436573/2-A	Lab Control Sample	Total/NA	Water	7470A	436573

Analysis Batch: 437341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Dissolved	Water	6020B	436499
310-292665-4	MW-315	Dissolved	Water	6020B	436499
MB 310-436499/1-A	Method Blank	Total/NA	Water	6020B	436499
LCS 310-436499/2-A	Lab Control Sample	Total/NA	Water	6020B	436499

QC Association Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Metals

Analysis Batch: 439907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	6020B	436194
310-292665-2	MW-308	Total/NA	Water	6020B	436194
310-292665-3	MW-309	Total/NA	Water	6020B	436194
310-292665-4	MW-315	Total/NA	Water	6020B	436194
MB 310-436194/1-A	Method Blank	Total/NA	Water	6020B	436194
LCS 310-436194/2-A	Lab Control Sample	Total/NA	Water	6020B	436194
310-292665-1 MS	MW-307	Total/NA	Water	6020B	436194
310-292665-1 MSD	MW-307	Total/NA	Water	6020B	436194

General Chemistry

Analysis Batch: 436035

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	SM 4500 H+ B	
310-292665-2	MW-308	Total/NA	Water	SM 4500 H+ B	
310-292665-3	MW-309	Total/NA	Water	SM 4500 H+ B	
310-292665-4	MW-315	Total/NA	Water	SM 4500 H+ B	
LCS 310-436035/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-292665-4 DU	MW-315	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 436511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	SM 2540C	
310-292665-2	MW-308	Total/NA	Water	SM 2540C	
310-292665-3	MW-309	Total/NA	Water	SM 2540C	
310-292665-4	MW-315	Total/NA	Water	SM 2540C	
MB 310-436511/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-436511/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-292665-3 DU	MW-309	Total/NA	Water	SM 2540C	

Analysis Batch: 436913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-4	MW-315	Total/NA	Water	SM 2320B	
LCS 310-436913/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Rad

Prep Batch: 683830

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	PrecSep-21	
310-292665-2	MW-308	Total/NA	Water	PrecSep-21	
310-292665-3	MW-309	Total/NA	Water	PrecSep-21	
310-292665-4	MW-315	Total/NA	Water	PrecSep-21	
MB 160-683830/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-683830/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
310-292665-4 DU	MW-315	Total/NA	Water	PrecSep-21	

Prep Batch: 683831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	PrecSep_0	
310-292665-2	MW-308	Total/NA	Water	PrecSep_0	
310-292665-3	MW-309	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 683831 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-4	MW-315	Total/NA	Water	PrecSep_0	
MB 160-683831/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-683831/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
310-292665-4 DU	MW-315	Total/NA	Water	PrecSep_0	

Field Service / Mobile Lab

Analysis Batch: 437221

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-292665-1	MW-307	Total/NA	Water	Field Sampling	
310-292665-2	MW-308	Total/NA	Water	Field Sampling	
310-292665-3	MW-309	Total/NA	Water	Field Sampling	
310-292665-4	MW-315	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-307
Lab Sample ID: 310-292665-1
Date Collected: 10/10/24 13:04
Matrix: Water
Date Received: 10/11/24 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	437303	ZRI4	EET CF	10/22/24 18:10
Dissolved	Prep	3005A			436499	F5MW	EET CF	10/17/24 09:30
Dissolved	Analysis	6020B		1	437341	NFT2	EET CF	10/23/24 16:48
Total/NA	Prep	3005A			436194	QTZ5	EET CF	10/15/24 09:30
Total/NA	Analysis	6020B		1	439907	A6US	EET CF	11/15/24 12:29
Total/NA	Prep	7470A			436573	QTZ5	EET CF	10/17/24 15:15
Total/NA	Analysis	7470A		1	436829	QTZ5	EET CF	10/18/24 16:02
Total/NA	Analysis	SM 2540C		1	436511	MDU9	EET CF	10/16/24 22:49
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:02
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687288	SWS	EET SL	11/07/24 08:20
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685958	FLC	EET SL	10/30/24 14:36
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01
Total/NA	Analysis	Field Sampling		1	437221	BJ0R	EET CF	10/10/24 13:04

Client Sample ID: MW-308
Lab Sample ID: 310-292665-2
Date Collected: 10/10/24 11:57
Matrix: Water
Date Received: 10/11/24 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	437303	ZRI4	EET CF	10/22/24 18:26
Total/NA	Prep	3005A			436194	QTZ5	EET CF	10/15/24 09:30
Total/NA	Analysis	6020B		1	439907	A6US	EET CF	11/15/24 12:37
Total/NA	Prep	7470A			436573	QTZ5	EET CF	10/17/24 15:15
Total/NA	Analysis	7470A		1	436829	QTZ5	EET CF	10/18/24 16:04
Total/NA	Analysis	SM 2540C		1	436511	MDU9	EET CF	10/16/24 22:49
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:01
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687288	SWS	EET SL	11/07/24 08:20
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685959	FLC	EET SL	10/30/24 14:36
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01
Total/NA	Analysis	Field Sampling		1	437221	BJ0R	EET CF	10/10/24 11:57

Client Sample ID: MW-309
Lab Sample ID: 310-292665-3
Date Collected: 10/10/24 09:46
Matrix: Water
Date Received: 10/11/24 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	437303	ZRI4	EET CF	10/22/24 18:41
Total/NA	Prep	3005A			436194	QTZ5	EET CF	10/15/24 09:30
Total/NA	Analysis	6020B		1	439907	A6US	EET CF	11/15/24 12:39

Lab Chronicle

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Client Sample ID: MW-309
Lab Sample ID: 310-292665-3
Date Collected: 10/10/24 09:46
Matrix: Water
Date Received: 10/11/24 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	7470A			436573	QTZ5	EET CF	10/17/24 15:15
Total/NA	Analysis	7470A		1	436829	QTZ5	EET CF	10/18/24 16:06
Total/NA	Analysis	SM 2540C		1	436511	MDU9	EET CF	10/16/24 22:49
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:03
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687288	SWS	EET SL	11/07/24 08:21
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685959	FLC	EET SL	10/30/24 14:36
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01
Total/NA	Analysis	Field Sampling		1	437221	BJ0R	EET CF	10/10/24 09:46

Client Sample ID: MW-315
Lab Sample ID: 310-292665-4
Date Collected: 10/10/24 10:56
Matrix: Water
Date Received: 10/11/24 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	437303	ZRI4	EET CF	10/22/24 18:57
Dissolved	Prep	3005A			436499	F5MW	EET CF	10/17/24 09:30
Dissolved	Analysis	6020B		1	437341	NFT2	EET CF	10/23/24 16:51
Total/NA	Prep	3005A			436194	QTZ5	EET CF	10/15/24 09:30
Total/NA	Analysis	6020B		1	439907	A6US	EET CF	11/15/24 12:42
Total/NA	Prep	7470A			436573	QTZ5	EET CF	10/17/24 15:15
Total/NA	Analysis	7470A		1	436829	QTZ5	EET CF	10/18/24 16:08
Total/NA	Analysis	SM 2320B		1	436913	HE7K	EET CF	10/19/24 01:46
Total/NA	Analysis	SM 2540C		1	436511	MDU9	EET CF	10/16/24 22:49
Total/NA	Analysis	SM 4500 H+ B		1	436035	ZJX4	EET CF	10/11/24 23:15
Total/NA	Prep	PrecSep-21			683830	BCE	EET SL	10/16/24 08:09
Total/NA	Analysis	903.0		1	687312	SWS	EET SL	11/07/24 08:25
Total/NA	Prep	PrecSep_0			683831	BCE	EET SL	10/16/24 08:13
Total/NA	Analysis	904.0		1	685959	FLC	EET SL	10/30/24 14:36
Total/NA	Analysis	Ra226_Ra228 Pos		1	687620	EMH	EET SL	11/08/24 14:01
Total/NA	Analysis	Field Sampling		1	437221	BJ0R	EET CF	10/10/24 10:56

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-25
Connecticut	State	PH-0241	11-10-24
Florida	NELAP	E87689	06-30-25
HI - RadChem Recognition	State	n/a	06-30-25
Illinois	NELAP	200023	11-30-25
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-25
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-25
Massachusetts	State	M-MO054	06-30-25
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-25
New Jersey	NELAP	MO002	11-12-24
New Mexico	State	MO00054	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-25
North Dakota	State	R-207	12-31-24
Oregon	NELAP	4157	09-01-25
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-25
Texas	NELAP	T104704193	07-31-25
US Fish & Wildlife	US Federal Programs	058448	07-31-25
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-25
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-25
West Virginia DEP	State	381	10-31-25

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2320B	Alkalinity	SM	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	EET SL
Field Sampling	Field Sampling	EPA	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency
None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

eurofins | Environment Testing America

310-292665 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 10/11/24 TIME 1710 Received By: PH

Delivery Type: ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☑ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☑ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☐ Yes ☑ No *If yes:* Cooler # _____ of _____

Cooler Custody Seals Present? ☐ Yes ☑ No *If yes:* Cooler custody seals intact? ☐ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☑ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☑ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: R Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.C Corrected Temp (°C): 1.5

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g , bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding If no, proceed with login

Additional Comments

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Michael Morgan	Lab PM: Sandie Fredrick	Carrier Tracking No(s):	COC No:
Client Contact: Meghan Blodgett	Phone: 55-63-0778	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25223072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25223072	Project #: 25223072			
Site: Ottumwa IA	SSOW#:			

Analysis Requested

Preservation Codes

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E - NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q - Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020 Metals total (Sb As Ba Be B Ca Cd Cr Co Fe Pb Li Mo Se Tl and Hg)	TDS and pH	Chloride Fluoride Sulfate	EPA 903/904 Radium 226 + 228	Bicarbonate & carbonate alkalinity	6020 Metals total (Mg Mn K Na)	6020 Metals dissolved (Co, Fe Mn)	6020 Metals dissolved (Co)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	I	I	D	I	D	D	D		
MW-307	10/10/24	1304	G	W	N/Y		X	X	X	X				X		
MW-308	10/10/24	1157	G	W	N		X	X	X	X						
MW-309	10/10/24	0946	G	W	N		X	X	X	X						
MW-315	10/10/24	1056	G	W	N/Y		X	X	X	X	X	X	X			

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Michael Morgan		SCS	CGE	10.11.24 1710	Eurofins
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No | Cooler Temperature(s) °C and Other Remarks.

Ver: 01/16/2019

Page 31 of 36

11/18/2024 (Rev. 1)

09/02/2025 - Classification: Internal - ECRM13574471

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-77316.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-292665-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/24/2024	Analysis Requested		Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station 25223072	Project #: 31011020			Other:
Site:	SSOW#:			

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-307 (310-292665-1)	10/10/24	13:04 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-308 (310-292665-2)	10/10/24	11:57 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-309 (310-292665-3)	10/10/24	09:46 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-315 (310-292665-4)	10/10/24	10:56 Central	G	Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	10/14 1205				
Relinquished by:	Date/Time:	Company	Received by: M Pinette	Date/Time: OCT 15 2024 0930	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 05/06/2024

11/18/2024 (Rev. 1)

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-292665-1

Login Number: 292665
List Number: 1
Creator: Collins, Charlotte G

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-292665-1

Login Number: 292665
List Number: 2
Creator: Pinette, Meadow L

List Source: Eurofins St. Louis
List Creation: 10/15/24 01:03 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-292665-1
Project/Site: Ottumwa Generating Station 25223072

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
310-292665-1	MW-307	93.9
310-292665-2	MW-308	94.7
310-292665-3	MW-309	90.6
310-292665-4	MW-315	92.2
310-292665-4 DU	MW-315	93.4
LCS 160-683830/2-A	Lab Control Sample	91.9
MB 160-683830/1-A	Method Blank	94.7

Tracer/Carrier Legend

Ba = Barium

Method: 904.0 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-292665-1	MW-307	93.9	81.1
310-292665-2	MW-308	94.7	82.6
310-292665-3	MW-309	90.6	83.0
310-292665-4	MW-315	92.2	81.9
310-292665-4 DU	MW-315	93.4	81.1
LCS 160-683831/2-A	Lab Control Sample	91.9	81.9
MB 160-683831/1-A	Method Blank	94.7	80.4

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25224072.00
October 2024

	Sample	Date	Groundwater Elevation (ft amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	10/11/2024	680.49	17.6	6.11	3.06	1017	204.5	3.02
Ash Pond	MW-302	10/10/2024	--	16.2	6.49	3.88	2556	143.3	5.65
	MW-303	10/10/2024	649.42	--	--	--	--	--	--
	MW-304	10/10/2024	646.30	14.5	6.86	0.37	2294	-48.8	2.96
	MW-305	10/11/2024	650.11	14.5	6.79	0.42	2176	151.4	3.55
	MW-305A	10/11/2024	644.16	19.9	7.09	6.50	1668	148.7	4.04
	MW-306	10/9/2024	655.30	14.8	6.54	0.36	2291	116.4	2.83
	MW-310	10/9/2024	637.99	14.3	6.74	0.41	1780	152.5	4.96
	MW-310A	10/9/2024	639.39	17.9	7.53	5.82	3791	150.2	4.20
	MW-311	--	--	--	--	--	--	--	--
	MW-311A	10/11/2024	641.01	18.2	7.84	6.42	4134	135.7	3.74
	MW-312	10/9/2024	640.17	13.9	6.86	0.25	1842	46.8	44.37
	MW-313	10/9/2024	638.87	16.0	6.94	0.39	2027	-10.3	188.31
	MW-316	--	--	--	--	--	--	--	--
	MW-316A	10/9/2024	639.96	22.2	7.32	2.09	2838	107.3	28.77
	MW-317	10/9/2024	638.82	14.5	6.53	1.36	2137	68.0	8.38
ZLDP	MW-307	10/10/2024	643.26	15.0	6.53	0.26	2271	19.0	3.43
	MW-308	10/10/2024	641.21	14.4	6.65	1.50	2081	24.1	6.99
	MW-309	10/10/2024	640.25	13.5	6.97	0.66	1997	31.7	19.38
	MW-315	10/10/2024	641.37	13.9	6.89	1.26	2008	2.7	9.56

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
ft amsl = feet above mean sea level
mV = millivolts

Created by: RM Date: 10/25/2023
Last revision by: RM Date: 10/18/2024
Checked by: KMV Date: 10/22/2024

C:\Users\hld0\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\KHXCPYNH\[2410_OGS combined_CCR_Field Data.xlsx]GW Field Parameters

09/02/2025 - Classification: Internal - ECRM13574471

Appendix D

Historical Monitoring Results

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-301
Number of Sampling Dates: 28

Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/23/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	2/5/2020
Boron	ug/L	574	612	597	620	599	565	657	779	488	480	735	--	410	--	380	680	540
Calcium	mg/L	66.9	62.5	65.6	71.9	74.1	61.5	59.3	66.8	65.2	63	72.5	--	47.2	--	43	78	68
Chloride	mg/L	63.4	66.9	73.3	76.3	71.6	54.8	69.8	73.5	59.8	63.4	--	63.1	33.9	--	50	110	120
Fluoride	mg/L	0.22	0.2	0.44	0.27	0.17	0.24	0.26	0.34	0.27	0.22	--	0.27	0.3	--	0.44	<0.23	--
Field pH	Std. Units	6.54	6.06	6.08	6.26	6.47	6.64	6.31	6.16	6.41	6.41	6.26	6.31	6.27	5.68	6.61	6.33	6.39
Sulfate	mg/L	150	157	159	169	171	190	166	162	178	186	--	181	164	--	81	130	130
Total Dissolved Solids	mg/L	500	531	576	545	545	499	490	557	448	514	--	532	392	--	340	510	570
Antimony	ug/L	<0.058	0.13	0.12	<0.058	0.11	<0.026	0.054	0.063	--	<0.026	0.2	--	<0.078	--	<0.53	<0.53	--
Arsenic	ug/L	0.38	0.38	0.26	0.14	0.23	0.22	0.15	0.14	--	0.074	0.29	--	0.16	--	<0.75	<0.75	<0.88
Barium	ug/L	51.6	55.8	52.3	53.3	42.4	35.5	39.9	44	--	31.6	44.5	--	28.1	--	25	56	43
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	0.14	--	<0.089	--	<0.27	<0.27	--
Cadmium	ug/L	<0.029	<0.029	0.12	0.038	<0.029	0.035	0.044	0.037	--	0.023	0.16	--	<0.033	--	<0.077	0.04	<0.039
Chromium	ug/L	0.59	0.74	0.64	<0.34	0.59	0.49	0.25	0.39	--	<0.054	0.25	--	0.11	--	<0.98	<0.98	<1.1
Cobalt	ug/L	4.1	3.1	1.8	1.8	1.3	0.97	1	0.96	--	0.46	1.4	--	0.36	--	0.44	0.6	1.1
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	0.06	0.1	0.049	--	0.041	0.18	--	<0.13	--	<0.27	<0.27	<0.27
Lithium	ug/L	22.8	28.7	27.6	25.5	20.1	21.8	24.9	27.9	--	19.1	26.5	--	19.4	--	15	24	17
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.083	--	--	<0.09	<0.1	<0.1	--
Molybdenum	ug/L	1.2	1.2	0.89	1	0.76	0.54	0.79	1.3	--	0.67	1.3	--	0.72	--	<1.1	1.1	--
Selenium	ug/L	4.7	5.4	6.1	6.5	5.9	4.2	5.5	7.2	--	4.3	6.3	--	3.4	--	3.1	6.2	--
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	<0.036	0.067	--	<0.036	0.16	--	<0.099	--	<0.27	<0.27	--
Total Radium	pCi/L	0.51	0.614	1.56	1.24	0.143	0.631	1.06	0.725	--	0.513	1.19	--	1.16	--	0.0956	0.956	0.228
Radium-226	pCi/L	0.084	0	0.831	-0.13	0.143	0.139	0.501	0.123	--	0.145	0.417	--	0.529	--	0.0726	0.15	0.049
Radium-228	pCi/L	0.426	0.614	0.732	1.24	-0.403	0.492	0.562	0.602	--	0.368	0.773	--	0.627	--	0.023	0.753	0.179
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	572	777	807	853	834	742	758	1107	743	770	867	781	599	310	501	902	966
Field Temperature	deg C	10.5	17.1	19.9	16.3	6.8	10.8	17.3	19.7	13.9	7.2	20.4	20.6	16.6	7.88	7.27	13.71	5.38
Groundwater Elevation	feet	682.8	682.58	682.27	682.04	681.67	682.15	681.91	681.28	681.54	681.53	680.91	681.09	682.5	682.22	682.69	683.07	683.3
Oxygen, Dissolved	mg/L	4.04	2.55	3.43	3.72	4.87	5.74	4.34	2.88	4.16	6.52	3.18	4.71	4.12	5.68	8.32	4.94	7.28
Turbidity	NTU	1.82	1.51	0.52	0.9	0.6	0.47	0.38	0.79	1.03	0.66	0.52	0.63	2.91	0.77	1.87	1.6	1.43
pH at 25 Degrees C	Std. Units	6.5	6.4	6.5	6.7	6.8	6.7	6.5	6.4	6.4	6.6	--	6.5	6.6	--	7.1	7.1	6.7
Field Oxidation Potential	millivolts	244.1	74.6	58.6	91.3	30.2	148	67.2	41.4	200.7	105.5	-55.5	--	119.7	118.3	37.6	9.9	68
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-301
Number of Sampling Dates: 28

Parameter Name	Units	3/12/2020	4/14/2020	10/8/2020	4/14/2021	10/7/2021	4/12/2022	10/26/2022	4/6/2023	10/13/2023	4/4/2024	10/11/2024
Boron	ug/L	--	700	650	690	800	640	780	530	760	410	520
Calcium	mg/L	--	84	94	96	100	92	110	76	94	85	71
Chloride	mg/L	--	140	170	150	180	140	160	120	150	87	93
Fluoride	mg/L	--	<0.23	<0.23	<0.28	<0.28	<0.22	<0.22	<0.22	<0.38	<0.38	<0.38
Field pH	Std. Units	6.48	6.58	6.22	6.26	6.26	6.37	6.29	6.25	6.24	6.65	6.11
Sulfate	mg/L	--	140	140	140	180	160	180	160	190	240	150
Total Dissolved Solids	mg/L	--	550	660	620	670	610	690	580	680	550	530
Antimony	ug/L	--	<0.58	<0.51	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1
Arsenic	ug/L	--	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	<0.53	<0.53	<0.53
Barium	ug/L	--	54	58	52	61	40	44	31	48	33	36
Beryllium	ug/L	--	<0.27	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Cadmium	ug/L	--	<0.039	0.075	<0.051	0.057	<0.055	0.055	<0.1	<0.1	<0.1	<0.1
Chromium	ug/L	--	<1.1	<1.1	<1.1	<1.1	<1.1	1.2	<1.1	<1.1	<1.2	<1.2
Cobalt	ug/L	0.43	0.52	0.41	0.29	0.48	0.23	0.29	0.21	0.2	<0.17	0.22
Lead	ug/L	--	<0.27	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lithium	ug/L	21	24	23	23	26	19	30	17	25	21	20
Mercury	ug/L	--	<0.1	--	<0.15	<0.15	<0.11	<0.11	<0.14	<0.14	<0.11	<0.11
Molybdenum	ug/L	--	1.2	<1.1	<1.3	<1.3	<1.2	<8.4	<0.91	1.1	<1.3	<1.3
Selenium	ug/L	--	6.8	7.7	6.5	7.5	6	6.9	4.7	5.8	5.1	3.9
Thallium	ug/L	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Total Radium	pCi/L	--	0.315	0.407	0.598	1.04	0.378	0.973	0.0491	0.681	0.452	0.371
Radium-226	pCi/L	--	0.0921	0.324	0.133	<0.339	0.149	0.223	0.0491	0.25	0.0723	0.202
Radium-228	pCi/L	--	0.223	0.0831	0.465	0.744	0.229	0.75	-0.135	0.431	0.38	0.169
Collected By		--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	962	939	1035	1062	1062	976	1036	832	1158	868	1017
Field Temperature	deg C	6.9	8.7	15.4	9.1	17.9	7.4	14.6	7.1	17.6	8.5	17.6
Groundwater Elevation	feet	682.82	683.25	682.34	682.94	681.95	682.08	680.68	682.05	680.2	680.79	680.49
Oxygen, Dissolved	mg/L	5.31	5.14	4.2	5.99	4.17	3.26	4.74	5.05	3.2	9.81	3.06
Turbidity	NTU	1.33	0.87	0.02	1.61	8.9	5.03	0.62	2.37	1.75	5.63	3.02
pH at 25 Degrees C	Std. Units	--	6.6	6.4	6.8	6.5	6.6	6.7	6.7	7	6.4	6.6
Field Oxidation Potential	millivolts	258.5	176.3	163.6	232.5	207.3	117.6	26.9	124.5	104.7	92	204.5
Bicarbonate Alkalinity as CaCO3	mg/L	--	150	160	170	210	190	250	--	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8	<4.6	<4.6	<4.6	<4.6	--	--	--	--
Total Alkalinity as CaCO3	mg/L	--	150	160	170	210	190	250	--	--	--	--
Iron, total	ug/L	--	50	<50	49	<36	<36	<36	58	<36	<36	<36
Magnesium, total	ug/L	--	33000	38000	34000	36000	36000	28000	--	--	--	--
Manganese, dissolved	ug/L	17	16	13	10	15	5	7.9	--	--	--	--
Potassium, total	ug/L	--	1500	1500	1200	1300	1100	980	--	--	--	--
Sodium, total	ug/L	--	77000	87000	78000	88000	89000	73000	--	--	--	--
Cobalt, dissolved	ug/L	0.32	0.44	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	<50	<50	<50	<36	<36	<36	<36	--	--	--	--
Manganese, total	ug/L	16	19	14	14	18	8.1	8	--	--	--	--
Lithium, dissolved	ug/L	22	--	--	--	--	--	--	--	--	--	--

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-307
Number of Sampling Dates: 29

Parameter Name	Units	1/19/2017	4/20/2017	6/21/2017	8/21/2017	11/8/2017	4/16/2018	5/30/2018	6/28/2018	7/18/2018	10/16/2018	4/8/2019	10/23/2019	12/11/2019	2/5/2020	4/14/2020
Boron	ug/L	207	205	197	197	214	200	--	210	--	195	240	200	190	200	240
Calcium	mg/L	230	241	229	221	227	220	--	239	--	222	240	230	230	210	240
Chloride	mg/L	210	201	213	219	217	224	--	--	223	293	220	220	200	220	230
Fluoride	mg/L	0.12	0.13	0.16	0.2	0.12	0.11	--	--	0.13	<0.19	0.28	<0.23	<0.23	--	<0.23
Field pH	Std. Units	6.7	6.51	6.82	6.4	6.61	7.04	6.44	6.87	6.62	6.54	6.76	6.68	6.37	6.67	6.76
Sulfate	mg/L	105	105	110	102	102	103	--	--	105	104	100	95	92	100	99
Total Dissolved Solids	mg/L	1050	1100	1070	1050	1030	--	1100	--	1070	1070	1000	1000	1000	970	980
Antimony	ug/L	0.1	<0.026	<0.026	<0.026	<0.026	<0.026	--	<0.15	--	<0.078	--	--	<0.53	--	<0.58
Arsenic	ug/L	1.1	0.96	0.62	0.52	0.54	0.41	--	0.86	--	0.66	--	--	<0.75	<0.88	<0.88
Barium	ug/L	127	139	132	128	131	126	--	147	--	145	--	--	140	130	140
Beryllium	ug/L	<0.08	0.029	0.016	<0.012	<0.012	<0.012	--	<0.12	--	<0.089	--	--	<0.27	--	<0.27
Cadmium	ug/L	<0.029	0.025	<0.018	<0.018	0.018	<0.018	--	<0.07	--	<0.033	--	--	<0.039	<0.039	<0.039
Chromium	ug/L	0.59	1.6	1	0.38	0.38	0.28	--	1.4	--	0.59	--	--	<0.98	<1.1	<1.1
Cobalt	ug/L	0.62	1.6	1.1	1.1	1.3	1.3	--	2.9	--	4.8	--	--	11	13	20
Lead	ug/L	<0.19	0.49	0.26	0.085	0.075	0.13	--	0.48	--	0.13	--	--	0.71	<0.27	0.31
Lithium	ug/L	10	9.4	11.2	15.2	12.9	9.3	--	13.2	--	11.6	--	--	12	9.1	13
Mercury	ug/L	<0.039	<0.046	<0.046	<0.046	<0.046	<0.09	--	<0.037	--	<0.09	--	--	<0.1	--	<0.1
Molybdenum	ug/L	0.5	0.56	0.31	0.31	0.37	0.3	--	0.39	--	<0.57	--	--	<1.1	--	<1.1
Selenium	ug/L	<0.18	0.12	0.11	0.11	0.13	<0.086	--	0.25	--	0.13	--	--	<1	--	<1
Thallium	ug/L	<0.5	<0.036	<0.036	<0.036	0.065	<0.036	--	<0.14	--	<0.099	--	--	<0.27	--	<0.26
Total Radium	pCi/L	2.66	2.77	2.83	3.07	2.88	2.96	--	2.47	--	3.1	--	--	2.46	2.23	2.06
Radium-226	pCi/L	1.55	1.72	1.87	1.69	1.76	1.31	--	1.84	--	2.11	--	--	1.65	1.51	1.5
Radium-228	pCi/L	1.11	1.05	0.96	1.38	1.12	1.65	--	0.629	--	0.991	--	--	0.81	0.718	0.562
Collected By		0	0	0	0	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1640	1648	1557	2193	1656	1674	1710	1686	1718	1697	1599	1684	1576	1681	1554
Field Temperature	deg C	12.9	12	12.7	13	13.2	11.6	12.7	13.4	12.9	14.3	12.47	13.38	11.5	11.65	10.6
Groundwater Elevation	feet	648.81	653.62	649.85	645.78	647.37	649.66	652.45	652.87	652.27	654.13	654.9	651.89	649.59	649.88	650.66
Oxygen, Dissolved	mg/L	0.16	0.2	0.08	0.08	0.17	0.29	0.18	0.21	0.21	0.08	0.51	0.25	0.18	0.9	0.69
Turbidity	NTU	9.01	66.67	34.94	4.89	11.16	11.93	18.58	53.34	14.94	14.08	26	12.5	43.13	9.74	28.9
Collected Time		--	--	--	--	--	--	--	--	13	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7	6.9	6.8	6.9	7	7.1	--	--	6.7	6.8	6.7	7.5	6.7	6.7	6.8
Field Oxidation Potential	millivolts	-42	-16	-23.1	23.7	176.7	-105.9	-45.8	-43.4	-416.3	-65.7	-3.7	-24.8	-45.8	-15.6	-52.9
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	520
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	520
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3800
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	28000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1900
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	97000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3100
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	310

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-307
Number of Sampling Dates: 29

Parameter Name	Units	10/7/2020	2/23/2021	4/14/2021	7/6/2021	10/7/2021	2/14/2022	4/11/2022	8/25/2022	10/25/2022	4/5/2023	10/10/2023	4/4/2024	6/6/2024	10/10/2024
Boron	ug/L	260	--	200	--	230	--	250	--	250	250	210	220	--	180
Calcium	mg/L	240	--	250	--	240	--	260	--	260	230	220	240	--	210
Chloride	mg/L	230	--	210	--	240	--	330	--	260	<2.3	270	260	--	250
Fluoride	mg/L	<0.23	--	<0.28	--	<0.28	--	<0.22	--	<0.22	<0.22	<0.38	<0.38	--	<0.38
Field pH	Std. Units	6.97	6.5	6.59	7.05	6.71	7.03	6.63	6.71	6.5	6.62	6.56	6.52	6.32	6.53
Sulfate	mg/L	100	--	92	--	110	--	140	--	130	130	140	140	--	130
Total Dissolved Solids	mg/L	1000	--	1000	--	1000	--	1100	--	1100	1200	1100	1000	--	1100
Antimony	ug/L	--	--	<1.1	--	<1.1	--	0.69	--	<0.69	<1	<1	<1	--	<1
Arsenic	ug/L	<0.88	--	<0.75	--	<0.75	--	0.77	--	<0.75	<0.53	0.62	<0.53	--	<0.53
Barium	ug/L	140	--	160	--	140	--	150	--	130	130	120	130	--	110
Beryllium	ug/L	--	--	<0.27	--	<0.27	--	<0.27	--	<0.27	<0.33	<0.33	<0.33	--	<0.33
Cadmium	ug/L	--	--	<0.051	--	<0.051	--	<0.055	--	<0.055	<0.1	<0.1	<0.1	--	<0.1
Chromium	ug/L	<1.1	--	<1.1	--	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	<1.2	--	<1.2
Cobalt	ug/L	18	64	46	60	48	24	31	25	27	30	36	38	63	34
Lead	ug/L	<0.11	--	<0.21	--	<0.21	--	<0.24	--	<0.24	<0.24	<0.24	<0.26	--	<0.26
Lithium	ug/L	11	--	14	--	14	--	14	--	10	11	12	13	--	10
Mercury	ug/L	--	--	<0.15	--	<0.15	--	<0.11	--	<0.11	<0.14	<0.14	<0.11	--	<0.11
Molybdenum	ug/L	<1.1	--	<1.3	--	<1.3	--	<1.2	--	<1.2	<0.91	<0.91	<1.3	--	<1.3
Selenium	ug/L	<1	--	<0.96	--	<0.96	--	<0.96	--	<0.96	<1.4	<1.4	<1.4	--	<1.4
Thallium	ug/L	--	--	<0.26	--	<0.26	--	<0.26	--	<0.26	<0.26	<0.26	<0.57	--	<0.57
Total Radium	pCi/L	2.36	--	3.08	--	3.9	--	2.84	--	3.01	1.51	1.83	2.55	--	2.15
Radium-226	pCi/L	1.47	--	1.99	--	2.52	--	1.51	--	1.51	1.17	1.3	1.43	--	1.65
Radium-228	pCi/L	0.885	--	1.09	--	1.38	--	1.34	--	1.5	0.343	0.527	1.11	--	0.5
Collected By		--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1637	1632	1675	1705	1552	1810	1718	1727	1604	1776	1856	1693	2009	2271
Field Temperature	deg C	13.2	12.2	11.5	13.2	14.4	12.25	11.8	13	12.9	11.9	12.6	12.4	12.9	15
Groundwater Elevation	feet	646.18	646.8	649.53	647.03	644.49	645.82	648.4	644.25	643.46	647.28	642.85	645.09	651.37	643.26
Oxygen, Dissolved	mg/L	0.08	0.2	0.41	0.21	0.19	0.97	0.13	0.56	0.22	0	0.2	0.75	0.35	0.26
Turbidity	NTU	4.56	2.41	21.2	17.91	10	0	4.09	2.17	7.21	0.02	6.4	3.69	23.65	3.43
Collected Time		--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	6.9	--	6.8	--	6.8	--	6.9	--	6.9	7	7.5	6.5	--	6.9
Field Oxidation Potential	millivolts	-62.2	0.8	-39.9	14.7	-23.8	-51	46.3	67.5	-36.4	31.9	-35	-31.8	-26.8	19
Bicarbonate Alkalinity as CaCO3	mg/L	480	--	490	--	550	--	470	--	500	--	--	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<3.8	--	<4.6	--	<4.6	--	<4.6	--	<4.6	--	--	--	--	--
Total Alkalinity as CaCO3	mg/L	480	--	490	--	550	--	470	--	500	--	--	--	--	--
Iron, total	ug/L	3500	--	3700	--	3900	--	2600	--	2700	2700	2900	3300	--	2800
Magnesium, total	ug/L	27000	--	30000	--	28000	--	26000	--	28000	--	--	--	--	--
Manganese, dissolved	ug/L	350	--	360	--	410	--	260	--	270	--	--	--	--	--
Potassium, total	ug/L	1900	--	2000	--	2000	--	1900	--	1800	--	--	--	--	--
Sodium, total	ug/L	100000	--	98000	--	100000	--	110000	--	91000	--	--	--	--	--
Cobalt, dissolved	ug/L	19	--	49	--	59	--	29	--	30	32	36	44	--	39
Iron, dissolved	ug/L	3600	--	3400	--	3400	--	2500	--	3100	--	--	--	--	--
Manganese, total	ug/L	290	--	330	--	440	--	260	--	230	--	--	--	--	--

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-308
Number of Sampling Dates: 24

Parameter Name	Units	1/19/2017	4/20/2017	6/21/2017	8/21/2017	11/8/2017	4/16/2018	5/30/2018	6/28/2018	7/18/2018	10/16/2018	4/8/2019	10/23/2019	12/11/2019	2/5/2020	4/14/2020
Boron	ug/L	218	146	182	214	240	210	--	153	--	162	190	220	160	220	210
Calcium	mg/L	212	222	209	218	212	229	--	215	--	209	240	240	220	210	240
Chloride	mg/L	151	149	146	151	156	153	--	--	158	158	160	160	150	160	170
Fluoride	mg/L	0.11	0.12	0.12	0.23	0.12	0.1	--	--	0.12	<0.19	<0.23	<0.23	<0.23	--	<0.23
Field pH	Std. Units	6.85	6.7	6.93	6.52	6.76	7.14	6.61	7.08	6.73	6.68	6.9	6.78	6.55	6.78	6.9
Sulfate	mg/L	296	283	303	294	297	305	--	--	310	311	300	300	280	300	290
Total Dissolved Solids	mg/L	1060	1100	1050	1020	1120	--	1090	--	1080	1110	1200	1100	1100	1100	1000
Antimony	ug/L	0.11	<0.026	0.039	<0.026	<0.026	<0.026	--	<0.15	--	<0.078	--	--	<0.53	--	<0.58
Arsenic	ug/L	0.44	0.34	0.14	0.32	0.32	0.29	--	0.39	--	0.44	--	--	<0.75	<0.88	<0.88
Barium	ug/L	118	118	125	132	133	123	--	134	--	143	--	--	130	130	140
Beryllium	ug/L	<0.08	<0.012	<0.012	<0.012	<0.012	<0.012	--	<0.12	--	<0.089	--	--	<0.27	--	<0.27
Cadmium	ug/L	<0.029	<0.018	<0.018	<0.018	<0.018	<0.018	--	<0.07	--	<0.033	--	--	<0.039	<0.039	<0.039
Chromium	ug/L	0.57	0.44	0.34	0.49	0.45	0.17	--	0.42	--	0.27	--	--	5.9	<1.1	<1.1
Cobalt	ug/L	0.52	0.43	0.25	0.26	0.23	0.18	--	0.19	--	0.15	--	--	0.26	0.14	0.14
Lead	ug/L	<0.19	0.066	<0.033	<0.033	<0.033	0.043	--	<0.12	--	<0.13	--	--	0.52	<0.27	<0.27
Lithium	ug/L	10.3	13.3	12.7	19.1	12.6	12.3	--	17.6	--	13.7	--	--	16	12	17
Mercury	ug/L	<0.039	<0.046	<0.046	<0.046	<0.046	<0.09	--	<0.037	--	<0.09	--	--	<0.1	--	<0.1
Molybdenum	ug/L	0.95	0.53	0.5	0.61	0.75	0.6	--	0.46	--	<0.57	--	--	<1.1	--	<1.1
Selenium	ug/L	<0.18	<0.086	<0.086	<0.086	<0.086	<0.086	--	<0.16	--	<0.085	--	--	<1	--	<1
Thallium	ug/L	<0.5	<0.036	<0.036	<0.036	<0.036	<0.036	--	<0.14	--	<0.099	--	--	<0.27	--	<0.26
Total Radium	pCi/L	1.45	0.496	3.3	2.17	1.47	1.63	--	1.88	--	2.85	--	--	2.73	2.13	1.69
Radium-226	pCi/L	0.282	-0.173	2	1.42	1.18	0.532	--	1.5	--	1.44	--	--	1.54	1.42	1.24
Radium-228	pCi/L	1.17	0.496	1.3	0.745	0.286	1.1	--	0.379	--	1.41	--	--	1.19	0.705	0.454
Collected By		0	0	0	0	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1559	1509	1467	2042	1577	1577	1611	1584	1628	1594	1539	1637	1532	1630	1502
Field Temperature	deg C	12.6	11.9	12.2	12.6	13	11.8	12.1	13.1	12.6	13.1	12.54	13.16	10.5	11.35	10.9
Groundwater Elevation	feet	647.42	651.09	648.26	643.12	644.99	647.91	651.05	651.43	650.67	--	653.7	651.31	647.39	650.12	650.09
Oxygen, Dissolved	mg/L	0.15	0.21	0.03	0.12	0.12	0.35	0.14	0.19	0.13	0.08	0.66	4.42	0.43	1.48	0.28
Turbidity	NTU	1.65	4.6	0.84	1.15	0.73	0.93	3.34	5.87	1.54	5.49	6.87	7.42	15.72	3.49	5.12
Collected Time		--	--	--	--	--	--	--	--	14	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.2	7.2	7	6.9	7	7.1	--	--	6.8	7	6.8	7.9	6.8	6.8	6.9
Field Oxidation Potential	millivolts	-44.4	1.7	-29.1	24.4	169.7	-47.2	-48.2	-60.3	-415.4	-80.8	-23	-38.7	-56.6	-35.9	-69.1
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	380
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	380
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5100
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	770
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3900
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	110000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.11
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4400
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	800

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-308
Number of Sampling Dates: 24

Parameter Name	Units	10/7/2020	4/14/2021	10/7/2021	4/12/2022	10/26/2022	4/5/2023	10/10/2023	4/4/2024	10/10/2024
Boron	ug/L	270	220	200	300	260	280	230	350	230
Calcium	mg/L	220	230	230	240	240	210	210	220	220
Chloride	mg/L	160	150	170	180	160	150	170	150	150
Fluoride	mg/L	<0.23	<0.28	<0.28	<0.22	<0.22	<0.22	<0.38	<0.38	<0.38
Field pH	Std. Units	7.24	6.7	6.83	6.7	6.5	6.7	6.66	6.61	6.65
Sulfate	mg/L	290	270	290	320	290	300	300	300	290
Total Dissolved Solids	mg/L	1000	1100	1000	1000	1000	1100	1100	1000	1100
Antimony	ug/L	--	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1
Arsenic	ug/L	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	0.53	<0.53	<0.53
Barium	ug/L	130	140	130	140	120	110	120	120	120
Beryllium	ug/L	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Cadmium	ug/L	--	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Cobalt	ug/L	0.14	0.16	0.22	0.24	0.24	0.45	0.17	<0.17	0.18
Lead	ug/L	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lithium	ug/L	14	16	16	17	14	14	15	16	15
Mercury	ug/L	--	<0.15	<0.15	<0.11	<0.11	<0.14	<0.14	<0.11	<0.11
Molybdenum	ug/L	<1.1	<1.3	<1.3	1.4	<1.2	<0.91	<0.91	<1.3	<1.3
Selenium	ug/L	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Thallium	ug/L	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Total Radium	pCi/L	2.67	2.87	3.22	2.29	2.15	1.81	2.29	1.94	1.54
Radium-226	pCi/L	1.53	1.36	1.78	1.19	1.13	1.31	1.49	0.945	1.15
Radium-228	pCi/L	1.14	1.51	1.43	1.1	1.01	0.508	0.801	0.996	0.388
Collected By		--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1575	1598	1453	1491	1507	1634	1704	1524	2081
Field Temperature	deg C	13.2	11.5	13	12.7	12.8	11.7	12.7	12	14.4
Groundwater Elevation	feet	642.85	647.66	641.81	645.75	641.13	645.16	640.79	643.32	641.21
Oxygen, Dissolved	mg/L	0.11	0.44	0.17	0.26	0	0.18	0.22	0.79	1.5
Turbidity	NTU	1.15	4.47	12.8	6	1.98	1.55	6.31	4.04	6.99
Collected Time		--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.1	7.1	6.9	7	7	7	7.6	6.6	7
Field Oxidation Potential	millivolts	-56.5	-49.3	-26.1	-30.9	-5.7	7.3	-54	-44	24.1
Bicarbonate Alkalinity as CaCO3	mg/L	390	370	410	380	390	--	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<3.8	<4.6	<4.6	<4.6	<4.6	--	--	--	--
Total Alkalinity as CaCO3	mg/L	390	370	410	380	390	--	--	--	--
Iron, total	ug/L	3800	3900	4700	3400	4000	3200	3600	3400	3600
Magnesium, total	ug/L	23000	26000	24000	22000	23000	--	--	--	--
Manganese, dissolved	ug/L	1400	1300	950	1500	1400	--	--	--	--
Potassium, total	ug/L	4000	4400	4300	4100	4300	--	--	--	--
Sodium, total	ug/L	100000	100000	110000	110000	110000	--	--	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	4000	3900	300	3200	3800	--	--	--	--
Manganese, total	ug/L	1200	1300	1100	1500	1300	--	--	--	--

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-309
Number of Sampling Dates: 24

Parameter Name	Units	1/19/2017	4/20/2017	6/21/2017	8/21/2017	11/8/2017	4/16/2018	5/30/2018	6/28/2018	7/18/2018	10/16/2018	4/8/2019	10/23/2019	12/11/2019	2/5/2020	4/14/2020
Boron	ug/L	1300	1280	1250	1320	1360	1340	--	1360	--	1280	1500	1300	1100	1300	1400
Calcium	mg/L	134	152	136	135	135	150	--	181	--	139	160	150	150	130	150
Chloride	mg/L	73.1	73.7	75.5	78.4	78.1	78.9	--	--	76.4	80.6	72	74	66	68	69
Fluoride	mg/L	0.12	0.13	0.16	0.19	0.14	0.094	--	--	0.13	<0.19	0.27	<0.23	<0.23	--	0.36
Field pH	Std. Units	7.18	7.01	7.17	6.9	7.11	7.52	6.92	7.36	7.02	6.95	7.18	6.98	6.67	7.09	7.21
Sulfate	mg/L	406	393	415	395	402	373	--	--	417	453	410	400	370	370	390
Total Dissolved Solids	mg/L	1030	1030	1020	1010	1010	--	1050	--	1030	1040	1100	1100	980	990	1000
Antimony	ug/L	0.095	<0.026	0.041	0.029	<0.026	0.079	--	<0.15	--	<0.078	--	--	<0.53	--	<0.58
Arsenic	ug/L	0.66	1.1	0.52	0.44	0.45	0.62	--	2	--	0.74	--	--	1.1	<0.88	0.88
Barium	ug/L	48.7	62.4	48.7	46.1	46	53.7	--	82.1	--	54.5	--	--	54	46	50
Beryllium	ug/L	<0.08	0.073	0.025	<0.012	0.016	0.056	--	0.28	--	<0.089	--	--	<0.27	--	<0.27
Cadmium	ug/L	<0.029	0.042	0.033	0.018	<0.018	0.052	--	0.15	--	<0.033	--	--	0.09	<0.039	<0.039
Chromium	ug/L	1.4	3.2	1.8	1.2	1.2	2.7	--	5.4	--	1.6	--	--	1.7	<1.1	1.3
Cobalt	ug/L	2	3.1	2.4	2.1	2	2.4	--	4.7	--	2.7	--	--	3.7	2.3	3.2
Lead	ug/L	<0.19	1	0.5	0.096	0.057	0.95	--	3.1	--	0.46	--	--	2.8	0.63	1.6
Lithium	ug/L	5.8	9.3	7.3	9.4	6.9	8	--	16.2	--	8.8	--	--	8.2	6.3	9.6
Mercury	ug/L	<0.039	<0.046	<0.046	<0.046	<0.046	<0.09	--	<0.037	--	<0.09	--	--	<0.1	--	<0.1
Molybdenum	ug/L	0.57	0.32	0.28	0.28	0.37	0.29	--	0.33	--	<0.57	--	--	<1.1	--	<1.1
Selenium	ug/L	<0.18	0.22	<0.086	<0.086	<0.086	<0.086	--	1	--	0.24	--	--	<1	--	<1
Thallium	ug/L	<0.5	<0.036	<0.036	<0.036	<0.036	<0.036	--	<0.14	--	<0.099	--	--	<0.27	--	<0.26
Total Radium	pCi/L	0.606	2.23	1.63	1.65	1.11	1.59	--	2.36	--	2.2	--	--	1.77	1.02	0.957
Radium-226	pCi/L	0.143	0.968	1.37	0.783	0.284	0.974	--	1.83	--	1.09	--	--	1.08	0.771	0.868
Radium-228	pCi/L	0.463	1.26	0.259	0.866	0.825	0.614	--	0.534	--	1.11	--	--	0.683	0.251	0.0894
Collected By		0	0	0	0	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1426	1430	1363	1821	1431	1445	1484	1477	1501	1464	1396	1461	1350	1433	1322
Field Temperature	deg C	12.7	12.1	12.4	12.6	13.1	11.2	12.4	13.8	12.6	13.5	12.4	12.83	11.5	11.42	11.2
Groundwater Elevation	feet	646.66	650.16	647.6	641.82	644.2	647.65	650.98	651.47	650.69	651.61	653.55	651.28	647.24	648.34	649.19
Oxygen, Dissolved	mg/L	0.09	0.16	0.06	0.08	0.13	0.37	0.12	0.17	0.11	0.03	0.66	0.36	0.26	1.07	0.16
Turbidity	NTU	8.56	77.74	20.33	2.34	3.71	36.7	40.55	241.4	40.38	28.27	72.1	42.6	413.6	18.1	100.1
Collected Time		--	--	--	--	--	--	--	--	16	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.4	7.4	7.2	7.2	7.4	7.3	--	--	7.3	7.2	7.2	7.2	7.1	7.2	7.1
Field Oxidation Potential	millivolts	-42.1	0.2	-34.8	-5	149.7	-58.5	-38	-45.5	-432.6	-81.6	-3.3	-27.5	-37.8	-7.8	-51.5
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1900
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	660
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	670
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	170000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2.2
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	740

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-309
Number of Sampling Dates: 24

Parameter Name	Units	10/7/2020	4/14/2021	10/7/2021	4/14/2022	10/26/2022	4/5/2023	10/10/2023	4/4/2024	10/10/2024
Boron	ug/L	1200	1400	1300	1600	1400	1400	1300	1400	1300
Calcium	mg/L	120	130	120	150	160	140	140	160	150
Chloride	mg/L	68	57	67	61	67	65	68	65	64
Fluoride	mg/L	<0.23	<0.28	<0.28	<0.22	<0.22	<0.22	<0.38	<0.38	<0.38
Field pH	Std. Units	7.57	7	7.18	7.16	6.89	7.1	7.01	6.93	6.97
Sulfate	mg/L	380	360	400	420	420	450	480	470	480
Total Dissolved Solids	mg/L	930	940	950	940	1100	1000	1100	1000	1100
Antimony	ug/L	--	<1.1	<1.1	<0.69	<0.69	<1	<1	<1	<1
Arsenic	ug/L	<0.88	<0.75	<0.75	<0.75	<0.75	<0.53	0.59	<0.53	<0.53
Barium	ug/L	42	52	47	55	51	51	55	56	56
Beryllium	ug/L	--	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33	<0.33
Cadmium	ug/L	--	<0.051	<0.051	<0.055	<0.055	<0.1	<0.1	<0.1	<0.1
Chromium	ug/L	<1.1	<1.1	1.3	<1.1	<1.1	<1.1	<1.1	<1.2	<1.2
Cobalt	ug/L	2	2.3	2	2	2.2	2	2.3	2.4	2.2
Lead	ug/L	<0.11	<0.21	<0.21	<0.24	<0.24	<0.24	<0.24	<0.26	<0.26
Lithium	ug/L	6.9	8.9	7.5	9.2	7.3	7.8	8.3	9.5	8.2
Mercury	ug/L	--	<0.15	<0.15	<0.11	<0.11	<0.14	<0.14	<0.11	<0.11
Molybdenum	ug/L	<1.1	<1.3	<1.3	<1.2	<1.2	<0.91	<0.91	<1.3	<1.3
Selenium	ug/L	<1	<0.96	<0.96	<0.96	<0.96	<1.4	<1.4	<1.4	<1.4
Thallium	ug/L	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.57	<0.57
Total Radium	pCi/L	1.77	1.05	1.6	0.922	2.16	0.882	1.27	1.5	1.47
Radium-226	pCi/L	0.863	0.604	1.14	0.576	0.621	0.71	0.808	0.656	0.778
Radium-228	pCi/L	0.906	0.448	<0.525	0.346	1.54	0.172	0.462	0.843	0.688
Collected By		--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1371	1411	1297	1305	1378	1511	1598	1459	1997
Field Temperature	deg C	13.3	11.7	13.1	11.7	12.6	11.7	13.3	12.2	13.5
Groundwater Elevation	feet	641.5	646.46	640.71	644.32	640.43	644.41	640.18	644.51	640.25
Oxygen, Dissolved	mg/L	0.09	0.36	0.21	0.7	0	0.42	0.25	0.56	0.66
Turbidity	NTU	7.7	9.32	19.6	14	0.79	0.02	8.35	3.68	19.38
Collected Time		--	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.4	7.3	7.3	7.3	7.3	7.3	7.8	6.9	7.4
Field Oxidation Potential	millivolts	-71.1	-40.6	-8.1	28.1	4.9	-7	-54.3	-48	31.7
Bicarbonate Alkalinity as CaCO3	mg/L	290	280	300	250	260	--	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<1.9	<4.6	<4.6	<4.6	<4.6	--	--	--	--
Total Alkalinity as CaCO3	mg/L	290	280	300	250	260	--	--	--	--
Iron, total	ug/L	890	900	950	680	740	720	990	800	680
Magnesium, total	ug/L	18000	19000	18000	16000	18000	--	--	--	--
Manganese, dissolved	ug/L	660	640	600	610	750	--	--	--	--
Potassium, total	ug/L	670	750	740	690	720	--	--	--	--
Sodium, total	ug/L	180000	180000	180000	180000	180000	--	--	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	690	660	680	590	710	--	--	--	--
Manganese, total	ug/L	620	630	650	600	750	--	--	--	--

Single Location
Name: IPL - Ottumwa Generating Station

Location ID: MW-315
Number of Sampling Dates: 6

Parameter Name	Units	2/2/2023	3/6/2023	4/5/2023	10/10/2023	4/4/2024	10/10/2024
Boron	ug/L	1300	--	1100	1100	1200	1200
Calcium	mg/L	140	--	120	120	130	130
Chloride	mg/L	45	--	45	55	63	61
Fluoride	mg/L	<0.22	--	0.22	<0.38	<0.38	<0.38
Field pH	Std. Units	6.94	6.86	6.96	6.93	6.85	6.89
Sulfate	mg/L	450	--	460	500	470	460
Total Dissolved Solids	mg/L	940	--	1100	1000	1000	1100
Antimony	ug/L	<0.69	--	<1	<1	<1	<1
Arsenic	ug/L	1.3	--	1.3	1.6	1.5	1.4
Barium	ug/L	36	--	35	35	36	37
Beryllium	ug/L	<0.27	--	<0.33	<0.33	<0.33	<0.33
Cadmium	ug/L	<0.055	--	<0.1	<0.1	<0.1	<0.1
Chromium	ug/L	<1.1	--	<1.1	<1.1	<1.2	<1.2
Cobalt	ug/L	7	6.4	7	6.6	7.8	7.4
Lead	ug/L	<0.24	--	<0.24	<0.24	<0.26	<0.26
Lithium	ug/L	6.2	--	5.3	5.4	6	5.6
Mercury	ug/L	<0.11	--	<0.14	<0.14	<0.11	<0.11
Molybdenum	ug/L	1.5	--	1.4	1.3	1.6	1.6
Selenium	ug/L	<0.96	--	<1.4	<1.4	<1.4	<1.4
Thallium	ug/L	<0.26	--	<0.26	<0.26	<0.57	<0.57
Total Radium	pCi/L	1.46	--	1.42	1.29	1.23	1.85
Radium-226	pCi/L	0.665	--	0.738	0.595	0.555	0.873
Radium-228	pCi/L	0.797	--	0.682	0.694	0.672	0.975
Field Specific Conductance	umhos/cm	1293	1539	1523	1615	1479	2008
Field Temperature	deg C	12.7	12.4	11.8	13.1	12.3	13.9
Groundwater Elevation	feet	642.4	648.55	645.12	641.1	644.23	641.37
Oxygen, Dissolved	mg/L	1.44	0.86	0.32	0.29	0.34	1.26
Turbidity	NTU	1.53	2.25	0.02	9.42	4.47	9.56
pH at 25 Degrees C	Std. Units	7.1	--	7.2	8.3	6.9	7.1
Field Oxidation Potential	millivolts	-6.3	-60.9	-45.7	-79.7	-74.3	2.7
Bicarbonate Alkalinity as CaCO3	mg/L	300	--	320	280	280	280
Carbonate Alkalinity as CaCO3	mg/L	<2.3	--	<2.5	<2.5	<2.5	<2.5
Total Alkalinity as CaCO3	mg/L	300	--	320	280	280	280
Iron, total	ug/L	3000	--	2800	2900	2700	2600
Magnesium, total	ug/L	22000	--	19000	21000	21000	21000
Manganese, dissolved	ug/L	6400	--	--	6800	7400	7600
Potassium, total	ug/L	2000	--	1400	1800	1600	1900
Sodium, total	ug/L	220000	--	200000	200000	210000	200000
Cobalt, dissolved	ug/L	7	6.5	--	7.3	7.5	7
Iron, dissolved	ug/L	3000	--	2700	2400	2300	2500
Manganese, total	ug/L	6300	--	6700	12000	7600	7900

Appendix E

Statistical Evaluation

E1 LCL Evaluation for April 2024 – Cobalt for Last Eight Monitoring Events of Assessment Monitoring

Confidence Interval

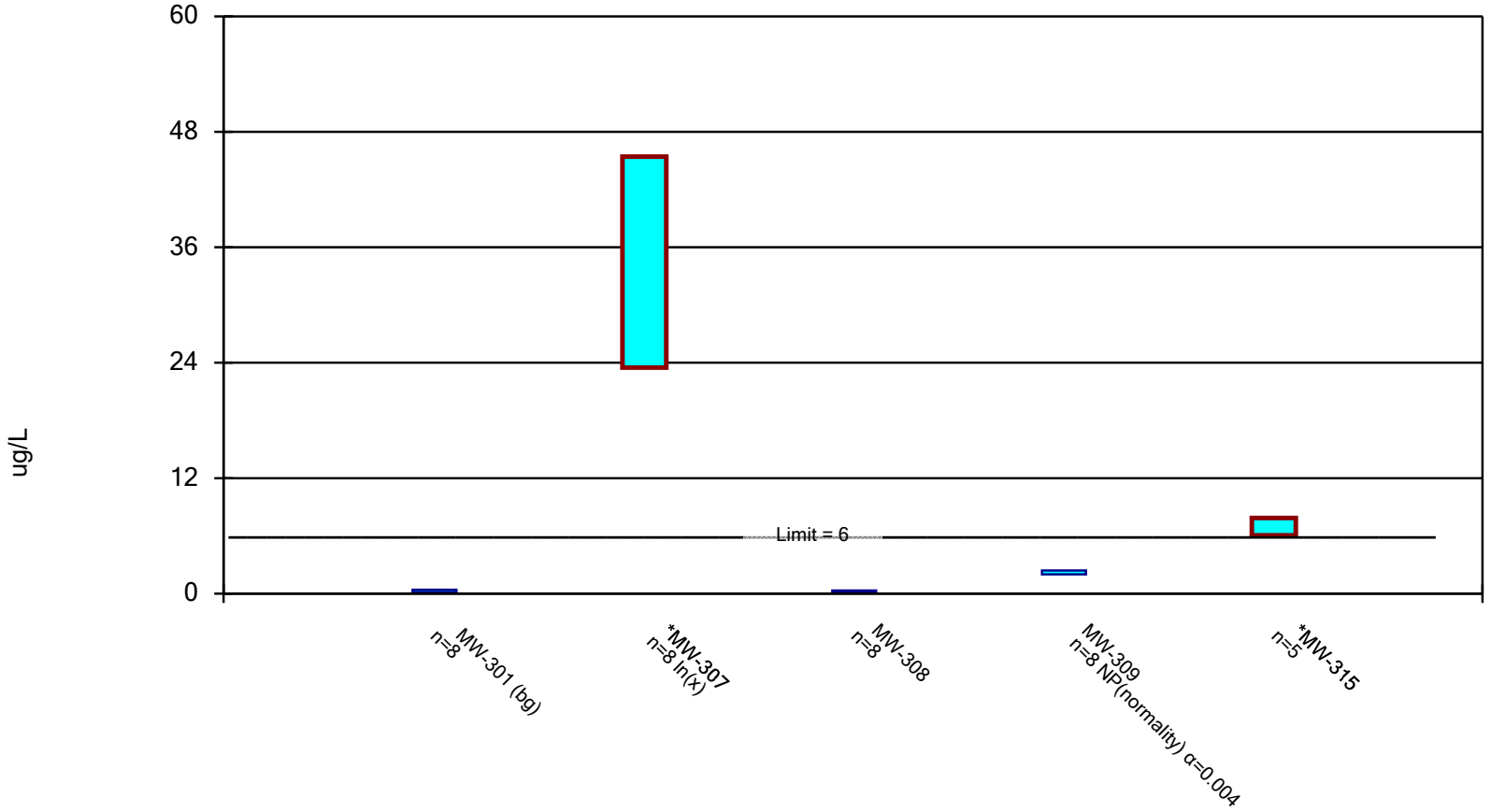
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 7/1/2024, 1:31 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	ND Adj.	Transform	Alpha	Method
Cobalt (ug/L)	MW-301 (bg)	0.4064	0.1423	6	No	8	12.5	None	No	0.01	Param.
Cobalt (ug/L)	**MW-307**	**45.42**	**23.5**	**6**	**Yes**	**8**	**0**	**None**	**ln(x)**	**0.01**	**Param.**
Cobalt (ug/L)	MW-308	0.3293	0.09698	6	No	8	12.5	None	No	0.01	Param.
Cobalt (ug/L)	MW-309	2.4	2	6	No	8	0	None	No	0.004	NP (normality)
Cobalt (ug/L)	**MW-315**	**7.859**	**6.061**	**6**	**Yes**	**5**	**0**	**None**	**No**	**0.01**	**Param.**

09/02/2025 - Classification: Internal - ECRM13574471

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/1/2024 1:29 PM View: OGS - ZLDP

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 7/1/2024 1:31 PM View: OGS - ZLDP
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-307	MW-308	MW-309	MW-315
10/7/2020			0.14 (J)	2	
10/8/2020	0.41 (J)				
4/14/2021	0.29 (J)		0.16 (J)	2.3	
10/7/2021	0.48 (J)		0.22 (J)	2	
2/14/2022		24			
4/11/2022		31			
4/12/2022	0.23 (J)		0.24 (J)		
4/14/2022				2	
8/25/2022		25			
10/25/2022		27			
10/26/2022	0.29 (J)		0.24 (J)	2.2	
2/2/2023					7
3/6/2023					6.4
4/5/2023		30	0.45 (J)	2	7
4/6/2023	0.21 (J)				
10/10/2023		36	0.17 (J)	2.3	6.6
10/13/2023	0.2 (J)				
4/4/2024	<0.17	38	<0.17	2.4	7.8
6/6/2024		63			
Mean	0.2744	34.25	0.2131	2.15	6.96
Std. Dev.	0.1246	12.62	0.1096	0.169	0.5367
Upper Lim.	0.4064	45.42	0.3293	2.4	7.859
Lower Lim.	0.1423	23.5	0.09698	2	6.061

ND substitution: RL or RL/2 if <15% NDs.

E2 LCL Evaluation for October 2024 – Cobalt for Last Eight Events of Assessment Monitoring

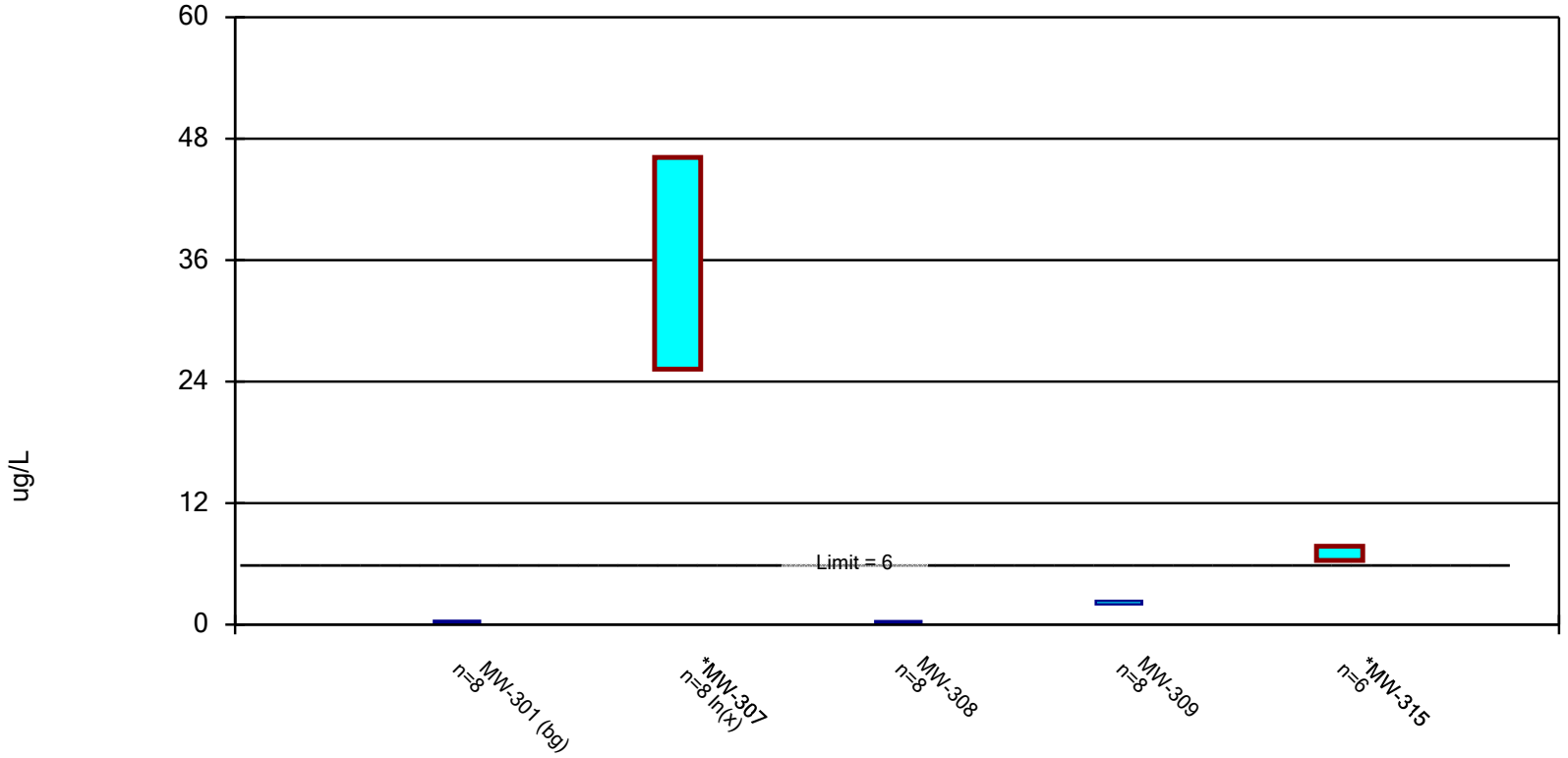
Confidence Interval

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 1/3/2025, 9:01 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt (ug/L)	MW-301 (bg)	0.37	0.1313	6	No	8	12.5	No	0.01	Param.
Cobalt (ug/L)	**MW-307**	**46.15**	**25.23**	**6**	**Yes**	**8**	**0**	**ln(x)**	**0.01**	**Param.**
Cobalt (ug/L)	MW-308	0.3312	0.1051	6	No	8	12.5	No	0.01	Param.
Cobalt (ug/L)	MW-309	2.343	2.007	6	No	8	0	No	0.01	Param.
Cobalt (ug/L)	**MW-315**	**7.737**	**6.329**	**6**	**Yes**	**6**	**0**	**No**	**0.01**	**Param.**

Parametric Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 1/3/2025 9:01 AM View: OGS - ZLDP

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 1/3/2025 9:01 AM View: OGS - ZLDP

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-307	MW-308	MW-309	MW-315
4/14/2021	0.29 (J)		0.16 (J)	2.3	
10/7/2021	0.48 (J)		0.22 (J)	2	
4/11/2022		31			
4/12/2022	0.23 (J)		0.24 (J)		
4/14/2022				2	
8/25/2022		25			
10/25/2022		27			
10/26/2022	0.29 (J)		0.24 (J)	2.2	
2/2/2023					7
3/6/2023					6.4
4/5/2023		30	0.45 (J)	2	7
4/6/2023	0.21 (J)				
10/10/2023		36	0.17 (J)	2.3	6.6
10/13/2023	0.2 (J)				
4/4/2024	<0.17	38	<0.17	2.4	7.8
6/6/2024		63			
10/10/2024		34	0.18 (J)	2.2	7.4
10/11/2024	0.22 (J)				
Mean	0.2506	35.5	0.2181	2.175	7.033
Std. Dev.	0.1126	11.94	0.1066	0.1581	0.5125
Upper Lim.	0.37	46.15	0.3312	2.343	7.737
Lower Lim.	0.1313	25.23	0.1051	2.007	6.329

ND substitution: RL or RL/2 if <15% NDs.