

# 2024 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Generating Station – Ash Pond  
Ottumwa, Iowa

Prepared for:

Alliant Energy



**SCS ENGINEERS**

25224072.00 | January 31, 2025

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## OVERVIEW OF CURRENT STATUS

### Ottumwa Generating Station, Ash 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. Supporting information is provided in the text of the annual report.

Category	Rule Requirement	Site Status
<b>Monitoring Status – Start of Year</b>	(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
<b>Monitoring Status – End of Year</b>	(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
<b>Statistically Significant Increases (SSIs)</b>	(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):	
	(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and	<p>SSIs initially determined on January 15, 2018, based on November 2017 monitoring results. For October 2023 and April 2024, SSIs for semiannual events for compliance wells at waste boundary included the following; see <b>Table 5</b> for complete results.</p> <p><u>October 2023</u></p> <p>Boron: MW-304, MW-306</p> <p>Calcium: MW-304, MW-305</p> <p>Chloride: MW-304, MW-305, MW-306</p> <p>Field pH: MW-304, MW-305</p> <p>Sulfate: MW-304, MW-305</p> <p>Total Dissolved Solids: MW-304, MW-305, MW-306</p>

Category	Rule Requirement	Site Status
		<p><u>April 2024</u></p> <p>Boron: MW-304, MW-305, MW-306</p> <p>Calcium: MW-303, MW-304, MW-305</p> <p>Chloride: MW-304, MW-305, MW-306</p> <p>Field pH: MW-303, MW-304, MW-305</p> <p>Sulfate: MW-303, MW-304, MW-305, MW-306</p> <p>Total Dissolved Solids: MW-303, MW-304, MW-305, MW-306</p>
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018
<b>Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)</b>	<p>(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:</p> <p>(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;</p>	<p>Cobalt: Initially determined to be at SSL above the GPS in January 2019 at compliance monitoring wells MW-305 and MW-306. In October 2023 and April 2024, concentrations determined to be at SSL above the GPS as follows:</p> <p><u>October 2023</u> MW-305</p> <p><u>April 2024</u> MW-305, MW-306</p>
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Cobalt: April 15, 2019

Category	Rule Requirement	Site Status
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	June 4, 2020  An additional public meeting was held on February 18, 2021.  A virtual public meeting was held on August 19, 2024.
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	September 12, 2019 - Original ACM  November 25, 2020 – Addendum No. 1 to ACM  August 5, 2022 – Addendum No. 2 to ACM
<b>Selection of Remedy</b>	(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	Not Selected (In Progress)
<b>Corrective Action</b>	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not Initiated



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## Table of Contents

Section	Page
<b>Overview of Current Status.....</b>	<b>i</b>
<b>1.0 Introduction.....</b>	<b>1</b>
<b>2.0 Background.....</b>	<b>1</b>
2.1 Geologic and Hydrogeologic Setting.....	1
2.1.1 Regional Information.....	1
2.1.2 Site Information.....	2
2.2 CCR Rule Monitoring System.....	3
<b>3.0 § 257.90(e) Annual Report Requirements.....</b>	<b>4</b>
3.1 §257.90(e)(1) Site Map.....	4
3.2 §257.90(e)(2) Monitoring System Changes.....	4
3.3 §257.90(e)(3) Summary of Sampling Events.....	4
3.4 § 257.90(E)(4) Monitoring Transition Narrative.....	5
3.5 § 257.90(e)(5) Other Requirements.....	6
3.5.1 § 257.90(e) General Requirements.....	6
3.5.2 § 257.94(d) Alternative Detection Monitoring Frequency.....	8
3.5.3 § 257.94(e)(2) Alternative Source Demonstration for Detection Monitoring.....	8
3.5.4 § 257.95(c) Alternative Assessment Monitoring Frequency.....	8
3.5.5 § 257.95(d)(3) Assessment Monitoring Results and Standards.....	8
3.5.6 § 257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring.....	8
3.5.7 § 257.96(a) Extension of Time for Corrective Measures Assessment.....	9
3.6 §257.90(e)(6) Overview.....	9
<b>4.0 References.....</b>	<b>9</b>

### Tables

Table 1	Groundwater Monitoring Well Network
Table 2	CCR Rule Groundwater Samples Summary
Table 3	Groundwater Elevations – CCR Rule Monitoring Well Networks
Table 4A	Horizontal Gradients and Flow Velocity
Table 4B	Vertical Gradients
Table 5	Groundwater Analytical Results Summary – October 2023 and April 2024
Table 6	Groundwater Field Parameters

## Figures

Figure 1	Site Location Map
Figure 2	Site Plan and Monitoring Well Locations—Ash Pond
Figure 3	Shallow Potentiometric Surface, April 4-5, 2024
Figure 4	Deep Potentiometric Surface, April 4-5, 2024
Figure 5	Shallow Potentiometric Surface, August 20, 2024
Figure 6	Deep Potentiometric Surface, August 20, 2024
Figure 7	Shallow Potentiometric Surface, October 8-11, 2024
Figure 8	Deep Potentiometric Surface, October 8-11, 2024

## Appendices

Appendix A	Regional Hydrogeologic Information
Appendix B	Boring Logs and Well Construction Documentation
Appendix C	Laboratory Reports
	C1    Assessment Monitoring, October 2023
	C2    Assessment Monitoring, April 2024
Appendix D	Historical Monitoring Results
Appendix E	Statistical Evaluation
	E1    LCL Evaluation – October 2023 Event
	E2    LCL Evaluation – April 2024 Event

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## 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) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). 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 Units. The Ottumwa Generating Station (OGS) site location is shown on **Figure 1**.

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

The groundwater monitoring system is designed to detect monitored constituents at the waste boundary of the OGS Ash Pond (existing CCR surface impoundment), as required by 40 CFR 257.91(d). The groundwater monitoring system currently consists of 1 upgradient monitoring well, 5 downgradient compliance monitoring wells at the waste boundaries, and 10 additional downgradient delineation monitoring wells.

Closure of the Ash Pond was initiated in 2022 and was completed in Summer 2023.

A separate groundwater monitoring system evaluates groundwater conditions for the OGS Zero Liquid Discharge Pond (ZLDP) CCR Unit. Monitoring results for the ZLDP monitoring system provide supplemental information for the Ash Pond evaluation. Complete documentation of the ZLDP groundwater monitoring in 2024 will be provided in a separate annual report for the ZLDP CCR Unit.

## 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

### 2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

#### 2.1.1 Regional 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 to be 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 fairly thin (approximately 20 to 30 feet or less) and consists of a clay layer overlying clay and sand. Monitoring wells MW-301 through MW-306 were installed to intersect the bedrock aquifer or unconsolidated material in contact with the bedrock aquifer at the site. 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 14.5 and 52 feet, and weathered bedrock was encountered at depths between 7 and 44 feet below ground surface. Boring logs, well construction, and development documentation for MW-301 through MW-306 are included in **Appendix B**.

Monitoring wells MW-310 and MW-311 were installed in August 2019 as delineation wells to assess the downgradient extent of groundwater impacts. Both wells were installed along the Des Moines River. Both are screened in alluvial sands. The total boring depths were 23 feet at MW-310 and 16 feet at MW-311. Boring logs, well construction, and development documentation for MW-310 and MW-311 are included in **Appendix B**.

Monitoring wells MW-305A, MW-310A, and MW-311A were installed in February and March 2020 as additional delineation wells to assess the downgradient vertical extent of groundwater impacts. They were installed as nested wells with MW-305, MW-310, and MW-311. All three wells were screened in the Mississippian Dolomite. The bedrock at the MW-305A location was a combination of interbedded sandstone and dolomite. The total boring depths were 80 feet at MW-305A, 54 feet at MW-310A, and 46 feet at MW-311A. Boring logs, well construction, and development documentation for MW-305A, MW-310A, and MW-311A are included in **Appendix B**.

Monitoring wells MW-312 and MW-313 were installed in December 2021 as additional delineation wells to assess groundwater conditions between the compliance well network and delineation well MW-310. MW-312 is screened in weathered Mississippian Dolomite, and MW-313 is screened in alluvial sand. The total boring depths were 27.5 feet at MW-312 and 22.5 feet at MW-313. Boring logs, well construction, and development documentation for MW-312 and MW-313 are included in **Appendix B**.

Additional downgradient delineation wells (MW-316, MW-316A, and MW-317) were installed in March 2023 prior to the April 2023 event. Boring logs, well construction, and development documentation are added in **Appendix B**.

The Mississippian bedrock aquifer, including some overlying weathered bedrock and sand, is confined below the clay layer. To evaluate groundwater flow directions and rates, potentiometric surface maps were developed for two depth intervals within the confined aquifer. The shallow potentiometric surface is based on monitoring wells installed near the top of the aquifer. The deep potentiometric surface is based on the deeper “A” wells.

The shallow and deep potentiometric surfaces and groundwater flow patterns based on April 2024 water level measurements are shown on **Figures 3** and **4**. A supplemental groundwater elevation sampling event was conducted in August 2024 and the shallow and deep groundwater surfaces are shown on **Figures 5** and **6**. The shallow and deep potentiometric surfaces and groundwater flow patterns for the October 2024 water level measurements are shown on **Figures 7** and **8**. All six potentiometric surface maps show groundwater flow moving to the east/northeast, following the same flow patterns observed in regional flow maps of the area. The groundwater elevation data for the CCR monitoring wells are provided in **Table 3**. Estimated horizontal gradients and flow velocities for flow at the shallow and deep levels within the aquifer are provided in **Table 4A**. Calculated vertical gradients for the nested wells are provided in **Table 4B**.

## 2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and five downgradient monitoring for the OGS Ash Pond (**Table 1** and **Figure 2**). The background well is MW-301, and the five downgradient compliance wells include MW-302, MW-303, MW-304, MW-305, and MW-306. Seven additional wells, MW-305A, MW-310/310A, MW-311/311A, MW-312, and MW-313 were added as delineation wells following initiation of assessment monitoring and the determination that cobalt concentrations in MW-305 and MW-306 exceeded the Groundwater Protection Standard (GPS). Three more delineation wells were installed in March 2023, including MW-316/316A and MW-317. 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 14 to 80 feet.

The background well (MW-301) is located west of the site. The downgradient compliance wells (MW-302 through MW-306) are located along the northeastern, eastern, and southeastern edges of the Ash Pond. The downgradient wells were installed as close as practicable to the pond boundaries considering the site layout.

Monitoring wells MW-307, MW-308, MW-309, and MW-315 were installed to monitor the ZLDP CCR Unit, which has a separate monitoring system.

Four additional water table monitoring wells, MW-302WT, MW-304WT, MW-306WT, MW-314WT, and monitoring well MW-314 were installed at OGS in 2022 to support closure activities for the Ash Pond. The water table wells are not part of the CCR rule monitoring system. Water levels from monitoring well MW-314, installed as a piezometer in the uppermost aquifer, are used in the evaluation of groundwater flow in the Ash Pond area, but this upgradient well will not be added to the sampling and analysis program.

### **3.0 § 257.90(E) ANNUAL REPORT REQUIREMENTS**

*Annual groundwater monitoring and corrective action report.* For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For CCR management units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31, 2029, and annually thereafter. 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:

#### **3.1 §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 of the site location is provided on **Figure 1**. A map with an aerial image showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**. The ZLDP CCR Unit, which is monitored by a separate network and is discussed in a separate groundwater monitoring report, is also shown on **Figure 2**.

#### **3.2 §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 to the compliance monitoring system installed at the waste boundary.

#### **3.3 §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 groundwater sampling events were completed in 2024. 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 assessment monitoring program is included in **Table 2**.

The two semiannual assessment monitoring rounds for the complete monitoring network were completed in April and October 2024. Samples from the background well and compliance wells



installed at the waste boundary were analyzed for Appendix III and Appendix IV parameters. Samples from the delineation wells were analyzed for cobalt. Both semiannual events included additional parameters chosen to support the selection of remedy. Supplemental parameters included general water quality parameters and parameters used to evaluate feasibility of monitored natural attenuation (MNA).

The validation and evaluation of the October 2023 monitoring event data was completed and transmitted to IPL on March 15, 2024. The April 2024 monitoring event data validation and evaluation was completed and transmitted to IPL on August 21, 2024. The validation and evaluation of the October 2024 monitoring event data was in progress at the end of 2024 and will be transmitted to IPL in 2025; therefore, the October 2024 monitoring results will be included in the 2025 annual report. The October 2024 groundwater elevation data is included in this report.

The October 2023 and April 2024 monitoring results are summarized in **Table 5**. Field parameter results for the October 2023 and April 2024 sampling events are provided in **Table 6**. The analytical laboratory reports for October 2023 and April 2024 are provided in **Appendix C**. Historical results through April 2023 for each monitoring well are summarized in **Appendix D**.

### **3.4 § 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 OGS Ash Pond was initiated in April 2018 and continued through 2024. An Assessment of Corrective Measures (ACM) was initiated for the OGS Ash Pond in April 2019 and completed in September 2019. Addendum No. 1 to the ACM was completed in November 2020. Addendum No. 2 to the ACM was completed in August 2022. The selection of remedy is in progress. The ACM was initiated in response to the detection of cobalt at a statistically significant level (SSL) exceeding the GPS in monitoring wells MW-305 and MW-306. 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. Environmental Protection Agency [U.S. EPA], 2009), the comparison of assessment monitoring results to the GPS was based on the lower confidence limit (LCL) for the arithmetic mean for all parameters that have been previously detected above the GPS (cobalt and thallium). To evaluate whether cobalt or thallium was present at an SSL above the GPS at any compliance monitoring well, LCLs were calculated with Sanitas™ groundwater statistical software using historical concentrations measured since assessment monitoring began in April 2018.

The LCL evaluations completed for the October 2023 and April 2024 monitoring events are provided in **Appendix E**.

Based on the LCL evaluation, SSLs above the GPS were identified for the following parameters and compliance wells:

- Cobalt: MW-305 and MW-306 (October 2023 and April 2024)



In addition to the cobalt results above the GPS in the Ash Pond monitoring well samples, cobalt has historically been detected above the GPS in samples from MW-307, which is part of the ZLDP CCR Unit monitoring network. Cobalt was determined to be at an SSL above the GPS at MW-307 on June 1, 2021, following statistical evaluation of the February 2021 monitoring event for the ZLDP. Alternative source demonstrations (ASDs) completed on August 30, 2021, and May 9, 2022, for the ZLDP CCR Unit concluded that the Ash Pond was the most likely source of cobalt concentrations at an SSL above the GPS at MW-307. MW-307 is located downgradient of both the Ash Pond and the ZLDP. The conclusion that the Ash Pond was the most likely source of cobalt was based on groundwater flow directions, distribution of cobalt in groundwater, and the historical use of the ponds. Cobalt concentrations at MW-307 will be addressed in the selection of remedy process for the Ash Pond. Complete information on the ZLDP monitoring in 2024 will be included in the 2024 Annual Groundwater Monitoring and Corrective Action Report for the ZLDP.

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 background data collected through April 2022. 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. The UPL calculations for Appendix III and UTL calculations for Appendix IV parameters were included in the 2022 Annual Groundwater Monitoring and Corrective Action Report for the Ash Pond. The UPLs/UTLs calculated in April 2022 were applied to the evaluation of the October 2023 and April 2024 monitoring results. The next update is planned for 2025.

### **3.5 § 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.

#### **3.5.1 § 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.*

**Status of Groundwater Monitoring and Corrective Action Program.** The groundwater monitoring and corrective action program is currently in the selection of remedy process, with assessment monitoring continuing.

#### **Summary of Key Actions Completed.**

- Prepared the 2023 Annual Groundwater Monitoring and Corrective Action Report for the Ash Pond.

- Installed extraction well (PW-1) and observation well (OW-1) for aquifer pumping tests to support selection of remedy.
- Completed statistical evaluation of October 2023 monitoring results and prepared October 2023 Groundwater Results Report (March 15, 2024).
- Prepared two Semiannual Progress Reports for the Selection of Remedy (March and September 2024).
- Completed two semiannual assessment monitoring events in April and October 2024.
- 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 of April 2024 monitoring results and prepared April 2024 Groundwater Results Report (August 21, 2024).

#### **Description of Any Problems Encountered.**

- There were no problems encountered during 2024.

#### **Discussion of Actions to Resolve the Problems.**

- Not Applicable.

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

- Complete statistical evaluation and determination of any SSLs exceeding the GPS and prepare groundwater results letter for the October 2024 monitoring event (February 2025).
- Complete statistical evaluation and determination of any SSLs exceeding the GPS and prepare groundwater results letter for the April 2025 monitoring event (August 2025).
- Prepare two progress reports for the Selection of Remedy process if applicable.
- Complete two semiannual assessment monitoring events (April and October 2025).
- Conduct an extended pumping test for the design of a pump and treat system.
- Finalize evaluation of remedial options and issue a final SOR Report per 40 CFR 257.97(a).

### **3.5.2 § 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. OGS is no longer in the detection monitoring program.

### **3.5.3 § 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. OGS is no longer in the detection monitoring program.

### **3.5.4 § 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.

### **3.5.5 § 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).*

The October 2023 and April 2024 assessment monitoring results, background UPLs, and GPSs established for the Ash Pond are provided in **Table 5**. 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, including the evaluation of MNA. The results for the supplemental parameters are included in **Table 5** and in the laboratory reports in **Appendix C**.

### **3.5.6 § 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.*

Not applicable. No ASDs were submitted during the 2024 monitoring period.

### **3.5.7 § 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 was initiated on April 15, 2019. The certification demonstrating the need for a 90-day deadline extension was completed on July 10, 2019, and was included in the 2019 annual groundwater monitoring and corrective action report. The ACM was completed on September 12, 2019. Addendum No. 1 to the ACM was completed on November 25, 2020. Addendum No. 2 to the ACM was completed on August 5, 2022.

### **3.6 §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.

## **4.0 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.

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## Tables

- 1 Groundwater Monitoring Well Network
- 2 CCR Rule Groundwater Samples Summary
- 3 Groundwater Elevations – CCR Rule Monitoring Well Networks
- 4A Horizontal Gradients and Flow Velocity
- 4B Vertical Gradients
- 5 Groundwater Analytical Results Summary
- 6 Groundwater Field Parameters

**Table 1. Groundwater Monitoring Well Network  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

<b>Monitoring Well</b>	<b>Location in Monitoring Network</b>	<b>Role in Monitoring Network</b>
MW-301	Upgradient	Background
MW-302	Downgradient	Compliance
MW-303	Downgradient	Compliance
MW-304	Downgradient	Compliance
MW-305	Downgradient	Compliance
MW-305A	Downgradient, deeper	Delineation
MW-306	Downgradient	Compliance
MW-310	Downgradient	Delineation
MW-310A	Downgradient, deeper	Delineation
MW-311	Downgradient	Delineation
MW-311A	Downgradient, deeper	Delineation
MW-312	Downgradient	Delineation
MW-313	Downgradient	Delineation
MW-316	Downgradient	Delineation
MW-316A	Downgradient, deeper	Delineation
MW-317	Downgradient	Delineation

**Note:**

1. Monitoring wells MW-302WT, MW-304WT, MW-306WT, MW-314, and MW-314WT were installed to monitor water levels for the 2022-2023 closure project, but are not part of the CCR Rule groundwater monitoring network.

Last revision by:	<u>NLB</u>	Date:	<u>11/21/2024</u>
Checked by:	<u>LH</u>	Date:	<u>11/27/2024</u>

**Table 2. CCR Rule Groundwater Samples Summary  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

Sample Dates	Background Well	Compliance Wells				Delineation Well	Compliance Well	Delineation Wells								
	MW-301	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-312	MW-313	MW-316	MW-316A	MW-317
April 4-5, 2024	A	DRY	A	A	A	A-NE	A	A-NE	A-NE	A-NE	A-NE	A-NE	A-NE	A-NE	A-NE	A-NE
September 5, 2024	--	A-S	A-S	--	--	--	--	--	--	--	--	"	--	--	--	--
October 9-11, 2024	A	A	DRY	A	A	A-NE	A	A-NE	A-NE	DRY	A-NE	A-NE	A-NE	DRY	A-NE	A-NE
Total Samples	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	2

Abbreviations:

A = Assessment Monitoring Program

A-S = Supplemental Assessment Monitoring Event

A-NE = Assessment Monitoring for nature and extent, wells sampled for cobalt and selection-of-remedy parameters

NI = Not Installed

DRY - Well was dry or had insufficient water for sample collection

-- - Not Sampled

Last revision by: NLB Date: 11/21/2024

Checked by: LH Date: 11/27/2024



**Table 3. Groundwater Elevations - CCR Rule Monitoring Well Networks  
IPL - Ottumwa Generating Station / SCS Engineers Project #25224072.00**

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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	NI	639.23	NI	NI
August 25, 2022	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	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	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	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	651.37	NM	NM	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	NM
September 5, 2024	NM	Below Top of Pump	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	NM
October 8-11, 2024	680.49	Below Top of Pump	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	
Bottom of Well Elevation (ft)	669.47	648.10	655.30	643.57	630.54	644.50	632.41	602.12	646.87	660.00	629.56	630.39	627.44	632.76	602.38	636.24	605.86	625.49	632.02	651.47	659.80	629.06	632.36	602.93	628.42	--	--	--	

Notes:  
 NM = not measured  
 NI = not installed  
 ND = not surveyed

Last rev. by: RM  
 Checked by: LH

Date: 10/22/2024  
 Date: 12/26/2024

**Table 4A. Horizontal Gradients and Flow Velocity  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00  
January - December 2024**

Northeast Flow Path - Shallow					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
April 4 - 5, 2024	650.00	644.09	1101	0.005	0.0001
August 20, 2024	655.00	643.67	1145	0.010	0.0002
October 8 - 11, 2024	655.00	640.00	975	0.015	0.0002

Northeast Flow Path - Deep					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
April 4 - 5, 2024	646.00	643.94	864	0.002	0.0001
August 20, 2024	649.69	645.00	1010	0.005	0.0001
October 8 - 11, 2024	644.16	640.00	840	0.005	0.0001

	Well	K Values (cm/sec)	K Values (ft/d)	Assumed Unconsolidated Porosity, n
Upgradient Well	MW-301	4.6E-03	13	0.40
Shallow Wells	MW-302	3.2E-03	9.1	
	MW-303	1.2E-04	0.35	
	MW-304	3.5E-04	0.98	
	MW-305	2.5E-03	7.1	
	MW-306	2.8E-03	8.1	
	MW-310	2.9E-03	8.2	
	MW-311	2.3E-02	64	
	MW-316	4.2E-02	119	
	MW-317	9.1E-03	26	
	Geometric Mean	3.1E-03	8.7	
Deep Wells	MW-305A	5.6E-06	0.02	0.25
	MW-310A	4.2E-07	0.001	
	MW-311A	5.4E-07	0.002	
	MW-316A	2.1E-05	0.060	
	Geometric Mean	2.3E-06	6.4E-03	

Note: Geometric mean calculations do not include upgradient well MW-301

Groundwater flow velocity equation:  $V = [K * (\Delta h / \Delta l)] / n$

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

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

Note:

- See Figures 3, 4, 5, and 6 for velocity calculation flow path locations.

Last revision by: LH \_\_\_\_\_ Date: 1/22/2025  
 Checked by: NLB \_\_\_\_\_ Date: 1/22/2025

**Table 4B. Vertical Gradients**  
**IPL - Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

Vertical Hydraulic Gradients	MW-305/MW-305A		MW-310/MW-310A		MW-311/MW-311A		MW-316/MW-316A	
	Shallow Well Screen midpoint (feet amsl)	MW-305 634.91		MW-310 635.26		MW-311 638.74		MW-316 637.36
Deep Well Screen midpoint (feet amsl)	MW-305A 604.62		MW-310A 604.88		MW-311A 608.36		MW-316A 605.43	
Measurement Date	Distance between midpoints (ft)	Vertical Gradient (ft/ft)	Distance between midpoints (ft)	Vertical Gradient (ft/ft)	Distance between midpoints (ft)	Vertical Gradient (ft/ft)	Distance between midpoints (ft)	Vertical Gradient (ft/ft)
April 4-5, 2024	30.3	-0.171	30.4	-0.023	30.4	NA	31.9	-0.005
August 20, 2024	30.3	-0.160	30.4	0.057	30.4	0.071	31.9	0.045
October 8-11, 2024	30.3	-0.196	30.4	0.046	30.4	NA	31.9	NA

Notes:

- 1: A positive vertical gradient indicates upward groundwater flow. A negative gradient indicates downward flow.
  2. MW-311/MW-311A - Vertical gradient for the April, 2024 data was unable to be calculated due to the water level being below the pump. MW-311 was DRY in October, 2024.
  3. MW-316 was DRY during the October 2024 event.
- amsl = above mean sea level  
 NA = not applicable because one well was dry, so vertical gradient not calculated

Last rev. by: NLB  
 Checked by: LH

Date: 11/4/2024  
 Date: 11/27/2024

**Table 5. Groundwater Analytical Results Summary - October 2023 and April 2024  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

Parameter Name	UPL Method	UPL	GPS	Background Well		Compliance Wells									
				MW-301		MW-302		MW-303		MW-304		MW-305		MW-306	
				10/13/2023	4/4/2024	10/10/2023	4/4/2024	10/10/2023	4/4/2024	10/10/2023	4/4/2024	10/10/2023	4/4/2024	10/12/2023	4/4/2024
Groundwater Elevation (ft amsl)				680.20	680.79	652.32	651.81	648.07	649.52	646.02	648.39	650.21	650.62	655.40	654.47
<b>Appendix III</b>															
Boron, ug/L	P	839		760	410	--	--	--	560	870	970	750	840	850	920
Calcium, mg/L	P	103		94	85	--	--	--	210	110	110	110	110	91	100
Chloride, mg/L	P	210		150	87	--	--	--	56	230	240	220	240	290	260
Fluoride, mg/L	P	0.381		<0.38	<0.38	--	--	--	<0.38	0.79 J	0.97 J	0.42 J	<0.38	<0.38	<0.38
Field pH, Std. Units	P	6.74		6.24	6.65	--	--	--	6.82	6.85	6.88	6.88	6.90	6.63	6.64
Sulfate, mg/L	P	208		190	240	--	--	--	360	230	240	230	220	93	250
Total Dissolved Solids, mg/L	P	697		680	550	--	--	--	980	1,100	1,000	970	1,000	980	1,000
<b>Appendix IV</b>															
		UTL	GPS												
Antimony, ug/L	NP	1.10	6	<1.0	<1.0	--	--	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic, ug/L	NP	0.88	10	<0.53	<0.53	--	--	--	0.8 J	1.0 J	0.71 J	0.91 J	0.54 J	0.62 J	<0.53
Barium, ug/L	P	71.0	2,000	48	33	--	--	--	44	77	77	110	110	82	90
Beryllium, ug/L	NP	0.270	4	<0.33	<0.33	--	--	--	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33	<0.33
Cadmium, ug/L	P	0.149	5	<0.10	<0.10	--	--	--	0.10 J	0.12 J	<0.10	0.13 J	<0.10	1.1	1.3
Chromium, ug/L	NP	1.10	100	<1.1	<1.2	--	--	--	1.2 J	<1.1	<1.2	<1.1	<1.2	<1.1	<1.2
Cobalt, ug/L	P	5.26	6	0.20 J	<0.17	--	--	--	3.8	0.43 J	0.34 J	17	17	7.1	8.5
Fluoride, mg/L	P	0.417	4	<0.38	<0.38	--	--	--	<0.38	0.79 J	0.97 J	0.42 J	<0.38	<0.38	<0.38
Lead, ug/L	NP	0.270	15	<0.24	<0.26	--	--	--	0.63	0.35 J	<0.26	0.26 J	<0.26	<0.24	<0.26
Lithium, ug/L	P	31.8	40	25	21	--	--	--	3.9 J	4.1 J	3.6 J	2.7 J	<2.5	<2.5	<2.5
Mercury, ug/L	DQ	DQ	2	<0.14	<0.11	--	--	--	<0.11	<0.14	<0.11	<0.14	<0.11	<0.14	<0.11
Molybdenum, ug/L	NP	1.30	100	1.1 J	<1.3	--	--	--	3.2	1.9 J	1.9 J	8.3	8.3	12	11
Selenium, ug/L	P	9.01	50	5.8	5.1	--	--	--	35	1.5 J	<1.4	1.9 J	<1.4	<1.4	<1.4
Thallium, ug/L	NP	0.500	2	<0.26	<0.57	--	--	--	<0.57	<0.26	<0.57	<0.26	<0.57	0.62 J	<0.57
Radium 226/228 Combined, pCi/L	P	1.71	5	0.681	0.452	--	--	--	1.38	3.18	2.54	0.963	0.989	0.661	0.998
<b>Additional Parameters Collected for Selection of Remedy</b>															
Cobalt, dissolved, ug/L				--	--	--	--	--	--	--	--	17	18	7.0	8.9
Iron, dissolved, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Iron, ug/L				<36	<36	--	--	--	1,200	4,800	5,300	73 J	51 J	80 J	66 J
Magnesium, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Manganese, dissolved, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Manganese, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Potassium, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Sodium, ug/L				--	--	--	--	--	--	--	--	--	--	--	--
Bicarbonate Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	--	--
Carbonate Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	--	--
Total Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	--	--

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

**Table 5. Groundwater Analytical Results Summary - October 2023 and April 2024  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

Parameter Name	UPL Method	UPL	GPS	Delineation Wells																			
				MW-305A		MW-310		MW-310A		MW-311		MW-311A		MW-312		MW-313		MW-316		MW-316A		MW-317	
				10/12/2023	4/5/2024	10/10/2023	4/4/2024	10/12/2023	4/5/2024	10/11/2023	4/5/2024	10/11/2023	4/5/2024	10/12/2023	4/4/2024	10/10/2023	4/4/2024	10/12/2023	4/5/2024	10/12/2023	4/5/2024	10/12/2023	4/5/2024
Groundwater Elevation (ft amsl)				643.60	645.43	638.32	643.51	640.13	628.24	638.31	Below pump	639.84	635.54	639.45	643.94	639.04	644.49	639.15	644.09	639.79	643.94	639.08	644.11
<b>Appendix III</b>																							
Boron, ug/L	P	839		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Calcium, mg/L	P	103		--	--	--	--	--	--	--	--	--	--	180	170	210	140	190	82	71	51	190	100
Chloride, mg/L	P	210		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fluoride, mg/L	P	0.381		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field pH, Std. Units	P	6.74		6.87	6.95	7.06	7.05	7.50	7.43	7.01	6.78	7.72	7.64	6.96	6.89	6.89	6.9	6.73	7.04	7.53	7.36	6.54	6.68
Sulfate, mg/L	P	208		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids, mg/L	P	697		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Appendix IV</b>																							
		UTL	GPS																				
Antimony, ug/L	NP	1.10	6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, ug/L	NP	0.88	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Barium, ug/L	P	71.0	2,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium, ug/L	NP	0.270	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium, ug/L	P	0.149	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium, ug/L	NP	1.10	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt, ug/L	P	5.26	6	1.2	0.96	<0.17	0.29 J	0.52	1.1	0.25 J	0.24 J	<0.17	0.44 J	10	8.5	4.4	2.9	0.69	0.2 J	0.35 J	<0.17	4.7	1.7
Fluoride, mg/L	P	0.417	4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead, ug/L	NP	0.270	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lithium, ug/L	P	31.8	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mercury, ug/L	DQ	DQ	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, ug/L	NP	1.30	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium, ug/L	P	9.01	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Thallium, ug/L	NP	0.500	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Radium 226/228 Combined, pCi/L	P	1.71	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>Additional Parameters Collected for Selection of Remedy</b>																							
Cobalt, dissolved, ug/L				--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron, dissolved, ug/L				--	--	--	--	--	--	--	--	--	--	210	280	1100	430	<36	<36	<36	<36	1800	<36
Iron, ug/L				58 J	<36	<36	<36	68 J	140	510	<36	44 J	<36	540	420	1500	580	74 J	<36	400	<36	3200	350
Magnesium, ug/L				--	--	--	--	--	--	--	--	--	--	62,000	59,000	69,000	46,000	66,000	27,000	30,000	29,000	41,000	28,000
Manganese, dissolved, ug/L				--	--	--	--	--	--	--	--	--	--	1,400	730	3,600	2,200	110	<3.6	1,100	20	1,700	320
Manganese, ug/L				--	--	--	--	--	--	--	--	--	--	1,500	910	3,700	2,000	110	15	120	22	1,900	350
Potassium, ug/L				--	--	--	--	--	--	--	--	--	--	5,200	5,000	5,600	4,300	2,000	930	8100	7800	3,400	1,600
Sodium, ug/L				--	--	--	--	--	--	--	--	--	--	120,000	110,000	150,000	120,000	100,000	53,000	450,000	470,000	130,000	68,000
Bicarbonate Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	250	290	230	140	310	95	380	310	490	270
Carbonate Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5
Total Alkalinity, mg/L				--	--	--	--	--	--	--	--	--	--	250	290	230	140	310	95	380	310	490	270

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

**Table 5. Groundwater Analytical Results Summary - October 2023 and April 2024  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25224072.00**

**Abbreviations:**

UPL = Upper Prediction Limit  
UTL = Upper Tolerance Limit  
GPS = Groundwater Protection Standard  
ft amsl = feet above mean sea level  
Std. Units = Standard Units

LOD = Limit of Detection  
LOQ = Limit of Quantitation  
-- = Not Analyzed  
mg/L = milligrams per liter  
ug/L = micrograms per liter

DQ = Double Quantitation Rule (not detected in background)  
NP = Nonparametric UPL or UTL  
P = Parametric UPL or UTL  
pCi/L = picocuries per liter

**Lab Notes:**

J = Result is less than the reporting limit (RL) but greater than or equal to the limit of detection (LOD) and the concentration is an approximate value.  
B = Compound was found in the blank and sample.

**Notes:**

1. An individual result above the UPL or GPS does not constitute an SSI above background or statistically significant level above the GPS. See the accompanying text for identification of statistically significant results.
2. GPS is the United States Environmental Protection Agency (USEPA) Maximum Contamination Levels (MCLs), 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 July 2022.
4. Compliance wells represent the groundwater monitoring network at the boundary of the CCR unit. The delineation wells were installed during the selection of remedy process to evaluate an extension of the downgradient groundwater monitoring network.

Last revision by: JM  
Checked by: LH

Date: 9/17/2024  
Date: 12/26/2024

**Table 6. Groundwater Field Parameters**  
**Ottumwa Generating Station - Ash Pond / SCS 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	10/13/2023	680.20	17.6	6.24	3.20	1158	104.7	1.75
	4/4/2024	680.79	8.5	6.65	9.81	868	92.0	5.63
MW-302	10/10/2023	652.32	-	-	-	-	-	-
	4/4/2024	651.52	-	-	-	-	-	-
MW-303	10/10/2023	648.07	-	-	-	-	-	-
	4/4/2024	649.52	8.6	6.82	3.00	1,456	78.4	34.31
MW-304	10/10/2023	646.02	13.3	6.85	0.18	1,948	-105.1	7.07
	4/4/2024	648.39	12.7	6.88	1.71	1,744	-32.0	6.08
MW-305	10/12/2023	650.21	13.7	6.88	0.26	1869	4.7	3.25
	4/4/2024	650.62	12.2	6.90	6.11	1,708	47.3	6.22
MW-305A	10/12/2023	643.60	17.8	6.87	5.74	1,357	88.1	12.32
	4/5/2024	645.43	12.0	6.95	4.31	1,169	71.8	6.28
MW-306	10/12/2023	655.40	13.6	6.63	0.29	1,794	25.3	1.90
	4/4/2024	654.47	12.5	6.64	1.51	1,724	69.9	5.98
MW-310	10/10/2023	638.32	14.7	7.06	0.45	1,344	7.5	6.05
	4/4/2024	643.51	11.3	7.05	7.89	1,363	71.6	5.97
MW-310A	10/12/2023	640.13	14.3	7.50	5.60	3,355	46.0	4.96
	4/5/2024	628.24	11.7	7.43	7.75	3,020	50.2	7.57
MW-311	10/11/2023	638.31	19.6	7.01	7.69	685	37.9	NM
	4/5/2024	Below Pump	10.4	6.78	0.29	834	42.6	8.69
MW-311A	10/11/2023	639.84	13.2	7.72	3.15	3,424	-4.2	14.16
	4/5/2024	635.54	11.5	7.64	2.18	3,244	61.3	7.40
MW-312	10/12/2023	639.45	14.6	6.96	0.23	1,827	-26.5	5.45
	4/4/2024	643.94	12.3	6.89	0.29	1,512	-11.7	8.53
MW-313	10/10/2023	639.04	13.9	6.89	0.23	2106	-47.9	6.85
	4/4/2024	644.49	11.8	6.90	0.21	1,395	-27.9	7.45
MW-316	10/12/2023	639.15	16.1	6.73	0.74	1,773	61.0	7.20
	4/5/2024	644.09	9.2	7.04	5.20	763	81.3	3.95
MW-316A	10/12/2023	639.79	17.2	7.53	3.43	2,399	49.5	43.00
	4/5/2024	643.94	10.6	7.36	3.57	2,189	40.1	4.46
MW-317	10/12/2023	639.08	13.7	6.54	0.09	1,853	-38.7	6.25
	4/5/2024	644.11	9.9	6.68	4.85	898	93.4	3.98

- = Not measured

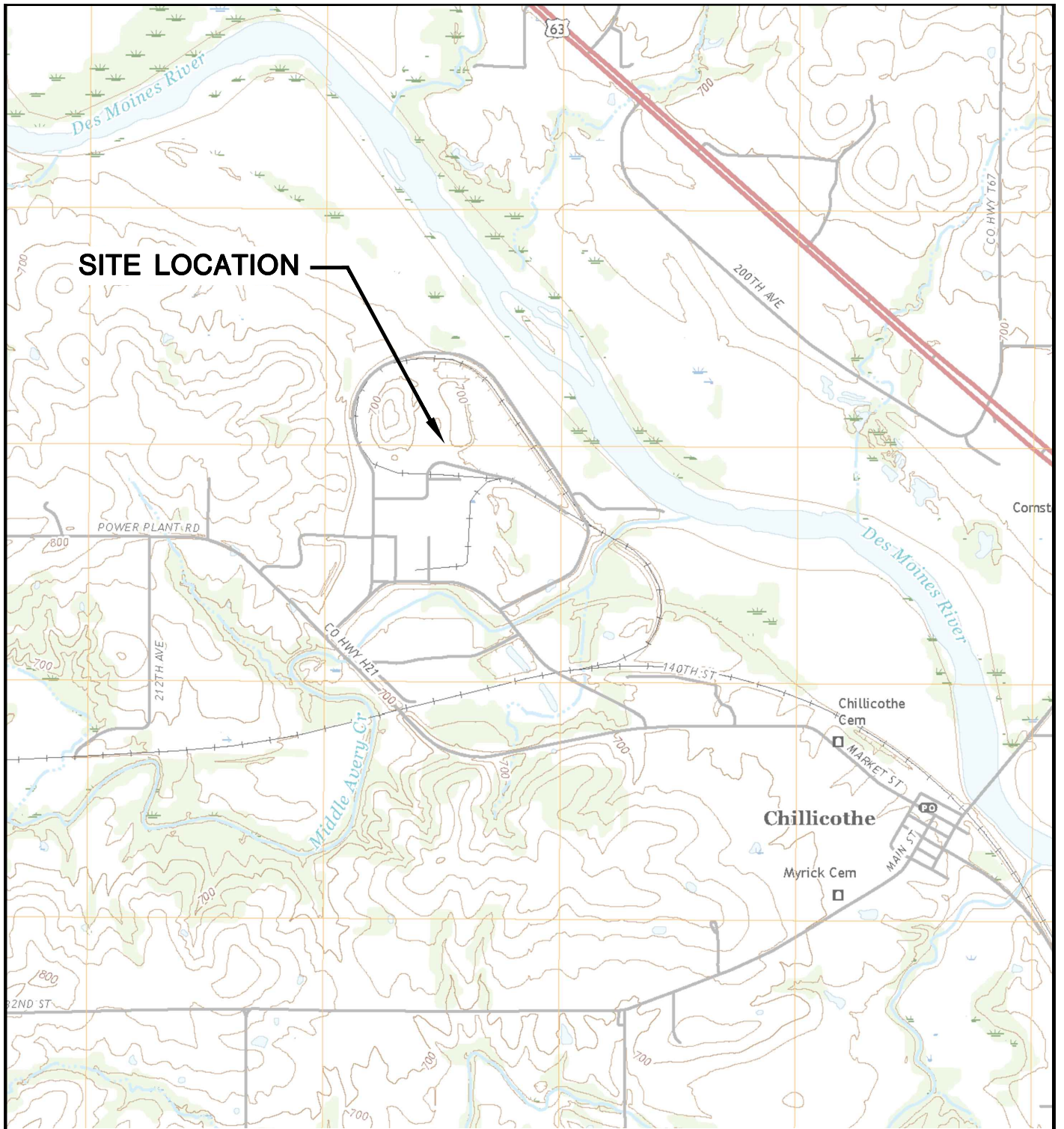
Updated: JM \_\_\_\_\_  
 QC Checked: LH \_\_\_\_\_

Date: 9/17/2024 \_\_\_\_\_  
 Date: 12/26/2024 \_\_\_\_\_

## Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations - Ash Pond
- 3 Shallow Potentiometric Surface, April 4-5, 2024
- 4 Deep Potentiometric Surface, April 4-5, 2024
- 5 Shallow Potentiometric Surface, August 20, 2024
- 6 Deep Potentiometric Surface, August 20, 2024
- 7 Shallow Potentiometric Surface, October 8-11, 2024
- 8 Deep Potentiometric Surface, October 8-11, 2024

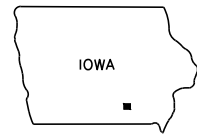




**SITE LOCATION**



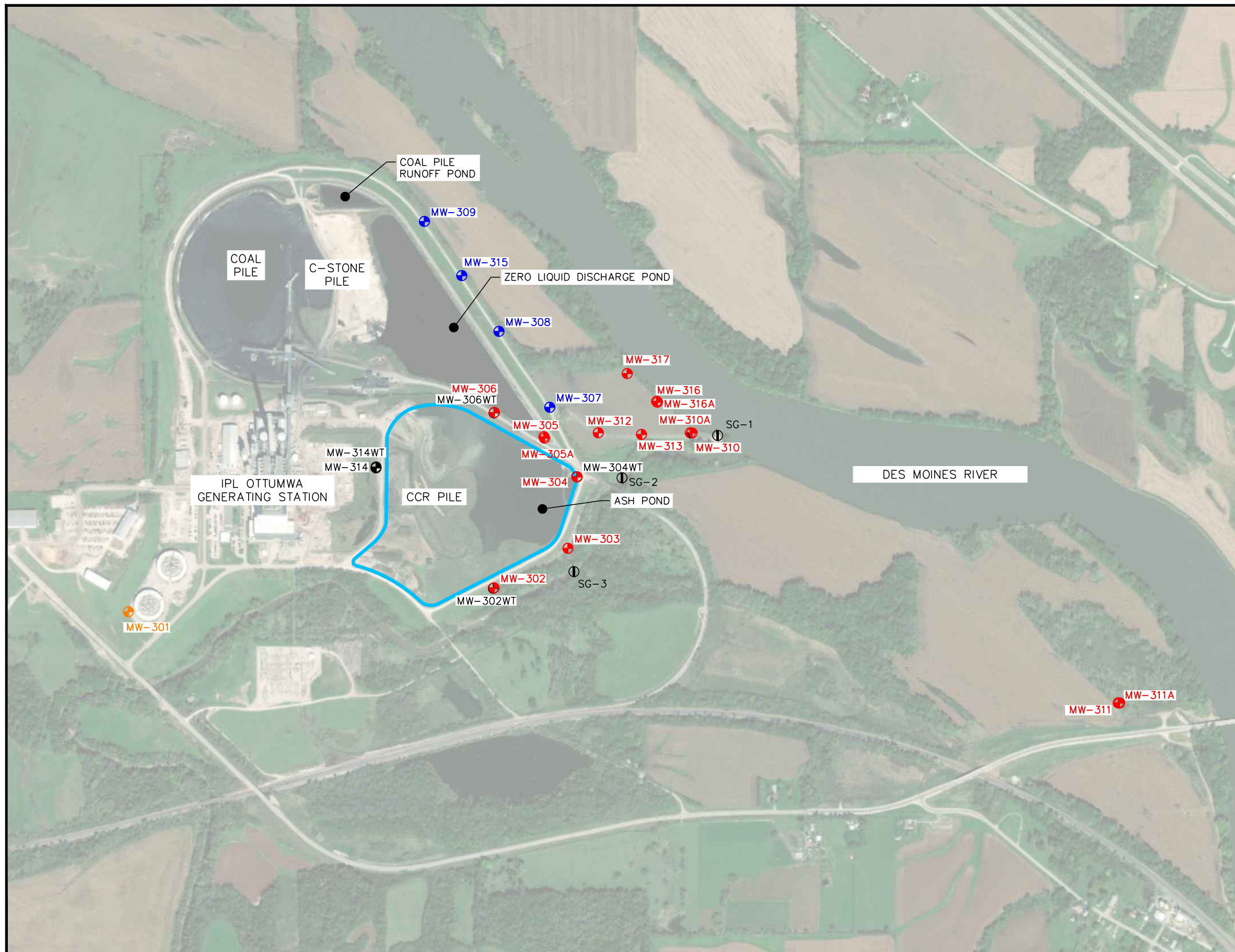
CHILLICOTHE QUADRANGLE  
 IOWA—WAPELLO CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 2018  
 SCALE: 1" = 2,000'



CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501		SITE	ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25219072.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	11/15/2019	CHECKED BY:	MDB	APPROVED BY:	TK 01/30/2020			
REVISED:	01/10/2020							

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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)
	RIVER ELEVATION MEASUREMENT LOCATION

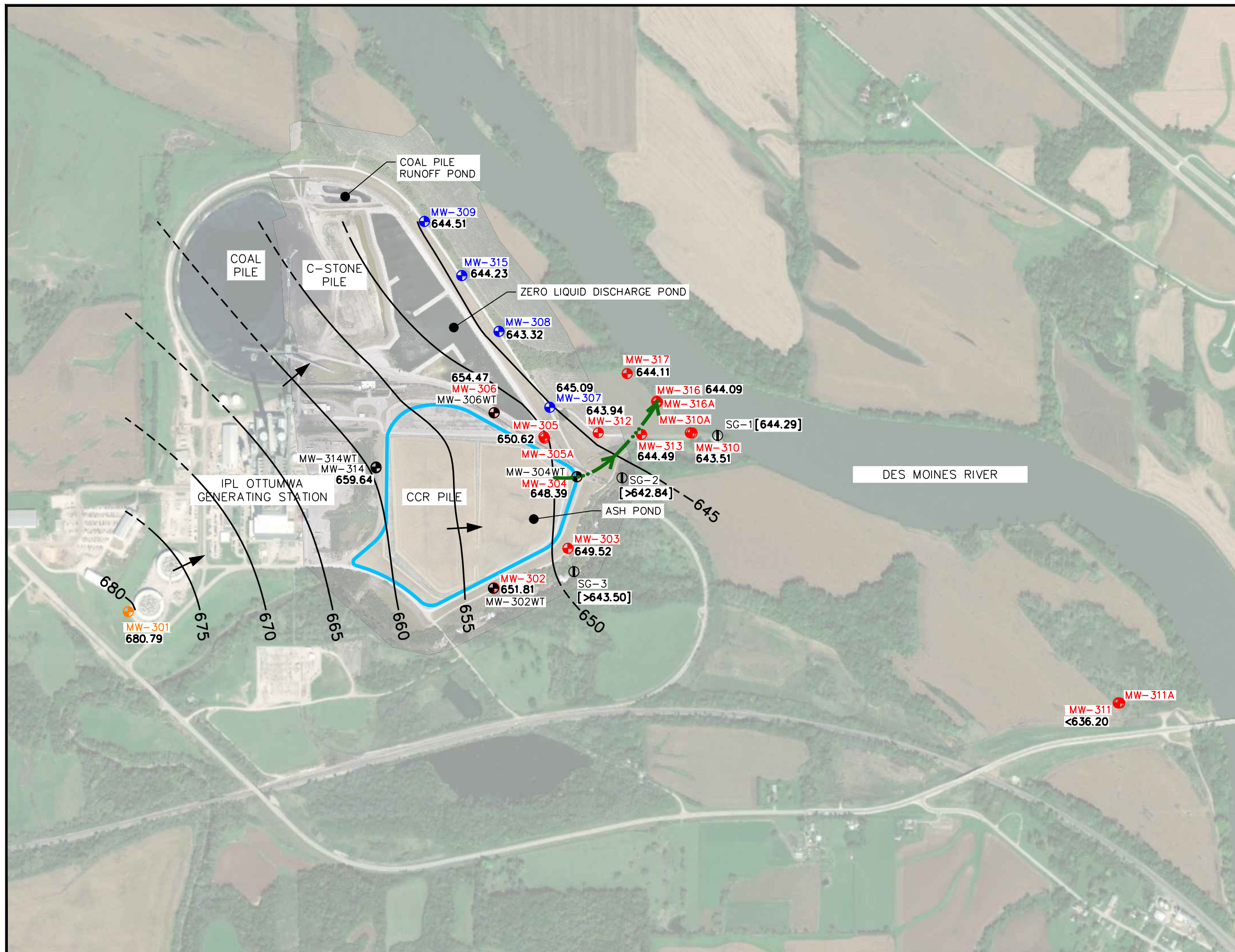


SCALE: 1" = 800'

PROJECT NO. 25223072.00	DRAWN BY: KP	<b>SCS ENGINEERS</b> 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	FIGURE 2
DRAWN: 12/05/2023	CHECKED BY: NLB				
REVISED: 12/21/2023	APPROVED BY: TK 1/17/2024				

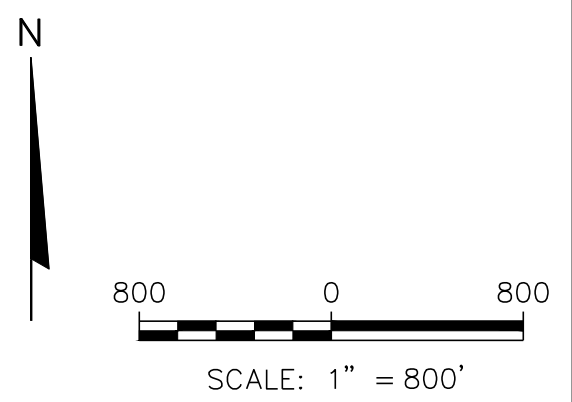
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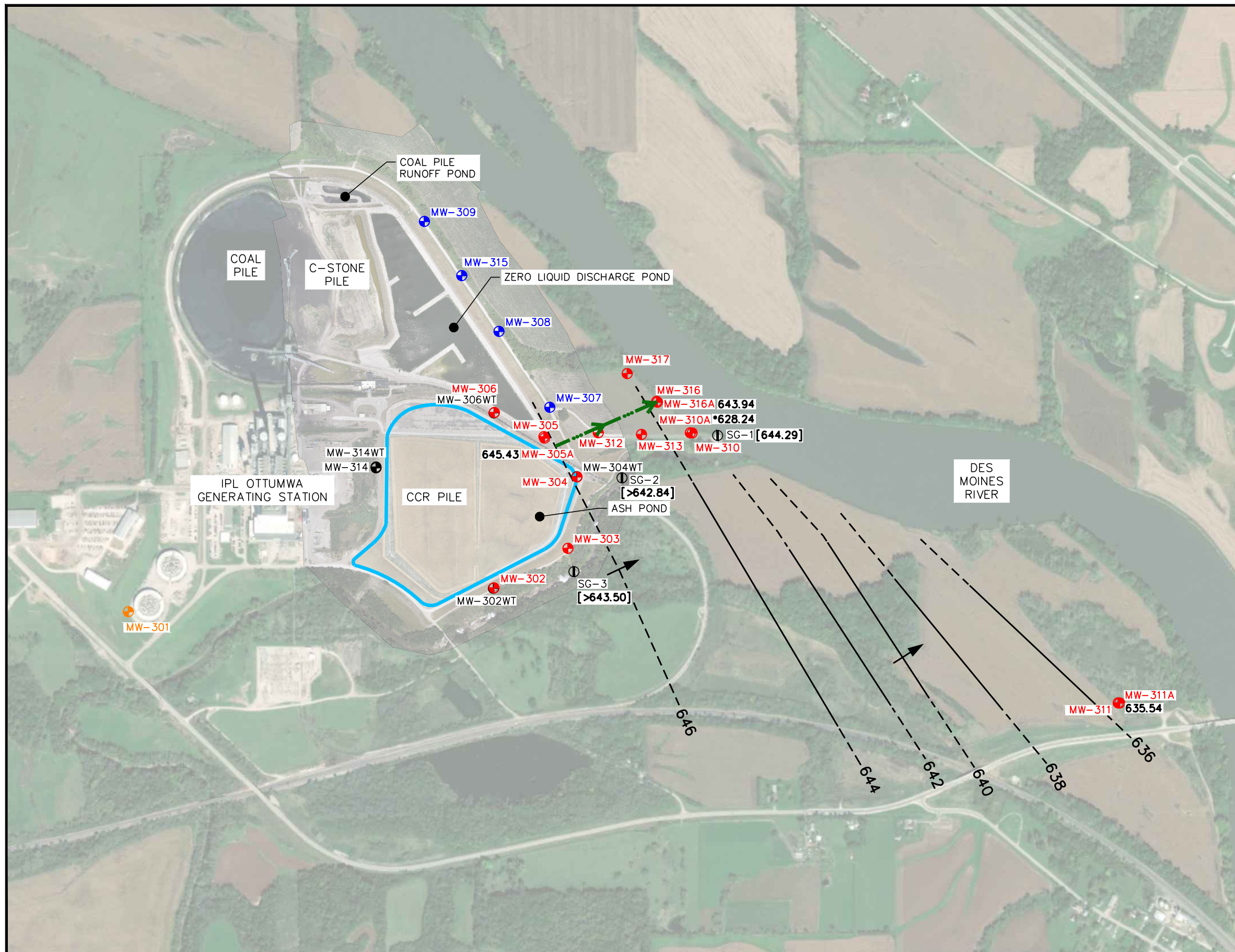
- LEGEND
- CCR UNIT
  - ⊕ CCR ZLDP MONITORING WELL
  - ⊕ CCR ASH POND MONITORING WELL
  - ⊕ CCR BACKGROUND MONITORING WELL
  - ⊕ WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
  - ⓪ SURFACE WATER ELEVATION MEASUREMENT LOCATION
  - [644.29]** SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED 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

- NOTES:
1. THE BACKGROUND MONITORING WELL FOR THE OGS ZERO LIQUID DISCHARGE POND IS MW-301.
  2. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF A PHOTOGRAPH FROM ESRI DATED 2014 AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19, 2023 IN THE CCR UNIT AREA.



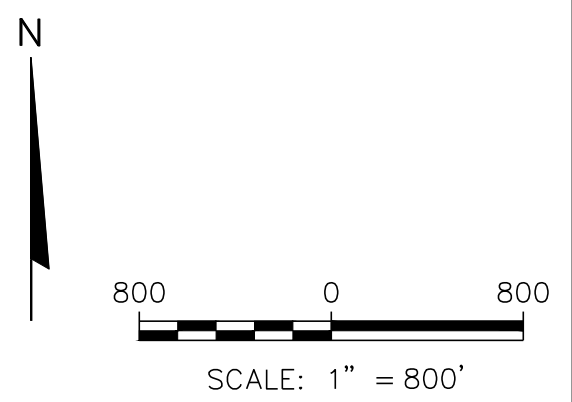
PROJECT NO. 25224072.00	DRAWN BY: SB	<b>SCS ENGINEERS</b> 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP APRIL 4-5, 2024	FIGURE
DRAWN: 05/05/2023	CHECKED BY: NLB					3
REVISED: 01/30/2025	APPROVED BY: BRK (01/30/2025)					





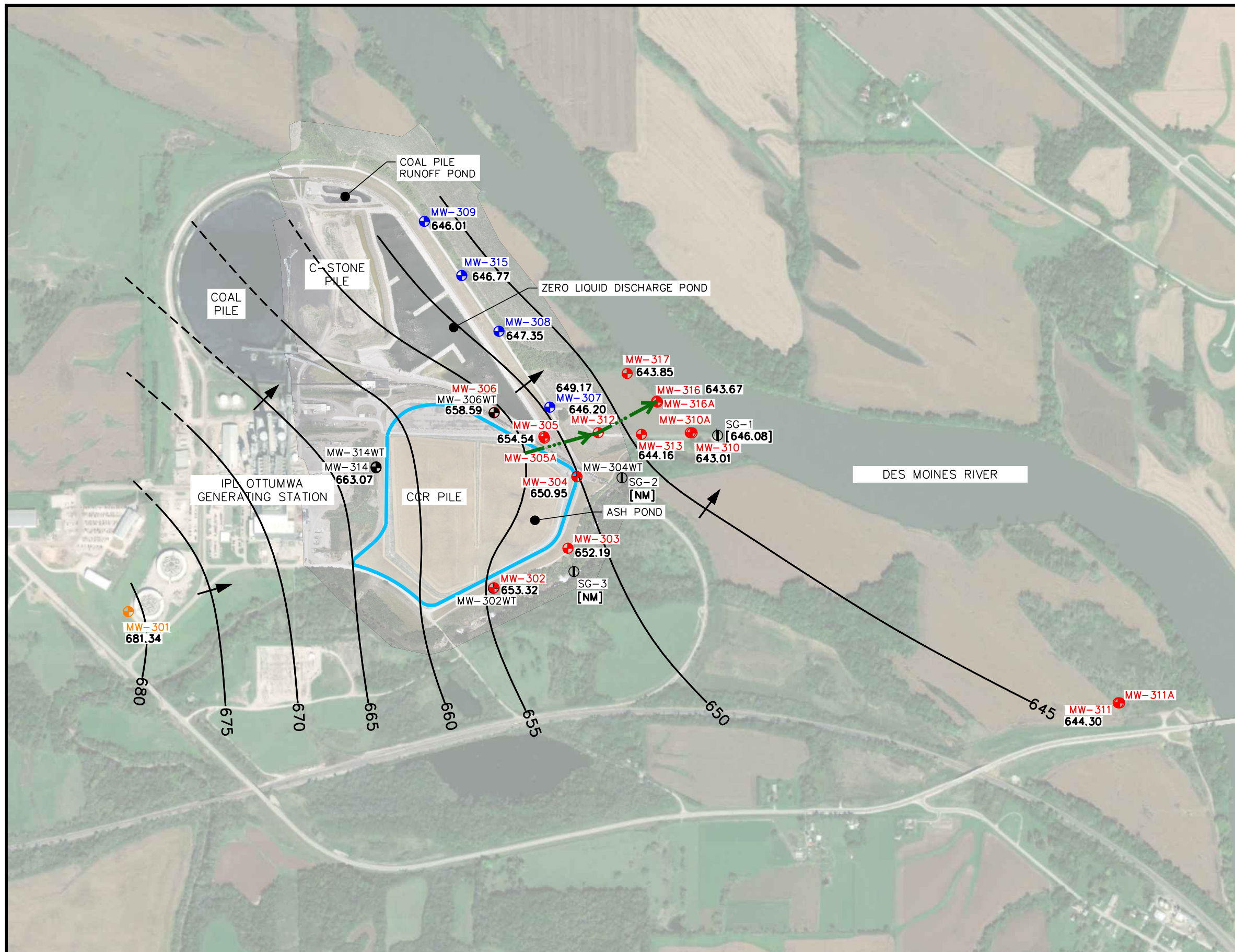
- LEGEND**
- CCR UNIT
  - ⊕ CCR ZLDP MONITORING WELL
  - ⊕ CCR ASH POND MONITORING WELL
  - ⊕ CCR BACKGROUND MONITORING WELL
  - ⊕ WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
  - ⊕ SURFACE WATER ELEVATION MEASUREMENT LOCATION
  - [644.29]** SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (APRIL 2024)
  - 643.94** DEEP PIEZOMETER POTENTIOMETRIC ELEVATION AT WELL (APRIL 2024)
  - POTENTIAL ANOMALOUS READING (NOT USED FOR INTERPRETATION)
  - POTENTIOMETRIC SURFACE CONTOUR (2-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
  - FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
  - APPROXIMATE GROUNDWATER FLOW DIRECTION

- NOTE:**
1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.
  2. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF A PHOTOGRAPH FROM ESRI DATED 2014 AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19, 2023 IN THE CCR UNIT AREA.



PROJECT NO.	25224072.00	DRAWN BY:	SB	<b>SCS ENGINEERS</b>	CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	DEEP PIEZOMETER POTENTIOMETRIC SURFACE CONTOUR MAP APRIL 4-5, 2024	FIGURE
DRAWN:	05/05/2023	CHECKED BY:	NLB							
REVISD:	01/17/2025	APPROVED BY:	BRK (01/30/2025)							

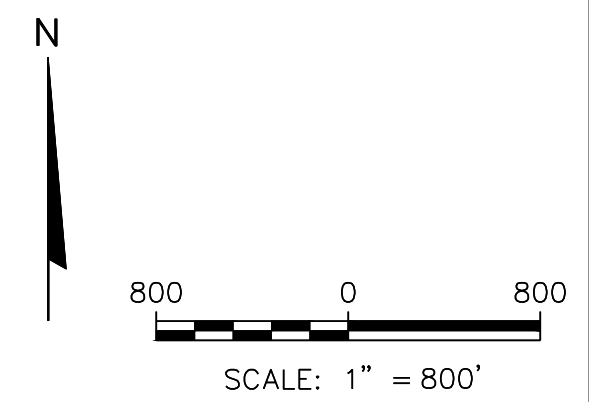




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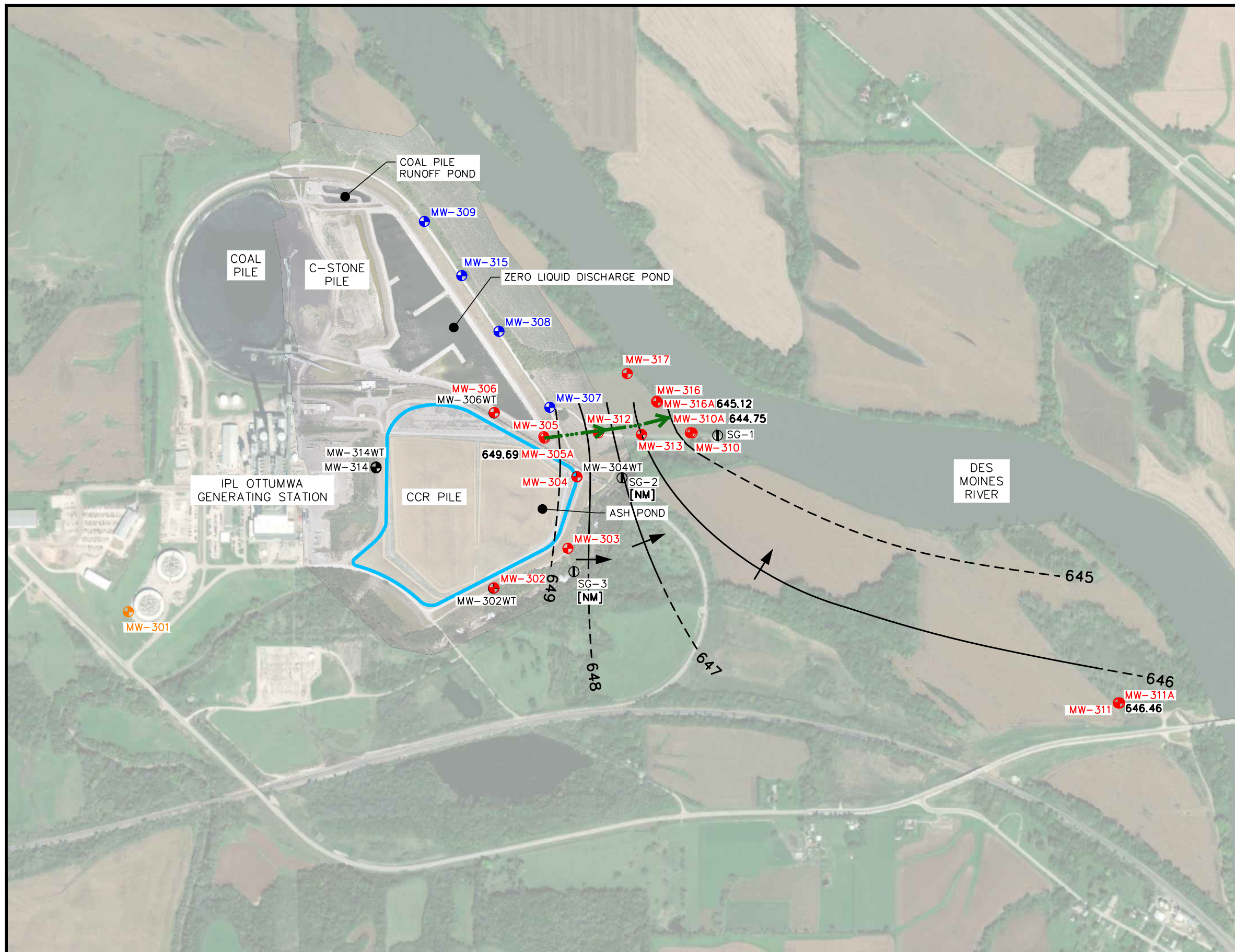
- CCR UNIT
- ⊕ CCR ZLDP MONITORING WELL
- ⊕ CCR ASH POND MONITORING WELL
- ⊕ CCR BACKGROUND MONITORING WELL
- ⊕ WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- ⊕ SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [646.08]** SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (AUGUST 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)

- NOTES:**
1. THE BACKGROUND MONITORING WELL FOR THE OGS ZERO LIQUID DISCHARGE POND IS MW-301.
  2. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF A PHOTOGRAPH FROM ESRI DATED 2014 AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19, 2023 IN THE CCR UNIT AREA.



PROJECT NO. 25224072.00	DRAWN BY: SB	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP AUGUST 2024	FIGURE
DRAWN: 10/31/2024	CHECKED BY: NLB					5
REVISED: 01/30/2025	APPROVED BY: BRK (01/30/2025)					

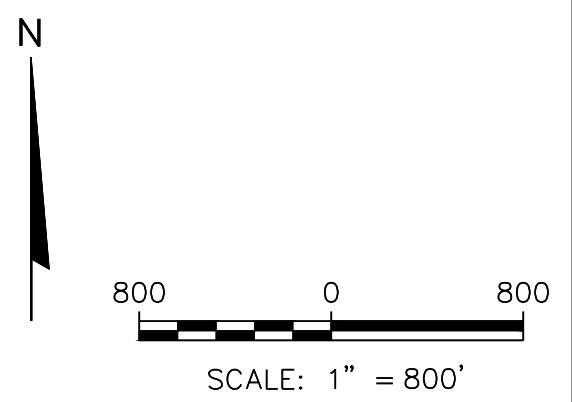




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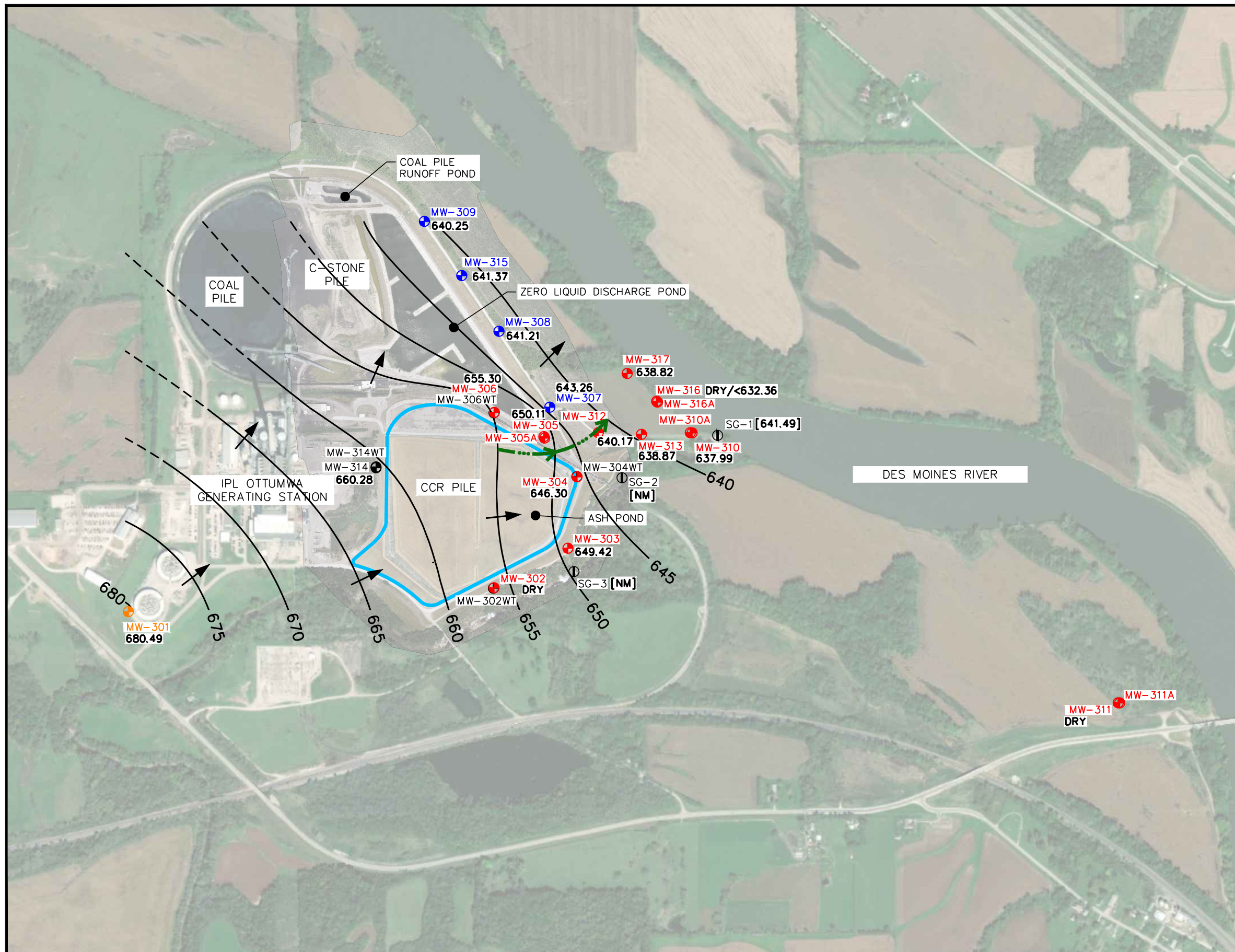
- CCR UNIT
- ⊕ CCR ZLDP MONITORING WELL
- ⊕ CCR ASH POND MONITORING WELL
- ⊕ CCR BACKGROUND MONITORING WELL
- ⊕ WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- ⊕ SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [651.74]** SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (AUGUST 2024)
- 649.69** DEEP PIEZOMETER POTENTIOMETRIC ELEVATION AT WELL (AUGUST 2024)
- POTENTIOMETRIC SURFACE CONTOUR (1-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)

- NOTES:**
- THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.
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PROJECT NO. 25224072.00	DRAWN BY: SB	<b>SCS ENGINEERS</b> 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	DEEP PIEZOMETER POTENTIOMETRIC SURFACE CONTOUR MAP AUGUST 2024	FIGURE
DRAWN: 10/31/2024	CHECKED BY: NLB/BRK					6
REVISED: 01/22/2025	APPROVED BY: BRK (01/30/2025)					

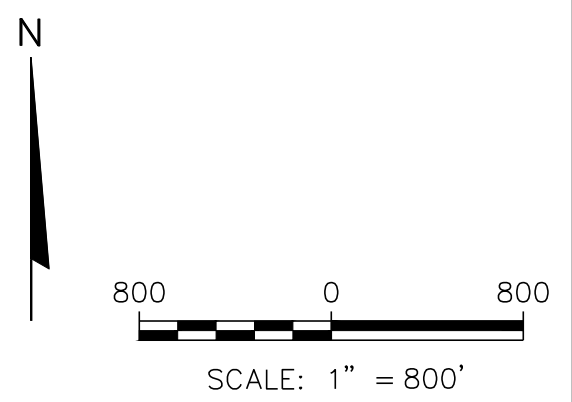




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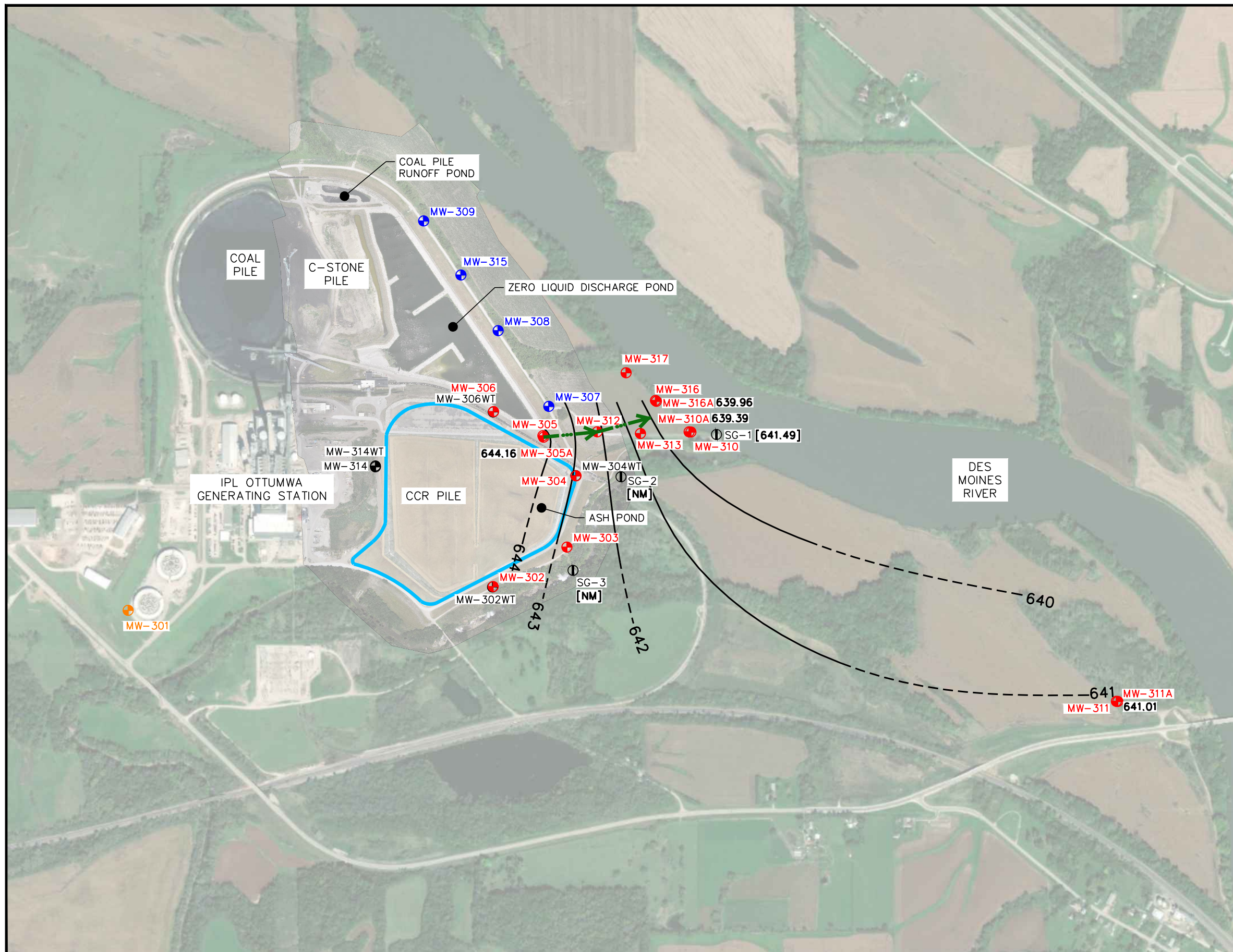
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- ⊕ CCR BACKGROUND MONITORING WELL
- ⊕ WATER LEVEL WELL (NOT PART OF CCR RULE MONITORING SYSTEM)
- ⊕ SURFACE WATER ELEVATION MEASUREMENT LOCATION
- [641.49]** SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (OCTOBER 2024)
- 680.49** 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)

- NOTES:**
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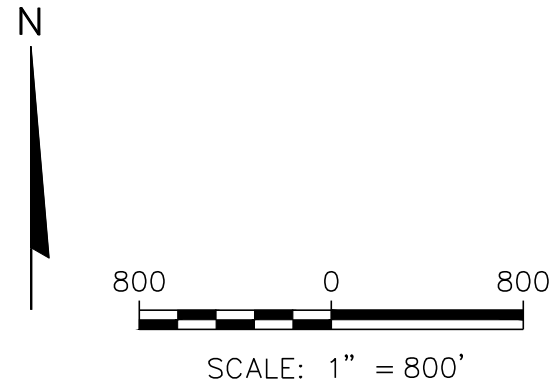
PROJECT NO. 25224072.00	DRAWN BY: SB		CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SHALLOW POTENTIOMETRIC SURFACE CONTOUR MAP OCTOBER 2024	FIGURE
DRAWN: 10/31/2024	CHECKED BY: NLB					7
REVISED: 01/30/2025	APPROVED BY: BRK (01/30/2025)					






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
<b>[641.49]</b>	SURFACE WATER OR GROUNDWATER ELEVATIONS NOT USED IN CONTOURING (OCTOBER 2024)
<b>644.16</b>	DEEP PIEZOMETER POTENTIOMETRIC ELEVATION AT WELL (OCTOBER 2024)
	POTENTIOMETRIC SURFACE CONTOUR (1-FT CONTOUR INTERVAL) (DASHED WHERE INFERRED)
	APPROXIMATE GROUNDWATER FLOW DIRECTION
	FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)

- NOTES:
1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.
  2. BACKGROUND AERIAL IMAGE IS A COMPOSITE OF A PHOTOGRAPH FROM ESRI DATED 2014 AND DRONE PHOTO BY RYAN INCORPORATED CENTRAL INC. DATED JUNE 19, 2023 IN THE CCR UNIT AREA.



PROJECT NO. 25224072.00	DRAWN BY: SB	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	DEEP PIEZOMETER POTENTIOMETRIC SURFACE CONTOUR MAP OCTOBER 2024	FIGURE
DRAWN: 10/31/2024	CHECKED BY: NLB/BRK					8
REVISED: 01/17/2025	APPROVED BY: BRK (01/30/2025)					





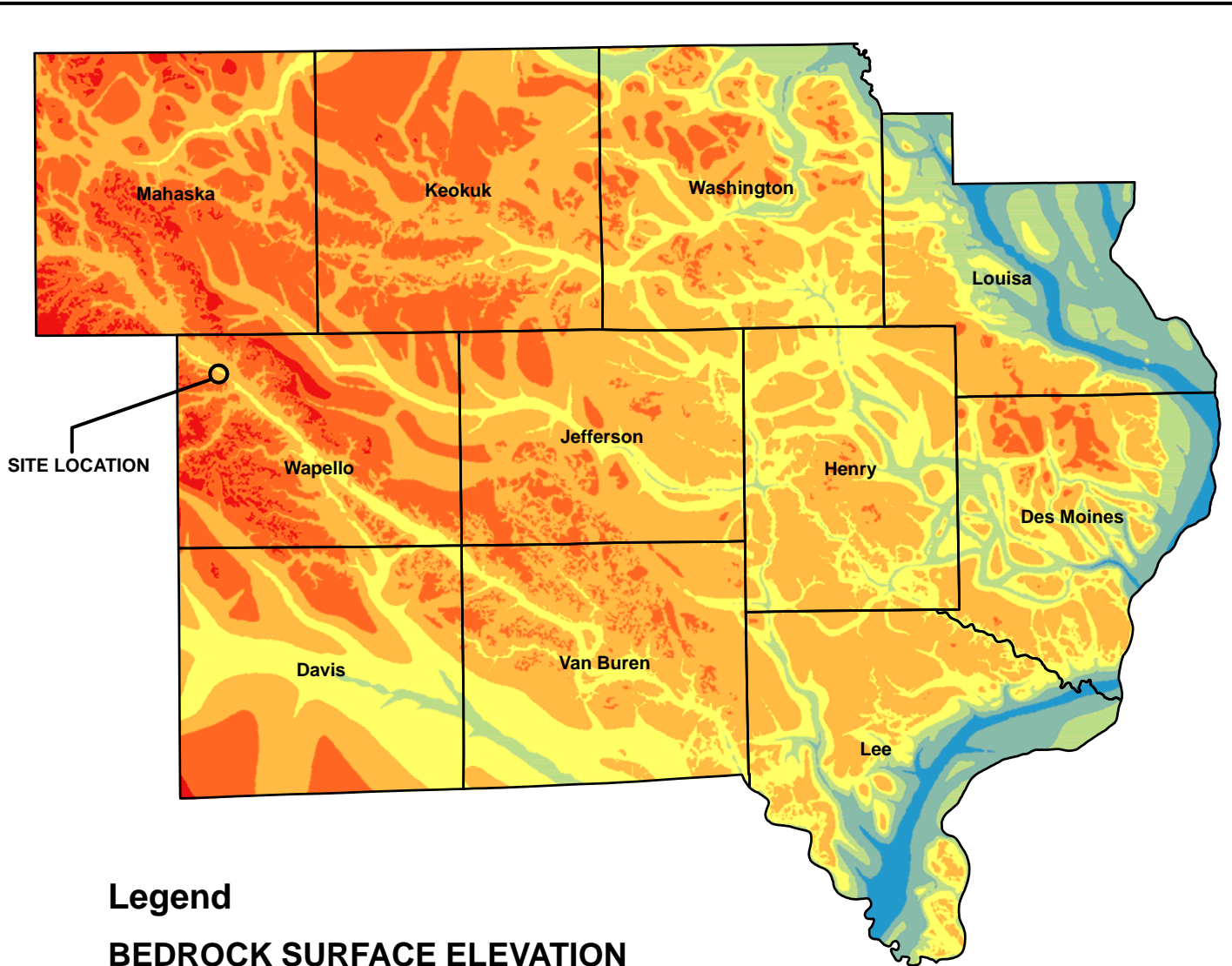
Appendix A  
Regional Hydrogeologic Information

**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	<ul style="list-style-type: none"> <li>• Sand, gravel, silt, and clay</li> <li>• Sand, gravel, silt, and clay</li> <li>• Till (sandy, pebbly clay), sand, and silt</li> </ul>
Pennsylvanian (180 to 310 million years old)	Aquiclude	0 to 370	Undifferentiated	<ul style="list-style-type: none"> <li>• Shale, sandstone, limestone, and coal</li> </ul>
Mississippian (310 to 345 million years old)	Mississippian Aquifer  • Upper	0 to 600	St. Louis Spergen	<ul style="list-style-type: none"> <li>• Limestone and sandstone</li> <li>• Limestone</li> </ul>
	• Lower		Warsaw Keokuk Burlington Hampton Starrs Cave	<ul style="list-style-type: none"> <li>• Shale and dolomite</li> <li>• Dolomite, limestone, and shale</li> <li>• Dolomite and limestone</li> <li>• Limestone and dolomite</li> <li>• Limestone</li> </ul>
	Aquiclude	0 to 425	Prospect Hill McCraney	<ul style="list-style-type: none"> <li>• Siltstone</li> <li>• Limestone</li> </ul>
Devonian (345 to 400 million years old)	Aquiclude	110 to 420	Yellow Spring Lime Creek	<ul style="list-style-type: none"> <li>• Shale, dolomite, and siltstone</li> <li>• Dolomite and shale</li> </ul>
	Devonian Aquifer		Cedar Valley Wapsipinicon	<ul style="list-style-type: none"> <li>• Limestone and dolomite</li> <li>• Dolomite, limestone, shale, and gypsum</li> </ul>
Silurian (400 to 425 million years old)		0 to 105	Undifferentiated	<ul style="list-style-type: none"> <li>• Dolomite</li> </ul>
Ordovician (425 to 500 million years old)	Aquiclude	150 to 600	Maquoketa Galena Decorah Platteville	<ul style="list-style-type: none"> <li>• Dolomite and shale</li> <li>• Dolomite and chert</li> <li>• Limestone and shale</li> <li>• Limestone, shale, and sandstone</li> </ul>
	Cambrian-Ordovician aquifer	750 to 1,110	St. Peter Prairie du Chien	<ul style="list-style-type: none"> <li>• Sandstone</li> <li>• Dolomite and sandstone</li> </ul>
Cambrian (500 to 600 million years old)		450 to 750+	Jordan St. Lawrence	<ul style="list-style-type: none"> <li>• Sandstone</li> <li>• Dolomite</li> </ul>
	Not considered an aquifer in southeast Iowa		Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> <li>• Shale, siltstone, and sandstone</li> <li>• Sandstone</li> <li>• Sandstone, shale, and dolomite</li> <li>• Sandstone</li> </ul>
Precambrian (600 million to 2 billion + years old)				<ul style="list-style-type: none"> <li>• Sandstone, igneous rocks, and metamorphic rocks</li> </ul>

\*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.

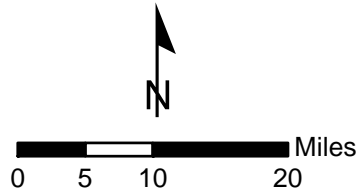


**Legend**

**BEDROCK SURFACE ELEVATION**

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

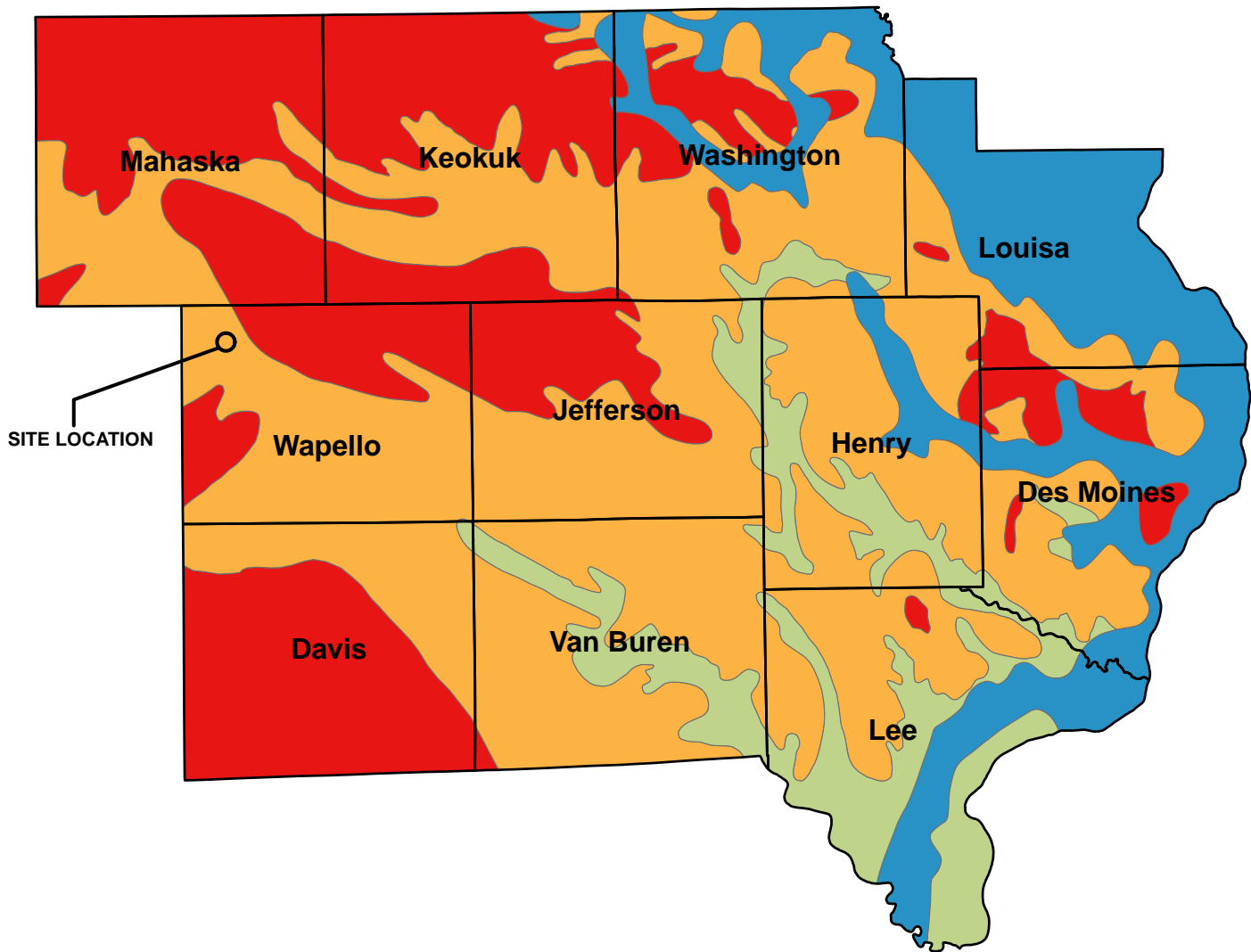
- BELOW 300
- 300 TO 400
- 400 TO 500
- 500 TO 600
- 600 TO 700
- 700 TO 800
- 800 TO 900



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

<b>CLIENT</b>	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	<b>SITE</b>	OTTUMWA GENERATING STATION OTTUMWA, IOWA	<b>SE IOWA REGIONAL BEDROCK SURFACE ELEVATION</b>
PROJECT NO. 25215053.03	DRAWN BY: JB	<b>ENGINEER</b>	<b>SCS ENGINEERS</b>	
DRAWN: 07/29/13	CHECKED BY: MDB		2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 FAX: (608) 224-2839	
REVISED: 05/29/15	APPROVED BY:		<b>FIGURE</b>	

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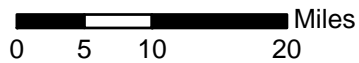


### Legend

#### MISSISSIPPIAN AQUIFER POTENTIOMETRIC SURFACE

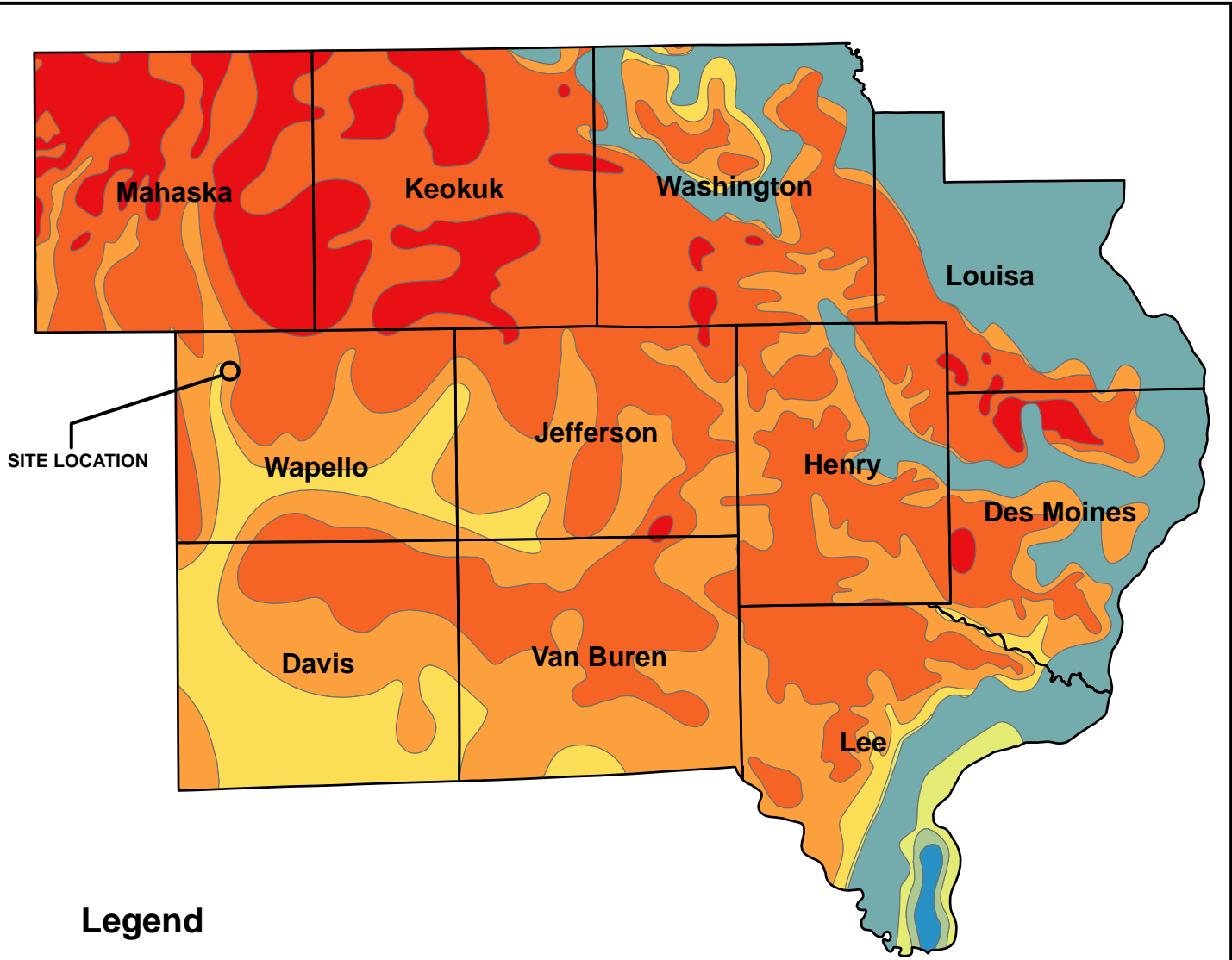
ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 550
- 650
- 750



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

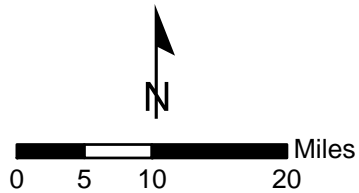
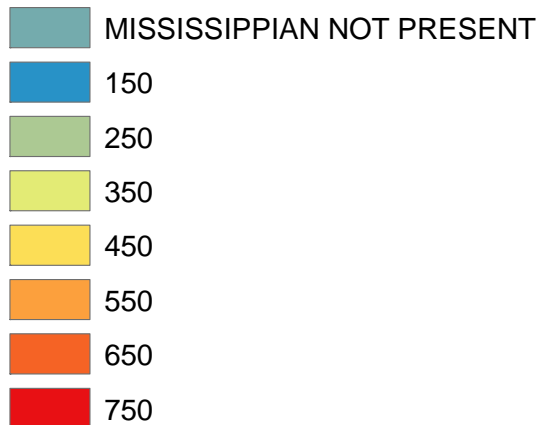
<b>CLIENT</b>	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	<b>SITE</b>	OTTUMWA GENERATING STATION OTTUMWA, IOWA	<b>SE IOWA REGIONAL MISSISSIPPIAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION</b>
PROJECT NO.	25215053.03	DRAWN BY:	JB	<b>SCS ENGINEERS</b> <small>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 FAX: (608) 224-2839</small>
DRAWN:	07/29/13	CHECKED BY:	MDB	
REVISED:	05/29/15	APPROVED BY:		
				<b>FIGURE</b>



**Legend**

**MISSISSIPPIAN AQUIFER ELEVATION**


ELEVATION ABOVE MEAN SEA LEVEL IN FEET



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

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Appendix B  
Boring Logs and Well Construction Documentation

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

Facility/Project Name IPL- Ottumwa Generating Station SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Todd Schmalfeld Cascade Drilling			Date Drilling Started 11/10/2015	Date Drilling Completed 11/10/2015	Drilling Method 4-1/4 hollow stem auger
Unique Well No.	DNR Well ID No.	Common Well Name MW-301	Final Static Water Level Feet	Surface Elevation 684.3 Feet	Borehole Diameter 8.5 in
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 400,077 N, 1,899,709 E S/C/N			Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		
NW 1/4 of SW 1/4 of Section 26, T 73 N, R 15 W			Lat _____ Long _____		
Facility ID		County Wapello	Civil Town/City/ or Village 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					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	TOPSOIL.	TOPSOIL										
			2	SANDY SILT WITH GRAVEL, gray (7.5YR 6/1), gravel is fine.	ML					W					
S1	10	woh 1 39	3												
			4												
			5												
			6												
S2	13	24 50	8	WEATHERED SANDSTONE, very weak, light gray matrix (10YR 7/1), secondary color very dark gray 910YR 3/1), massive.	SANDSTONE				W						
			9												
S3	5	50	10												
			11												
			12												
S4	6	50	13	Endo of Boring at 15 feet bgs.					W						
			14												
S5	4	50	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 53718	Tel: (608) 224-2830 Fax:
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Route To:  Watershed/Wastewater  Waste Management   
 Remediation/Redevelopment  Other

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-302</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/10/2015</b>		Date Drilling Completed <b>11/10/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-302</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>671.6 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>400,267 N, 1,902,625 E S/C/N</b>		Lat <b>° ' "</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W		Long <b>° ' "</b>		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

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					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	TOPSOIL.	TOPSOIL									
			2	LEAN CLAY WITH SAND, dark gray (10YR 4/1).										
			3											
			4											
			5											
			6											
			7											
			8		CL									
			9											
			10											
S1	19	14 57	11							M				
			12											
S2	19	24 711	13							M				
			14	LEAN CLAY WITH SAND, very dark gray (5Y 3/1).										
			15		CL									
			16											

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
---------------	---	-----------------------------



Boring Number MW-302

Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	24	23 99	17	POORLY GRADED SAND, olive yellow (2.5Y 6/6).	SP				M					
			18	LEAN CLAY, dark grayish brown (10YR 4/2).	CL									
S4	24	44 44	19	POORLY GRADED GRAVEL, fine.	GP				W				saturation @ 18 ft bgs.	
			20	LEAN CLAY, brownish yellow (10YR 6/8).	CL									
S5	15	23 36	21	POORLY GRADED GRAVEL WITH CLAY, gray (10YR 5/1), fine.					W					
			22		GP-GC									
S6	24	34 89	23						W					
			24	POORLY GRADED SAND, gray (10YR 5/1), medium grained.										
S7	24	43 68	25		SP				W					
			26											
			27											
S8	24	78 119	28	Same as above, but brown (10YR 5/3).					W					
			29	POORLY GRADED SAND, gray (10YR 5/1), fine grained, (weathered bedrock?).										
			30	Medium grained.										
S9	23	514 3350/4	31		SP				W					
			32											
S10	12	250/3	33						W					
			34	POORLY GRADED SAND, olive yellow (2.5Y 7/1), fine grained, (weathered bedrock?).										
			35											
S11	3	50/3	36		SP				W					
			37	End of Boring at 37 feet bgs.										

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-303</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>12/8/2015</b>		Date Drilling Completed <b>12/8/2015</b>	
Unique Well No.		DNR Well ID No.	Common Well Name <b>MW-303</b>	Final Static Water Level Feet	Surface Elevation <b>659.0 Feet</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/>		State Plane <b>400,583 N, 1,903,215 E S/C/N</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W		Lat _____ ' _____ "		Long _____ ' _____ "	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	FILL, boring location was cleared to 9' bgs by hydrovac, then back filled.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	WEATHERED SANDSTONE, medium grained, brown (10YR 5/4).										
S1	I	50	11	SANDSTONE										
			12											
			13											
S2	NR		14											
			14.5	End of Boring at 14.5 ft bgs.										

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
---------------	--	-----------------------------

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-304</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/11/2015</b>		Date Drilling Completed <b>11/11/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-304</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>680.1 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,152 N, 1,903,287 E S/C/N</b>		Lat _____ " _____ "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SE 1/4 of NE 1/4 of Section <b>26, T 73 N, R 15 W</b>		Long _____ " _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	TOPSOIL.	TOPSOIL										
			2	FAT CLAY, black (10YR 2/1).											
			3												
			4												
			5												
			6												
			7		CH										
			8												
			9												
			10												
S1	23	4 5 4 5	11								M				
			12												
			13	FAT CLAY, yellowish brown (10YR 5/4).											
S2	19.5	4 4 5 5	14		CH						M				
			15	FAT CLAY, yellowish brown (10YR 3/4).											
			16		CH										

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:



Boring Number MW-304

Page 2 of 3

Sample		Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)							Blow Counts	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	
S3	12	33 45	FAT CLAY, yellowish brown (10YR 3/4). (continued)					M					
		17											
S4	22	43 712						M					
		18											
S5	23	27 89						M					
		20											
S6	23	34 86						M					
		23											
S7	23	511 1511		CH				M					
		25											
S8	15	44 56						M					
		26											
S9	18	46 99						M					
		27											
S10	24	46 76						M					
		28											
S11	16	22 46	FAT CLAY, DARK OLIVE BROWN (2.5Y 3/3).					M					
		29											
S12	24	43 55		CH				M					
		30											
S13	18	23 33						M					
		31											
		32											
		33											
		34											
		35											
		36											
		37											
		38											
		39											
		40											
		41											
		42											

Boring Number MW-304

Page 3 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S14	24	3 4	43	FAT CLAY, DARK OLIVE BROWN (2.5Y 3/3). <i>(continued)</i>	CH									
		9 14	44	SANDY SILT, very dark gray.	ML					W				
S16	15	30 50/4	45	POORLY GRADED SAND, medium grained, gray (5Y 6/1), (weathered bedrock).	SP									
			46											
S17	5	33 50/2	47											
			48		W									
S18		50/4	49											
			50		W									
			51											
			52	End of Boring at 52 feet bgs.										

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-305</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>			Date Drilling Started <b>12/7/2015</b>		Date Drilling Completed <b>12/8/2015</b>
Unique Well No.	DNR Well ID No.	Common Well Name <b>MW-305</b>	Final Static Water Level <b>Feet</b>		Surface Elevation <b>681.5 Feet</b>
					Borehole Diameter <b>8.5 in</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,473 N, 1,903,023 E S/C/N</b>			Lat <input type="checkbox"/> ° <input type="checkbox"/> ' <input type="checkbox"/> "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W			Long <input type="checkbox"/> ° <input type="checkbox"/> ' <input type="checkbox"/> "		Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	


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					RQD/ Comments		
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200			
			0	TOPSOIL	TOPSOIL											
			1	GRAVEL	GP											
			2	FAT CLAY												
			3													
			4													
			5													
			6													
			7													
			8													
			9		CH											
			10													
			11	FAT CLAY, very dark grayish brown (10YR 3/2).												
S1	18	36 9 11	11													
			12													
			13	same as above except, brown (10YR 4/3).												
S2	22	37 14 22	13													
			14													
			15													
			16													

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Boring Number MW-305

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	22	5 15 14 15	17	FAT CLAY (continued)										
S4	20	3 5 13 15	18 19		CH									
S5	24	4 5 7 11	20 21 22	FAT CLAY WITH SILT, dark gray (10YR 4/1).					M					
S6	20	7 11 15 20	23 24	same as above except, very dark brown (10YR 2/2).					M					
S7	24	4 8 11 12	25 26 27	same as above except, very dark gray (10YR 3/1).	CH				M					
S8	24	8 12 16 21	28 29						M					
S9	13	4 4 7 12	30 31 32						M					
S10	24	5 6 9	33 34	LEAN CLAY, very dark brown (10YR 2/2).					W					
S11	24	4 4 5 7	35 36 37		CL				W					
S12	22	2 2 3 5	38 39	same as above except, very dark grayish brown (10YR 3/2).					W					
S13	6	3 9 11	40 41 42	POORLY GRADED SANDY GRAVEL, fine, brown (10YR 4/3).	GPS				W				water @ 41.0 ft bgs.	



Boring Number MW-305

Page 3 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S14	22	23 50	43	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4), (weathered bedrock). <i>(continued)</i>	SP										
			44												
			45												
S15	6	5 10 50	46		SP										
			47												
			48												
S16	6	50	49												
			50	End of Boring at 50 ft bgs.											



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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-306</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/12/2015</b>		Date Drilling Completed <b>11/12/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-306</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>681.1 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/>		State Plane <b>401,666 N, 1,902,629 E S/C/N</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Lat _____ ° _____ ' _____ "		Long _____ ° _____ ' _____ "	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	TOPSOIL.	TOPSOIL									
			2	FAT CLAY, dark olive brown (2.5Y 3/3).										
			3											
			4											
			5											
			6											
			7		CH									
			8											
			9											
			10											
S1	18	36 9 11	11								M			
			12											
			13											
S2	22	56 7 9	14	FAT CLAY, gray (10YR 5/1).	CH						M			
			15											
			16											

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

Signature <i>Kyle Kramer</i>	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Boring Number MW-306

Page 2 of 2

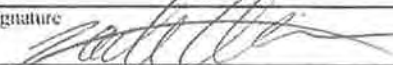
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	22	5 10 10 14	17	FAT CLAY, gray (10YR 5/1). (continued) FAT CLAY, gray (10YR 5/1).	CH				M					
S4	13	5 8 14 17	18	FAT CLAY, dark olive brown (2.5Y 3/3).					M					
S5	15	5 6 13 16	21		CH				W					
S6	15	3 5 7 9	23						W					
S7	22	2 5 7 11	26	POORLY GRADED SAND, very dark grayish brown (10YR 3/2), medium to coarse grained, (weathered bedrock?).					W					
S8	NR	7 3 4 3	28						W					
S9	18	1 1 2 2	31		SP				W					
S10	13	WOR	33						W					
			34	End of Boring at 34.5 feet bgs.										

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

<b>Facility/Project Name</b> IPL - Ottumwa Generating Station SCS#: 25219028.00		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-310	
<b>Boring Drilled By: Name of crew chief (first, last) and Firm</b> Eric Wetzel Roberts Environmental Drilling, Inc.			<b>Date Drilling Started</b> 8/27/2019		<b>Date Drilling Completed</b> 8/27/2019
<b>Drilling Method</b> 4 1/4 hollow stem auger	<b>WI Unique Well No.</b>	<b>DNR Well ID No.</b>	<b>Common Well Name</b> MW-310	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> 655.76 Feet MSL
<b>Borehole Diameter</b> 8.5 in.	<b>Local Grid Origin</b> <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or <b>Boring Location</b> <input checked="" type="checkbox"/>	<b>State Plane</b> 401,502 N, 1,904,206 E S/C/N	<b>Lat</b> _____ "	<b>Local Grid Location</b>	<b>Feet</b> <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
<b>1/4 of</b>	<b>1/4 of Section</b>	<b>T</b>	<b>N, R</b>	<b>Long</b> _____ "	
<b>Facility ID</b>		<b>County</b> Wapello	<b>County Code</b>	<b>Civil Town/City/ or Village</b> Ottumwa	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FTD	Soil Properties					ROD/ Comments			
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200				
			1	Hydrovac through clay for utility clearances													
			2														
			3														
			4														
			5														
			6														
			7														
			8	LEAN CLAY, brown, massive													
S1	11	WOR 10 10	9	Some reddish brown and grey mottling, some silt.									M				
S2	15	22 32	11										M				
S3	20	11 19	13										M/W				
			14	SILT, brown, with clay													
			15														

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

<b>Signature</b> 	<b>Firm</b> SCS Engineers 2830 Dairy Drive Madison, WI 53718	Tel: 608-224-2830 Fax
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Boring Number		MW-310		Use only as an attachment to Form 4400-122						Page 2 of 2				
Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	24	WOR	16		ML				M/W					
S5	18	13 23	17	POORLY GRADED SAND, fine to medium, 1/2" coarse sand seam at 17.75'					W					
S6	14	WOR WOR 23	19						W					
S7	10	WOR 2 42	21		SP				W					
			22	Trace small rounded gravel										
S8	24	66 1120	23						W					
			24	End of boring at 24'										




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

Facility/Project Name IPL - Ottumwa Generating Station SCS#: 25219028.00		License/Permit/Monitoring Number		Boring Number MW-311	
Boring Drilled By: Name of crew chief (first, last) and Firm Eric Wetzel Roberts Environmental Drilling, Inc.			Date Drilling Started 8/27/2019	Date Drilling Completed 8/27/2019	Drilling Method 4 1/4 hollow stem auger
WI Unique Well No.	DNR Well ID No.	Common Well Name MW-311	Final Static Water Level Feet MSL	Surface Elevation 651.24 Feet MSL	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 399,350 N, 1,907,603 E S/C/N 1/4 of 1/4 of Section T N. R.			Local Grid Location Lat _____ " Feet <input type="checkbox"/> N <input type="checkbox"/> E Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Wapello	County Code	Civil Town/City/ or Village 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					RQD/ Comments			
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200				
S1	14	23 4.6	1	LEAN CLAY, brown, massive, trace fine to medium sand, roots, 1" sand seam at 1.5'	CL												
S2	14	33 4.6	4		CL												
S3	6	23 4.6	6	SILT, brown, massive.	ML												
S4	20	23 4.5	8	LEAN CLAY, brown, massive.	CL												
S5	12	23 4.5	10	POORLY GRADED SAND, fine to medium, brown massive.													
S6	14	12 4.2	12	2" clay seam at 10.5'													
S7	14	12 3.3	14		SM												


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: 608-224-2830 Fax

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**SOIL BORING LOG INFORMATION SUPPLEMENT**  
 Form 4400-122A


Boring Number **MW-311** Use only as an attachment to Form 4400-122. Page **2** of **2**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16	End of boring at 16'	SI									

Facility/Project Name IPL-Ottumwa Generating Station		SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-305A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services				Date Drilling Started 2/25/2020		Date Drilling Completed 2/27/2020	
DNR Well ID No.		Common Well Name MW-305A		Final Static Water Level 32.7 Feet		Surface Elevation 681.76 Feet	
						Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 401,461 N, 1,903,028 E S/C/N SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W				Lat _____ ° _____ ' _____ " _____ ° _____ ' _____ "		Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> S      Feet <input type="checkbox"/> E <input type="checkbox"/> W	
Facility ID		County Wapello		County Code		Civil Town/City/ or Village Ottumwa	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Hydrovaced to 9.5 feet for utility clearance.										Drilled using hollow stem augers to 55 feet
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	Blind drilled to 46 feet. See boring log MW-305 for lithology.										
			11											
			12											
			13											
			14											
			15											

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

Signature 	Firm scs engineers	Tel: Fax:
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Boring Number **MW-305A** Use only as an attachment to Form 4400-122. Page **4** of **4**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			66 67 68 69 70 71 72 73 74 75 76 77 78 79 80	LIMESTONE, light gray, with fine, light brown sandstone, (bedrock).										
				LIMESTONE, gray, with dark brownish gray shale, (bedrock).										
				SANDSTONE, fine, light grayish white, with gray limestone, (bedrock).										
				End of boring at 80 feet below ground surface.										At 68 feet, driller noted a fracture in the bedrock.

Facility/Project Name IPL-Ottumwa Generating Station		SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-310A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services				Date Drilling Started 2/27/2020		Date Drilling Completed 3/2/2020	
DNR Well ID No.		Common Well Name MW-310A		Final Static Water Level 12.0 Feet		Surface Elevation 655.26 Feet	
						Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 401,504 N, 1,904,191 E S/C/N SW 1/4 of NW 1/4 of Section 25, T 73 N, R 15 W				Lat _____ ° _____ ' _____ "		Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Wapello		County Code		Civil Town/City/ or Village Ottumwa	




Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Hydrovaced to 8 feet for utility clearance.										Drilled using hollow stem augers to 40 feet
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9	Blind drilled to 24 feet. See boring log MW-310 for lithology.										
			10											
			11											
			12											
			13											
			14											
			15											

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

Signature	Firm scs engineers	Tel: Fax:
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Boring Number **MW-310A** Use only as an attachment to Form 4400-122. Page **2** of **3**


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16											
			17											
			18											
			19											
			20											
			21											
			22											
			23											
S1	14	7 20 23 21	24	POORLY GRADED SAND, fine to coarse, brown, trace gravel and lenses of lean clay.	SP									
			25							W				
			26	POORLY GRADED SAND, fine, light gray, trace lean clay, (weathered sandstone bedrock).										
S2	17	9 11 12 13	27							W				
			28	Same as above but brown with small gravel.										
S3	13	14 36 50/5	29							W				
			30	Same as above but fine to medium and brown to light gray.										
S4	5	50/5	31							W				
			32	Same as above but fine and light gray.										
S5	5	50/5	33		SP					W				
			34											
S6	5	50/5	35							W				
			36											
S7	5	50/5	37							W				
			38											
S8	4	50/4	39							W				
			40	Same as above but much more competent.										Auger refusal at 39 feet

Boring Number **MW-310A** Use only as an attachment to Form 4400-122. Page **3** of **3**


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments												
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200													
S9			41	LIMESTONE, light brownish gray, with fine to medium light gray sandstone, (bedrock).	SP																					
			42																							
			43	Same as above but with gravel and very little sand.																						
			44																							
			45																							
			46																							
			47																							
			48																							
			49																							
			50																							
			51																							
			52																							
			53																							
			54	End of boring at 54 feet below ground surface.																						

Switching to air rotary drilling at 40 feet  
 Intermittent gravel between 43 to 54 feet

Facility/Project Name IPL-Ottumwa Generating Station      SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-311A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services		Date Drilling Started 3/2/2020		Date Drilling Completed 3/3/2020	
DNR Well ID No.		Common Well Name MW-311A		Final Static Water Level 8.9 Feet	
				Surface Elevation 651.16 Feet	
				Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/>			Local Grid Location		
State Plane      399,349 N, 1,907,615 E      S/C/N			Lat _____ ° _____ ' _____ "		
SW    1/4 of SE    1/4 of Section 25,    T 73 N, R 15 W			Long _____ ° _____ ' _____ "		
Facility ID		County Wapello		County Code	
				Civil Town/City/ or Village Ottumwa	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Blind drilled to 16 feet. See boring log MW-311 for lithology.									Drilled using hollow stem augers to 28 feet	

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

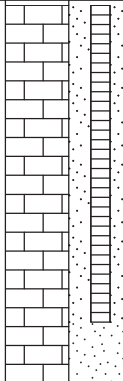
Signature 	Firm    scs engineers	Tel: Fax:
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Boring Number **MW-311A** Use only as an attachment to Form 4400-122. Page **2** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16	POORLY GRADED SAND, fine to coarse, brown, with trace gravel and silt.										
S1	2		17							W				Began collecting split spoon samples at 16 feet
S2	11	4 5 6 7	19							W				
S3	12	5 5 6 7	21		SP					W				
S4		7 8 9 8	23							W				No return
S5		3 3 5 10	25							W				No return
S6	14	5 9 50/5	27							W				Driller noted bedrock at 27.5 feet
			28	POORLY GRADED SAND, very fine, white, with pieces of competent rock, (weatherd sandstone bedrock).	SP									Switched to air rotary drilling at 28 feet
			29	LIMESTONE, gray with fine, light gray to white sandstone, (bedrock).										
			31	POORLY GRADED SAND, fine to medium, brown, with trace brown limestone, (bedrock).										
			32											
			34		SP									
			37	LIMESTONE, gray, with fine to medium brownish gray sandstone, (bedrock).										
			38											
			39											
			40											

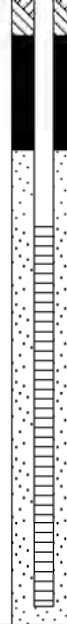
Boring Number **MW-311A** Use only as an attachment to Form 4400-122. Page **3** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			41 42 43 44 45 46											
			46	End of boring at 46 feet below ground surface.										




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

Facility/Project Name <b>IPL-Ottumwa Generating Station</b> SCS#: 25220083.00		License/Permit/Monitoring Number		Boring Number <b>MW-302WT</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Brian Kinzer Direct Push Analytical</b>			Date Drilling Started <b>4/27/2022</b>	Date Drilling Completed <b>4/27/2022</b>	Drilling Method <b>hollow stem auger</b>
Unique Well No.	DNR Well ID No.	Common Well Name <b>MW-302WT</b>	Final Static Water Level <b>Feet MSL</b>	Surface Elevation <b>671.54 Feet MSL</b>	Borehole Diameter <b>8.25 in</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>400,264 N, 1,902,620 E</b> S/C/N			Lat <b>41° 5' 40.9"</b>		Local Grid Location
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 16 W			Long <b>-92° 32' 55.2"</b>		<input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Wapello</b>	Civil Town/City/ or Village <b>Ottumwa</b>		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2 4 6 8 10 12 14 16	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 16.5 feet bgs. See boring log MW-302 for lithology.										
				End of boring at 16.5 feet below ground surface.										

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 608-224-2830	Tel: Fax:
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Route To: Watershed/Wastewater  Waste Management   
Remediation/Redevelopment  Other

Facility/Project Name <b>IPL-Ottumwa Generating Station</b> SCS#: 25220083.00		License/Permit/Monitoring Number		Boring Number <b>MW-304WT</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Brian Kinzer Direct Push Analytical</b>		Date Drilling Started <b>4/27/2022</b>		Date Drilling Completed <b>4/27/2022</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-304WT</b>	
Final Static Water Level <b>645.38 Feet MSL</b>		Surface Elevation <b>679.69 Feet MSL</b>		Borehole Diameter <b>8.25 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,154 N, 1,903,286 E      S/C/N</b>		Lat <b>41° 5' 49.6"</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E	
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Long <b>-92° 32' 46.4"</b>		Feet <input type="checkbox"/> S      Feet <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

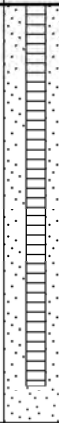
Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2 4 6 8 10 12 14 16 18 20 22 24	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 36 feet bgs. See boring log MW-304 for lithology.										

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

Signature	Firm <b>SCS Engineers 2830 Dairy Drive, Madison, WI 608-224-2830</b>	Tel: _____ Fax: _____
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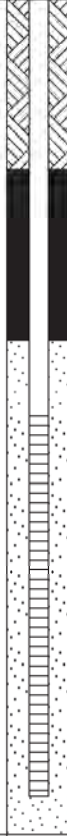
Boring Number MW-304WT

Page 2 of 2


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26 28 30 32 34 36											
			36	End of boring at 36 feet below ground surface.										

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

Facility/Project Name <b>IPL-Ottumwa Generating Station</b> SCS#: 25220083.00		License/Permit/Monitoring Number		Boring Number <b>MW-306WT</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Brian Kinzer Direct Push Analytical</b>		Date Drilling Started <b>4/27/2022</b>		Date Drilling Completed <b>4/27/2022</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-306WT</b>	
Final Static Water Level <b>655.25 Feet MSL</b>		Surface Elevation <b>681.34 Feet MSL</b>		Borehole Diameter <b>8.25 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,662 N, 1,902,626 E S/C/N</b>		Lat <b>41° 5' 54.7"</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Long <b>-92° 32' 55.0"</b>			
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 22 feet bgs. See boring log MW-306 for lithology.										
			2											
			4											
			6											
			8											
			10											
			12											
			14											
			16											
			18											
			20											
			22	End of boring at 22 feet below ground surface.										

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 608-224-2830	Tel: Fax:
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Route To:  Watershed/Wastewater  Waste Management   
 Remediation/Redevelopment  Other

Facility/Project Name <b>IPL-Ottumwa Generating Station</b> SCS#: 25220083.00		License/Permit/Monitoring Number		Boring Number <b>MW-314</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Brian Kinzer Direct Push Analytical</b>		Date Drilling Started <b>4/28/2022</b>		Date Drilling Completed <b>4/28/2022</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-314</b>	
Final Static Water Level <b>667.67 Feet MSL</b>		Surface Elevation <b>681.89 Feet MSL</b>		Borehole Diameter <b>8.25 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,224 N, 1,901,685 E S/C/N</b>		Lat <b>41° 5' 50.5"</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SW 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Long <b>-92° 33' 7.3"</b>		Feet <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	


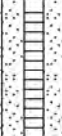


Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0-2	Hydrovaced to 8 feet below ground surface (bgs).											
S1	20		6-8	LEAN CLAY, gray to dark gray with orange mottling, trace sand (backfill), medium stiff.						M					Hydrovaced hole collapsed in from 6 to 8 feet bgs
S2	44		10-12	Same as above but gray to brownish gray with trace organics, medium stiff.						M					
S3	33		14-16	Same as above but soft to medium stiff.	CL					M					
S4	48		18-20	Same as above but stiff to very stiff.						M					
S5	48		22-24	Same as above but stiff to very stiff.						M/W					
			24	POORLY GRADED SAND, fine to coarse grained, brown to orangish brown, with trace clay.	SP										

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 608-224-2830	Tel: Fax:
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Boring Number MW-314

Page 2 of 2


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S6	29		26	Same as above but with trace fine gravel.	SP					W				
S7	24		28											
			30	SANDY LEAN CLAY, fine to coarse grained, brown to orangish brown, brownish gray, and trace white, with trace gravel and organics. White clay appears to be thixotropic in composition.	CL					W				
				End of boring at 31 feet below ground surface.										




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

Facility/Project Name <b>IPL-Ottumwa Generating Station</b> SCS#: 25220083.00		License/Permit/Monitoring Number		Boring Number <b>MW-314WT</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Brian Kinzer Direct Push Analytical</b>			Date Drilling Started <b>4/28/2022</b>	Date Drilling Completed <b>4/28/2022</b>	Drilling Method <b>hollow stem auger</b>
Unique Well No.	DNR Well ID No.	Common Well Name <b>MW-314WT</b>	Final Static Water Level <b>667.85 Feet MSL</b>	Surface Elevation <b>681.74 Feet MSL</b>	Borehole Diameter <b>8.25 in</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,232 N, 1,901,685 E S/C/N</b> <b>SW 1/4 of NE 1/4 of Section 76, T 73 N, R 15 W</b>			Local Grid Location Lat <b>41° 5' 50.6"</b> <input type="checkbox"/> N <input type="checkbox"/> E Long <b>-92° 33' 7.3"</b> <input type="checkbox"/> S <input type="checkbox"/> W		

Facility ID	County <b>Wapello</b>	Civil Town/City/ or Village <b>Ottumwa</b>
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Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0-22.5	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 22.5 feet bgs. See boring log MW-314 for lithology.										
			22.5	End of boring at 22.5 feet below ground surface.										

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


Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 608-224-2830	Tel: Fax:
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Route To:  Watershed/Wastewater  Waste Management   
 Remediation/Redevelopment  Other

Facility/Project Name <b>Ottumwa Generating Station</b> SCS#: 25221162.00		License/Permit/Monitoring Number		Boring Number <b>MW-312</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Mike Mueller Cascade Drilling</b>			Date Drilling Started <b>12/14/2021</b>		Date Drilling Completed <b>12/14/2021</b>
Unique Well No.	DNR Well ID No.	Common Well Name <b>MW-312</b>	Final Static Water Level <b>642.2 Feet</b>		Surface Elevation <b>655.4 Feet</b>
Borehole Diameter <b>6.0 in</b>	Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,504 N, 1,903,457 E</b> <input checked="" type="checkbox"/> C/N <b>SE 1/4 of NE 1/4 of Section 26, T 72 N, R 15 W</b>				
Local Grid Location	Lat <b>41° 5' 53.1"</b>		<input type="checkbox"/> N	<input type="checkbox"/> E	<input type="checkbox"/> W
Long <b>-92° 32' 44.1"</b>	Feet <input type="checkbox"/> S	Feet <input type="checkbox"/> W			
Facility ID		County <b>Wapello, Iowa</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1-7	Hydrovacued to 8' below ground surface through clay.											
S1	21		8-10	LEAN CLAY, dark grayish brown (10YR 4/2) with trace roots, medium stiff.					1.0	M					
S2	46		10-15	Same as above but stiff to medium stiff with brown and black mottling.	CL				0.75-1.25M/W						Water is at 11.5' bgs.

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 53718 608-224-2830	Tel: Fax:
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Boring Number MW-312

Page 2 of 2


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16	Same as above but dark gray.	CL									
S3	60		17	SILT, dark grayish brown (10YR 4/2) to gray - dark gray (2.5Y 3/1), soft to medium stiff.	ML			0.5/0.25-0.5W						
			18											
			19											
			20	POORLY GRADED SAND, fine to coarse grained, orange brown to white with trace gravel.										
			21	Same as above but fine grained, white to light gray (5Y 7/1) with pieces of rock and trace cobbles (Weathered Bedrock).										
S4	60		22		SP					M				Hard drilling from 20-27.5' bgs.
			23											
			24											
			25	Same as above										
S5	28		26							M				Sampled S4 and S5.
			27											
				End of boring at 27.5' below ground surface.										

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

Facility/Project Name <b>Ottumwa Generating Station</b>		SCS#: 25221162.00		License/Permit/Monitoring Number		Boring Number <b>MW-313</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Mike Mueller Cascade Drilling</b>				Date Drilling Started <b>12/14/2021</b>		Date Drilling Completed <b>12/14/2021</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-313</b>		Final Static Water Level <b>641.2 Feet</b>	
				Surface Elevation <b>655.8 Feet</b>		Borehole Diameter <b>6.0 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,491 N, 1,903,802 E</b> <input checked="" type="checkbox"/> C/N				Lat <b>41° 5' 52.9"</b>		Local Grid Location	
<b>SW 1/4 of NW 1/4 of Section 25, T 73 N, R 15 W</b>				Long <b>-92° 32' 39.6"</b>		<input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County <b>Wapello, Iowa</b>		Civil Town/City/ or Village <b>Ottumwa</b>			

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					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	Hydrovacued to 8' below ground surface through clay.											
			2												
			3												
			4												
			5		CL										
			6												
			7												
S1	12		8	LEAN CLAY, dark grayish brown (10YR 4/2) with trace roots, stiff.	CL					1.25	M				
			9												
			10		CL										
			11												
S2	55		12	SILT, dark grayish brown (10YR 4/2), with trace sand, soft.	ML					0.75/0.25	W				
			13												
			14												
			15	POORLY GRADED SAND, fine to coarse grained, brown (10YR 4/2) with trace fine gravel.	SP										Water at 13' bgs.

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive, Madison, WI 53718 608-224-2830	Tel: Fax:
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Boring Number MW-313

Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	85		16	Same as above but ranging from dark grayish brown to red brown, gray, and tan.	SP					W				Sampled S3
			17											
			18											
			19											
			20	Same as above but with layer of cobbles at 21' bgs.										
			21											
			22	Trace silt at bottom of sample.										
				End of boring at 22.5' below ground surface.										



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	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____	Name & Address of Construction Company: _____
Specify corner of site: <u>SE of Parcel 003052640340000</u>	<u>Cascade Drilling, LP</u>
Distance & direction along boundary: <u>106' W</u>	<u>301 Alderson St</u>
Distance & direction from boundary to wall: <u>306' N</u>	<u>Schofield, WI 54476</u>
Elevations ( $\pm 0.01$ ft MSL): _____	Name of Driller: <u>Todd Schmalfeld</u>
Ground Surface: <u>684.28</u>	Drilling Method: <u>HSA</u>
Top of protective casing: <u>687.12</u>	Drilling Fluid: <u>NA</u>
Top of well casing: _____ <u>686.63</u>	Bore Hole Diameter: <u>8 inch</u>
Benchmark elevation: _____	Soil Sampling Method: <u>Spoon</u>
Benchmark description: _____	Depth of Boring: <u>15 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 40</u>	Placement method: <u>Gravity</u>
Length of casing: _____ <u>4 ft</u>	Volume: <u>8 cu. ft.</u>
Outside casing diameter: _____ <u>2.38"</u>	Backfill (if different from seal): _____
Inside casing diameter: _____ <u>2"</u>	Material: _____
Casing joint type: _____ <u>threaded</u>	Placement method: _____
Casing/screen joint type: <u>threaded</u>	Volume: _____
Screen material: _____ <u>PVC</u>	Surface seal design: _____
Screen opening size: <u>0.010"</u>	Material of protective casing: <u>Steel 6 inch</u>
Screen length: _____ <u>10 ft</u>	Material of grout between protective casing and well casing: <u>sand</u>
Depth of well: _____ <u>14 ft</u>	Protective cap: _____
Filter Pack: _____	Material: <u>Steel, vented</u>
Material: _____ <u>Red Flint</u>	Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Grain size: _____ <u>#40</u>	Well Cap: _____
Volume: _____ <u>4 cu. ft.</u>	Material: <u>PVC</u>
Seal (minimum 3 ft length above filter pack): _____	Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Material: <u>3/8 inch bentonite chips</u>	

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>3.09 ft</u>	Stabilization Time: <u>&lt;5 minutes</u>
Well development method: <u>Surged with block and pumped to reduce turbidity. 435 gallons pumped.</u>	
Average depth of frostline: <u>3.5'</u>	

**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

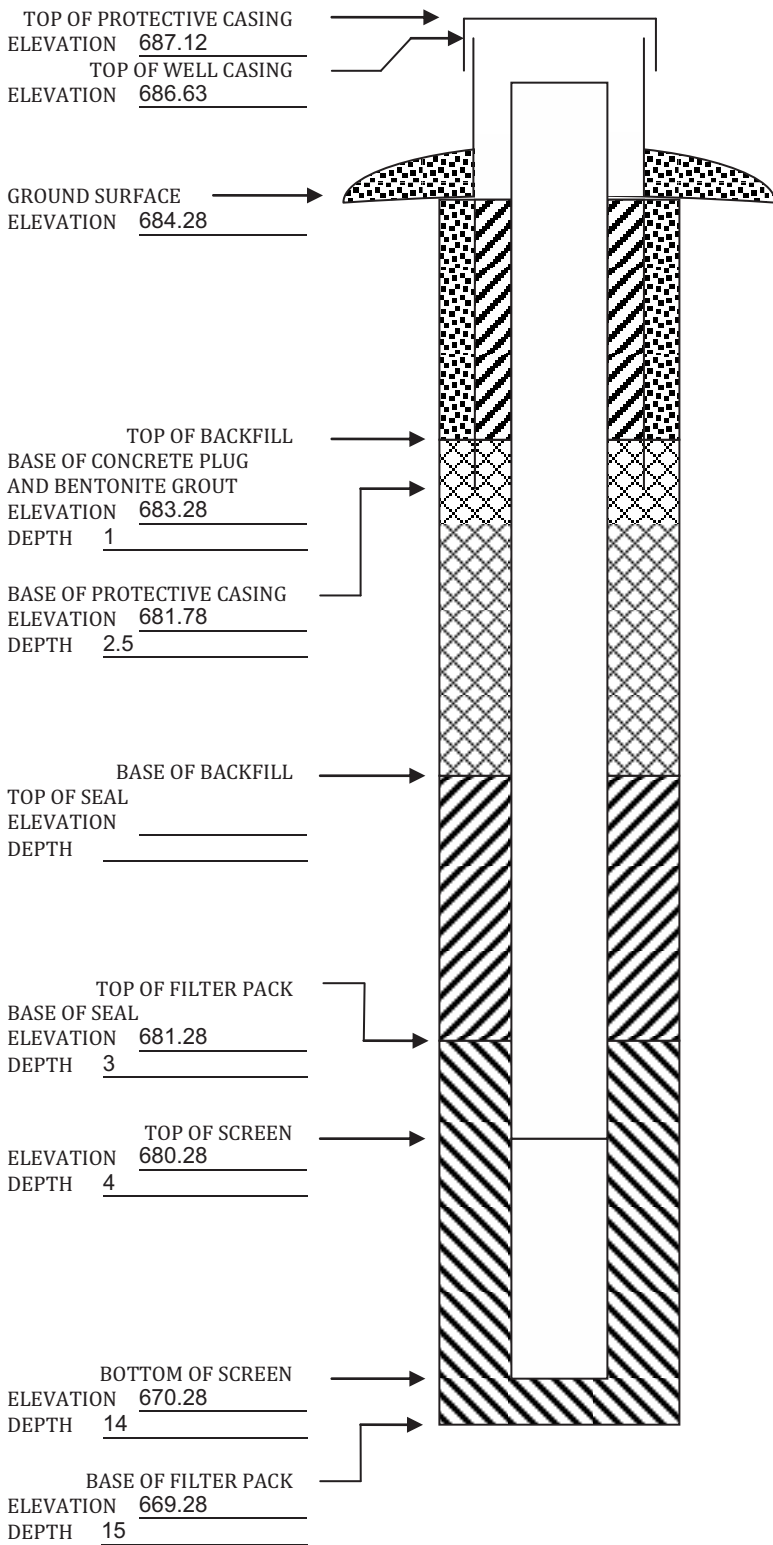
**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)



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.)





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-302

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

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>NW of Parcel 003052630215000</u> Distance & direction along boundary: <u>844' NE</u> Distance & direction from boundary to wall: <u>4.5' S</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>671.55</u> Top of protective casing: <u>674.39</u> Top of well casing: _____ <u>673.90</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>24 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 40</u> Length of casing: _____ <u>13 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>10 ft</u> Depth of well: _____ <u>23 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>3.5 cu. ft</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>2.6 cu. ft</u> Backfill (if different from seal): _____ Material: <u>3/8" bentonite chips</u> Placement method: <u>Gravity</u> Volume: <u>1 cu. ft.</u> Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>18.19</u> Well development method: <u>Surged with block and pumped to remove turbidity. 183 gallons purged</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>&lt; 5 min</u>

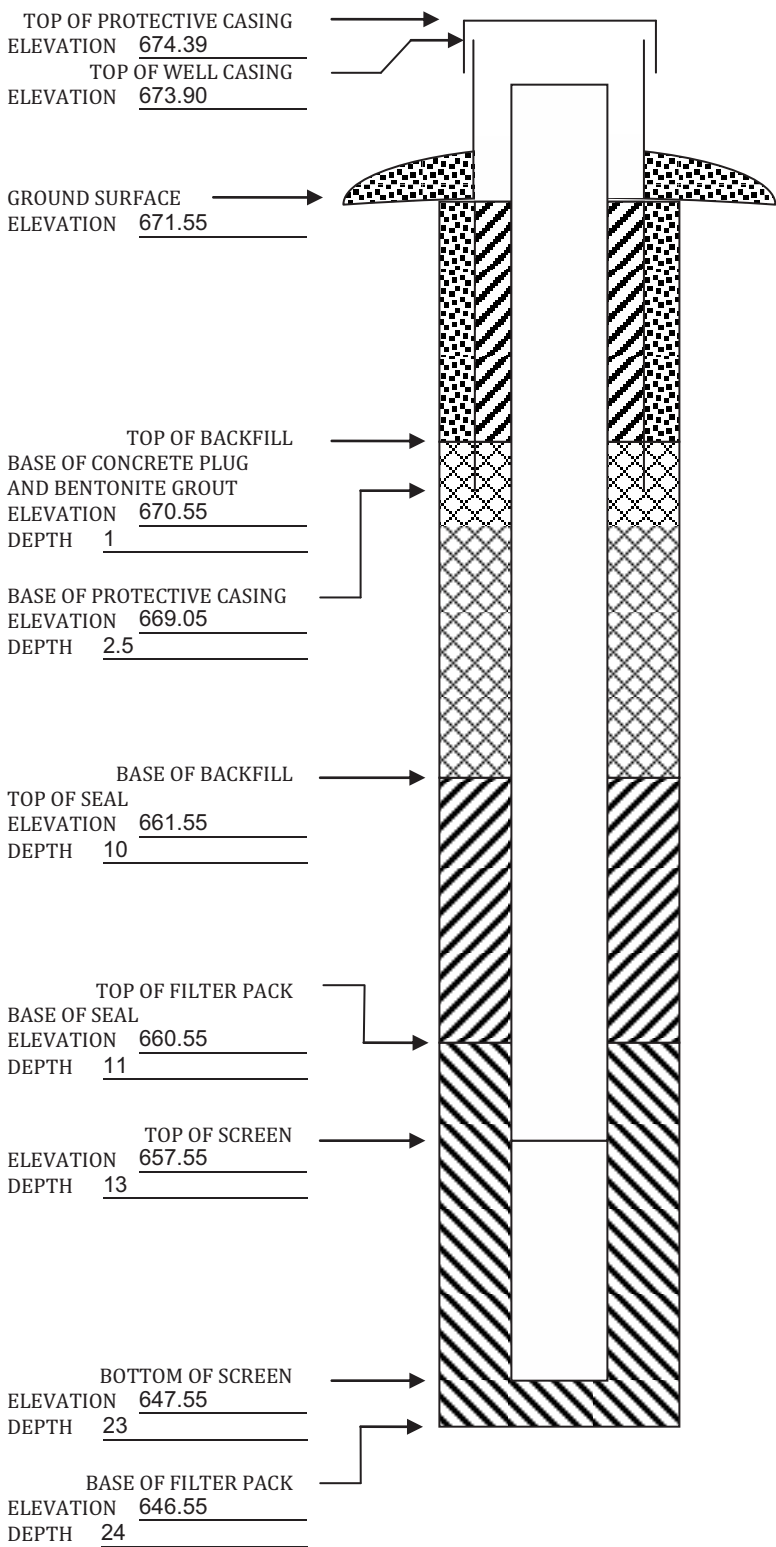
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

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

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

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.)





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-303

Dates Started: 12/8/15 Date Completed: 12/8/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SE of parcel 003052630207000</u> Distance & direction along boundary: <u>181' NW</u> Distance & direction from boundary to wall: <u>0</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>658.95</u> Top of protective casing: <u>661.67</u> Top of well casing: _____ <u>661.07</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>14.5 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u> Length of casing: _____ <u>3 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>10 ft</u> Depth of well: _____ <u>14 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>7.5 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>10 cu. ft.</u> Backfill (if different from seal): _____ Material: _____ Placement method: _____ Volume: _____ Surface seal design: _____ Material of protective casing: <u>Steel 6 inch</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>7.71'</u> Well development method: <u>Bailed dry 3 times to reduce turbidity</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>~ 1 day (bails dry)</u>

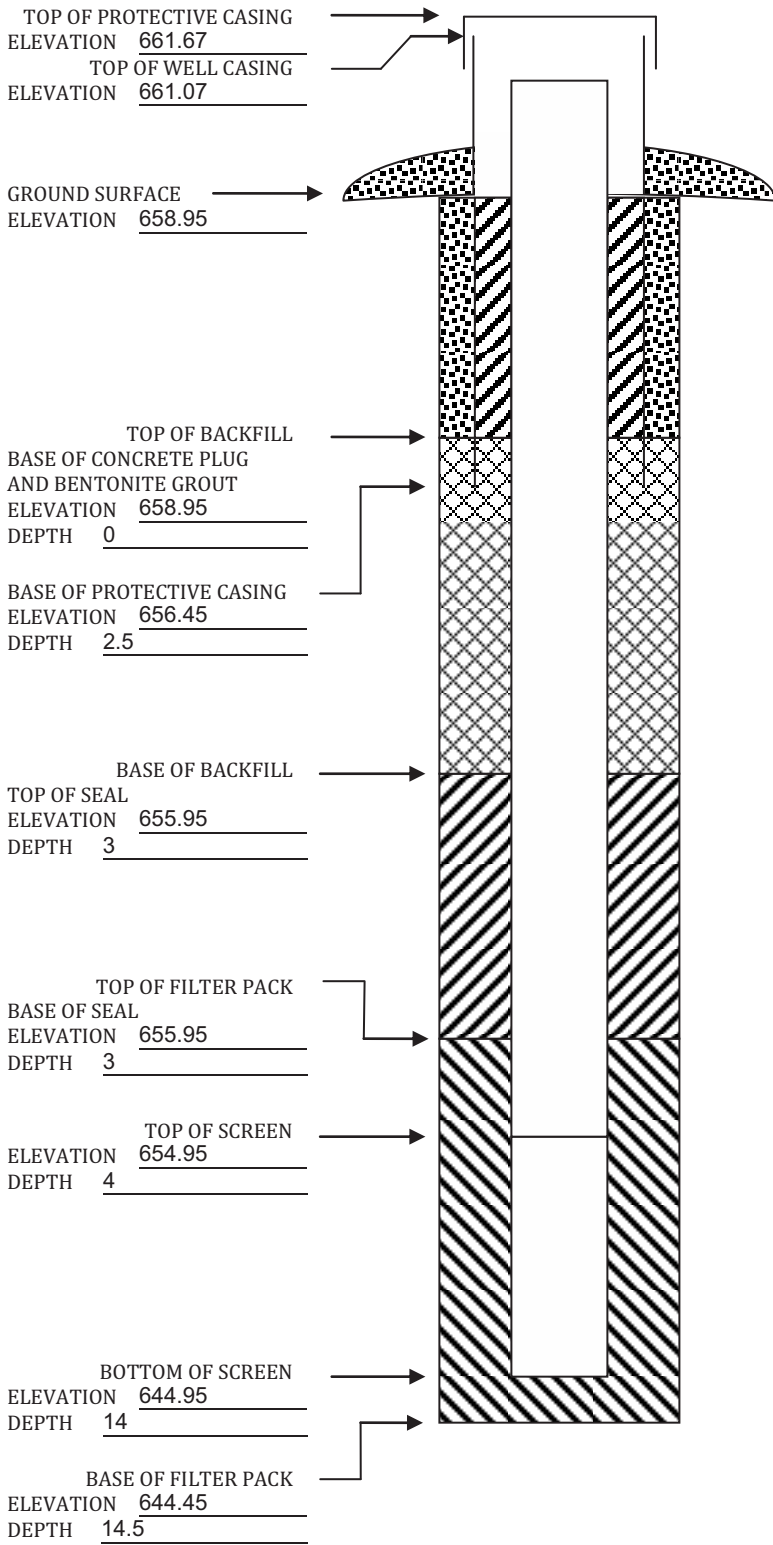
**Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

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

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

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.)





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-304

Dates Started: 11/11/15 Date Completed: 11/12/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SE of Parcel 003052620200000</u> Distance & direction along boundary: <u>502' W</u> Distance & direction from boundary to wall: <u>44' N</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>680.09</u> Top of protective casing: <u>683.36</u> Top of well casing: _____ <u>682.84</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>52 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 40</u> Length of casing: _____ <u>40 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010"</u> Screen length: _____ <u>5 ft</u> Depth of well: _____ <u>50 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>2 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>gravity</u> Volume: <u>.3 cu. ft.</u> Backfill (if different from seal): _____ Material: <u>AquaGuard Grout</u> Placement method: <u>tremie</u> Volume: <u>75 gallons</u> Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>24.5 ft</u> Well development method: <u>bailed dry 3 times to reduce turbidity</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>~1 day (bails dry)</u>

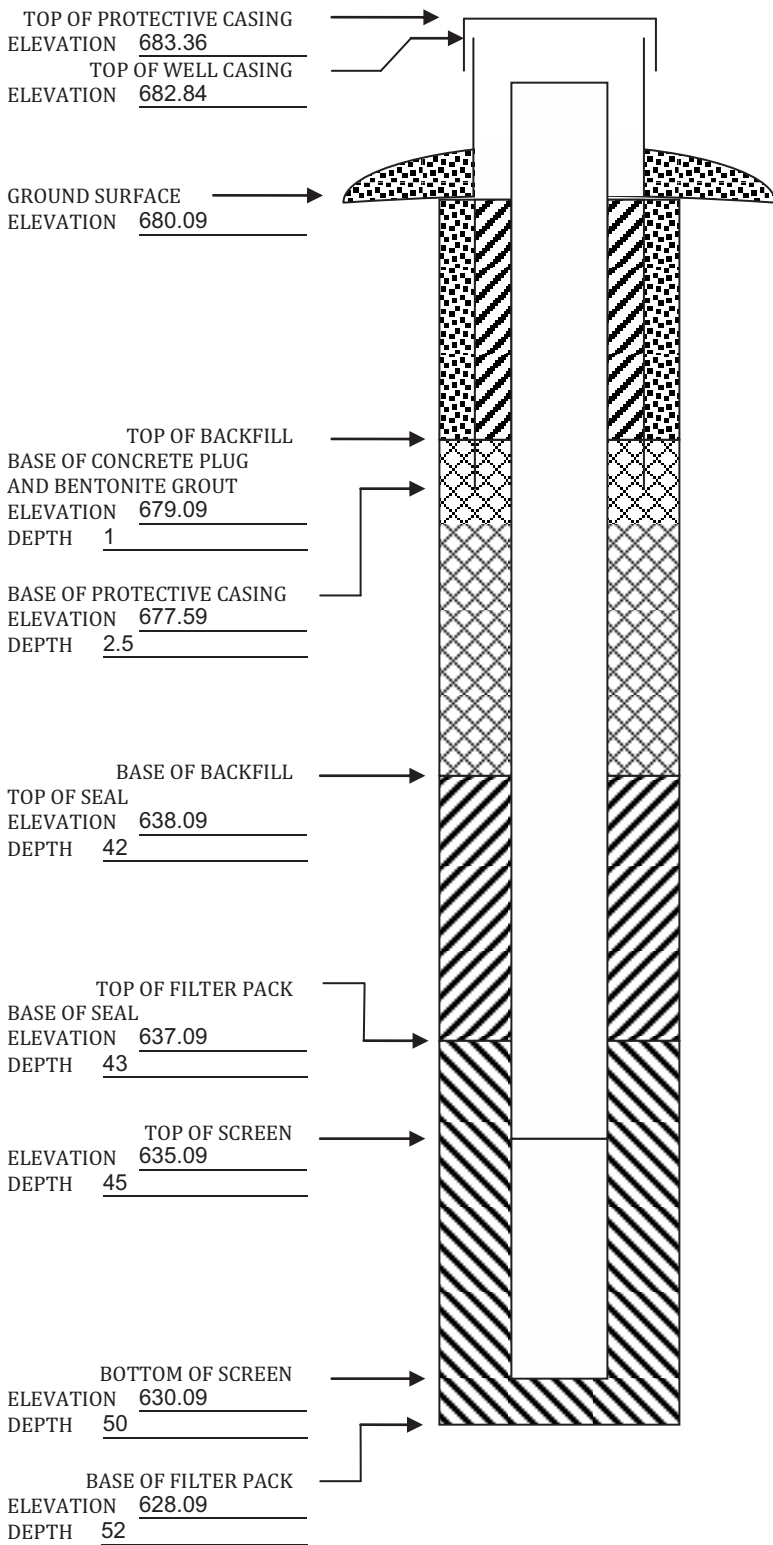
**Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

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

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

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.)







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-305

Dates Started: 12/7/15 Date Completed: 12/8/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SW of Parcel 003052620200000</u> Distance & direction along boundary: <u>539' E</u> Distance & direction from boundary to wall: <u>404' N</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>681.54</u> Top of protective casing: <u>684.53</u> Top of well casing: _____ <u>683.91</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>50 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u> Length of casing: _____ <u>44 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>5 ft</u> Depth of well: _____ <u>49 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>2 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>gravity</u> Volume: <u>.3 cu. ft.</u> Backfill (if different from seal): _____ Material: <u>AquaGuard grou</u> Placement method: <u>tremie</u> Volume: <u>80 gallons</u> Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>22.02</u> Well development method: <u>Surged with block and pumped to reduce turbidity</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>&lt; 5 min</u>

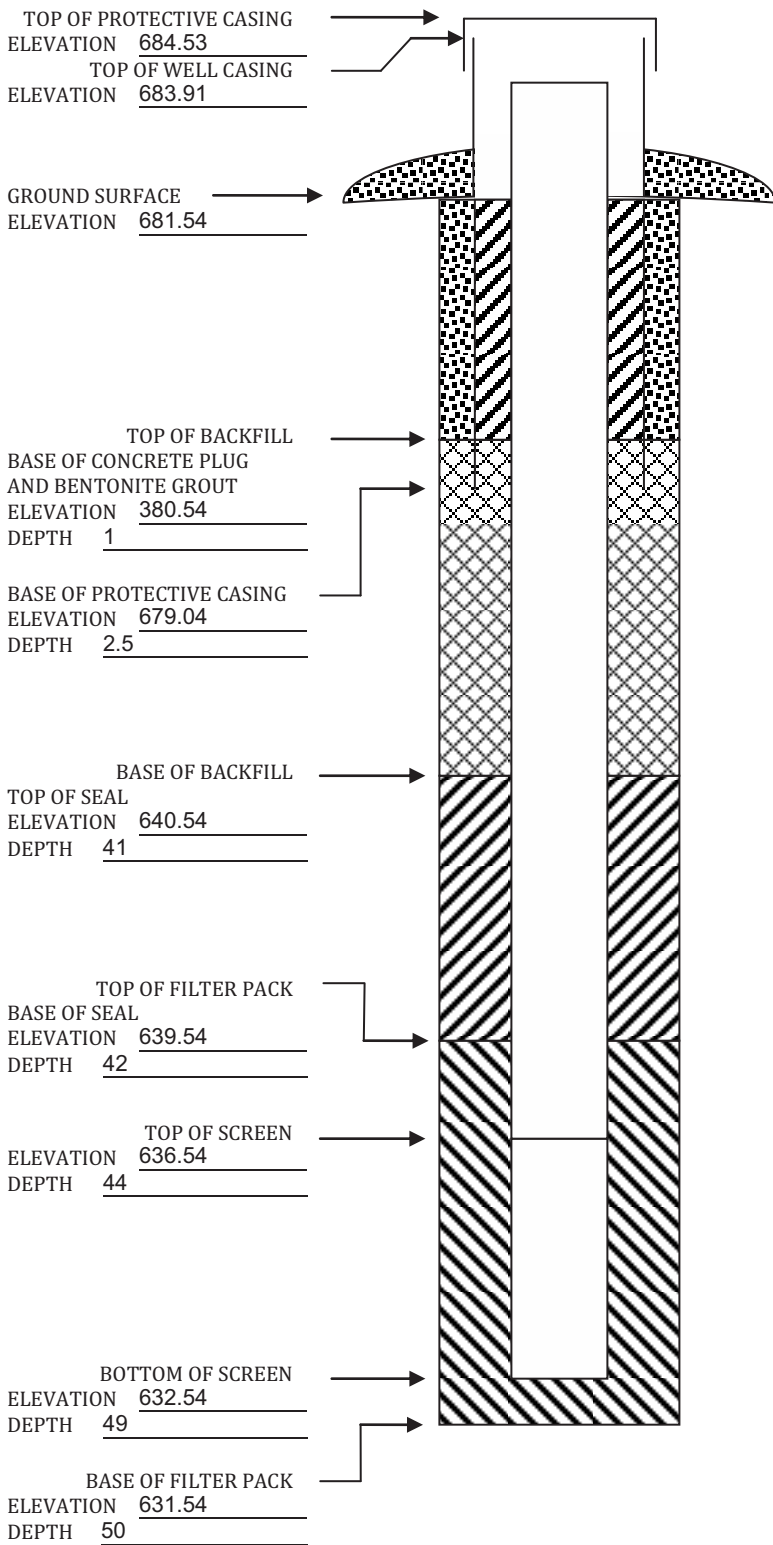
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

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

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

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.)





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-306

Dates Started: 11/12/15 Date Completed: 11/12/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____	Name & Address of Construction Company: _____
Specify corner of site: <u>NW of Parcel 003052620200000</u>	<u>Cascade Drilling, LP</u>
Distance & direction along boundary: <u>137.5' E</u>	<u>301 Alderson St</u>
Distance & direction from boundary to wall: <u>321' S</u>	<u>Schofield, WI 54476</u>
Elevations ( $\pm 0.01$ ft MSL): _____	Name of Driller: <u>Todd Schmalfeld</u>
Ground Surface: <u>681.05</u>	Drilling Method: <u>HSA</u>
Top of protective casing: <u>683.98</u>	Drilling Fluid: <u>NA</u>
Top of well casing: _____ <u>683.47</u>	Bore Hole Diameter: <u>8 inch</u>
Benchmark elevation: _____	Soil Sampling Method: <u>Spoon</u>
Benchmark description: _____	Depth of Boring: <u>34.5 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u>	Placement method: <u>Gravity</u>
Length of casing: _____ <u>29 ft</u>	Volume: <u>10.5 cu. ft.</u>
Outside casing diameter: _____ <u>2.38"</u>	Backfill (if different from seal): _____
Inside casing diameter: _____ <u>2"</u>	Material: _____
Casing joint type: _____ <u>threaded</u>	Placement method: _____
Casing/screen joint type: <u>threaded</u>	Volume: _____
Screen material: _____ <u>PVC</u>	Surface seal design: _____
Screen opening size: <u>0.010"</u>	Material of protective casing: <u>Steel</u>
Screen length: _____ <u>5 ft</u>	Material of grout between protective casing and well casing: <u>sand</u>
Depth of well: _____ <u>34 ft</u>	Protective cap: _____
Filter Pack: _____	Material: <u>Steel, vented</u>
Material: _____ <u>Red Flint</u>	Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Grain size: _____ <u>#40</u>	Well Cap: _____
Volume: _____ <u>2 cu. ft.</u>	Material: <u>PVC</u>
Seal (minimum 3 ft length above filter pack): _____	Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Material: <u>3/8" bentonite chips</u>	

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>12.96'</u>	Stabilization Time: <u>&lt; 5 min</u>
Well development method: <u>Surged with block and pumped. 193 gallons purged.</u>	
Average depth of frostline: <u>3.5'</u>	

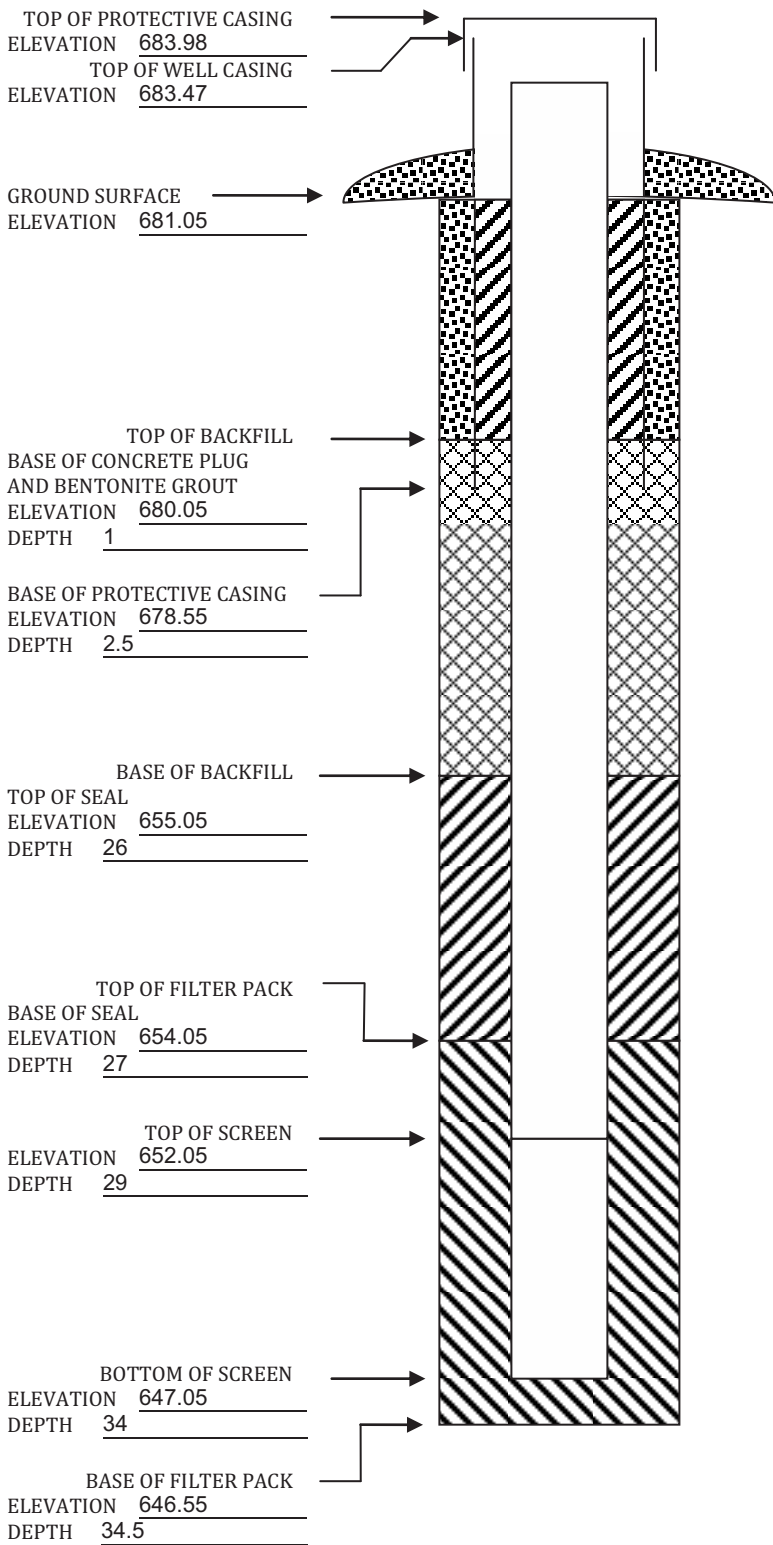
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

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

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

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.)





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL - Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-310 Dates Started 8/27/2019 Date Completed 8/27/2019

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

Specify corner of site Middle Avery Creek @ Distance and direction along boundary 340' NW  
Des Moines River  
Distance and direction from boundary to surface monitoring well 45' SW  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 655.76 Top of protective casing 658.97  
Top of well casing 658.63 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Drilling Inc.  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL, 62260  
Name of driller Eric Wetzel  
Drilling method 4 1/4" HSA Drilling fluid \_\_\_\_\_ Bore Hole diameter 8.5"  
Soil sampling method Split Spoon Depth of boring 24'

## C. MONITORING WELL INSTALLATION

Casing material PVC - Sch. 40 Placement method Gravity  
Length of casing 20.87 Volume 4 cubic feet  
Outside casing diameter 2.4" Backfill (if different from seal): \_\_\_\_\_  
Inside casing diameter 2.0" Material \_\_\_\_\_  
Casing joint type Threaded Placement method \_\_\_\_\_  
Casing/screen joint type Threaded Volume \_\_\_\_\_  
Screen material PVC - Sch. 40 Surface seal design: Concrete  
Screen opening size 0.01' Material of protective casing: Steel  
Material of grout between  
Screen length 5' protective casing and well casing: Bentonite/Filter Sand  
Depth of Well 23' Protective cap: \_\_\_\_\_  
Filter Pack: Material Steel  
Material Filter Sand Vented?:  Y  N Locking?:  Y  N  
Grain Size #5 Well cap: \_\_\_\_\_  
Volume 1.25 cubic feet Material Plastic  
Seal (minimum 3 ft. length above filter pack): Vented?:  Y  N  
Material 3/8" Bentonite Chips

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 16.67 Stabilization time 5 min  
Well development method surge and purge with pump to remove turbidity  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 11509 Date 10.3.19

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

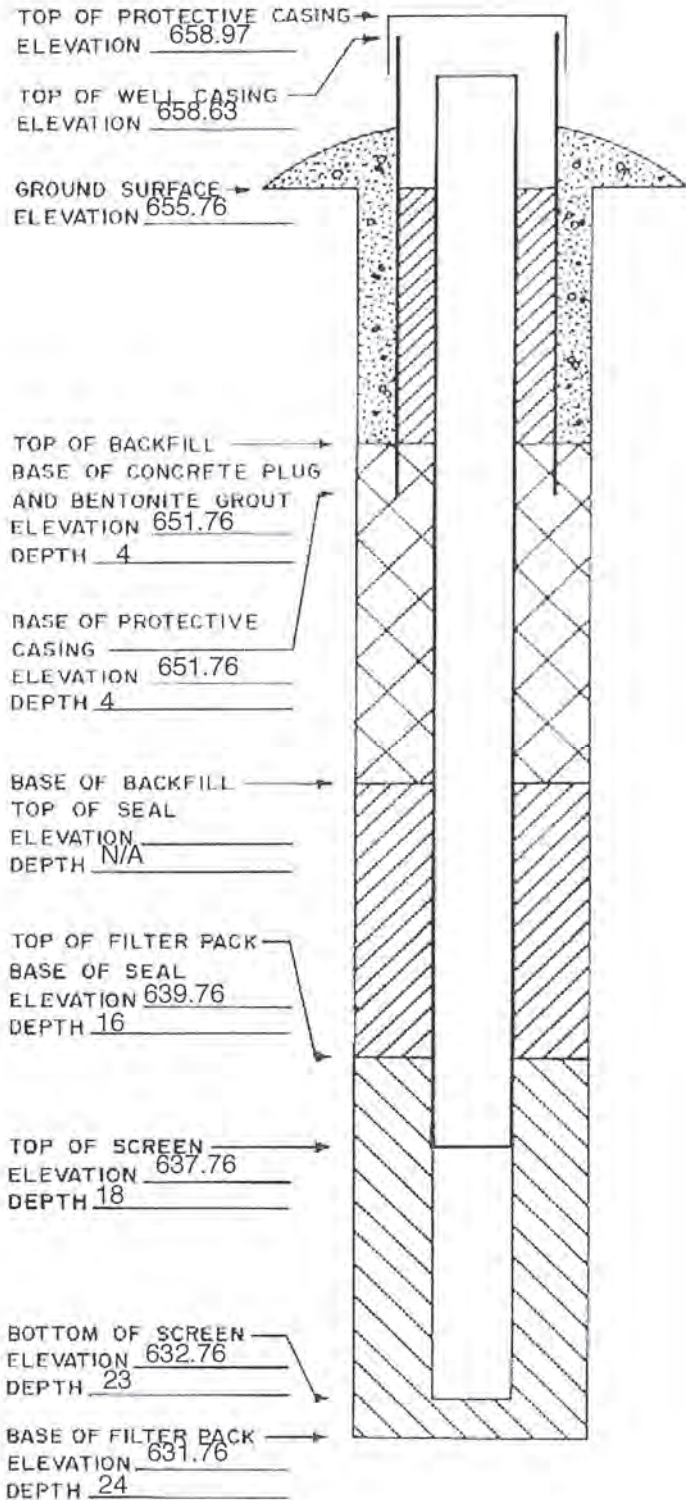
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

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



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 ),



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL - Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-311 Dates Started 8/27/2019 Date Completed 8/27/2019

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

Specify corner of site SE Distance and direction along boundary 730' W  
Distance and direction from boundary to surface monitoring well 160' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 651.24 Top of protective casing 654.49  
Top of well casing 654.18 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Drilling Inc.  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL, 62260  
Name of driller Eric Wetzel  
Drilling method 4 1/4" HSA Drilling fluid \_\_\_\_\_ Bore Hole diameter 8.5"  
Soil sampling method Split Spoon Depth of boring 16'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC - Sch. 40</u>	Placement method <u>Gravity</u>
Length of casing <u>12.94'</u>	Volume <u>2 cubic feet</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.0"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>PVC - Sch. 40</u>	Surface seal design: <u>Concrete</u>
Screen opening size <u>0.01'</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between
Depth of Well <u>15'</u>	protective casing and well casing: <u>Bentonite/Filter Sand</u>
Filter Pack: _____	Protective cap: _____
Material <u>Filter Sand</u>	Material <u>Steel</u>
Grain Size <u>#5</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Volume <u>1.5 cubic feet</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic</u>
Material <u>3/8" Bentonite Chips</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

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

Water level 12.04 Stabilization time 5 min  
Well development method surge and purge with pump to remove turbidity  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 11509 Date 10.3.19

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 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. 9<sup>th</sup> St, Des Moines, IA 50319.

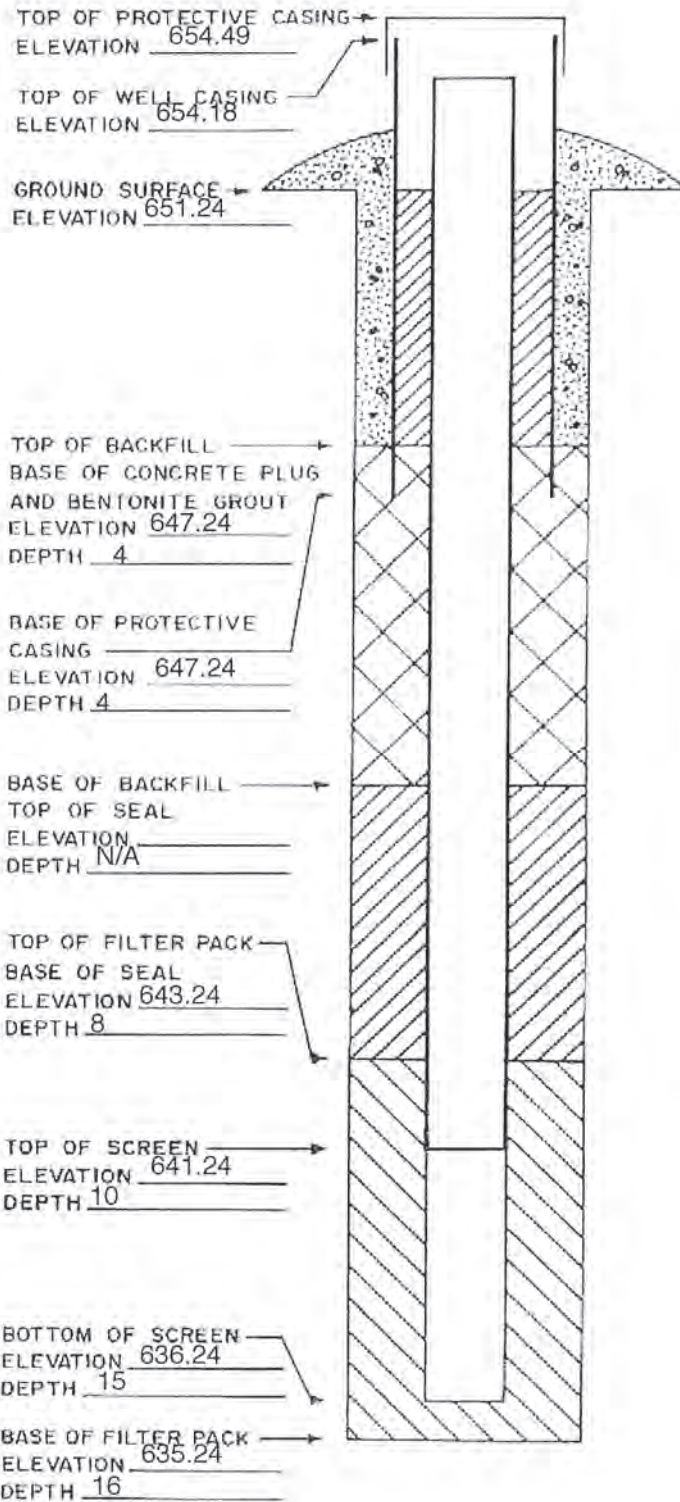
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)



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 ).



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-305A Dates Started 2/25/2020 Date Completed 3/4/2020

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

Specify corner of site SW of Parcel 00305262020 Distance and direction along boundary 539' E  
Distance and direction from boundary to surface monitoring well 404' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 681.76' Top of protective casing 684.35'  
Top of well casing 684.03' Benchmark elevation 654.48'  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA,6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 80'

## C. MONITORING WELL INSTALLATION

Casing material PVC-Sch. 80 Placement method Gravity  
Length of casing 82' Volume 2 cu. ft.  
Outside casing diameter 2.4" Backfill (if different from seal): \_\_\_\_\_  
Inside casing diameter 1.9 Material Bentonite grout  
Casing joint type Threaded Placement method pumped  
Casing/screen joint type Threaded Volume 300 gallons  
Screen material PVC-Sch. 80 Surface seal design: \_\_\_\_\_  
Screen opening size 0.01" Material of protective casing: Steel  
Screen length 5' Material of grout between protective casing and well casing: Sand  
Depth of Well 79' Protective cap: \_\_\_\_\_  
Filter Pack: \_\_\_\_\_ Material Steel  
Material Filter sand Vented?:  Y  N Locking?:  Y  N  
Grain Size #18 Well cap: \_\_\_\_\_  
Volume 3 bags (50 lbs bags, Sil filter sand) Material Plastic  
Seal (minimum 3 ft. length above filter pack): \_\_\_\_\_ Vented?:  Y  N  
Material 3/8" Bentonite chips

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

Water level 32.7' Stabilization time ~ 1 day  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

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

Signature Jeff Crank Certification # 8515 Date 9-16-20

Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2 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. 9<sup>th</sup> St, Des Moines, IA 50319.

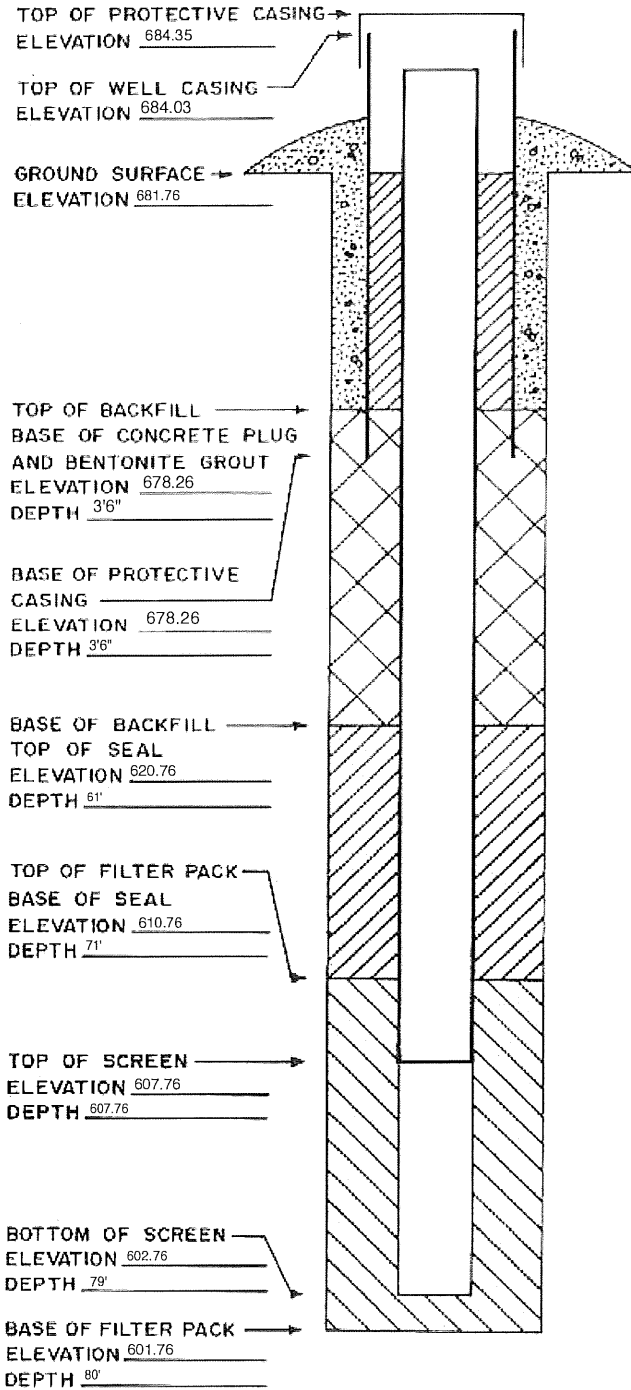
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

09/2017 cmc

DNR Form 542-1277

ELEVATIONS:  $\pm$  0.01 FT. MSL  
DEPTHS:  $\pm$  0.1 FT. FROM  
GROUND SURFACE

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





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-310A Dates Started 2/27/2020 Date Completed 3/4/2020

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

Specify corner of site \_\_\_\_\_ Distance and direction along boundary 340' NW  
Distance and direction from boundary to surface monitoring well 45' SW  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 655.26' Top of protective casing 658.25'  
Top of well casing 657.93' Benchmark elevation 654.48'  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA,6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 54'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC-Sch. 80</u>	Placement method <u>Gravity</u>
Length of casing <u>55.5'</u>	Volume <u>2 cu. ft.</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>1.9"</u>	Material <u>Bentonite grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>200 gallons</u>
Screen material <u>PVC-Sch. 80</u>	Surface seal design: _____
Screen opening size <u>0.1</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>53'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#18</u>	Well cap: _____
Volume <u>3 bags (50 lbs bags, Sil filter sand)</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>3/8" Bentonite chips</u>	

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

Water level 12' Stabilization time ~ 1 week  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

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

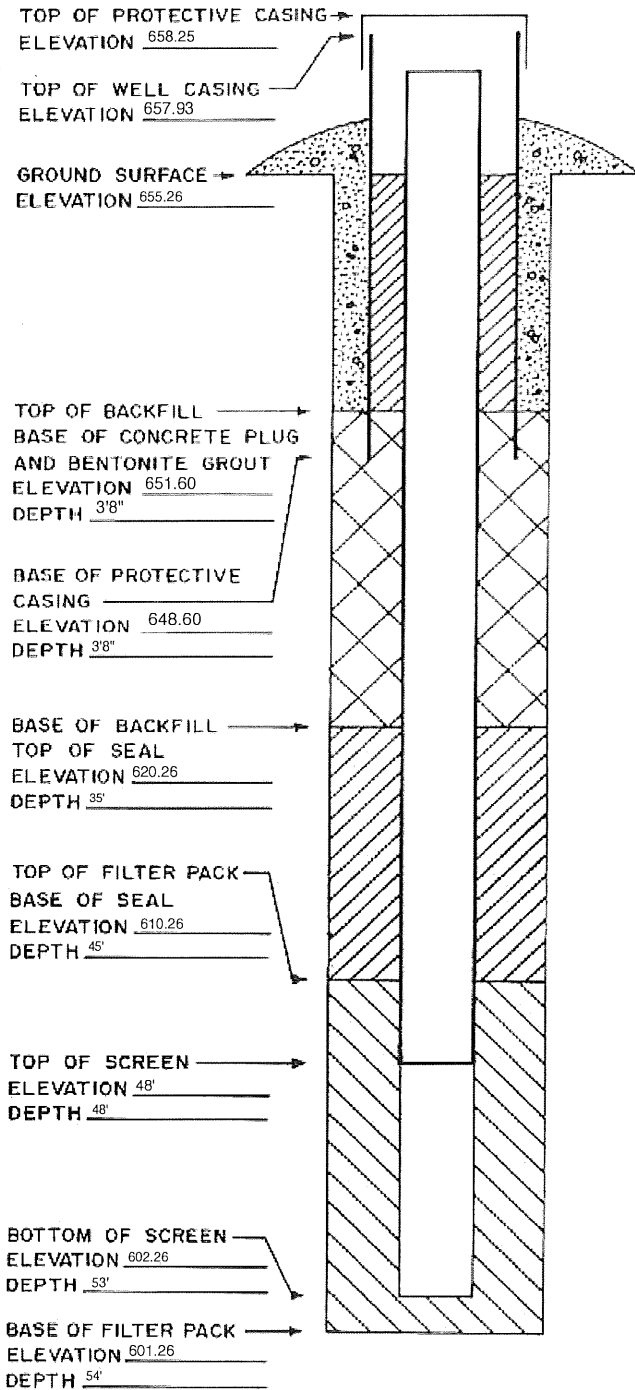
Signature Jeff Crank Certification # 8515 Date 9-16-20

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 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. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

ELEVATIONS:  $\pm$  0.01 FT. MSL  
DEPTHS:  $\pm$  0.1 FT. FROM  
GROUND SURFACE

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





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-311A Dates Started 3/2/2020 Date Completed 3/4/2020

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

Specify corner of site SE Distance and direction along boundary 730' W  
Distance and direction from boundary to surface monitoring well 160' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 651.16' Top of protective casing 653.88  
Top of well casing 653.54' Benchmark elevation 654.48  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA, 6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 46'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC-Sch. 40</u>	Placement method <u>Gravity</u>
Length of casing <u>47.68'</u>	Volume <u>2 cu. ft.</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.1"</u>	Material <u>Bentonite grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>200 gallons</u>
Screen material <u>PVC-Sch. 40</u>	Surface seal design: _____
Screen opening size <u>0.1</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>45'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#18</u>	Well cap: _____
Volume <u>3 bags (50 lbs bags, Sil filter sand)</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>3/8" Bentonite chips</u>	

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 8.89' Stabilization time ~ 1 week  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

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

Signature *Jeff Crank* Certification # 8515 Date 9-16-20

Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2 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. 9<sup>th</sup> St, Des Moines, IA 50319.

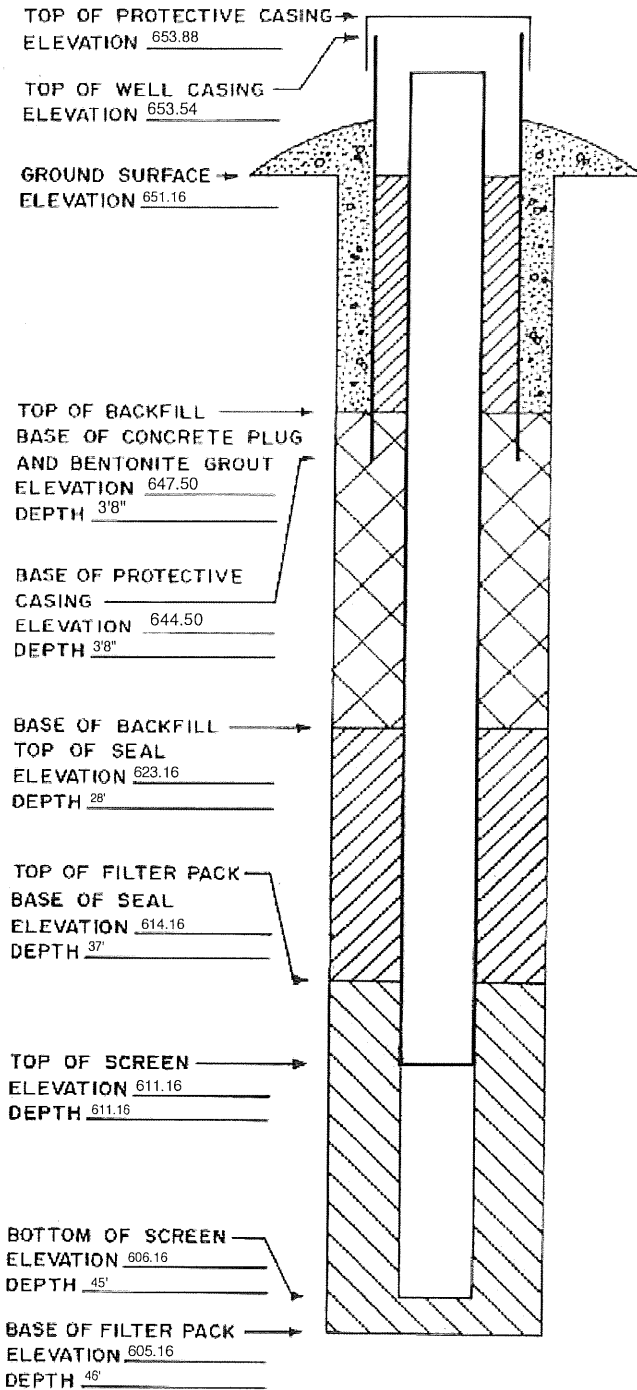
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

09/2017 cmc

DNR Form 542-1277

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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-312 Dates Started 12/14/21 Date Completed 12/15/21

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

Specify corner of site NE of parcel 3052510081000 Distance and direction along boundary 340' S  
Distance and direction from boundary to surface monitoring well 325' W  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 652.87 Top of protective casing 655.97  
Top of well casing 655.36 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Cascade Drilling  
Address 301 Alderson St. City, State, Zip Code Schofield, WI. 54476  
Name of driller Mike Mueller  
Drilling method Roto Sonic Drilling fluid water Bore Hole diameter 6"  
Soil sampling method Bagged Depth of boring 27.5'

## C. MONITORING WELL INSTALLATION

Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured</u>
Length of casing <u>~29.68'</u>	Volume <u>1 - 50 lbs bag</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.05"</u>	Material <u>Bentonite Grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>Pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>2.5 ft^3</u>
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.001"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Bentonite and sand</u>
Depth of Well <u>27'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Aluminium</u>
Material <u>Red Flint Sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#40</u>	Well cap: _____
Volume <u>1ft^3</u>	Material <u>Plastice</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>Bentonite chips</u>	

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 12.65 Stabilization time 1.75 hours  
Well development method Surge and purge with pump  
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 # 9362 Date 12-15-2021

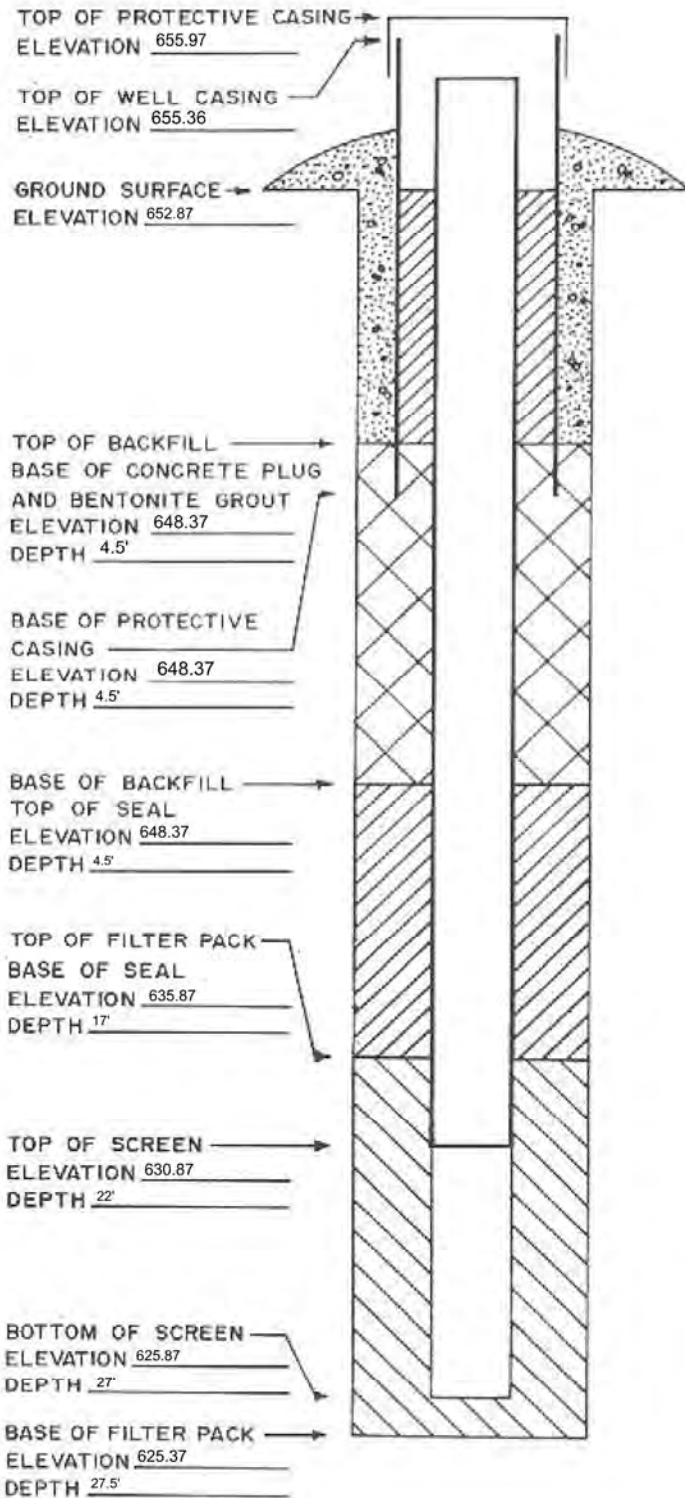
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

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

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

ELEVATIONS:  $\pm$  0.01 FT. MSL  
DEPTHS:  $\pm$  0.1 FT. FROM  
GROUND SURFACE

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





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-313 Dates Started 12/14/21 Date Completed 12/15/21

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

Specify corner of site NE of parcel 3052510081000 Distance and direction along boundary 340' S  
Distance and direction from boundary to surface monitoring well 20' E  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 653.25 Top of protective casing 656.30  
Top of well casing 655.84 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Cascade Drilling  
Address 301 Alderson St. City, State, Zip Code Schofield, WI. 54476  
Name of driller Mike Mueller  
Drilling method Roto Sonic Drilling fluid water Bore Hole diameter 6"  
Soil sampling method Bagged Depth of boring 22.5'

## C. MONITORING WELL INSTALLATION


Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured</u>
Length of casing <u>~23.82'</u>	Volume <u>1 - 50 lbs bag</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.05"</u>	Material <u>Bentonite Grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>Pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>2.25 ft^3</u>
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.001"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Bentonite and sand</u>
Depth of Well <u>21'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Aluminium</u>
Material <u>Red Flint Sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#40</u>	Well cap: _____
Volume <u>1ft^3</u>	Material <u>Plastice</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>Bentonite chips</u>	

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 15.63 Stabilization time 1.75 hours  
Well development method Surge and purge with pump  
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 # 9362 Date 12-15-2021

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

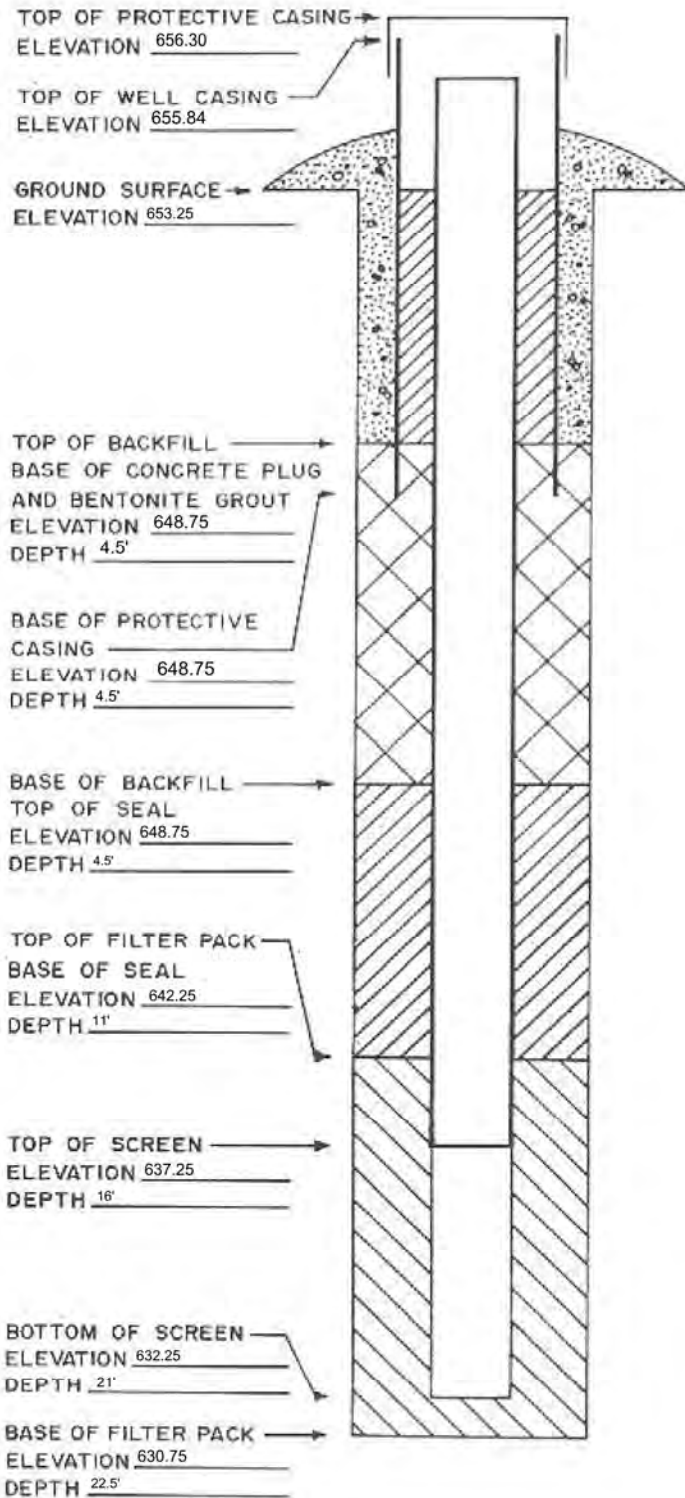
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

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

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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. 58910  
Well or Piezometer No. MW-302WT Dates Started 4/27/2022 Date Completed 4/27/2022

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

Specify corner of site NW parc. 003052630215000 Distance and direction along boundary 840 NE  
Distance and direction from boundary to surface monitoring well 4.5 S  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 671.54' Top of protective casing 674.74  
Top of well casing 674.53' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Direct Push Analytical  
Address 41909 Old Linton Rd. VALE City, State, Zip Code Saint Charles IL. 60175  
Name of driller Bryan Kinzer  
Drilling method HSA Drilling fluid None Bore Hole diameter 8.25"  
Soil sampling method Blind drilled Depth of boring 16.5'

## C. MONITORING WELL INSTALLATION

Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured/Hydrated</u>
Length of casing <u>19.23'</u>	Volume <u>1, 50lbs bag</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.05"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.01"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>10'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>16"</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>RW Sidley filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#5</u>	Well cap: _____
Volume <u>3.5 ft^3 (7 bags)</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Material <u>3/8" Bentonite chips</u>	

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

Water level 18.85 Stabilization time >1 day  
Well development method N/A  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 0496 Date 4-27-22

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

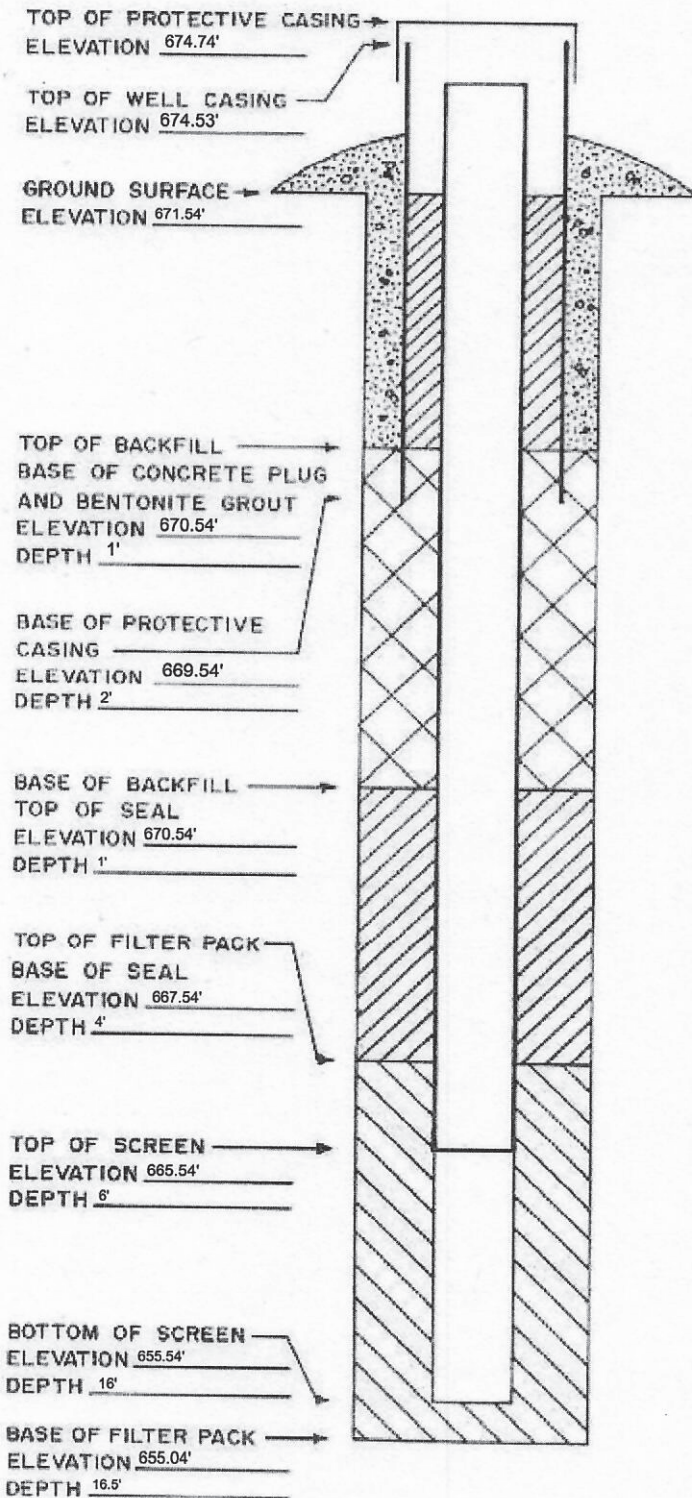
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)  
09/2017 cmc



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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. 58910  
Well or Piezometer No. MW-304WT Dates Started 4/27/2022 Date Completed 4/27/2022

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

Specify corner of site SE of parcel 3052620200000 Distance and direction along boundary 500' W  
Distance and direction from boundary to surface monitoring well 40' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 679.698' Top of protective casing 682.493'  
Top of well casing 682.203' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Direct Push Analytical  
Address 44969 Old LaFox Rd. UNIT E City, State, Zip Code Saint Charles IL. 60175  
Name of driller Bryan Kinzer  
Drilling method HSA Drilling fluid None Bore Hole diameter 8.25"  
Soil sampling method Blind drilled Depth of boring 36'

## C. MONITORING WELL INSTALLATION

Casing material Sch. 40 PVC Placement method Poured/Hydrated  
Length of casing 37.76' Volume 10, 50lbs bags  
Outside casing diameter 2.4" Backfill (if different from seal): \_\_\_\_\_  
Inside casing diameter 2.05" Material \_\_\_\_\_  
Casing joint type Threaded Placement method \_\_\_\_\_  
Casing/screen joint type Threaded Volume \_\_\_\_\_  
Screen material Sch. 40 PVC Surface seal design: \_\_\_\_\_  
Screen opening size 0.01" Material of protective casing: Steel  
Screen length 10' Material of grout between  
Depth of Well 35' protective casing and well casing: Sand  
Filter Pack: \_\_\_\_\_ Protective cap: \_\_\_\_\_  
Material RW Sidley filter sand Material Steel  
Grain Size #5 Vented?:  Y  N Locking?:  Y  N  
Volume 3.5 ft^3 (7 bags) Well cap: \_\_\_\_\_  
Seal (minimum 3 ft. length above filter pack): \_\_\_\_\_ Material Plastic  
Material 3/8" Bentonite chips Vented?:  Y  N

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

Water level 30.5' Stabilization time > 1 day  
Well development method N/A  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 0490 Date 0-7-22

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 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. 9<sup>th</sup> St, Des Moines, IA 50319.

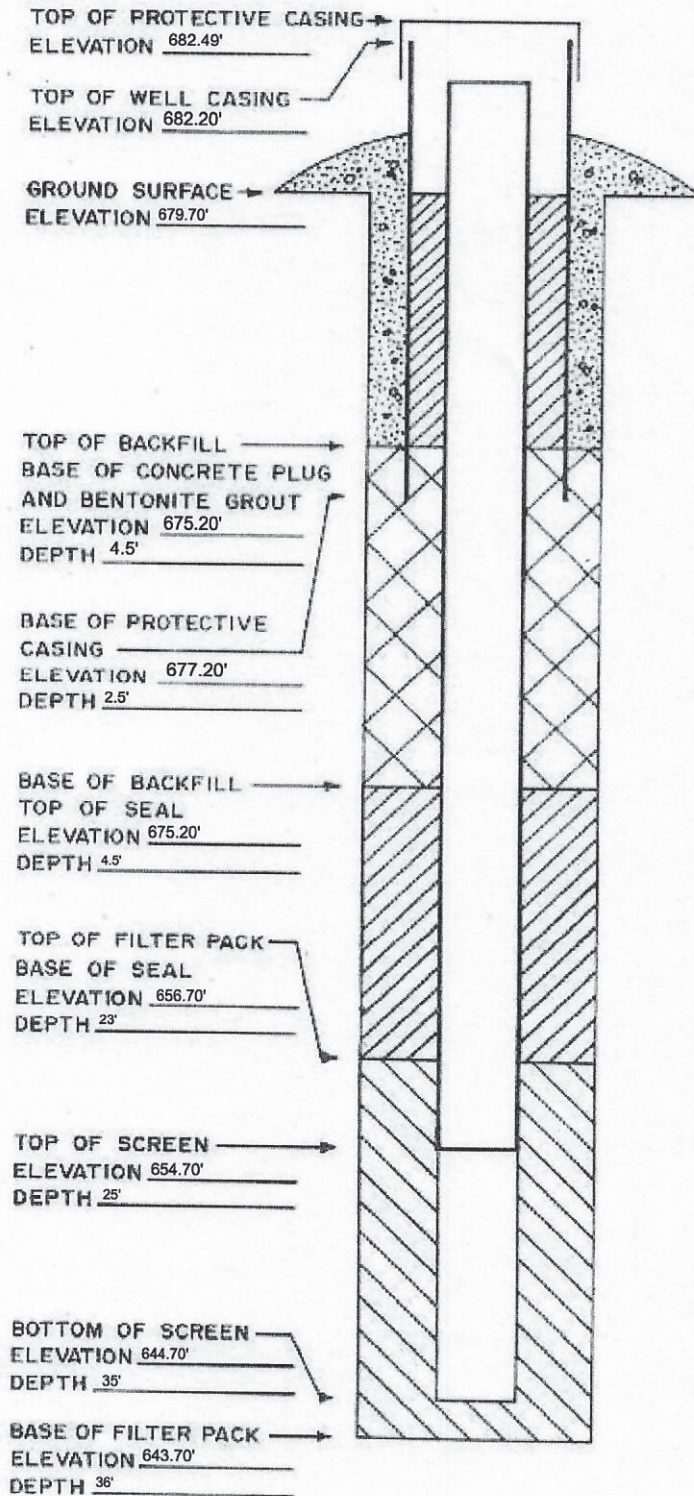
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)



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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. 58910  
Well or Piezometer No. MW-306WT Dates Started 4/27/2022 Date Completed 4/27/2022

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

Specify corner of site NW parcel 3052620200000 Distance and direction along boundary 140' E  
Distance and direction from boundary to surface monitoring well 320' S  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 681.342' Top of protective casing 684.291'  
Top of well casing 684.050' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Direct Push Analytical  
Address 42969 Old LaFox Rd. UNIT E City, State, Zip Code Saint Charles IL. 60175  
Name of driller Bryan Kinzer  
Drilling method HSA Drilling fluid None Bore Hole diameter 8.25"  
Soil sampling method Blind drilled Depth of boring 22'

## C. MONITORING WELL INSTALLATION

Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured/Hydrated</u>
Length of casing <u>24.05'</u>	Volume <u>2, 50lbs bags</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.05"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.01"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>10'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>21'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>RW Sidley filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#5</u>	Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Volume <u>2.75 ft^3 (1.25 bags)</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic</u>
Material <u>3/8" Bentonite chips</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level Dry Stabilization time N/A  
Well development method N/A  
Average depth of frost line 3.5'

### DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 8496 Date 4-23-22

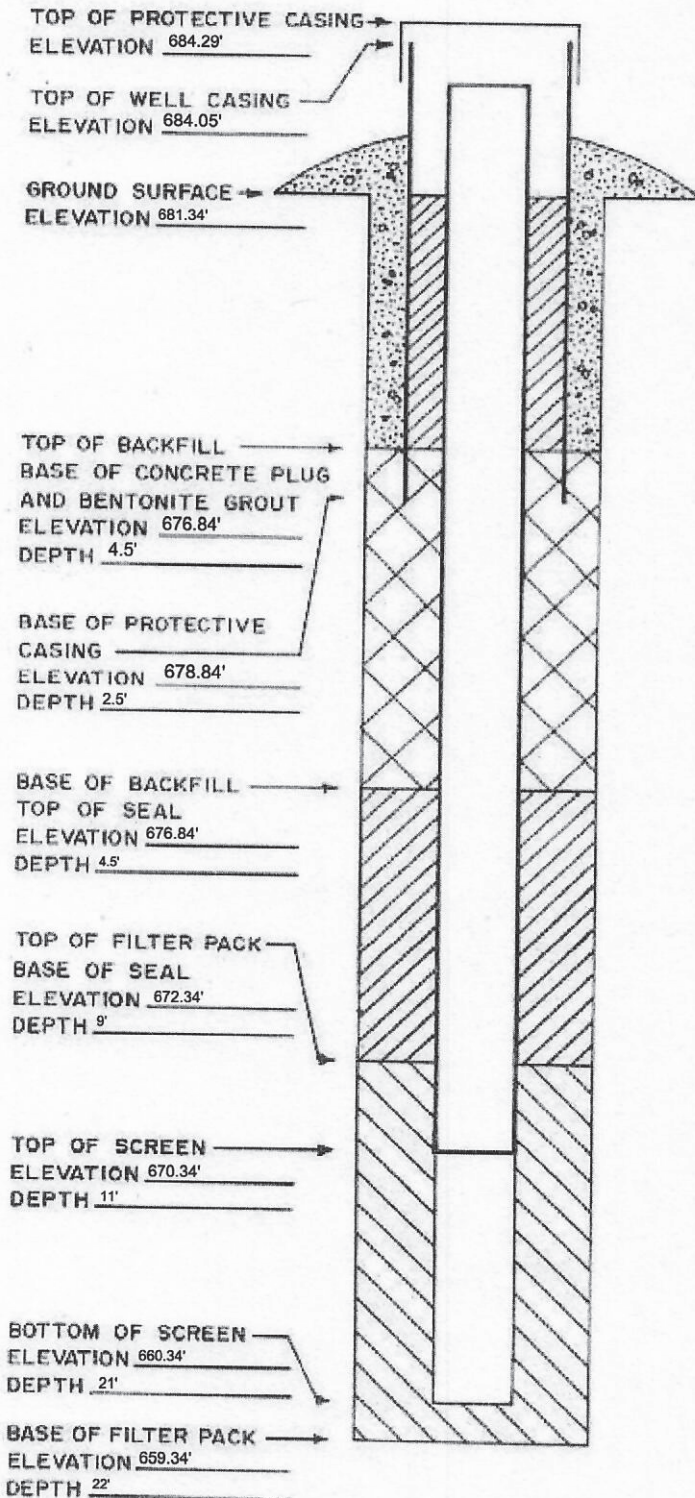
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)



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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. 58910  
Well or Piezometer No. MW-314 Dates Started 4/28/2022 Date Completed 4/28/2022

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

Specify corner of site SW parcel 3052620199000 Distance and direction along boundary 488' E  
Distance and direction from boundary to surface monitoring well 132' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 681.886' Top of protective casing 684.985'  
Top of well casing 684.712' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Direct Push Analytical  
Address 4N969 Old Lafox Rd. UNIT E City, State, Zip Code Saint Charles IL. 60175  
Name of driller Bryan Kinzer  
Drilling method HSA Drilling fluid None Bore Hole diameter 8.25"  
Soil sampling method Blind drilled Depth of boring 31'

## C. MONITORING WELL INSTALLATION

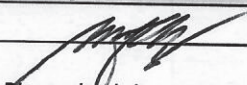
Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured/Hydrated</u>
Length of casing <u>33.24'</u>	Volume <u>6, 50lbs bags</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal):
Inside casing diameter <u>2.05"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.01"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between
Depth of Well <u>30.4'</u>	protective casing and well casing: <u>Sand</u>
Filter Pack:	Protective cap: _____
Material <u>RW Sidley filter sand</u>	Material <u>Steel</u>
Grain Size <u>#5</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Volume <u>1.5 ft^3 (3 bags)</u>	Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Seal (minimum 3 ft. length above filter pack):	Well cap: _____
Material <u>3/8" Bentonite chips</u>	Material <u>Plastic</u>
	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

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

Water level 17.04' Stabilization time < 1 hour  
Well development method Surge and purge with pump  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature  Certification # 849E Date 8-23-22

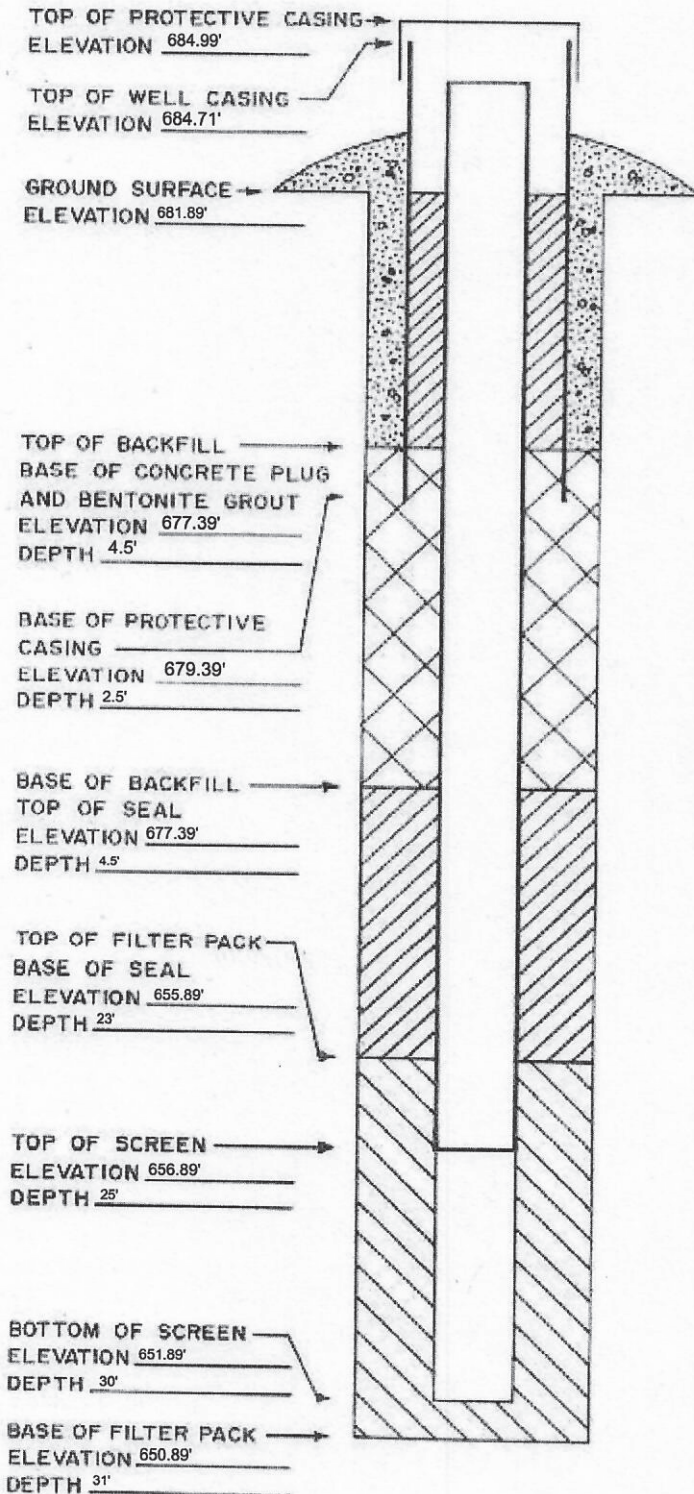
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)



ELEVATIONS:  $\pm$  0.01 FT. MSL  
DEPTHS:  $\pm$  0.1 FT. FROM  
GROUND SURFACE

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





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. 58910  
Well or Piezometer No. MW-314WT Dates Started 4/28/2022 Date Completed 4/28/2022

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

Specify corner of site SW parcel 3052620199000 Distance and direction along boundary 488' E  
Distance and direction from boundary to surface monitoring well 120' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 681.743' Top of protective casing 684.880'  
Top of well casing 684.610' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Direct Push Analytical  
Address 4N969 Old Wagon Rd. VAITE City, State, Zip Code Saint Charles IL. 60175  
Name of driller Bryan Kinzer  
Drilling method HSA Drilling fluid None Bore Hole diameter 8.25"  
Soil sampling method Blind drilled Depth of boring 22.5'

## C. MONITORING WELL INSTALLATION

Casing material <u>Sch. 40 PVC</u>	Placement method <u>Poured/Hydrated</u>
Length of casing <u>24.81'</u>	Volume <u>3.75, 50lbs bags</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.05"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>Sch. 40 PVC</u>	Surface seal design: _____
Screen opening size <u>0.01"</u>	Material of protective casing: <u>Steel</u>
Screen length <u>10'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>21.9'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>RW Sidley filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#5</u>	Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Volume <u>3.6 ft^3 (7.25 bags)</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic</u>
Material <u>3/8" Bentonite chips</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 17.03 Stabilization time >1 day  
Well development method N/A  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

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

Signature [Signature] Certification # 8498 Date 4-28-22

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

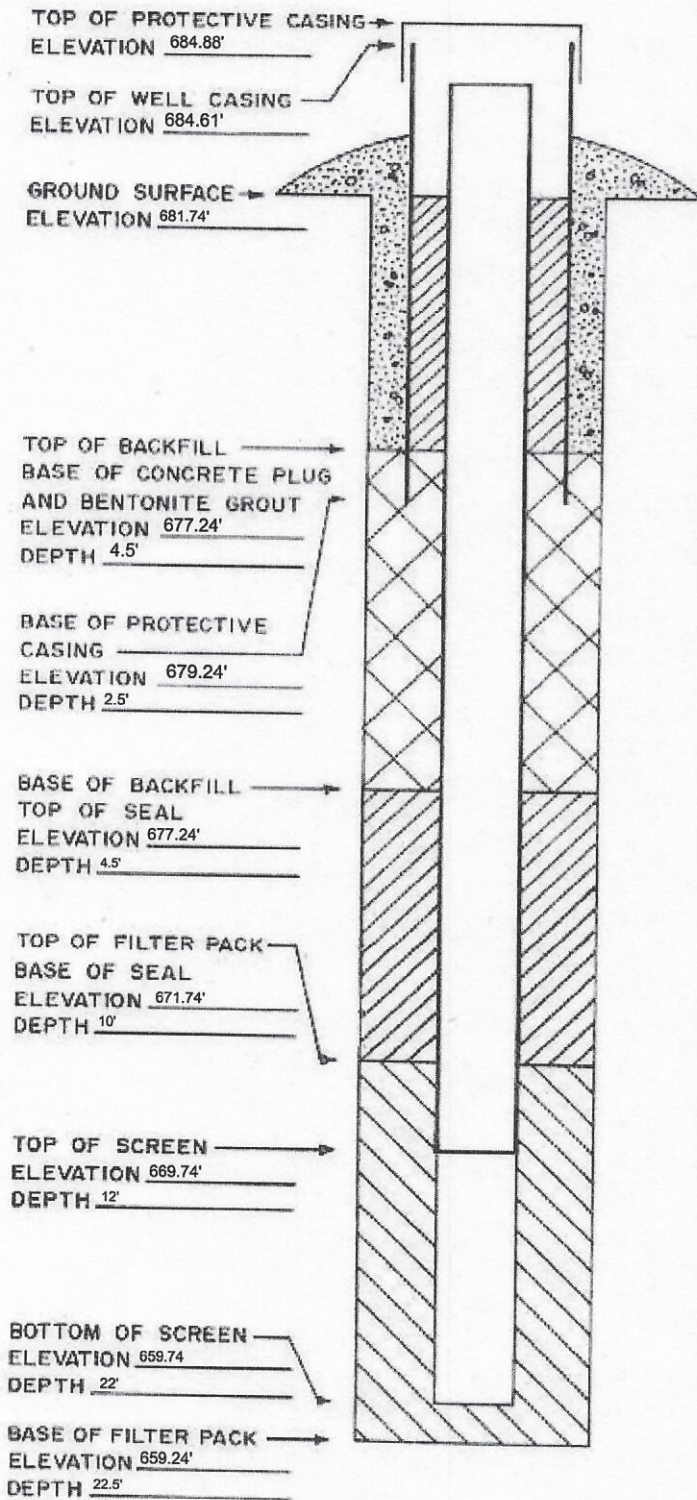
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)



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 ).



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name Ottumwa Generating Station Permit No. 60630  
Well or Piezometer No. MW-316 Dates Started 3/28/2023 Date Completed 3/29/2023

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

Specify corner of site N parcel 003052510081000 Distance and direction along boundary 373' north  
Distance and direction from boundary to surface monitoring well 140' west  
Elevation (+0.01 ft. MSL) 654.52  
Ground Surface 654.52 Top of protective casing 657.74  
Top of well casing 657.30 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Cascade Environmental  
Address 301 Alderson St. City, State, Zip Code Schofield, WI 54476  
Name of driller Jeff Jehn  
Drilling method Sonic Drilling fluid Water Bore Hole diameter 6"  
Soil sampling method Grab/bagged Depth of boring 23'

## C. MONITORING WELL INSTALLATION


Casing material <u>PVC</u>	Placement method <u>Gravity</u>
Length of casing <u>14.5'</u>	Volume <u>0.75 cu ft</u>
Outside casing diameter <u>2.37</u>	Backfill (if different from seal): <u>N/A</u>
Inside casing diameter <u>2.01</u>	Material <u>N/A</u>
Casing joint type <u>Thread</u>	Placement method <u>N/A</u>
Casing/screen joint type <u>Thread</u>	Volume <u>N/A</u>
Screen material <u>PVC</u>	Surface seal design: _____
Screen opening size <u>0.010</u>	Material of protective casing: <u>Steel</u>
Screen length <u>10'</u>	Material of grout between protective casing and well casing: <u>3/8" Bentonite chips</u>
Depth of Well <u>22'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Aluminum</u>
Material <u>Sand</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Grain Size <u>Red Flint #40</u>	Locking?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Volume <u>2.5 cu ft</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic/Rubber</u>
Material <u>3/8" Bentonite Chips</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 14.52 Stabilization time \_\_\_\_\_  
Well development method Surge and purge with pump  
Average depth of frost line \_\_\_\_\_

## DRILLER'S CERTIFICATION

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

Signature  Certification # 12374 Date 3-29-2023

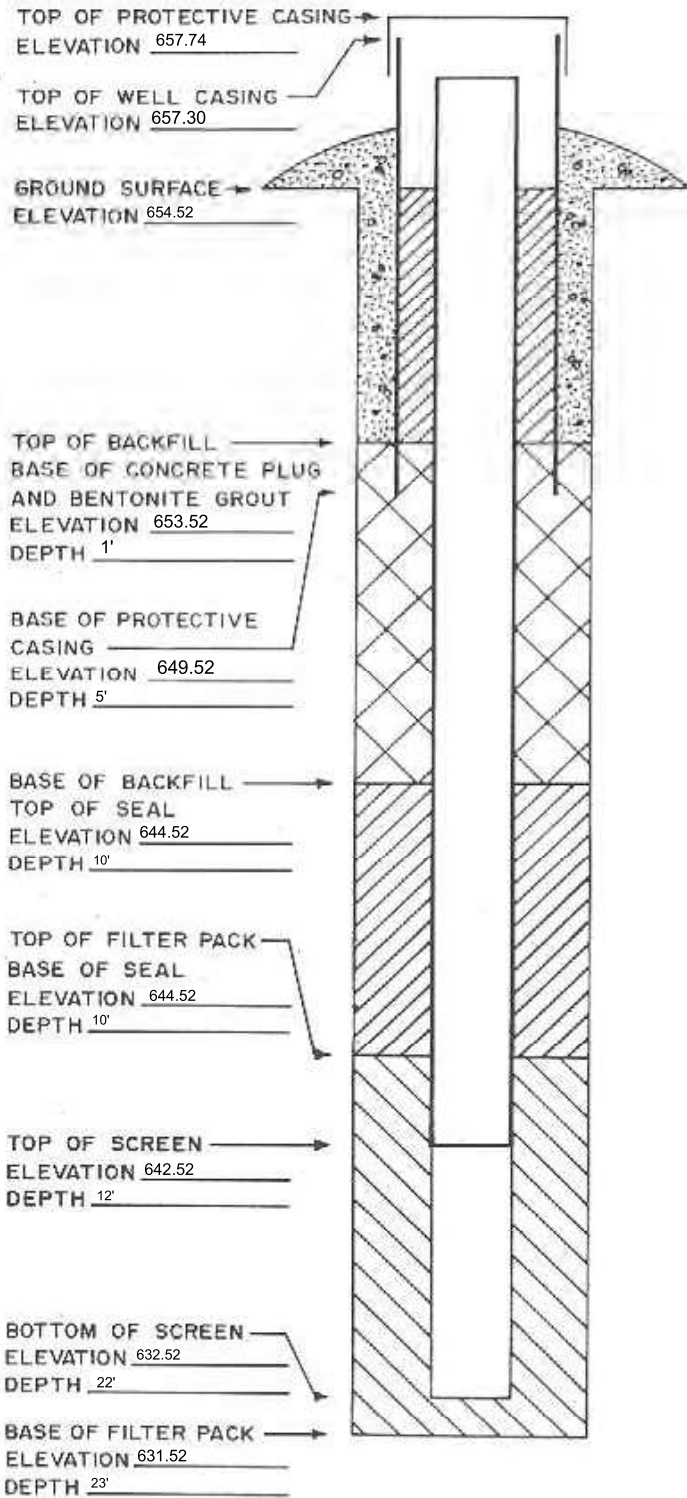
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

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

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

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 ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name Ottumwa Generating Station Permit No. 60630  
Well or Piezometer No. MW-316A Dates Started 3/28/2023 Date Completed 3/28/2023

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

Specify corner of site N parcel 003052510081000 Distance and direction along boundary 365' north  
Distance and direction from boundary to surface monitoring well 146' west  
Elevation (+0.01 ft. MSL) 654.54  
Ground Surface 654.54 Top of protective casing 658.01'  
Top of well casing 657.74' Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Cascade Environmental  
Address 301 Alderson St. City, State, Zip Code Schofield, WI 54476  
Name of driller Jeff Jehn  
Drilling method Sonic Drilling fluid Water Bore Hole diameter 6"  
Soil sampling method Grab/bagged Depth of boring 53'

## C. MONITORING WELL INSTALLATION


Casing material <u>PVC</u>	Placement method <u>Gravity</u>
Length of casing <u>49.5'</u>	Volume <u>4.5 cu ft</u>
Outside casing diameter <u>2.37</u>	Backfill (if different from seal): <u>N/A</u>
Inside casing diameter <u>2.01</u>	Material <u>N/A</u>
Casing joint type <u>Thread</u>	Placement method <u>N/A</u>
Casing/screen joint type <u>Thread</u>	Volume <u>N/A</u>
Screen material <u>PVC</u>	Surface seal design: _____
Screen opening size <u>0.010</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>3/8" Bentonite chips</u>
Depth of Well <u>52'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Aluminum</u>
Material <u>Sand</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Grain Size <u>Red Flint #40</u>	Locking?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Volume <u>1.25 cu ft</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic/Rubber</u>
Material <u>3/8" Bentonite Chips</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 14.25 Stabilization time \_\_\_\_\_  
Well development method Surge and purge with pump  
Average depth of frost line \_\_\_\_\_

## DRILLER'S CERTIFICATION

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

Signature  Certification # 12374 Date 3-28-2023

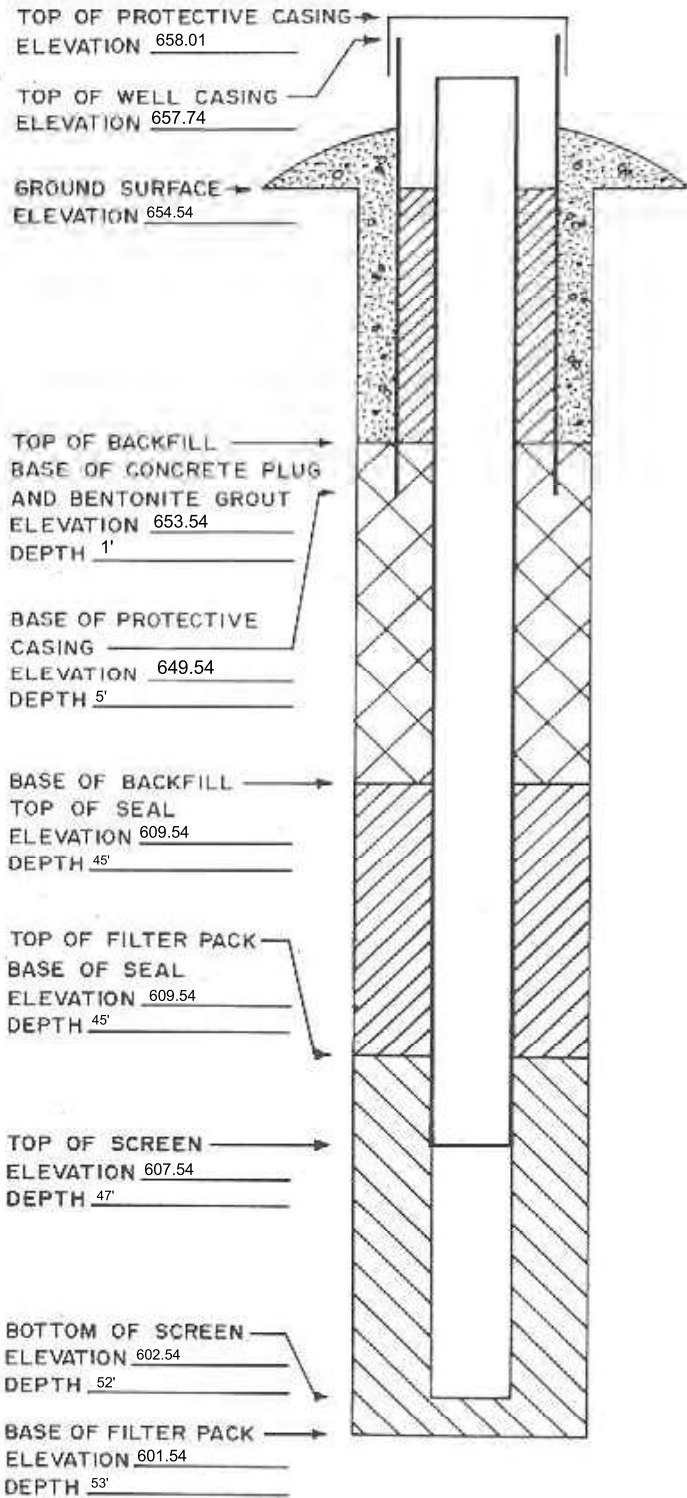
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

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

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

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 ).



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name Ottumwa Generating Station Permit No. 60630  
Well or Piezometer No. MW-317 Dates Started 3/28/2023 Date Completed 3/28/2023

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

Specify corner of site NW parc. 003052620200000 Distance and direction along boundary 62' south  
Distance and direction from boundary to surface monitoring well 90' east  
Elevation (+0.01 ft. MSL) 653.70  
Ground Surface 653.70 Top of protective casing 656.69  
Top of well casing 656.33 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Cascade Environmental  
Address 301 Alderson St. City, State, Zip Code Schofield, WI 54476  
Name of driller Jeff Jehn  
Drilling method Sonic Drilling fluid Water Bore Hole diameter 6"  
Soil sampling method Grab/bagged Depth of boring 27'

## C. MONITORING WELL INSTALLATION


Casing material <u>PVC</u>	Placement method <u>Gravity</u>
Length of casing <u>19.5</u>	Volume <u>0.5 cu ft</u>
Outside casing diameter <u>2.37</u>	Backfill (if different from seal): <u>N/A</u>
Inside casing diameter <u>2.01</u>	Material <u>N/A</u>
Casing joint type <u>Thread</u>	Placement method <u>N/A</u>
Casing/screen joint type <u>Thread</u>	Volume <u>N/A</u>
Screen material <u>PVC</u>	Surface seal design: _____
Screen opening size <u>0.010</u>	Material of protective casing: <u>Steel</u>
Screen length <u>10'</u>	Material of grout between protective casing and well casing: <u>3/8" Bentonite chips</u>
Depth of Well <u>25'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Aluminum</u>
Material <u>Sand</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Grain Size <u>Red Flint #40</u>	Locking?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Volume <u>1.75 cu ft</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic/Rubber</u>
Material <u>3/8" Bentonite Chips</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 13.49 Stabilization time \_\_\_\_\_  
Well development method Surge and purge with pump  
Average depth of frost line \_\_\_\_\_

## DRILLER'S CERTIFICATION

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

Signature  Certification # 12374 Date 3-28-2023

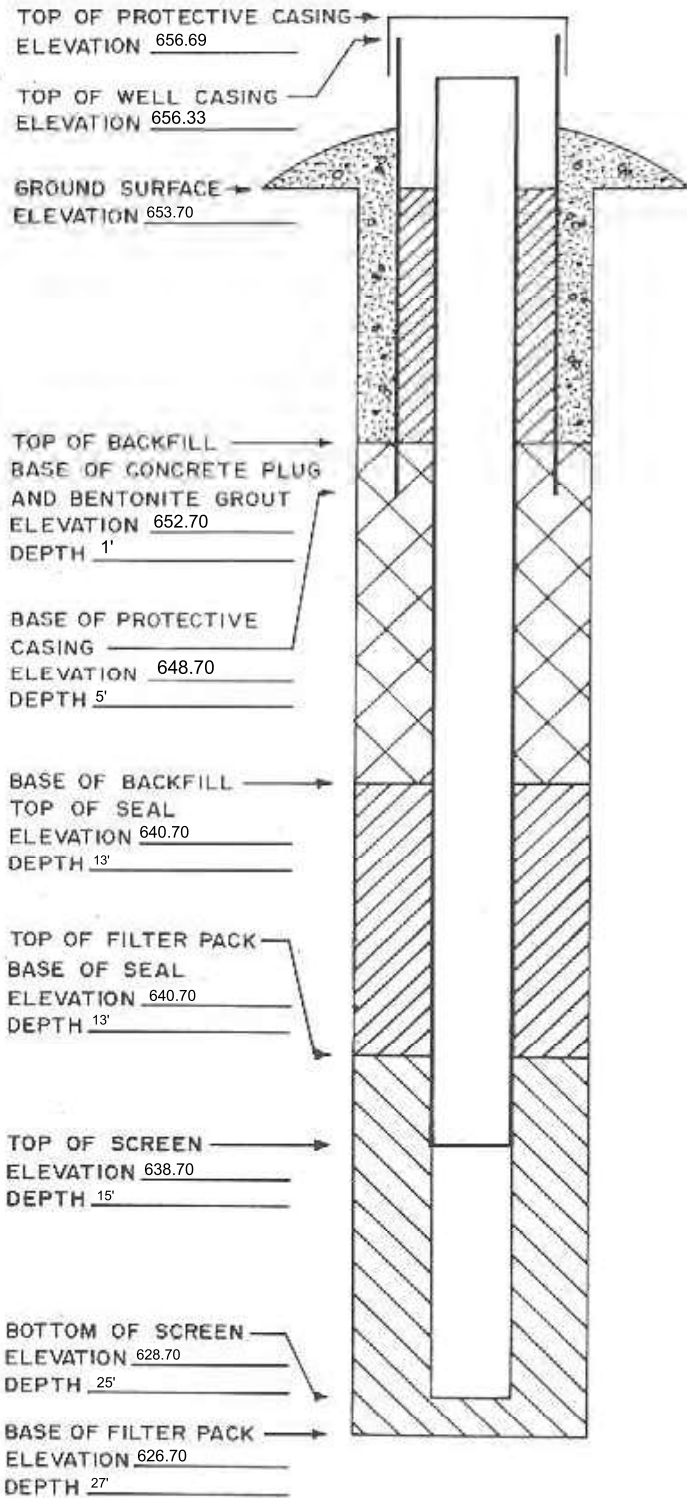
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

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


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

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 ).







# Appendix C

## Laboratory Reports

## C1 Assessment Monitoring, October 2023

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

# ANALYTICAL REPORT

## PREPARED FOR

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

Generated 12/18/2023 2:56:15 PM Revision 1

## JOB DESCRIPTION

Ottuwma Generating Station 25223072

## JOB NUMBER

310-267262-1

# Eurofins Cedar Falls

## 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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Revision 1

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





# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	11
Definitions . . . . .	27
QC Sample Results . . . . .	28
QC Association . . . . .	34
Chronicle . . . . .	38
Certification Summary . . . . .	42
Method Summary . . . . .	43
Chain of Custody . . . . .	44
Receipt Checklists . . . . .	51
Tracer Carrier Summary . . . . .	53
Field Data Sheets . . . . .	54

# Case Narrative

Client: SCS Engineers  
Project: Ottumwa Generating Station 25223072

Job ID: 310-267262-1

**Job ID: 310-267262-1**

**Eurofins Cedar Falls**

## Job Narrative 310-267262-1

### Revision

The report being provided is a revision of the original report sent on 11/13/2023. The report (revision 1) is being revised due to: Updated units on metals & reanalysis of Tl.

### Receipt

The samples were received on 10/13/2023 5:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 1.0° C, 1.8° C and 2.5° C.

### HPLC/IC

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-306 (310-267262-3). 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.

Eurofins Cedar Falls

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-267262-1	MW-304	Water	10/10/23 08:50	10/13/23 17:30
310-267262-2	MW-305	Water	10/12/23 11:35	10/13/23 17:30
310-267262-3	MW-306	Water	10/12/23 10:55	10/13/23 17:30
310-267262-4	MW-310	Water	10/10/23 16:00	10/13/23 17:30
310-267262-5	MW-310A	Water	10/12/23 12:15	10/13/23 17:30
310-267262-6	MW-311	Water	10/11/23 16:50	10/13/23 17:30
310-267262-7	MW-311A	Water	10/11/23 15:15	10/13/23 17:30
310-267262-8	MW-312	Water	10/12/23 16:45	10/13/23 17:30
310-267262-9	MW-313	Water	10/10/23 14:45	10/13/23 17:30
310-267262-10	MW-316	Water	10/12/23 13:50	10/13/23 17:30
310-267262-11	MW-316A	Water	10/12/23 12:30	10/13/23 17:30
310-267262-12	MW-317	Water	10/12/23 15:35	10/13/23 17:30
310-267262-13	MW-305A	Water	10/12/23 10:25	10/13/23 17:30

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-267262-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	230		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.79	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	230		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	1.0	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	77		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	870		100	76	ug/L	1		6020B	Total/NA
Cadmium	0.12	J	0.20	0.10	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.43	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	4800		100	36	ug/L	1		6020B	Total/NA
Lead	0.35	J	0.50	0.24	ug/L	1		6020B	Total/NA
Lithium	4.1	J	10	2.5	ug/L	1		6020B	Total/NA
Molybdenum	1.9	J	2.0	0.91	ug/L	1		6020B	Total/NA
Selenium	1.5	J	5.0	1.4	ug/L	1		6020B	Total/NA
Total Dissolved Solids	1100		250	170	mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	646.02				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-105.1				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.18				mg/L	1		Field Sampling	Total/NA
Field pH	6.85				SU	1		Field Sampling	Total/NA
Field Conductivity	1948				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.3				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	7.07				NTU	1		Field Sampling	Total/NA

**Client Sample ID: MW-305**

**Lab Sample ID: 310-267262-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	220		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.42	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	230		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.91	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	110		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	750		100	76	ug/L	1		6020B	Total/NA
Cadmium	0.13	J	0.20	0.10	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	17		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	73	J	100	36	ug/L	1		6020B	Total/NA
Lead	0.26	J	0.50	0.24	ug/L	1		6020B	Total/NA
Lithium	2.7	J	10	2.5	ug/L	1		6020B	Total/NA
Molybdenum	8.3		2.0	0.91	ug/L	1		6020B	Total/NA
Selenium	1.9	J	5.0	1.4	ug/L	1		6020B	Total/NA
Cobalt	17		0.50	0.17	ug/L	1		6020B	Dissolved
Total Dissolved Solids	970		50	34	mg/L	1		SM 2540C	Total/NA
pH	7.8	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	650.21				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	4.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.26				mg/L	1		Field Sampling	Total/NA
Field pH	6.88				SU	1		Field Sampling	Total/NA
Field Conductivity	1869				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.7				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.25				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls



# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-306

## Lab Sample ID: 310-267262-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	290		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	93		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.62	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	82		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	850		100	76	ug/L	1		6020B	Total/NA
Cadmium	1.1		0.20	0.10	ug/L	1		6020B	Total/NA
Calcium	91		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	7.1		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	80	J	100	36	ug/L	1		6020B	Total/NA
Molybdenum	12		2.0	0.91	ug/L	1		6020B	Total/NA
Thallium	0.62	J	1.0	0.26	ug/L	1		6020B	Total/NA
Cobalt	7.0		0.50	0.17	ug/L	1		6020B	Dissolved
Total Dissolved Solids	980		50	34	mg/L	1		SM 2540C	Total/NA
pH	7.6	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	655.40				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	25.3				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.29				mg/L	1		Field Sampling	Total/NA
Field pH	6.63				SU	1		Field Sampling	Total/NA
Field Conductivity	1794				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	1.90				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-267262-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Groundwater Elevation	638.32				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	7.5				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.45				mg/L	1		Field Sampling	Total/NA
Field pH	7.06				SU	1		Field Sampling	Total/NA
Field Conductivity	1344				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	14.7				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.05				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-267262-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.52		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	68	J	100	36	ug/L	1		6020B	Total/NA
Groundwater Elevation	640.13				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	46.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	5.60				mg/L	1		Field Sampling	Total/NA
Field pH	7.50				SU	1		Field Sampling	Total/NA
Field Conductivity	3355				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	14.3				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	4.96				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311

## Lab Sample ID: 310-267262-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.25	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	510		100	36	ug/L	1		6020B	Total/NA
Groundwater Elevation	638.31				ft	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-311 (Continued)

## Lab Sample ID: 310-267262-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oxidation Reduction Potential	37.9				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	7.69				mg/L	1		Field Sampling	Total/NA
Field pH	7.01				SU	1		Field Sampling	Total/NA
Field Conductivity	685				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	19.6				Degrees C	1		Field Sampling	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-267262-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	44	J	100	36	ug/L	1		6020B	Total/NA
Groundwater Elevation	639.84				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-4.2				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3.15				mg/L	1		Field Sampling	Total/NA
Field pH	7.72				SU	1		Field Sampling	Total/NA
Field Conductivity	3424				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.2				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	14.16				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-312

## Lab Sample ID: 310-267262-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	10		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	540		100	36	ug/L	1		6020B	Total/NA
Magnesium	62000		500	150	ug/L	1		6020B	Total/NA
Manganese	1500		10	3.6	ug/L	1		6020B	Total/NA
Potassium	5200		500	150	ug/L	1		6020B	Total/NA
Sodium	120000		1000	460	ug/L	1		6020B	Total/NA
Iron	210		100	36	ug/L	1		6020B	Dissolved
Manganese	1400		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	250		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	250		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	639.45				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-26.5				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.23				mg/L	1		Field Sampling	Total/NA
Field pH	6.96				SU	1		Field Sampling	Total/NA
Field Conductivity	1827				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	14.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	5.45				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-313

## Lab Sample ID: 310-267262-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	210		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	4.4		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	1500		100	36	ug/L	1		6020B	Total/NA
Magnesium	69000		500	150	ug/L	1		6020B	Total/NA
Manganese	3700		10	3.6	ug/L	1		6020B	Total/NA
Potassium	5600		500	150	ug/L	1		6020B	Total/NA
Sodium	150000		1000	460	ug/L	1		6020B	Total/NA
Iron	1100		100	36	ug/L	1		6020B	Dissolved
Manganese	3600		10	3.6	ug/L	1		6020B	Dissolved

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-313 (Continued)

## Lab Sample ID: 310-267262-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Bicarbonate Alkalinity as CaCO3	230		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	230		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	639.04				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-47.9				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.23				mg/L	1		Field Sampling	Total/NA
Field pH	6.89				SU	1		Field Sampling	Total/NA
Field Conductivity	2106				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.9				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.85				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-316

## Lab Sample ID: 310-267262-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	190		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.69		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	74	J	100	36	ug/L	1		6020B	Total/NA
Magnesium	66000		500	150	ug/L	1		6020B	Total/NA
Manganese	110		10	3.6	ug/L	1		6020B	Total/NA
Potassium	2000		500	150	ug/L	1		6020B	Total/NA
Sodium	100000		1000	460	ug/L	1		6020B	Total/NA
Manganese	110		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	310		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	310		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	639.15				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	61.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.74				mg/L	1		Field Sampling	Total/NA
Field pH	6.73				SU	1		Field Sampling	Total/NA
Field Conductivity	1773				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	16.1				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	7.20				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-316A

## Lab Sample ID: 310-267262-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	71		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.35	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	400		100	36	ug/L	1		6020B	Total/NA
Magnesium	30000		500	150	ug/L	1		6020B	Total/NA
Manganese	120		10	3.6	ug/L	1		6020B	Total/NA
Potassium	8100		500	150	ug/L	1		6020B	Total/NA
Sodium	450000		1000	460	ug/L	1		6020B	Total/NA
Manganese	1100		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	380		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	380		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	639.79				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	49.5				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3.43				mg/L	1		Field Sampling	Total/NA
Field pH	7.53				SU	1		Field Sampling	Total/NA
Field Conductivity	2399				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	17.2				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	43.00				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-317

## Lab Sample ID: 310-267262-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	190		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	4.7		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	3200		100	36	ug/L	1		6020B	Total/NA
Magnesium	41000		500	150	ug/L	1		6020B	Total/NA
Manganese	1900		10	3.6	ug/L	1		6020B	Total/NA
Potassium	3400		500	150	ug/L	1		6020B	Total/NA
Sodium	130000		1000	460	ug/L	1		6020B	Total/NA
Iron	1800		100	36	ug/L	1		6020B	Dissolved
Manganese	1700		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	490		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	490		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	639.08				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-38.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.09				mg/L	1		Field Sampling	Total/NA
Field pH	6.54				SU	1		Field Sampling	Total/NA
Field Conductivity	1853				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	13.7				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.25				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305A

## Lab Sample ID: 310-267262-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	1.2		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	58	J	100	36	ug/L	1		6020B	Total/NA
Groundwater Elevation	643.60				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	88.1				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	5.74				mg/L	1		Field Sampling	Total/NA
Field pH	6.87				SU	1		Field Sampling	Total/NA
Field Conductivity	1357				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	17.8				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	12.32				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-267262-1**

Date Collected: 10/10/23 08:50

Matrix: Water

Date Received: 10/13/23 17:30

### Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	230		5.0	2.3	mg/L			10/24/23 23:43	5
Fluoride	0.79	J	1.0	0.38	mg/L			10/24/23 23:43	5
Sulfate	230		5.0	2.1	mg/L			10/24/23 23:43	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		10/17/23 09:15	10/19/23 17:44	1
Arsenic	1.0	J	2.0	0.53	ug/L		10/17/23 09:15	10/19/23 17:44	1
Barium	77		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 17:44	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 17:44	1
Boron	870		100	76	ug/L		10/17/23 09:15	10/19/23 17:44	1
Cadmium	0.12	J	0.20	0.10	ug/L		10/17/23 09:15	10/19/23 17:44	1
Calcium	110		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 17:44	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 17:44	1
Cobalt	0.43	J	0.50	0.17	ug/L		10/17/23 09:15	10/19/23 17:44	1
Iron	4800		100	36	ug/L		10/17/23 09:15	10/19/23 17:44	1
Lead	0.35	J	0.50	0.24	ug/L		10/17/23 09:15	10/19/23 17:44	1
Lithium	4.1	J	10	2.5	ug/L		10/17/23 09:15	10/19/23 17:44	1
Molybdenum	1.9	J	2.0	0.91	ug/L		10/17/23 09:15	10/19/23 17:44	1
Selenium	1.5	J	5.0	1.4	ug/L		10/17/23 09:15	10/19/23 17:44	1
Thallium	<0.26	F1	1.0	0.26	ug/L		12/15/23 10:00	12/18/23 11:31	1

### Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:07	10/27/23 10:21	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	1100		250	170	mg/L			10/16/23 15:37	1
pH (SM 4500 H+ B)	7.7	HF	1.0	1.0	SU			10/14/23 05:45	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	1.10		0.261	0.279	1.00	0.223	pCi/L	10/18/23 09:10	11/09/23 21:08	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Barium	90.2		30 - 110					10/18/23 09:10	11/09/23 21:08	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	2.08		0.507	0.542	1.00	0.527	pCi/L	10/18/23 09:12	11/07/23 11:20	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
Barium	90.2		30 - 110					10/18/23 09:12	11/07/23 11:20	1
Y Carrier	86.0		30 - 110					10/18/23 09:12	11/07/23 11:20	1

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-304**  
 Date Collected: 10/10/23 08:50  
 Date Received: 10/13/23 17:30

**Lab Sample ID: 310-267262-1**  
 Matrix: Water

**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	3.18		0.570	0.610	5.00	0.527	pCi/L		11/10/23 16:59	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	646.02				ft			10/10/23 08:50	1
Oxidation Reduction Potential	-105.1				mV			10/10/23 08:50	1
Oxygen, Dissolved	0.18				mg/L			10/10/23 08:50	1
Field pH	6.85				SU			10/10/23 08:50	1
Field Conductivity	1948				umhos/cm			10/10/23 08:50	1
Field Temperature	13.3				Degrees C			10/10/23 08:50	1
Field Turbidity	7.07				NTU			10/10/23 08:50	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-305**

**Lab Sample ID: 310-267262-2**

Date Collected: 10/12/23 11:35

Matrix: Water

Date Received: 10/13/23 17:30

### Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220		5.0	2.3	mg/L			10/27/23 00:45	5
Fluoride	0.42	J	1.0	0.38	mg/L			10/27/23 00:45	5
Sulfate	230		5.0	2.1	mg/L			10/27/23 00:45	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		10/17/23 09:15	10/19/23 17:55	1
Arsenic	0.91	J	2.0	0.53	ug/L		10/17/23 09:15	10/19/23 17:55	1
Barium	110		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 17:55	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 17:55	1
Boron	750		100	76	ug/L		10/17/23 09:15	10/19/23 17:55	1
Cadmium	0.13	J	0.20	0.10	ug/L		10/17/23 09:15	10/19/23 17:55	1
Calcium	110		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 17:55	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 17:55	1
Cobalt	17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 17:55	1
Iron	73	J	100	36	ug/L		10/17/23 09:15	10/19/23 17:55	1
Lead	0.26	J	0.50	0.24	ug/L		10/17/23 09:15	10/19/23 17:55	1
Lithium	2.7	J	10	2.5	ug/L		10/17/23 09:15	10/19/23 17:55	1
Molybdenum	8.3		2.0	0.91	ug/L		10/17/23 09:15	10/19/23 17:55	1
Selenium	1.9	J	5.0	1.4	ug/L		10/17/23 09:15	10/19/23 17:55	1
Thallium	<0.26		1.0	0.26	ug/L		12/15/23 10:00	12/18/23 11:33	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	17		0.50	0.17	ug/L		10/17/23 10:30	10/18/23 19:48	1

### Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:07	10/27/23 10:23	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	970		50	34	mg/L			10/16/23 15:44	1
pH (SM 4500 H+ B)	7.8	HF	1.0	1.0	SU			10/14/23 04:29	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	0.384		0.170	0.173	1.00	0.198	pCi/L	10/18/23 09:10	11/09/23 21:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	90.0		30 - 110					10/18/23 09:10	11/09/23 21:08	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	0.578	U	0.388	0.392	1.00	0.589	pCi/L	10/18/23 09:12	11/07/23 11:20	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-305**  
**Date Collected: 10/12/23 11:35**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-2**  
**Matrix: Water**

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	90.0		30 - 110	10/18/23 09:12	11/07/23 11:20	1
Y Carrier	88.2		30 - 110	10/18/23 09:12	11/07/23 11:20	1

**Method: TAL-STL Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
Radium 226 and 228	0.963		(2σ+/-) 0.424	(2σ+/-) 0.428	5.00	0.589	pCi/L		11/10/23 16:59	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	650.21				ft			10/12/23 11:35	1
Oxidation Reduction Potential	4.7				mV			10/12/23 11:35	1
Oxygen, Dissolved	0.26				mg/L			10/12/23 11:35	1
Field pH	6.88				SU			10/12/23 11:35	1
Field Conductivity	1869				umhos/cm			10/12/23 11:35	1
Field Temperature	13.7				Degrees C			10/12/23 11:35	1
Field Turbidity	3.25				NTU			10/12/23 11:35	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-306**

**Lab Sample ID: 310-267262-3**

Date Collected: 10/12/23 10:55

Matrix: Water

Date Received: 10/13/23 17:30

**Method: SW846 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	290		5.0	2.3	mg/L			10/27/23 01:28	5
Fluoride	<0.38		1.0	0.38	mg/L			10/27/23 01:28	5
Sulfate	93		5.0	2.1	mg/L			10/27/23 01:28	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		10/17/23 09:15	10/19/23 17:57	1
Arsenic	0.62	J	2.0	0.53	ug/L		10/17/23 09:15	10/19/23 17:57	1
Barium	82		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 17:57	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 17:57	1
Boron	850		100	76	ug/L		10/17/23 09:15	10/19/23 17:57	1
Cadmium	1.1		0.20	0.10	ug/L		10/17/23 09:15	10/19/23 17:57	1
Calcium	91		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 17:57	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 17:57	1
Cobalt	7.1		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 17:57	1
Iron	80	J	100	36	ug/L		10/17/23 09:15	10/19/23 17:57	1
Lead	<0.24		0.50	0.24	ug/L		10/17/23 09:15	10/19/23 17:57	1
Lithium	<2.5		10	2.5	ug/L		10/17/23 09:15	10/19/23 17:57	1
Molybdenum	12		2.0	0.91	ug/L		10/17/23 09:15	10/19/23 17:57	1
Selenium	<1.4		5.0	1.4	ug/L		10/17/23 09:15	10/19/23 17:57	1
Thallium	0.62	J	1.0	0.26	ug/L		10/17/23 09:15	10/19/23 17:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	7.0		0.50	0.17	ug/L		10/17/23 10:30	10/18/23 19:50	1

**Method: SW846 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:07	10/27/23 10:25	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	980		50	34	mg/L			10/16/23 15:44	1
pH (SM 4500 H+ B)	7.6	HF	1.0	1.0	SU			10/14/23 04:24	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	0.0205	U	0.0940	0.0941	1.00	0.182	pCi/L	10/18/23 09:10	11/09/23 21:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	94.9		30 - 110					10/18/23 09:10	11/09/23 21:08	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	0.640		0.330	0.335	1.00	0.455	pCi/L	10/18/23 09:12	11/07/23 11:20	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-306**  
**Date Collected: 10/12/23 10:55**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-3**  
**Matrix: Water**

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	94.9		30 - 110	10/18/23 09:12	11/07/23 11:20	1
Y Carrier	88.6		30 - 110	10/18/23 09:12	11/07/23 11:20	1

**Method: TAL-STL Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
Radium 226 and 228	0.661		(2σ+/-) 0.343	(2σ+/-) 0.348	5.00	0.455	pCi/L		11/10/23 16:59	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	655.40				ft			10/12/23 10:55	1
Oxidation Reduction Potential	25.3				mV			10/12/23 10:55	1
Oxygen, Dissolved	0.29				mg/L			10/12/23 10:55	1
Field pH	6.63				SU			10/12/23 10:55	1
Field Conductivity	1794				umhos/cm			10/12/23 10:55	1
Field Temperature	13.6				Degrees C			10/12/23 10:55	1
Field Turbidity	1.90				NTU			10/12/23 10:55	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-310**  
**Date Collected: 10/10/23 16:00**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-4**  
**Matrix: Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:00	1
Iron	<36		100	36	ug/L		10/17/23 09:15	10/19/23 18:00	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	638.32				ft			10/10/23 16:00	1
Oxidation Reduction Potential	7.5				mV			10/10/23 16:00	1
Oxygen, Dissolved	0.45				mg/L			10/10/23 16:00	1
Field pH	7.06				SU			10/10/23 16:00	1
Field Conductivity	1344				umhos/cm			10/10/23 16:00	1
Field Temperature	14.7				Degrees C			10/10/23 16:00	1
Field Turbidity	6.05				NTU			10/10/23 16:00	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-267262-5**

Date Collected: 10/12/23 12:15

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.52		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:11	1
Iron	68	J	100	36	ug/L		10/17/23 09:15	10/19/23 18:11	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	640.13				ft			10/12/23 12:15	1
Oxidation Reduction Potential	46.0				mV			10/12/23 12:15	1
Oxygen, Dissolved	5.60				mg/L			10/12/23 12:15	1
Field pH	7.50				SU			10/12/23 12:15	1
Field Conductivity	3355				umhos/cm			10/12/23 12:15	1
Field Temperature	14.3				Degrees C			10/12/23 12:15	1
Field Turbidity	4.96				NTU			10/12/23 12:15	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-311**  
 Date Collected: 10/11/23 16:50  
 Date Received: 10/13/23 17:30

**Lab Sample ID: 310-267262-6**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.25	J	0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:13	1
Iron	510		100	36	ug/L		10/17/23 09:15	10/19/23 18:13	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	638.31				ft			10/11/23 16:50	1
Oxidation Reduction Potential	37.9				mV			10/11/23 16:50	1
Oxygen, Dissolved	7.69				mg/L			10/11/23 16:50	1
Field pH	7.01				SU			10/11/23 16:50	1
Field Conductivity	685				umhos/cm			10/11/23 16:50	1
Field Temperature	19.6				Degrees C			10/11/23 16:50	1
Field Turbidity	ND				NTU			10/11/23 16:50	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-267262-7**

Date Collected: 10/11/23 15:15

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:16	1
Iron	44	J	100	36	ug/L		10/17/23 09:15	10/19/23 18:16	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.84				ft			10/11/23 15:15	1
Oxidation Reduction Potential	-4.2				mV			10/11/23 15:15	1
Oxygen, Dissolved	3.15				mg/L			10/11/23 15:15	1
Field pH	7.72				SU			10/11/23 15:15	1
Field Conductivity	3424				umhos/cm			10/11/23 15:15	1
Field Temperature	13.2				Degrees C			10/11/23 15:15	1
Field Turbidity	14.16				NTU			10/11/23 15:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-312**

**Lab Sample ID: 310-267262-8**

Date Collected: 10/12/23 16:45

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	180		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:18	1
Cobalt	10		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:18	1
Iron	540		100	36	ug/L		10/17/23 09:15	10/19/23 18:18	1
Magnesium	62000		500	150	ug/L		10/17/23 09:15	10/19/23 18:18	1
Manganese	1500		10	3.6	ug/L		10/17/23 09:15	10/19/23 18:18	1
Potassium	5200		500	150	ug/L		10/17/23 09:15	10/19/23 18:18	1
Sodium	120000		1000	460	ug/L		10/17/23 09:15	10/19/23 18:18	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	210		100	36	ug/L		10/17/23 10:30	10/18/23 19:52	1
Manganese	1400		10	3.6	ug/L		10/17/23 10:30	10/18/23 19:52	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	250		5.0	2.5	mg/L			10/16/23 14:50	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/16/23 14:50	1
Total Alkalinity as CaCO3 (SM 2320B)	250		5.0	2.5	mg/L			10/16/23 14:50	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.45				ft			10/12/23 16:45	1
Oxidation Reduction Potential	-26.5				mV			10/12/23 16:45	1
Oxygen, Dissolved	0.23				mg/L			10/12/23 16:45	1
Field pH	6.96				SU			10/12/23 16:45	1
Field Conductivity	1827				umhos/cm			10/12/23 16:45	1
Field Temperature	14.6				Degrees C			10/12/23 16:45	1
Field Turbidity	5.45				NTU			10/12/23 16:45	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-313**  
 Date Collected: 10/10/23 14:45  
 Date Received: 10/13/23 17:30

**Lab Sample ID: 310-267262-9**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	210		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:20	1
Cobalt	4.4		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:20	1
Iron	1500		100	36	ug/L		10/17/23 09:15	10/19/23 18:20	1
Magnesium	69000		500	150	ug/L		10/17/23 09:15	10/19/23 18:20	1
Manganese	3700		10	3.6	ug/L		10/17/23 09:15	10/19/23 18:20	1
Potassium	5600		500	150	ug/L		10/17/23 09:15	10/19/23 18:20	1
Sodium	150000		1000	460	ug/L		10/17/23 09:15	10/19/23 18:20	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1100		100	36	ug/L		10/17/23 10:30	10/18/23 19:55	1
Manganese	3600		10	3.6	ug/L		10/17/23 10:30	10/18/23 19:55	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	230		5.0	2.5	mg/L			10/16/23 14:59	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/16/23 14:59	1
Total Alkalinity as CaCO3 (SM 2320B)	230		5.0	2.5	mg/L			10/16/23 14:59	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.04				ft			10/10/23 14:45	1
Oxidation Reduction Potential	-47.9				mV			10/10/23 14:45	1
Oxygen, Dissolved	0.23				mg/L			10/10/23 14:45	1
Field pH	6.89				SU			10/10/23 14:45	1
Field Conductivity	2106				umhos/cm			10/10/23 14:45	1
Field Temperature	13.9				Degrees C			10/10/23 14:45	1
Field Turbidity	6.85				NTU			10/10/23 14:45	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-316**

**Lab Sample ID: 310-267262-10**

Date Collected: 10/12/23 13:50

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	190		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:23	1
Cobalt	0.69		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:23	1
Iron	74	J	100	36	ug/L		10/17/23 09:15	10/19/23 18:23	1
Magnesium	66000		500	150	ug/L		10/17/23 09:15	10/19/23 18:23	1
Manganese	110		10	3.6	ug/L		10/17/23 09:15	10/19/23 18:23	1
Potassium	2000		500	150	ug/L		10/17/23 09:15	10/19/23 18:23	1
Sodium	100000		1000	460	ug/L		10/17/23 09:15	10/19/23 18:23	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		10/17/23 10:30	10/18/23 19:57	1
Manganese	110		10	3.6	ug/L		10/17/23 10:30	10/18/23 19:57	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	310		5.0	2.5	mg/L			10/16/23 15:08	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/16/23 15:08	1
Total Alkalinity as CaCO3 (SM 2320B)	310		5.0	2.5	mg/L			10/16/23 15:08	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.15				ft			10/12/23 13:50	1
Oxidation Reduction Potential	61.0				mV			10/12/23 13:50	1
Oxygen, Dissolved	0.74				mg/L			10/12/23 13:50	1
Field pH	6.73				SU			10/12/23 13:50	1
Field Conductivity	1773				umhos/cm			10/12/23 13:50	1
Field Temperature	16.1				Degrees C			10/12/23 13:50	1
Field Turbidity	7.20				NTU			10/12/23 13:50	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-316A**

**Lab Sample ID: 310-267262-11**

Date Collected: 10/12/23 12:30

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	71		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:25	1
Cobalt	0.35	J	0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:25	1
Iron	400		100	36	ug/L		10/17/23 09:15	10/19/23 18:25	1
Magnesium	30000		500	150	ug/L		10/17/23 09:15	10/19/23 18:25	1
Manganese	120		10	3.6	ug/L		10/17/23 09:15	10/19/23 18:25	1
Potassium	8100		500	150	ug/L		10/17/23 09:15	10/19/23 18:25	1
Sodium	450000		1000	460	ug/L		10/17/23 09:15	10/19/23 18:25	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		10/17/23 10:30	10/18/23 19:59	1
Manganese	1100		10	3.6	ug/L		10/17/23 10:30	10/18/23 19:59	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	380		5.0	2.5	mg/L			10/16/23 15:17	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/16/23 15:17	1
Total Alkalinity as CaCO3 (SM 2320B)	380		5.0	2.5	mg/L			10/16/23 15:17	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.79				ft			10/12/23 12:30	1
Oxidation Reduction Potential	49.5				mV			10/12/23 12:30	1
Oxygen, Dissolved	3.43				mg/L			10/12/23 12:30	1
Field pH	7.53				SU			10/12/23 12:30	1
Field Conductivity	2399				umhos/cm			10/12/23 12:30	1
Field Temperature	17.2				Degrees C			10/12/23 12:30	1
Field Turbidity	43.00				NTU			10/12/23 12:30	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-317**

**Lab Sample ID: 310-267262-12**

Date Collected: 10/12/23 15:35

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	190		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:30	1
Cobalt	4.7		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:30	1
Iron	3200		100	36	ug/L		10/17/23 09:15	10/19/23 18:30	1
Magnesium	41000		500	150	ug/L		10/17/23 09:15	10/19/23 18:30	1
Manganese	1900		10	3.6	ug/L		10/17/23 09:15	10/19/23 18:30	1
Potassium	3400		500	150	ug/L		10/17/23 09:15	10/19/23 18:30	1
Sodium	130000		1000	460	ug/L		10/17/23 09:15	10/19/23 18:30	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	1800		100	36	ug/L		10/17/23 10:30	10/18/23 20:02	1
Manganese	1700		10	3.6	ug/L		10/17/23 10:30	10/18/23 20:02	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	490		5.0	2.5	mg/L			10/16/23 15:37	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			10/16/23 15:37	1
Total Alkalinity as CaCO3 (SM 2320B)	490		5.0	2.5	mg/L			10/16/23 15:37	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	639.08				ft			10/12/23 15:35	1
Oxidation Reduction Potential	-38.7				mV			10/12/23 15:35	1
Oxygen, Dissolved	0.09				mg/L			10/12/23 15:35	1
Field pH	6.54				SU			10/12/23 15:35	1
Field Conductivity	1853				umhos/cm			10/12/23 15:35	1
Field Temperature	13.7				Degrees C			10/12/23 15:35	1
Field Turbidity	6.25				NTU			10/12/23 15:35	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-267262-13**

Date Collected: 10/12/23 10:25

Matrix: Water

Date Received: 10/13/23 17:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	1.2		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:32	1
Iron	58	J	100	36	ug/L		10/17/23 09:15	10/19/23 18:32	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	643.60				ft			10/12/23 10:25	1
Oxidation Reduction Potential	88.1				mV			10/12/23 10:25	1
Oxygen, Dissolved	5.74				mg/L			10/12/23 10:25	1
Field pH	6.87				SU			10/12/23 10:25	1
Field Conductivity	1357				umhos/cm			10/12/23 10:25	1
Field Temperature	17.8				Degrees C			10/12/23 10:25	1
Field Turbidity	12.32				NTU			10/12/23 10:25	1

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# Definitions/Glossary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Qualifiers

### HPLC/IC

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.

### Metals

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
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.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL, and the absolute difference between results is < the upper reporting limits for both.
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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-403841/3**  
**Matrix: Water**  
**Analysis Batch: 403841**

**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			10/24/23 18:16	1
Fluoride	<0.075		0.20	0.075	mg/L			10/24/23 18:16	1
Sulfate	<0.42		1.0	0.42	mg/L			10/24/23 18:16	1

**Lab Sample ID: LCS 310-403841/4**  
**Matrix: Water**  
**Analysis Batch: 403841**

**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	9.31		mg/L		93	90 - 110
Fluoride	2.00	1.90		mg/L		95	90 - 110
Sulfate	10.0	9.82		mg/L		98	90 - 110

**Lab Sample ID: MB 310-404077/3**  
**Matrix: Water**  
**Analysis Batch: 404077**

**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			10/26/23 23:19	1
Fluoride	<0.075		0.20	0.075	mg/L			10/26/23 23:19	1
Sulfate	<0.42		1.0	0.42	mg/L			10/26/23 23:19	1

**Lab Sample ID: LCS 310-404077/4**  
**Matrix: Water**  
**Analysis Batch: 404077**

**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	9.84		mg/L		98	90 - 110
Fluoride	2.00	2.09		mg/L		105	90 - 110
Sulfate	10.0	10.3		mg/L		103	90 - 110

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

**Lab Sample ID: MB 310-402684/1-A**  
**Matrix: Water**  
**Analysis Batch: 403027**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 402684**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	<3.6		10	3.6	ug/L		10/17/23 10:30	10/18/23 18:45	1
Iron	<36		100	36	ug/L		10/17/23 10:30	10/18/23 18:45	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 10:30	10/18/23 18:45	1

**Lab Sample ID: LCS 310-402684/2-A**  
**Matrix: Water**  
**Analysis Batch: 403027**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 402684**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Manganese	100	102		ug/L		102	80 - 120
Iron	200	234		ug/L		117	80 - 120
Cobalt	100	116		ug/L		116	80 - 120

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

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

**Lab Sample ID: MB 310-402827/1-A**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		10/17/23 09:15	10/19/23 17:40	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 17:40	1

**Lab Sample ID: LCS 310-402827/2-A**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	209		ug/L		104	80 - 120
Barium	100	107		ug/L		107	80 - 120
Beryllium	100	98.8		ug/L		99	80 - 120
Magnesium	2.00	2.07		mg/L		104	80 - 120
Boron	200	193		ug/L		96	80 - 120
Manganese	0.100	0.0979		mg/L		98	80 - 120
Cadmium	100	103		ug/L		103	80 - 120
Potassium	2.00	2.25		mg/L		113	80 - 120
Calcium	2.00	1.85		mg/L		92	80 - 120
Sodium	2.00	2.17		mg/L		108	80 - 120
Chromium	100	104		ug/L		104	80 - 120
Iron	200	226		ug/L		113	80 - 120
Lead	200	212		ug/L		106	80 - 120
Lithium	200	199		ug/L		99	80 - 120
Molybdenum	200	215		ug/L		108	80 - 120
Selenium	400	409		ug/L		102	80 - 120
Cobalt	100	112		ug/L		112	80 - 120

**Lab Sample ID: LCS 310-402827/2-A**  
**Matrix: Water**  
**Analysis Batch: 403284**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	230		ug/L		115	80 - 120
Thallium	200	173		ug/L		86	80 - 120

**Lab Sample ID: 310-267262-1 MS**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: MW-304**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.0	J	200	207		ug/L		103	75 - 125
Barium	77		100	175		ug/L		98	75 - 125
Beryllium	<0.33		100	98.1		ug/L		98	75 - 125
Magnesium	39000		2.00	40.5	4	mg/L		-1928 988	75 - 125
Boron	870		200	1060	4	ug/L		98	75 - 125
Manganese	3700		0.100	3.83	4	mg/L		-3731 508	75 - 125
Cadmium	0.12	J	100	94.7		ug/L		95	75 - 125
Potassium	7200		2.00	9.09	4	mg/L		-3598 81	75 - 125

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

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

**Lab Sample ID: 310-267262-1 MS**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: MW-304**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Sample	Sample Qualifier	Spike Added	MS	MS	Unit	D	%Rec	%Rec	
	Result			Result	Qualifier				Limits	
Calcium	110		2.00	111	4	mg/L		-51	75 - 125	
Sodium	200000		2.00	199	4	mg/L		-1013	75 - 125	
Chromium	<1.1		100	92.4		ug/L		9896	92 75 - 125	
Iron	4800		200	4940	4	ug/L		91	75 - 125	
Lead	0.35	J	200	194		ug/L		97	75 - 125	
Lithium	4.1	J	200	205		ug/L		101	75 - 125	
Molybdenum	1.9	J	200	197		ug/L		97	75 - 125	
Selenium	1.5	J	400	406		ug/L		101	75 - 125	
Cobalt	0.43	J	100	104		ug/L		103	75 - 125	

**Lab Sample ID: 310-267262-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: MW-304**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Sample	Sample Qualifier	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec		RPD	
	Result			Result	Qualifier				Limits	RPD	Limit	
Arsenic	1.0	J	200	202		ug/L		100	75 - 125		3	20
Barium	77		100	178		ug/L		101	75 - 125		1	20
Beryllium	<0.33		100	95.3		ug/L		95	75 - 125		3	20
Magnesium	39000		2.00	40.3	4	mg/L		-1929	75 - 125		1	20
Boron	870		200	1060	4	ug/L		002	95 75 - 125		1	20
Manganese	3700		0.100	3.75	4	mg/L		-3731	75 - 125		2	20
Cadmium	0.12	J	100	92.7		ug/L		589	93 75 - 125		2	20
Potassium	7200		2.00	9.08	4	mg/L		-3598	75 - 125		0	20
Calcium	110		2.00	111	4	mg/L		81	-82 75 - 125		1	20
Sodium	200000		2.00	197	4	mg/L		-1013	75 - 125		1	20
Chromium	<1.1		100	90.5		ug/L		9965	91 75 - 125		2	20
Iron	4800		200	4880	4	ug/L		59	75 - 125		1	20
Lead	0.35	J	200	189		ug/L		94	75 - 125		3	20
Lithium	4.1	J	200	198		ug/L		97	75 - 125		4	20
Molybdenum	1.9	J	200	186		ug/L		92	75 - 125		6	20
Selenium	1.5	J	400	394		ug/L		98	75 - 125		3	20
Cobalt	0.43	J	100	101		ug/L		101	75 - 125		2	20

**Lab Sample ID: 310-267262-11 DU**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: MW-316A**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Sample	Sample Qualifier	DU	DU	Unit	D	RPD	RPD	
	Result		Result	Qualifier				Limit	
Antimony	<1.0		<1.0	*+	ug/L		NC	20	
Arsenic	<0.53		<0.53		ug/L		NC	20	
Barium	58		58.9		ug/L		2	20	
Beryllium	<0.33		<0.33		ug/L		NC	20	
Magnesium	30000		30.3		mg/L		0.3	20	
Boron	1100		1080		ug/L		0.9	20	
Manganese	120		0.117		mg/L		0.3	20	

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

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

**Lab Sample ID: 310-267262-11 DU**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: MW-316A**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Cadmium	<0.10		<0.10		ug/L		NC	20
Potassium	8100		8.26		mg/L		2	20
Calcium	71		72.8		mg/L		2	20
Sodium	450000		449		mg/L		0.3	20
Chromium	<1.1		<1.1		ug/L		NC	20
Iron	400		414		ug/L		3	20
Lead	0.32	J	<0.24		ug/L		NC	20
Lithium	160		166		ug/L		1	20
Molybdenum	<0.91		<0.91		ug/L		NC	20
Selenium	<1.4		<1.4		ug/L		NC	20
Cobalt	0.35	J	0.229	J F5	ug/L		43	20

**Lab Sample ID: MB 310-408913/1-A**  
**Matrix: Water**  
**Analysis Batch: 409203**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 408913**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Thallium	<0.26		1.0	0.26	ug/L		12/15/23 10:00	12/18/23 11:29	1

**Lab Sample ID: LCS 310-408913/2-A**  
**Matrix: Water**  
**Analysis Batch: 409203**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 408913**

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Thallium	200	189		ug/L		94	80 - 120

**Lab Sample ID: 310-267262-1 MS**  
**Matrix: Water**  
**Analysis Batch: 409203**

**Client Sample ID: MW-304**  
**Prep Type: Total/NA**  
**Prep Batch: 408913**

Analyte	Sample	Sample	Spike Added	MS	MS	Unit	D	%Rec	%Rec Limits
	Result	Qualifier		Result	Qualifier				
Thallium	<0.26	F1	200	148	F1	ug/L		74	75 - 125

**Lab Sample ID: 310-267262-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 409203**

**Client Sample ID: MW-304**  
**Prep Type: Total/NA**  
**Prep Batch: 408913**

Analyte	Sample	Sample	Spike Added	MSD	MSD	Unit	D	%Rec	%Rec Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Thallium	<0.26	F1	200	155		ug/L		78	75 - 125	5	20

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 310-403843/1-A**  
**Matrix: Water**  
**Analysis Batch: 404051**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 403843**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:06	10/27/23 09:51	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 310-403843/2-A  
 Matrix: Water  
 Analysis Batch: 404051

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 403843

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.68		ug/L		101	80 - 120

## Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-402826/2  
 Matrix: Water  
 Analysis Batch: 402826

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	1010		mg/L		101	90 - 110

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

Lab Sample ID: MB 310-402676/1  
 Matrix: Water  
 Analysis Batch: 402676

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			10/16/23 15:37	1

Lab Sample ID: LCS 310-402676/2  
 Matrix: Water  
 Analysis Batch: 402676

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	968		mg/L		97	90 - 110

Lab Sample ID: MB 310-402678/1  
 Matrix: Water  
 Analysis Batch: 402678

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			10/16/23 15:44	1

Lab Sample ID: LCS 310-402678/2  
 Matrix: Water  
 Analysis Batch: 402678

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	980		mg/L		98	90 - 110

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-402565/79  
 Matrix: Water  
 Analysis Batch: 402565

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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-632482/1-A**  
**Matrix: Water**  
**Analysis Batch: 636166**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 632482**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium 226	0.06510	U	0.108	0.108	1.00	0.188	pCi/L	10/18/23 09:10	11/09/23 21:08	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Barium	92.7		30 - 110				10/18/23 09:10		11/09/23 21:08	1

**Lab Sample ID: LCS 160-632482/2-A**  
**Matrix: Water**  
**Analysis Batch: 636166**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 632482**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium 226	11.3	10.88		1.24	1.00	0.229	pCi/L	96	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Barium	88.0		30 - 110						

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

**Lab Sample ID: MB 160-632483/1-A**  
**Matrix: Water**  
**Analysis Batch: 635681**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 632483**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium 228	0.6466		0.328	0.334	1.00	0.446	pCi/L	10/18/23 09:12	11/07/23 11:15	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Barium	92.7		30 - 110				10/18/23 09:12		11/07/23 11:15	1
Y Carrier	84.9		30 - 110				10/18/23 09:12		11/07/23 11:15	1

**Lab Sample ID: LCS 160-632483/2-A**  
**Matrix: Water**  
**Analysis Batch: 635681**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 632483**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec Limits
				Uncert. (2σ+/-)					
Radium 228	7.74	8.655		1.21	1.00	0.462	pCi/L	112	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Barium	88.0		30 - 110						
Y Carrier	83.4		30 - 110						

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## HPLC/IC

### Analysis Batch: 403841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	9056A	
MB 310-403841/3	Method Blank	Total/NA	Water	9056A	
LCS 310-403841/4	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 404077

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-2	MW-305	Total/NA	Water	9056A	
310-267262-3	MW-306	Total/NA	Water	9056A	
MB 310-404077/3	Method Blank	Total/NA	Water	9056A	
LCS 310-404077/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 402684

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-2	MW-305	Dissolved	Water	3005A	
310-267262-3	MW-306	Dissolved	Water	3005A	
310-267262-8	MW-312	Dissolved	Water	3005A	
310-267262-9	MW-313	Dissolved	Water	3005A	
310-267262-10	MW-316	Dissolved	Water	3005A	
310-267262-11	MW-316A	Dissolved	Water	3005A	
310-267262-12	MW-317	Dissolved	Water	3005A	
MB 310-402684/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-402684/2-A	Lab Control Sample	Total/NA	Water	3005A	

### Prep Batch: 402827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	3005A	
310-267262-2	MW-305	Total/NA	Water	3005A	
310-267262-3	MW-306	Total/NA	Water	3005A	
310-267262-4	MW-310	Total/NA	Water	3005A	
310-267262-5	MW-310A	Total/NA	Water	3005A	
310-267262-6	MW-311	Total/NA	Water	3005A	
310-267262-7	MW-311A	Total/NA	Water	3005A	
310-267262-8	MW-312	Total/NA	Water	3005A	
310-267262-9	MW-313	Total/NA	Water	3005A	
310-267262-10	MW-316	Total/NA	Water	3005A	
310-267262-11	MW-316A	Total/NA	Water	3005A	
310-267262-12	MW-317	Total/NA	Water	3005A	
310-267262-13	MW-305A	Total/NA	Water	3005A	
MB 310-402827/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-267262-1 MS	MW-304	Total/NA	Water	3005A	
310-267262-1 MSD	MW-304	Total/NA	Water	3005A	
310-267262-11 DU	MW-316A	Total/NA	Water	3005A	

### Analysis Batch: 403027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-2	MW-305	Dissolved	Water	6020B	402684
310-267262-3	MW-306	Dissolved	Water	6020B	402684
310-267262-8	MW-312	Dissolved	Water	6020B	402684

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Metals (Continued)

### Analysis Batch: 403027 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-9	MW-313	Dissolved	Water	6020B	402684
310-267262-10	MW-316	Dissolved	Water	6020B	402684
310-267262-11	MW-316A	Dissolved	Water	6020B	402684
310-267262-12	MW-317	Dissolved	Water	6020B	402684
MB 310-402684/1-A	Method Blank	Total/NA	Water	6020B	402684
LCS 310-402684/2-A	Lab Control Sample	Total/NA	Water	6020B	402684

### Analysis Batch: 403200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	6020B	402827
310-267262-2	MW-305	Total/NA	Water	6020B	402827
310-267262-3	MW-306	Total/NA	Water	6020B	402827
310-267262-4	MW-310	Total/NA	Water	6020B	402827
310-267262-5	MW-310A	Total/NA	Water	6020B	402827
310-267262-6	MW-311	Total/NA	Water	6020B	402827
310-267262-7	MW-311A	Total/NA	Water	6020B	402827
310-267262-8	MW-312	Total/NA	Water	6020B	402827
310-267262-9	MW-313	Total/NA	Water	6020B	402827
310-267262-10	MW-316	Total/NA	Water	6020B	402827
310-267262-11	MW-316A	Total/NA	Water	6020B	402827
310-267262-12	MW-317	Total/NA	Water	6020B	402827
310-267262-13	MW-305A	Total/NA	Water	6020B	402827
MB 310-402827/1-A	Method Blank	Total/NA	Water	6020B	402827
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	6020B	402827
310-267262-1 MS	MW-304	Total/NA	Water	6020B	402827
310-267262-1 MSD	MW-304	Total/NA	Water	6020B	402827
310-267262-11 DU	MW-316A	Total/NA	Water	6020B	402827

### Analysis Batch: 403284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	6020B	402827

### Prep Batch: 403843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	7470A	
310-267262-2	MW-305	Total/NA	Water	7470A	
310-267262-3	MW-306	Total/NA	Water	7470A	
MB 310-403843/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-403843/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 404051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	7470A	403843
310-267262-2	MW-305	Total/NA	Water	7470A	403843
310-267262-3	MW-306	Total/NA	Water	7470A	403843
MB 310-403843/1-A	Method Blank	Total/NA	Water	7470A	403843
LCS 310-403843/2-A	Lab Control Sample	Total/NA	Water	7470A	403843

### Prep Batch: 408913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	3005A	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Metals (Continued)

### Prep Batch: 408913 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-2	MW-305	Total/NA	Water	3005A	
MB 310-408913/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-408913/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-267262-1 MS	MW-304	Total/NA	Water	3005A	
310-267262-1 MSD	MW-304	Total/NA	Water	3005A	

### Analysis Batch: 409203

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	6020B	408913
310-267262-2	MW-305	Total/NA	Water	6020B	408913
MB 310-408913/1-A	Method Blank	Total/NA	Water	6020B	408913
LCS 310-408913/2-A	Lab Control Sample	Total/NA	Water	6020B	408913
310-267262-1 MS	MW-304	Total/NA	Water	6020B	408913
310-267262-1 MSD	MW-304	Total/NA	Water	6020B	408913

## General Chemistry

### Analysis Batch: 402565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	SM 4500 H+ B	
310-267262-2	MW-305	Total/NA	Water	SM 4500 H+ B	
310-267262-3	MW-306	Total/NA	Water	SM 4500 H+ B	
LCS 310-402565/79	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 402676

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	SM 2540C	
MB 310-402676/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-402676/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 402678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-2	MW-305	Total/NA	Water	SM 2540C	
310-267262-3	MW-306	Total/NA	Water	SM 2540C	
MB 310-402678/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-402678/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 402826

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-8	MW-312	Total/NA	Water	SM 2320B	
310-267262-9	MW-313	Total/NA	Water	SM 2320B	
310-267262-10	MW-316	Total/NA	Water	SM 2320B	
310-267262-11	MW-316A	Total/NA	Water	SM 2320B	
310-267262-12	MW-317	Total/NA	Water	SM 2320B	
LCS 310-402826/2	Lab Control Sample	Total/NA	Water	SM 2320B	

## Rad

### Prep Batch: 632482

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	PrecSep-21	
310-267262-2	MW-305	Total/NA	Water	PrecSep-21	

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Rad (Continued)

### Prep Batch: 632482 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-3	MW-306	Total/NA	Water	PrecSep-21	
MB 160-632482/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-632482/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 632483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	PrecSep_0	
310-267262-2	MW-305	Total/NA	Water	PrecSep_0	
310-267262-3	MW-306	Total/NA	Water	PrecSep_0	
MB 160-632483/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-632483/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

## Field Service / Mobile Lab

### Analysis Batch: 404163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267262-1	MW-304	Total/NA	Water	Field Sampling	
310-267262-2	MW-305	Total/NA	Water	Field Sampling	
310-267262-3	MW-306	Total/NA	Water	Field Sampling	
310-267262-4	MW-310	Total/NA	Water	Field Sampling	
310-267262-5	MW-310A	Total/NA	Water	Field Sampling	
310-267262-6	MW-311	Total/NA	Water	Field Sampling	
310-267262-7	MW-311A	Total/NA	Water	Field Sampling	
310-267262-8	MW-312	Total/NA	Water	Field Sampling	
310-267262-9	MW-313	Total/NA	Water	Field Sampling	
310-267262-10	MW-316	Total/NA	Water	Field Sampling	
310-267262-11	MW-316A	Total/NA	Water	Field Sampling	
310-267262-12	MW-317	Total/NA	Water	Field Sampling	
310-267262-13	MW-305A	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-304**  
**Date Collected: 10/10/23 08:50**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-1**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	403841	QTZ5	EET CF	10/24/23 23:43
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 17:44
Total/NA	Prep	3005A			408913	KCK5	EET CF	12/15/23 10:00
Total/NA	Analysis	6020B		1	409203	A6US	EET CF	12/18/23 11:31
Total/NA	Prep	7470A			403843	NFT2	EET CF	10/26/23 11:07
Total/NA	Analysis	7470A		1	404051	NFT2	EET CF	10/27/23 10:21
Total/NA	Analysis	SM 2540C		1	402676	D7CP	EET CF	10/16/23 15:37
Total/NA	Analysis	SM 4500 H+ B		1	402565	D7CP	EET CF	10/14/23 05:45
Total/NA	Prep	PrecSep-21			632482	KAC	EET SL	10/18/23 09:10
Total/NA	Analysis	903.0		1	636168	SCB	EET SL	11/09/23 21:08
Total/NA	Prep	PrecSep_0			632483	KAC	EET SL	10/18/23 09:12
Total/NA	Analysis	904.0		1	635643	CMM	EET SL	11/07/23 11:20
Total/NA	Analysis	Ra226_Ra228 Pos		1	636390	EMH	EET SL	11/10/23 16:59
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/10/23 08:50

**Client Sample ID: MW-305**  
**Date Collected: 10/12/23 11:35**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-2**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	404077	QTZ5	EET CF	10/27/23 00:45
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:48
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 17:55
Total/NA	Prep	3005A			408913	KCK5	EET CF	12/15/23 10:00
Total/NA	Analysis	6020B		1	409203	A6US	EET CF	12/18/23 11:33
Total/NA	Prep	7470A			403843	NFT2	EET CF	10/26/23 11:07
Total/NA	Analysis	7470A		1	404051	NFT2	EET CF	10/27/23 10:23
Total/NA	Analysis	SM 2540C		1	402678	D7CP	EET CF	10/16/23 15:44
Total/NA	Analysis	SM 4500 H+ B		1	402565	D7CP	EET CF	10/14/23 04:29
Total/NA	Prep	PrecSep-21			632482	KAC	EET SL	10/18/23 09:10
Total/NA	Analysis	903.0		1	636168	SCB	EET SL	11/09/23 21:08
Total/NA	Prep	PrecSep_0			632483	KAC	EET SL	10/18/23 09:12
Total/NA	Analysis	904.0		1	635643	CMM	EET SL	11/07/23 11:20
Total/NA	Analysis	Ra226_Ra228 Pos		1	636390	EMH	EET SL	11/10/23 16:59
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/12/23 11:35

Eurofins Cedar Falls



# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

**Client Sample ID: MW-306**  
**Date Collected: 10/12/23 10:55**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-3**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	404077	QTZ5	EET CF	10/27/23 01:28
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:50
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 17:57
Total/NA	Prep	7470A			403843	NFT2	EET CF	10/26/23 11:07
Total/NA	Analysis	7470A		1	404051	NFT2	EET CF	10/27/23 10:25
Total/NA	Analysis	SM 2540C		1	402678	D7CP	EET CF	10/16/23 15:44
Total/NA	Analysis	SM 4500 H+ B		1	402565	D7CP	EET CF	10/14/23 04:24
Total/NA	Prep	PrecSep-21			632482	KAC	EET SL	10/18/23 09:10
Total/NA	Analysis	903.0		1	636168	SCB	EET SL	11/09/23 21:08
Total/NA	Prep	PrecSep_0			632483	KAC	EET SL	10/18/23 09:12
Total/NA	Analysis	904.0		1	635643	CMM	EET SL	11/07/23 11:20
Total/NA	Analysis	Ra226_Ra228 Pos		1	636390	EMH	EET SL	11/10/23 16:59
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/12/23 10:55

**Client Sample ID: MW-310**  
**Date Collected: 10/10/23 16:00**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-4**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:00
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/10/23 16:00

**Client Sample ID: MW-310A**  
**Date Collected: 10/12/23 12:15**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:11
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/12/23 12:15

**Client Sample ID: MW-311**  
**Date Collected: 10/11/23 16:50**  
**Date Received: 10/13/23 17:30**

**Lab Sample ID: 310-267262-6**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:13
Total/NA	Analysis	Field Sampling		1	404163	BJOR	EET CF	10/11/23 16:50

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-311A

Lab Sample ID: 310-267262-7

Date Collected: 10/11/23 15:15

Matrix: Water

Date Received: 10/13/23 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:16
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/11/23 15:15

## Client Sample ID: MW-312

Lab Sample ID: 310-267262-8

Date Collected: 10/12/23 16:45

Matrix: Water

Date Received: 10/13/23 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:52
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:18
Total/NA	Analysis	SM 2320B		1	402826	MAQ3	EET CF	10/16/23 14:50
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/12/23 16:45

## Client Sample ID: MW-313

Lab Sample ID: 310-267262-9

Date Collected: 10/10/23 14:45

Matrix: Water

Date Received: 10/13/23 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:55
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:20
Total/NA	Analysis	SM 2320B		1	402826	MAQ3	EET CF	10/16/23 14:59
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/10/23 14:45

## Client Sample ID: MW-316

Lab Sample ID: 310-267262-10

Date Collected: 10/12/23 13:50

Matrix: Water

Date Received: 10/13/23 17:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:57
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:23
Total/NA	Analysis	SM 2320B		1	402826	MAQ3	EET CF	10/16/23 15:08
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/12/23 13:50

Eurofins Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## Client Sample ID: MW-316A

Date Collected: 10/12/23 12:30

Date Received: 10/13/23 17:30

## Lab Sample ID: 310-267262-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 19:59
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:25
Total/NA	Analysis	SM 2320B		1	402826	MAQ3	EET CF	10/16/23 15:17
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/12/23 12:30

## Client Sample ID: MW-317

Date Collected: 10/12/23 15:35

Date Received: 10/13/23 17:30

## Lab Sample ID: 310-267262-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			402684	KCK5	EET CF	10/17/23 10:30
Dissolved	Analysis	6020B		1	403027	A6US	EET CF	10/18/23 20:02
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:30
Total/NA	Analysis	SM 2320B		1	402826	MAQ3	EET CF	10/16/23 15:37
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/12/23 15:35

## Client Sample ID: MW-305A

Date Collected: 10/12/23 10:25

Date Received: 10/13/23 17:30

## Lab Sample ID: 310-267262-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:32
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/12/23 10:25

### 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  
 Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## 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	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-23
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	11-16-23
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-23
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-23
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-23
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	MO000542020-1	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-24
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	02-28-24
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	MO000542021-14	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	12-31-23

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



# Method Summary

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

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.

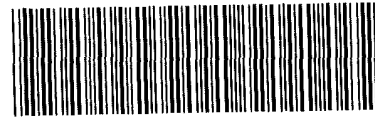
## Laboratory References:

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



Environment Testing  
America



310-267262 Chain of Custody

**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/13/23</u>	<u>1730</u>	<u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>+0.0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>1.8</u>	Corrected Temp (°C):	<u>1.8</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			
<u>Did not receive 305A</u>			





Environment Testing  
America

Place COC scanning label  
here

**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>			
Client: <u>SLS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/13/23</u>	<u>1730</u>	<u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler ID: _____			
Multiple Coolers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler # <u>2</u> of <u>3</u>			
Cooler Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Which VOA samples are in cooler? ↓			
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>T</u>		Correction Factor (°C): <u>+0.0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>25</u>		Corrected Temp (°C): <u>25</u>	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1		CONTAINER 2
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/13/23</u>	<u>1730</u>	<u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0.0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>1.0</u>	Corrected Temp (°C):	<u>1.0</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





### Chain of Custody Record

<b>Client Information</b>		Sampler: <u>Tyler Stading</u>		Lab PM: <u>Sandie Fredrick</u>		Carrier Tracking No(s)		COC No	
Client Contact: <u>Meghan Blodgett</u>		Phone: <u>515-905-2766</u>		E-Mail: <u>Sandra.Fredrick@et.eurofins.com</u>		State of Origin: <u>IA</u>		Page 1 of 2	
Company: <u>SCS Engineers</u>		Address: <u>2830 Dairy Drive</u>		City: <u>Madison</u>		State: <u>IA</u>		Job #: <u>25223072</u>	
Address: <u>2830 Dairy Drive</u>		City: <u>Madison</u>		State: <u>IA</u>		Country: <u>USA</u>		Preservation Codes	
City: <u>Madison</u>		State: <u>IA</u>		Country: <u>USA</u>		Matrix: <u>W</u>		M - Hexane	
State Zip: <u>WI 53718</u>		Phone: <u>608-224-2830</u>		PO #: <u>25223072</u>		Sample Type: <u>G</u>		N - None	
Phone: <u>608-224-2830</u>		Email: <u>mblodgett@scsengineers.com</u>		Project #: <u>25223072</u>		Preservation Code: <u>G</u>		O - AsNaO2	
Email: <u>mblodgett@scsengineers.com</u>		Project Name: <u>Ottumwa Generating Station 25223072</u>		SSOW#: <u></u>		Sample Date: <u>10/10/23</u>		P - Na2O4S	
Project Name: <u>Ottumwa Generating Station 25223072</u>		Site: <u>Ottumwa IA</u>		Sample Time: <u>8:50</u>		Sample Date: <u>10/12/23</u>		Q - Na2SO3	
Site: <u>Ottumwa IA</u>		Sample Time: <u>8:50</u>		Sample Date: <u>10/13/23</u>		Sample Date: <u>10/13/23</u>		R - Na2S2O3	
Sample Identification		Sample Time		Sample Date		Sample Date		S - H2SO4	
<u>MW-992</u>		<u>NOT SAMPLED</u>		<u>10/12/23 10:55</u>		<u>10/10/23 16:00</u>		T - TSP Dodecahydrate	
<u>MW-993</u>		<u>NOT SAMPLED</u>		<u>10/12/23 11:35</u>		<u>10/10/23 16:00</u>		U - Acetone	
<u>MW-304</u>		<u>NOT SAMPLED</u>		<u>10/12/23 10:25</u>		<u>10/10/23 16:00</u>		V - MCAA	
<u>MW-305</u>		<u>NOT SAMPLED</u>		<u>10/12/23 12:15</u>		<u>10/11/23 16:50</u>		W - pH 4-5	
<u>MW-305A</u>		<u>NOT SAMPLED</u>		<u>10/12/23 15:15</u>		<u>10/12/23 16:45</u>		Z - other (specify)	
<u>MW-306</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>		Other	
<u>MW-310</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>		Total Number of containers	
<u>MW-310A</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>		Special Instructions/Note	
<u>MW-311</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>			
<u>MW-311A</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>			
<u>MW-312</u>		<u>NOT SAMPLED</u>		<u>10/12/23 16:00</u>		<u>10/12/23 16:45</u>			
<b>Possible Hazard Identification</b>		<input type="checkbox"/> Non-Hazard		<input type="checkbox"/> Flammable		<input type="checkbox"/> Skin Irritant		<input type="checkbox"/> Poison B	
<input type="checkbox"/> Unknown		<input type="checkbox"/> Unknown		<input type="checkbox"/> Unknown		<input type="checkbox"/> Radiological		<input type="checkbox"/> Other (specify)	
<b>Deliverable Requested</b>		<input type="checkbox"/> I		<input type="checkbox"/> II		<input type="checkbox"/> III		<input type="checkbox"/> IV	
<b>Empty Kit Relinquished by</b>		Date/Time		Date/Time		Date/Time		Date/Time	
Relinquished by: <u>Tyler St</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 17:30</u>		Date/Time: <u>10/13/23 17:30</u>	
Relinquished by: <u>Tyler St</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 17:30</u>		Date/Time: <u>10/13/23 17:30</u>	
Relinquished by: <u>Tyler St</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 2:00</u>		Date/Time: <u>10/13/23 17:30</u>		Date/Time: <u>10/13/23 17:30</u>	
Custody Seals Intact: <u>Yes</u>		Custody Seal No: <u>Yes</u>		Cooler Temperature(s) °C and Other Remarks: <u>MC</u>		Cooler Temperature(s) °C and Other Remarks: <u>MC</u>		Cooler Temperature(s) °C and Other Remarks: <u>MC</u>	

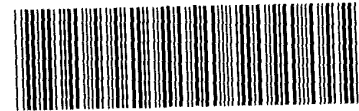








Environment Testing  
America



310-267262 Chain of Custody

Cooler/Sample Receipt and Temperature Log

<b>Client Information</b>			
Client: <u>ETA St. Louis</u>			
City/State:	CITY	STATE	Project:
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>12/14/23</u>	<u>0935</u>	<u>AM</u>
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler ID: _____			
Multiple Coolers? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Cooler # ____ of ____			
Cooler Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No			
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes: Which VOA samples are in cooler? ↓			
<b>Temperature Record</b>			
Coolant: <input type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input checked="" type="checkbox"/> NONE			
Thermometer ID: <u>X</u>		Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):		Corrected Temp (°C):	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
	<u>1 L Nitric</u>		
Uncorrected Temp (°C):	<u>12.1</u>		
Corrected Temp (°C):	<u>12.1</u>		
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding If no, proceed with login			
<b>Additional Comments</b>			
<u>metals</u>			

Document: CED-P-SAM-FRM45521  
Revision: 26  
Date: 27 Jan 2022

Eurofins Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-267262-1

**Login Number: 267262**

**List Number: 1**

**Creator: Homolar, Dana J**

**List Source: Eurofins Cedar Falls**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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 <math><6\text{mm}</math> (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: 310-267262-1

**Login Number: 267262**

**List Number: 2**

**Creator: Pinette, Meadow L**

**List Source: Eurofins St. Louis**

**List Creation: 10/17/23 02:51 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?	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	



# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottuwma Generating Station 25223072

Job ID: 310-267262-1

## 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)	
310-267262-1	MW-304	90.2	
310-267262-2	MW-305	90.0	
310-267262-3	MW-306	94.9	
LCS 160-632482/2-A	Lab Control Sample	88.0	
MB 160-632482/1-A	Method Blank	92.7	

**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)
310-267262-1	MW-304	90.2	86.0
310-267262-2	MW-305	90.0	88.2
310-267262-3	MW-306	94.9	88.6
LCS 160-632483/2-A	Lab Control Sample	88.0	83.4
MB 160-632483/1-A	Method Blank	92.7	84.9

**Tracer/Carrier Legend**  
Ba = Barium  
Y = Y Carrier

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25223072.00**  
**October 2023**

	Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	10/13/2023 1000	680.20	17.6	6.24	3.20	1158	104.7	1.75
Ash Pond	MW-302	--	652.32	--	--	--	--	--	--
	MW-303	--	648.07	--	--	--	--	--	--
	MW-304	10/10/2023 850	646.02	13.3	6.85	0.18	1948	-105.1	7.07
	MW-305	10/12/2023 1135	650.21	13.7	6.88	0.26	1869	4.7	3.25
	MW-305A	10/13/2023 1025	643.60	17.8	6.87	5.74	1357	88.1	12.32
	MW-306	10/12/2023 1055	655.40	13.6	6.63	0.29	1794	25.3	1.90
	MW-310	10/10/2023 1600	638.32	14.7	7.06	0.45	1344	7.5	6.05
	MW-310A	10/12/2023 1215	640.13	14.3	7.50	5.60	3355	46.0	4.96
	MW-311	10/11/2023 1650	638.31	19.6	7.01	7.69	685	37.9	--
	MW-311A	10/11/2023 1515	639.84	13.2	7.72	3.15	3424	-4.2	14.16
	MW-312	10/12/2023 1645	639.45	14.6	6.96	0.23	1827	-26.5	5.45
	MW-313	10/10/2023 1445	639.04	13.9	6.89	0.23	2106	-47.9	6.85
	MW-316	10/12/2023 1350	639.15	16.1	6.73	0.74	1773	61.0	7.20
	MW-316A	10/10/2023 1230	639.79	17.2	7.53	3.43	2399	49.5	43.00
MW-317	10/12/2023 1535	639.08	13.7	6.54	0.09	1853	-38.7	6.25	
ZLDP	MW-307	10/10/2023 950	642.85	12.6	6.56	0.20	1856	-35.0	6.40
	MW-308	10/10/2023 1045	640.79	12.7	6.66	0.22	1704	-54.0	6.31
	MW-309	10/10/2023 1305	640.18	13.3	7.01	0.25	1598	-54.3	8.35
	MW-315	10/10/2023 1210	641.10	13.1	6.93	0.29	1615	-79.7	9.42

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed      NM= Not Measured

Created by: RM \_\_\_\_\_ Date: 10/25/2023 \_\_\_\_\_  
 Last revision by: RM \_\_\_\_\_ Date: 10/25/2023 \_\_\_\_\_  
 Checked by: JSN \_\_\_\_\_ Date: 10/27/2023 \_\_\_\_\_

C:\Users\hld0\AppData\Local\Microsoft\Windows\NetCache\Content.Outlook\USG3GGGC\2310\_Oct - OGS combined\_CCR\_Field.xlsx\GW Field Parameters



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# ANALYTICAL REPORT

## PREPARED FOR

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

Generated 11/13/2023 10:22:01 AM

## JOB DESCRIPTION

Ottumwa Generating Station 25223072

## JOB NUMBER

310-267273-1

# Eurofins Cedar Falls

## 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  
11/13/2023 10:22:01 AM

Authorized for release by  
Sandie Fredrick, Project Manager II  
[Sandra.Fredrick@et.eurofinsus.com](mailto:Sandra.Fredrick@et.eurofinsus.com)  
(920)261-1660



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
Definitions . . . . .	11
QC Sample Results . . . . .	12
QC Association . . . . .	16
Chronicle . . . . .	18
Certification Summary . . . . .	19
Method Summary . . . . .	20
Chain of Custody . . . . .	21
Receipt Checklists . . . . .	25
Tracer Carrier Summary . . . . .	27
Field Data Sheets . . . . .	28

# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

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**Job ID: 310-267273-1**

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**Laboratory: Eurofins Cedar Falls**

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**Narrative**

**Job Narrative  
310-267273-1**

**Receipt**

The samples were received on 10/13/2023 5:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.8° C and 2.3° C.

**HPLC/IC**

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-267273-1). 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  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

---

<u>Lab Sample ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Collected</u>	<u>Received</u>
310-267273-1	MW-301	Water	10/13/23 10:00	10/13/23 17:30
310-267273-2	Field Blank	Water	10/13/23 09:30	10/13/23 17:30

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## Client Sample ID: MW-301

## Lab Sample ID: 310-267273-1

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	190		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	48		2.0	0.64	ug/L	1		6020B	Total/NA
Boron	760		100	76	ug/L	1		6020B	Total/NA
Calcium	94		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.20	J	0.50	0.17	ug/L	1		6020B	Total/NA
Lithium	25		10	2.5	ug/L	1		6020B	Total/NA
Molybdenum	1.1	J	2.0	0.91	ug/L	1		6020B	Total/NA
Selenium	5.8		5.0	1.4	ug/L	1		6020B	Total/NA
Total Dissolved Solids	680		50	34	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	680.20				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	104.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3.20				mg/L	1		Field Sampling	Total/NA
Field pH	6.24				SU	1		Field Sampling	Total/NA
Field Conductivity	1158				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	17.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	1.75				NTU	1		Field Sampling	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-267273-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.1	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-267273-1**

Date Collected: 10/13/23 10:00

Matrix: Water

Date Received: 10/13/23 17:30

**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			10/27/23 02:24	5
Fluoride	<0.38		1.0	0.38	mg/L			10/27/23 02:24	5
Sulfate	190		5.0	2.1	mg/L			10/27/23 02:24	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		10/17/23 09:15	10/19/23 18:43	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/23 09:15	10/19/23 18:43	1
Barium	48		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 18:43	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 18:43	1
Boron	760		100	76	ug/L		10/17/23 09:15	10/19/23 18:43	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/23 09:15	10/19/23 18:43	1
Calcium	94		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:43	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 18:43	1
Cobalt	0.20	J	0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:43	1
Iron	<36		100	36	ug/L		10/17/23 09:15	10/19/23 18:43	1
Lead	<0.24		0.50	0.24	ug/L		10/17/23 09:15	10/19/23 18:43	1
Lithium	25		10	2.5	ug/L		10/17/23 09:15	10/19/23 18:43	1
Molybdenum	1.1	J	2.0	0.91	ug/L		10/17/23 09:15	10/19/23 18:43	1
Selenium	5.8		5.0	1.4	ug/L		10/17/23 09:15	10/19/23 18:43	1
Thallium	<0.26		1.0	0.26	ug/L		10/17/23 09:15	10/19/23 18:43	1

**Method: SW846 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:07	10/27/23 10:29	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	680		50	34	mg/L			10/17/23 15:08	1
pH (SM 4500 H+ B)	7.0	HF	1.0	1.0	SU			10/14/23 03:26	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	0.250		0.126	0.128	1.00	0.132	pCi/L	10/18/23 09:10	11/09/23 21:08	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	89.5		30 - 110					10/18/23 09:10	11/09/23 21:08	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	0.431	U	0.334	0.337	1.00	0.514	pCi/L	10/18/23 09:12	11/07/23 11:20	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	89.5		30 - 110					10/18/23 09:12	11/07/23 11:20	1
Y Carrier	86.4		30 - 110					10/18/23 09:12	11/07/23 11:20	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

**Client Sample ID: MW-301**  
 Date Collected: 10/13/23 10:00  
 Date Received: 10/13/23 17:30

**Lab Sample ID: 310-267273-1**  
 Matrix: Water

**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	0.681		0.357	0.360	5.00	0.514	pCi/L		11/10/23 16:59	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	680.20				ft			10/13/23 10:00	1
Oxidation Reduction Potential	104.7				mV			10/13/23 10:00	1
Oxygen, Dissolved	3.20				mg/L			10/13/23 10:00	1
Field pH	6.24				SU			10/13/23 10:00	1
Field Conductivity	1158				umhos/cm			10/13/23 10:00	1
Field Temperature	17.6				Degrees C			10/13/23 10:00	1
Field Turbidity	1.75				NTU			10/13/23 10:00	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-267273-2**

Date Collected: 10/13/23 09:30

Matrix: Water

Date Received: 10/13/23 17:30

**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			10/27/23 02:38	1
Fluoride	<0.075		0.20	0.075	mg/L			10/27/23 02:38	1
Sulfate	<0.42		1.0	0.42	mg/L			10/27/23 02:38	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		10/17/23 09:15	10/19/23 18:46	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/23 09:15	10/19/23 18:46	1
Barium	<0.64		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 18:46	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 18:46	1
Boron	<76		100	76	ug/L		10/17/23 09:15	10/19/23 18:46	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/23 09:15	10/19/23 18:46	1
Calcium	<0.19		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 18:46	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 18:46	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 18:46	1
Iron	<36		100	36	ug/L		10/17/23 09:15	10/19/23 18:46	1
Lead	<0.24		0.50	0.24	ug/L		10/17/23 09:15	10/19/23 18:46	1
Lithium	<2.5		10	2.5	ug/L		10/17/23 09:15	10/19/23 18:46	1
Molybdenum	<0.91		2.0	0.91	ug/L		10/17/23 09:15	10/19/23 18:46	1
Selenium	<1.4		5.0	1.4	ug/L		10/17/23 09:15	10/19/23 18:46	1
Thallium	<0.26		1.0	0.26	ug/L		10/17/23 09:15	10/19/23 18:46	1

**Method: SW846 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:07	10/27/23 10:31	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<34		50	34	mg/L			10/17/23 15:08	1
pH (SM 4500 H+ B)	7.1	HF	1.0	1.0	SU			10/14/23 03:30	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	0.0859	U	0.102	0.102	1.00	0.166	pCi/L	10/18/23 09:10	11/09/23 21:08	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	89.2		30 - 110					10/18/23 09:10	11/09/23 21:08	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	0.466	U	0.324	0.327	1.00	0.484	pCi/L	10/18/23 09:12	11/07/23 11:20	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	89.2		30 - 110					10/18/23 09:12	11/07/23 11:20	1
Y Carrier	87.9		30 - 110					10/18/23 09:12	11/07/23 11:20	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-267273-2**

Date Collected: 10/13/23 09:30

Matrix: Water

Date Received: 10/13/23 17:30

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	0.552		0.340	0.343	5.00	0.484	pCi/L		11/10/23 16:59	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## 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.
α	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  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-404077/3**  
**Matrix: Water**  
**Analysis Batch: 404077**

**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			10/26/23 23:19	1
Fluoride	<0.075		0.20	0.075	mg/L			10/26/23 23:19	1
Sulfate	<0.42		1.0	0.42	mg/L			10/26/23 23:19	1

**Lab Sample ID: LCS 310-404077/4**  
**Matrix: Water**  
**Analysis Batch: 404077**

**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	9.84		mg/L		98	90 - 110
Fluoride	2.00	2.09		mg/L		105	90 - 110
Sulfate	10.0	10.3		mg/L		103	90 - 110

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

**Lab Sample ID: MB 310-402827/1-A**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.0		2.0	1.0	ug/L		10/17/23 09:15	10/19/23 17:40	1
Arsenic	<0.53		2.0	0.53	ug/L		10/17/23 09:15	10/19/23 17:40	1
Barium	<0.64		2.0	0.64	ug/L		10/17/23 09:15	10/19/23 17:40	1
Beryllium	<0.33		1.0	0.33	ug/L		10/17/23 09:15	10/19/23 17:40	1
Boron	<76		100	76	ug/L		10/17/23 09:15	10/19/23 17:40	1
Cadmium	<0.10		0.20	0.10	ug/L		10/17/23 09:15	10/19/23 17:40	1
Calcium	<0.19		0.50	0.19	mg/L		10/17/23 09:15	10/19/23 17:40	1
Chromium	<1.1		5.0	1.1	ug/L		10/17/23 09:15	10/19/23 17:40	1
Cobalt	<0.17		0.50	0.17	ug/L		10/17/23 09:15	10/19/23 17:40	1
Iron	<36		100	36	ug/L		10/17/23 09:15	10/19/23 17:40	1
Lead	<0.24		0.50	0.24	ug/L		10/17/23 09:15	10/19/23 17:40	1
Lithium	<2.5		10	2.5	ug/L		10/17/23 09:15	10/19/23 17:40	1
Molybdenum	<0.91		2.0	0.91	ug/L		10/17/23 09:15	10/19/23 17:40	1
Selenium	<1.4		5.0	1.4	ug/L		10/17/23 09:15	10/19/23 17:40	1
Thallium	<0.26		1.0	0.26	ug/L		10/17/23 09:15	10/19/23 17:40	1

**Lab Sample ID: LCS 310-402827/2-A**  
**Matrix: Water**  
**Analysis Batch: 403200**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 402827**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	209		ug/L		104	80 - 120
Barium	100	107		ug/L		107	80 - 120
Beryllium	100	98.8		ug/L		99	80 - 120
Boron	200	193		ug/L		96	80 - 120
Cadmium	100	103		ug/L		103	80 - 120
Calcium	2.00	1.85		mg/L		92	80 - 120
Chromium	100	104		ug/L		104	80 - 120
Cobalt	100	112		ug/L		112	80 - 120

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

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

Lab Sample ID: LCS 310-402827/2-A  
 Matrix: Water  
 Analysis Batch: 403200

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 402827

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	200	226		ug/L		113	80 - 120
Lead	200	212		ug/L		106	80 - 120
Lithium	200	199		ug/L		99	80 - 120
Molybdenum	200	215		ug/L		108	80 - 120
Selenium	400	409		ug/L		102	80 - 120

Lab Sample ID: LCS 310-402827/2-A  
 Matrix: Water  
 Analysis Batch: 403284

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 402827

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	230		ug/L		115	80 - 120
Thallium	200	173		ug/L		86	80 - 120

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-403843/1-A  
 Matrix: Water  
 Analysis Batch: 404051

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 403843

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.14		0.20	0.14	ug/L		10/26/23 11:06	10/27/23 09:51	1

Lab Sample ID: LCS 310-403843/2-A  
 Matrix: Water  
 Analysis Batch: 404051

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 403843

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.68		ug/L		101	80 - 120

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

Lab Sample ID: MB 310-402825/1  
 Matrix: Water  
 Analysis Batch: 402825

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			10/17/23 15:08	1

Lab Sample ID: LCS 310-402825/2  
 Matrix: Water  
 Analysis Batch: 402825

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	1000		mg/L		100	90 - 110

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-402565/53  
 Matrix: Water  
 Analysis Batch: 402565

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 160-632482/1-A  
 Matrix: Water  
 Analysis Batch: 636166

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 632482

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.06510	U	0.108	0.108	1.00	0.188	pCi/L	10/18/23 09:10	11/09/23 21:08	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	92.7		30 - 110					10/18/23 09:10	11/09/23 21:08	1

Lab Sample ID: LCS 160-632482/2-A  
 Matrix: Water  
 Analysis Batch: 636166

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 632482

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium 226	11.3	10.88		1.24	1.00	0.229	pCi/L	96	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Barium	88.0		30 - 110						

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

Lab Sample ID: MB 160-632483/1-A  
 Matrix: Water  
 Analysis Batch: 635681

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 632483

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.6466		0.328	0.334	1.00	0.446	pCi/L	10/18/23 09:12	11/07/23 11:15	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	92.7		30 - 110					10/18/23 09:12	11/07/23 11:15	1
Y Carrier	84.9		30 - 110					10/18/23 09:12	11/07/23 11:15	1

Lab Sample ID: LCS 160-632483/2-A  
 Matrix: Water  
 Analysis Batch: 635681

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 632483

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium 228	7.74	8.655		1.21	1.00	0.462	pCi/L	112	75 - 125

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# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

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

Lab Sample ID: LCS 160-632483/2-A  
Matrix: Water  
Analysis Batch: 635681

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 632483

<i>Carrier</i>	<i>LCS</i> <i>%Yield</i>	<i>LCS</i> <i>Qualifier</i>	<i>Limits</i>
Barium	88.0		30 - 110
Y Carrier	83.4		30 - 110

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## HPLC/IC

### Analysis Batch: 404077

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	9056A	
310-267273-2	Field Blank	Total/NA	Water	9056A	
MB 310-404077/3	Method Blank	Total/NA	Water	9056A	
LCS 310-404077/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 402827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	3005A	
310-267273-2	Field Blank	Total/NA	Water	3005A	
MB 310-402827/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	3005A	

### Analysis Batch: 403200

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	6020B	402827
310-267273-2	Field Blank	Total/NA	Water	6020B	402827
MB 310-402827/1-A	Method Blank	Total/NA	Water	6020B	402827
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	6020B	402827

### Analysis Batch: 403284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-402827/2-A	Lab Control Sample	Total/NA	Water	6020B	402827

### Prep Batch: 403843

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	7470A	
310-267273-2	Field Blank	Total/NA	Water	7470A	
MB 310-403843/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-403843/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 404051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	7470A	403843
310-267273-2	Field Blank	Total/NA	Water	7470A	403843
MB 310-403843/1-A	Method Blank	Total/NA	Water	7470A	403843
LCS 310-403843/2-A	Lab Control Sample	Total/NA	Water	7470A	403843

## General Chemistry

### Analysis Batch: 402565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	SM 4500 H+ B	
310-267273-2	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-402565/53	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 402825

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	SM 2540C	
310-267273-2	Field Blank	Total/NA	Water	SM 2540C	
MB 310-402825/1	Method Blank	Total/NA	Water	SM 2540C	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## General Chemistry (Continued)

### Analysis Batch: 402825 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-402825/2	Lab Control Sample	Total/NA	Water	SM 2540C	

## Rad

### Prep Batch: 632482

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	PrecSep-21	
310-267273-2	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-632482/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-632482/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 632483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	PrecSep_0	
310-267273-2	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-632483/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-632483/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

## Field Service / Mobile Lab

### Analysis Batch: 404163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-267273-1	MW-301	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-267273-1**

**Date Collected: 10/13/23 10:00**

**Matrix: Water**

**Date Received: 10/13/23 17:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	404077	QTZ5	EET CF	10/27/23 02:24
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:43
Total/NA	Prep	7470A			403843	NFT2	EET CF	10/26/23 11:07
Total/NA	Analysis	7470A		1	404051	NFT2	EET CF	10/27/23 10:29
Total/NA	Analysis	SM 2540C		1	402825	ENB7	EET CF	10/17/23 15:08
Total/NA	Analysis	SM 4500 H+ B		1	402565	D7CP	EET CF	10/14/23 03:26
Total/NA	Prep	PrecSep-21			632482	KAC	EET SL	10/18/23 09:10
Total/NA	Analysis	903.0		1	636008	SCB	EET SL	11/09/23 21:08
Total/NA	Prep	PrecSep_0			632483	KAC	EET SL	10/18/23 09:12
Total/NA	Analysis	904.0		1	635643	CMM	EET SL	11/07/23 11:20
Total/NA	Analysis	Ra226_Ra228 Pos		1	636390	EMH	EET SL	11/10/23 16:59
Total/NA	Analysis	Field Sampling		1	404163	BJ0R	EET CF	10/13/23 10:00

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-267273-2**

**Date Collected: 10/13/23 09:30**

**Matrix: Water**

**Date Received: 10/13/23 17:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	404077	QTZ5	EET CF	10/27/23 02:38
Total/NA	Prep	3005A			402827	KCK5	EET CF	10/17/23 09:15
Total/NA	Analysis	6020B		1	403200	A6US	EET CF	10/19/23 18:46
Total/NA	Prep	7470A			403843	NFT2	EET CF	10/26/23 11:07
Total/NA	Analysis	7470A		1	404051	NFT2	EET CF	10/27/23 10:31
Total/NA	Analysis	SM 2540C		1	402825	ENB7	EET CF	10/17/23 15:08
Total/NA	Analysis	SM 4500 H+ B		1	402565	D7CP	EET CF	10/14/23 03:30
Total/NA	Prep	PrecSep-21			632482	KAC	EET SL	10/18/23 09:10
Total/NA	Analysis	903.0		1	636008	SCB	EET SL	11/09/23 21:08
Total/NA	Prep	PrecSep_0			632483	KAC	EET SL	10/18/23 09:12
Total/NA	Analysis	904.0		1	635643	CMM	EET SL	11/07/23 11:20
Total/NA	Analysis	Ra226_Ra228 Pos		1	636390	EMH	EET SL	11/10/23 16:59

**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  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

## 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	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-23
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	11-30-23
Iowa	State	373	12-01-24
Kentucky (DW)	State	KY90125	12-31-23
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-23
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-23
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	MO000542020-1	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-24
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	02-28-24
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	MO000542021-14	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	12-31-23

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



# Method Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

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





Environment Testing  
America



310-267273 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/13/23</u>	<u>1730</u>	<u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>T</u>	Correction Factor (°C): <u>0.0</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.3</u>	Corrected Temp (°C): <u>2.3</u>	
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			



Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>10/13/23</u>	<u>1730</u>	<u>[Signature]</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>10.0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>1.8</u>	Corrected Temp (°C):	<u>1.8</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			









# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-267273-1

**Login Number: 267273**

**List Number: 1**

**Creator: Homolar, Dana J**

**List Source: Eurofins Cedar Falls**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
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 <math><6\text{mm}</math> (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: 310-267273-1

**Login Number: 267273**

**List Number: 2**

**Creator: Pinette, Meadow L**

**List Source: Eurofins St. Louis**

**List Creation: 10/17/23 02:51 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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?	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 <math><6\text{mm}</math> (1/4").	True	
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  
Project/Site: Ottumwa Generating Station 25223072

Job ID: 310-267273-1

## 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)							
310-267273-1	MW-301	89.5							
310-267273-2	Field Blank	89.2							
LCS 160-632482/2-A	Lab Control Sample	88.0							
MB 160-632482/1-A	Method Blank	92.7							

#### 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)						
310-267273-1	MW-301	89.5	86.4						
310-267273-2	Field Blank	89.2	87.9						
LCS 160-632483/2-A	Lab Control Sample	88.0	83.4						
MB 160-632483/1-A	Method Blank	92.7	84.9						

#### Tracer/Carrier Legend

Ba = Barium

Y = Y Carrier

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25223072.00**  
**October 2023**

	Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
Background	MW-301	10/13/2023 1000	680.20	17.6	6.24	3.20	1158	104.7	1.75
Ash Pond	MW-302	--	652.32	--	--	--	--	--	--
	MW-303	--	648.07	--	--	--	--	--	--
	MW-304	10/10/2023 850	646.02	13.3	6.85	0.18	1948	-105.1	7.07
	MW-305	10/12/2023 1135	650.21	13.7	6.88	0.26	1869	4.7	3.25
	MW-305A	10/13/2023 1025	643.60	17.8	6.87	5.74	1357	88.1	12.32
	MW-306	10/12/2023 1055	655.40	13.6	6.63	0.29	1794	25.3	1.90
	MW-310	10/10/2023 1600	638.32	14.7	7.06	0.45	1344	7.5	6.05
	MW-310A	10/12/2023 1215	640.13	14.3	7.50	5.60	3355	46.0	4.96
	MW-311	10/11/2023 1650	638.31	19.6	7.01	7.69	685	37.9	--
	MW-311A	10/11/2023 1515	639.84	13.2	7.72	3.15	3424	-4.2	14.16
	MW-312	10/12/2023 1645	639.45	14.6	6.96	0.23	1827	-26.5	5.45
	MW-313	10/10/2023 1445	639.04	13.9	6.89	0.23	2106	-47.9	6.85
	MW-316	10/12/2023 1350	639.15	16.1	6.73	0.74	1773	61.0	7.20
	MW-316A	10/10/2023 1230	639.79	17.2	7.53	3.43	2399	49.5	43.00
MW-317	10/12/2023 1535	639.08	13.7	6.54	0.09	1853	-38.7	6.25	
ZLDP	MW-307	10/10/2023 950	642.85	12.6	6.56	0.20	1856	-35.0	6.40
	MW-308	10/10/2023 1045	640.79	12.7	6.66	0.22	1704	-54.0	6.31
	MW-309	10/10/2023 1305	640.18	13.3	7.01	0.25	1598	-54.3	8.35
	MW-315	10/10/2023 1210	641.10	13.1	6.93	0.29	1615	-79.7	9.42

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed      NM= Not Measured

Created by: RM \_\_\_\_\_ Date: 10/25/2023 \_\_\_\_\_  
 Last revision by: RM \_\_\_\_\_ Date: 10/25/2023 \_\_\_\_\_  
 Checked by: JSN \_\_\_\_\_ Date: 10/27/2023 \_\_\_\_\_

C:\Users\hld0\AppData\Local\Microsoft\Windows\NetCache\Content.Outlook\USG3GGGC\2310\_Oct - OGS combined\_CCR\_Field.xlsx\GW Field Parameters

## C2 Assessment Monitoring, April 2024



1
2
3
4
5
6
7
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9
10
11
12
13
14
15
16

# ANALYTICAL REPORT

## PREPARED FOR

Attn: Meghan Blodgett  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718  
Generated 5/23/2024 1:51:19 PM Revision 2

## JOB DESCRIPTION

Ottumwa Generating Station 25224072.00

## JOB NUMBER

310-278397-1

# Eurofins Cedar Falls

## 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  
5/23/2024 1:51:19 PM  
Revision 2

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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	6
Detection Summary . . . . .	7
Client Sample Results . . . . .	12
Definitions . . . . .	30
QC Sample Results . . . . .	31
QC Association . . . . .	36
Chronicle . . . . .	40
Certification Summary . . . . .	45
Method Summary . . . . .	46
Chain of Custody . . . . .	47
Receipt Checklists . . . . .	52
Tracer Carrier Summary . . . . .	54
Field Data Sheets . . . . .	55

# Case Narrative

Client: SCS Engineers  
Project: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Job ID: 310-278397-1**

**Eurofins Cedar Falls**

## Job Narrative 310-278397-1

### Revision

The report being provided is a revision of the original report sent on 5/7/2024. The report (revision 2) is being revised due to: Updated units for metals.

#### Report revision history

Revision 1 - 5/20/2024 - Reason - Mercury Missed on initial login/review. Added to revision..

### 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 temperatures of the 2 coolers at receipt time were 2.8° C and 3.8° C.

### HPLC/IC

Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-303 (310-278397-1), MW-305 (310-278397-3) and MW-306 (310-278397-5). 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.

Eurofins Cedar Falls

# Case Narrative

Client: SCS Engineers  
Project: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Job ID: 310-278397-2**

**Eurofins Cedar Falls**

## Job Narrative 310-278397-2

### 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 temperatures of the 2 coolers at receipt time were 2.8° C and 3.8° C.

### Metals

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

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Eurofins Cedar Falls



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278397-1	MW-303	Water	04/04/24 10:25	04/05/24 16:40
310-278397-2	MW-304	Water	04/04/24 12:40	04/05/24 16:40
310-278397-3	MW-305	Water	04/04/24 13:40	04/05/24 16:40
310-278397-4	MW-305A	Water	04/05/24 08:10	04/05/24 16:40
310-278397-5	MW-306	Water	04/04/24 15:05	04/05/24 16:40
310-278397-6	MW-310	Water	04/04/24 16:35	04/05/24 16:40
310-278397-7	MW-310A	Water	04/05/24 09:00	04/05/24 16:40
310-278397-8	MW-311	Water	04/05/24 09:55	04/05/24 16:40
310-278397-9	MW-311A	Water	04/05/24 10:30	04/05/24 16:40
310-278397-10	MW-312	Water	04/04/24 15:10	04/05/24 16:40
310-278397-11	MW-313	Water	04/04/24 16:30	04/05/24 16:40
310-278397-12	MW-316	Water	04/05/24 09:30	04/05/24 16:40
310-278397-13	MW-316A	Water	04/05/24 10:05	04/05/24 16:40
310-278397-14	MW-317	Water	04/05/24 09:00	04/05/24 16:40

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-303

## Lab Sample ID: 310-278397-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	56		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	360		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.80	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	44		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	560		100	76	ug/L	1		6020B	Total/NA
Cadmium	0.10	J	0.20	0.10	ug/L	1		6020B	Total/NA
Calcium	210		0.50	0.19	mg/L	1		6020B	Total/NA
Chromium	1.2	J	5.0	1.2	ug/L	1		6020B	Total/NA
Cobalt	3.8		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	1200		100	36	ug/L	1		6020B	Total/NA
Lead	0.63		0.50	0.26	ug/L	1		6020B	Total/NA
Lithium	3.9	J	10	2.5	ug/L	1		6020B	Total/NA
Molybdenum	3.2		2.0	1.3	ug/L	1		6020B	Total/NA
Selenium	35		5.0	1.4	ug/L	1		6020B	Total/NA
Total Dissolved Solids	980		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	649.52				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	78.4				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3				mg/L	1		Field Sampling	Total/NA
Field pH	6.82				SU	1		Field Sampling	Total/NA
Field Conductivity	1456				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	8.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	34.31				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-304

## Lab Sample ID: 310-278397-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.97	J	1.0	0.38	mg/L	5		9056A	Total/NA
Sulfate	240		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.71	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	77		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	970		100	76	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.34	J	0.50	0.17	ug/L	1		6020B	Total/NA
Iron	5300		100	36	ug/L	1		6020B	Total/NA
Lithium	3.6	J	10	2.5	ug/L	1		6020B	Total/NA
Molybdenum	1.9	J	2.0	1.3	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
Groundwater Elevation	648.39				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-32.0				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	1.71				mg/L	1		Field Sampling	Total/NA
Field pH	6.88				SU	1		Field Sampling	Total/NA
Field Conductivity	1744				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.7				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.08				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305

## Lab Sample ID: 310-278397-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	240		5.0	2.3	mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-305 (Continued)

## Lab Sample ID: 310-278397-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	220		5.0	2.1	mg/L	5		9056A	Total/NA
Arsenic	0.54	J	2.0	0.53	ug/L	1		6020B	Total/NA
Barium	110		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	840		100	76	ug/L	1		6020B	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	17		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	51	J	100	36	ug/L	1		6020B	Total/NA
Molybdenum	8.3		2.0	1.3	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	18		0.50	0.17	ug/L	1		6020B	Dissolved
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	650.62				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	47.3				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	6.11				mg/L	1		Field Sampling	Total/NA
Field pH	6.90				SU	1		Field Sampling	Total/NA
Field Conductivity	1708				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.2				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.22				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305A

## Lab Sample ID: 310-278397-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.96		0.50	0.17	ug/L	1		6020B	Total/NA
Groundwater Elevation	645.43				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	71.8				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	4.31				mg/L	1		Field Sampling	Total/NA
Field pH	6.95				SU	1		Field Sampling	Total/NA
Field Conductivity	1169				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.0				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	6.28				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-306

## Lab Sample ID: 310-278397-5

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	250		5.0	2.1	mg/L	5		9056A	Total/NA
Barium	90		2.0	0.66	ug/L	1		6020B	Total/NA
Boron	920		100	76	ug/L	1		6020B	Total/NA
Cadmium	1.3		0.20	0.10	ug/L	1		6020B	Total/NA
Calcium	100		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	8.5		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	66	J	100	36	ug/L	1		6020B	Total/NA
Molybdenum	11		2.0	1.3	ug/L	1		6020B	Total/NA
Cobalt, Dissolved	8.9		0.50	0.17	ug/L	1		6020B	Dissolved
Total Dissolved Solids	1000		50	34	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	1.0	1.0	SU	1		SM 4500 H+ B	Total/NA
Groundwater Elevation	654.47				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	69.9				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	1.51				mg/L	1		Field Sampling	Total/NA
Field pH	6.64				SU	1		Field Sampling	Total/NA
Field Conductivity	1724				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.5				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-306 (Continued)

## Lab Sample ID: 310-278397-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Field Turbidity	5.98				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-278397-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.29	J	0.50	0.17	ug/L	1		6020B	Total/NA
Groundwater Elevation	643.51				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	71.6				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	7.89				mg/L	1		Field Sampling	Total/NA
Field pH	7.05				SU	1		Field Sampling	Total/NA
Field Conductivity	1363				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	11.3				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	5.97				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-278397-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	1.1		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	140		100	36	ug/L	1		6020B	Total/NA
Groundwater Elevation	628.24				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	50.2				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	7.75				mg/L	1		Field Sampling	Total/NA
Field pH	7.43				SU	1		Field Sampling	Total/NA
Field Conductivity	3020				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	11.7				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	7.57				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311

## Lab Sample ID: 310-278397-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.24	J	0.50	0.17	ug/L	1		6020B	Total/NA
Groundwater Elevation	-				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	42.6				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.29				mg/L	1		Field Sampling	Total/NA
Field pH	6.78				SU	1		Field Sampling	Total/NA
Field Conductivity	834				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	10.4				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	8.69				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-278397-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.44	J	0.50	0.17	ug/L	1		6020B	Total/NA
Groundwater Elevation	635.54				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	61.3				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	2.18				mg/L	1		Field Sampling	Total/NA
Field pH	7.64				SU	1		Field Sampling	Total/NA
Field Conductivity	3244				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	11.5				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	7.40				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-312

## Lab Sample ID: 310-278397-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	170		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	8.5		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	420		100	36	ug/L	1		6020B	Total/NA
Magnesium	59000		500	150	ug/L	1		6020B	Total/NA
Manganese	910		10	3.6	ug/L	1		6020B	Total/NA
Potassium	5000		500	150	ug/L	1		6020B	Total/NA
Sodium	110000		1000	480	ug/L	1		6020B	Total/NA
Iron, Dissolved	280	B	100	36	ug/L	1		6020B	Dissolved
Manganese, Dissolved	730		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	290		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	290		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	643.94				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-11.7				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.29				mg/L	1		Field Sampling	Total/NA
Field pH	6.89				SU	1		Field Sampling	Total/NA
Field Conductivity	1512				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	12.3				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	8.53				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-313

## Lab Sample ID: 310-278397-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	140		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	2.9		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	580		100	36	ug/L	1		6020B	Total/NA
Magnesium	46000		500	150	ug/L	1		6020B	Total/NA
Manganese	2000		10	3.6	ug/L	1		6020B	Total/NA
Potassium	4300		500	150	ug/L	1		6020B	Total/NA
Sodium	120000		1000	480	ug/L	1		6020B	Total/NA
Iron, Dissolved	430	B	100	36	ug/L	1		6020B	Dissolved
Manganese, Dissolved	2200		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	140		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	140		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	644.49				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-27.9				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	0.21				mg/L	1		Field Sampling	Total/NA
Field pH	6.90				SU	1		Field Sampling	Total/NA
Field Conductivity	1395				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	11.8				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	7.45				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-316

## Lab Sample ID: 310-278397-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	82		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	0.20	J	0.50	0.17	ug/L	1		6020B	Total/NA
Magnesium	27000		500	150	ug/L	1		6020B	Total/NA
Manganese	15		10	3.6	ug/L	1		6020B	Total/NA
Potassium	930		500	150	ug/L	1		6020B	Total/NA
Sodium	53000		1000	480	ug/L	1		6020B	Total/NA
Bicarbonate Alkalinity as CaCO3	95		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	95		5.0	2.5	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls



# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-316 (Continued)

## Lab Sample ID: 310-278397-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Groundwater Elevation	644.09				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	81.3				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	5.20				mg/L	1		Field Sampling	Total/NA
Field pH	7.04				SU	1		Field Sampling	Total/NA
Field Conductivity	763				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	9.2				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.95				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-316A

## Lab Sample ID: 310-278397-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	51		0.50	0.19	mg/L	1		6020B	Total/NA
Magnesium	29000		500	150	ug/L	1		6020B	Total/NA
Manganese	22		10	3.6	ug/L	1		6020B	Total/NA
Potassium	7800		500	150	ug/L	1		6020B	Total/NA
Sodium	470000		4000	1900	ug/L	4		6020B	Total/NA
Manganese, Dissolved	20		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	310		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	310		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	643.94				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	40.1				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	3.57				mg/L	1		Field Sampling	Total/NA
Field pH	7.36				SU	1		Field Sampling	Total/NA
Field Conductivity	2189				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	10.6				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	4.46				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-317

## Lab Sample ID: 310-278397-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	100		0.50	0.19	mg/L	1		6020B	Total/NA
Cobalt	1.7		0.50	0.17	ug/L	1		6020B	Total/NA
Iron	350		100	36	ug/L	1		6020B	Total/NA
Magnesium	28000		500	150	ug/L	1		6020B	Total/NA
Manganese	350		10	3.6	ug/L	1		6020B	Total/NA
Potassium	1600		500	150	ug/L	1		6020B	Total/NA
Sodium	68000		1000	480	ug/L	1		6020B	Total/NA
Manganese, Dissolved	320		10	3.6	ug/L	1		6020B	Dissolved
Bicarbonate Alkalinity as CaCO3	270		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	270		5.0	2.5	mg/L	1		SM 2320B	Total/NA
Groundwater Elevation	644.11				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	93.4				mV	1		Field Sampling	Total/NA
Oxygen, Dissolved	4.85				mg/L	1		Field Sampling	Total/NA
Field pH	6.68				SU	1		Field Sampling	Total/NA
Field Conductivity	898				umhos/cm	1		Field Sampling	Total/NA
Field Temperature	9.9				Degrees C	1		Field Sampling	Total/NA
Field Turbidity	3.98				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-303**

**Lab Sample ID: 310-278397-1**

Date Collected: 04/04/24 10:25

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	56		5.0	2.3	mg/L			04/12/24 15:16	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 15:16	5
Sulfate	360		5.0	2.1	mg/L			04/12/24 15:16	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	04/18/24 00:07	1
Arsenic	0.80	J	2.0	0.53	ug/L		04/09/24 09:00	04/18/24 00:07	1
Barium	44		2.0	0.66	ug/L		04/09/24 09:00	04/18/24 00:07	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/18/24 00:07	1
Boron	560		100	76	ug/L		04/09/24 09:00	04/19/24 12:41	1
Cadmium	0.10	J	0.20	0.10	ug/L		04/09/24 09:00	04/18/24 00:07	1
Calcium	210		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:07	1
Chromium	1.2	J	5.0	1.2	ug/L		04/09/24 09:00	04/18/24 00:07	1
Cobalt	3.8		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:07	1
Iron	1200		100	36	ug/L		04/09/24 09:00	04/18/24 00:07	1
Lead	0.63		0.50	0.26	ug/L		04/09/24 09:00	04/18/24 00:07	1
Lithium	3.9	J	10	2.5	ug/L		04/09/24 09:00	04/18/24 00:07	1
Molybdenum	3.2		2.0	1.3	ug/L		04/09/24 09:00	04/18/24 00:07	1
Selenium	35		5.0	1.4	ug/L		04/09/24 09:00	04/18/24 00:07	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/18/24 00:07	1

**Method: SW846 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11	H F1	0.20	0.11	ug/L		05/17/24 11:17	05/20/24 11:35	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	980		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 18:42	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	0.0660	U	0.0687	0.0690	1.00	0.105	pCi/L	04/10/24 10:16	05/05/24 12:27	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	87.6		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	1.31		0.498	0.512	1.00	0.625	pCi/L	04/10/24 10:27	05/01/24 12:22	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	87.6		30 - 110					04/10/24 10:27	05/01/24 12:22	1
Y Carrier	75.9		30 - 110					04/10/24 10:27	05/01/24 12:22	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-303**

**Lab Sample ID: 310-278397-1**

Date Collected: 04/04/24 10:25

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	1.38		0.503	0.517	5.00	0.625	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	649.52				ft			04/04/24 10:25	1
Oxidation Reduction Potential	78.4				mV			04/04/24 10:25	1
Oxygen, Dissolved	3				mg/L			04/04/24 10:25	1
Field pH	6.82				SU			04/04/24 10:25	1
Field Conductivity	1456				umhos/cm			04/04/24 10:25	1
Field Temperature	8.6				Degrees C			04/04/24 10:25	1
Field Turbidity	34.31				NTU			04/04/24 10:25	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-278397-2**

Date Collected: 04/04/24 12:40

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	240		5.0	2.3	mg/L			04/12/24 15:28	5
Fluoride	0.97	J	1.0	0.38	mg/L			04/12/24 15:28	5
Sulfate	240		5.0	2.1	mg/L			04/12/24 15:28	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	04/18/24 00:09	1
Arsenic	0.71	J	2.0	0.53	ug/L		04/09/24 09:00	04/18/24 00:09	1
Barium	77		2.0	0.66	ug/L		04/09/24 09:00	04/18/24 00:09	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/18/24 00:09	1
Boron	970		100	76	ug/L		04/09/24 09:00	04/19/24 12:45	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/18/24 00:09	1
Calcium	110		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:09	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/18/24 00:09	1
Cobalt	0.34	J	0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:09	1
Iron	5300		100	36	ug/L		04/09/24 09:00	04/18/24 00:09	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/18/24 00:09	1
Lithium	3.6	J	10	2.5	ug/L		04/09/24 09:00	04/18/24 00:09	1
Molybdenum	1.9	J	2.0	1.3	ug/L		04/09/24 09:00	04/18/24 00:09	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/18/24 00:09	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/18/24 00:09	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		05/17/24 11:17	05/20/24 11:41	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 18:45	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	1.03		0.205	0.225	1.00	0.122	pCi/L	04/10/24 10:16	05/05/24 12:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	98.5		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	1.51		0.479	0.498	1.00	0.579	pCi/L	04/10/24 10:27	05/01/24 12:22	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	98.5		30 - 110					04/10/24 10:27	05/01/24 12:22	1
Y Carrier	81.1		30 - 110					04/10/24 10:27	05/01/24 12:22	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-304**  
 Date Collected: 04/04/24 12:40  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-2**  
 Matrix: Water

**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	2.54		0.521	0.546	5.00	0.579	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	648.39				ft			04/04/24 12:40	1
Oxidation Reduction Potential	-32.0				mV			04/04/24 12:40	1
Oxygen, Dissolved	1.71				mg/L			04/04/24 12:40	1
Field pH	6.88				SU			04/04/24 12:40	1
Field Conductivity	1744				umhos/cm			04/04/24 12:40	1
Field Temperature	12.7				Degrees C			04/04/24 12:40	1
Field Turbidity	6.08				NTU			04/04/24 12:40	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-305**

**Lab Sample ID: 310-278397-3**

Date Collected: 04/04/24 13:40

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
<b>Chloride</b>	<b>240</b>		5.0	2.3	mg/L			04/12/24 16:04	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 16:04	5
<b>Sulfate</b>	<b>220</b>		5.0	2.1	mg/L			04/12/24 16:04	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	04/18/24 00:12	1
<b>Arsenic</b>	<b>0.54</b>	<b>J</b>	2.0	0.53	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Barium</b>	<b>110</b>		2.0	0.66	ug/L		04/09/24 09:00	04/18/24 00:12	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Boron</b>	<b>840</b>		100	76	ug/L		04/09/24 09:00	04/19/24 12:48	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Calcium</b>	<b>110</b>		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:12	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Cobalt</b>	<b>17</b>		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Iron</b>	<b>51</b>	<b>J</b>	100	36	ug/L		04/09/24 09:00	04/18/24 00:12	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/18/24 00:12	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/18/24 00:12	1
<b>Molybdenum</b>	<b>8.3</b>		2.0	1.3	ug/L		04/09/24 09:00	04/18/24 00:12	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/18/24 00:12	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/18/24 00:12	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Cobalt, Dissolved</b>	<b>18</b>		0.50	0.17	ug/L		04/09/24 09:00	04/11/24 18:12	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		05/17/24 11:17	05/20/24 11:43	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids (SM 2540C)</b>	<b>1000</b>		50	34	mg/L			04/09/24 11:50	1
<b>pH (SM 4500 H+ B)</b>	<b>6.9</b>	<b>HF</b>	1.0	1.0	SU			04/05/24 18:48	1

**Method: EPA 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 226</b>	<b>0.350</b>		0.134	0.138	1.00	0.136	pCi/L	04/10/24 10:16	05/05/24 12:46	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Barium	94.2		30 - 110					04/10/24 10:16	05/05/24 12:46	1

**Method: EPA 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 228</b>	<b>0.639</b>		0.402	0.406	1.00	0.597	pCi/L	04/10/24 10:27	05/01/24 12:23	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-305**  
**Date Collected: 04/04/24 13:40**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-3**  
**Matrix: Water**

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	94.2		30 - 110	04/10/24 10:27	05/01/24 12:23	1
Y Carrier	82.6		30 - 110	04/10/24 10:27	05/01/24 12:23	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	0.989		0.424	0.429	5.00	0.597	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	650.62				ft			04/04/24 13:40	1
Oxidation Reduction Potential	47.3				mV			04/04/24 13:40	1
Oxygen, Dissolved	6.11				mg/L			04/04/24 13:40	1
Field pH	6.90				SU			04/04/24 13:40	1
Field Conductivity	1708				umhos/cm			04/04/24 13:40	1
Field Temperature	12.2				Degrees C			04/04/24 13:40	1
Field Turbidity	6.22				NTU			04/04/24 13:40	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-278397-4**

Date Collected: 04/05/24 08:10

Matrix: Water

Date Received: 04/05/24 16:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.96		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:14	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:14	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	645.43				ft			04/05/24 08:10	1
Oxidation Reduction Potential	71.8				mV			04/05/24 08:10	1
Oxygen, Dissolved	4.31				mg/L			04/05/24 08:10	1
Field pH	6.95				SU			04/05/24 08:10	1
Field Conductivity	1169				umhos/cm			04/05/24 08:10	1
Field Temperature	12.0				Degrees C			04/05/24 08:10	1
Field Turbidity	6.28				NTU			04/05/24 08:10	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-306

## Lab Sample ID: 310-278397-5

Date Collected: 04/04/24 15:05

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	260		5.0	2.3	mg/L			04/12/24 16:16	5
Fluoride	<0.38		1.0	0.38	mg/L			04/12/24 16:16	5
Sulfate	250		5.0	2.1	mg/L			04/12/24 16:16	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	04/18/24 00:16	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/18/24 00:16	1
Barium	90		2.0	0.66	ug/L		04/09/24 09:00	04/18/24 00:16	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/18/24 00:16	1
Boron	920		100	76	ug/L		04/09/24 09:00	04/19/24 12:51	1
Cadmium	1.3		0.20	0.10	ug/L		04/09/24 09:00	04/18/24 00:16	1
Calcium	100		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:16	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/18/24 00:16	1
Cobalt	8.5		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:16	1
Iron	66	J	100	36	ug/L		04/09/24 09:00	04/18/24 00:16	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/18/24 00:16	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/18/24 00:16	1
Molybdenum	11		2.0	1.3	ug/L		04/09/24 09:00	04/18/24 00:16	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/18/24 00:16	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/18/24 00:16	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt, Dissolved	8.9		0.50	0.17	ug/L		04/09/24 09:00	04/11/24 18:14	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		05/17/24 11:17	05/20/24 11:45	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)	6.7	HF	1.0	1.0	SU			04/05/24 18:51	1

### Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium 226	0.0259	U	0.0849	0.0849	1.00	0.158	pCi/L	04/10/24 10:16	05/05/24 12:46	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Barium	99.7		30 - 110					04/10/24 10:16	05/05/24 12:46	1

### Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			(2σ+/-)	(2σ+/-)						
Radium 228	0.972		0.401	0.411	1.00	0.515	pCi/L	04/10/24 10:27	05/01/24 12:23	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-306**  
**Date Collected: 04/04/24 15:05**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-5**  
**Matrix: Water**

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Barium	99.7		30 - 110	04/10/24 10:27	05/01/24 12:23	1
Y Carrier	81.9		30 - 110	04/10/24 10:27	05/01/24 12:23	1

**Method: TAL-STL Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
Radium 226 and 228	0.998		(2σ+/-) 0.410	(2σ+/-) 0.420	5.00	0.515	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	654.47				ft			04/04/24 15:05	1
Oxidation Reduction Potential	69.9				mV			04/04/24 15:05	1
Oxygen, Dissolved	1.51				mg/L			04/04/24 15:05	1
Field pH	6.64				SU			04/04/24 15:05	1
Field Conductivity	1724				umhos/cm			04/04/24 15:05	1
Field Temperature	12.5				Degrees C			04/04/24 15:05	1
Field Turbidity	5.98				NTU			04/04/24 15:05	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-310**  
 Date Collected: 04/04/24 16:35  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-6**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.29	J	0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:28	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:28	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	643.51				ft			04/04/24 16:35	1
Oxidation Reduction Potential	71.6				mV			04/04/24 16:35	1
Oxygen, Dissolved	7.89				mg/L			04/04/24 16:35	1
Field pH	7.05				SU			04/04/24 16:35	1
Field Conductivity	1363				umhos/cm			04/04/24 16:35	1
Field Temperature	11.3				Degrees C			04/04/24 16:35	1
Field Turbidity	5.97				NTU			04/04/24 16:35	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-310A**  
 Date Collected: 04/05/24 09:00  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-7**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	1.1		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:33	1
Iron	140		100	36	ug/L		04/09/24 09:00	04/18/24 00:33	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	628.24				ft			04/05/24 09:00	1
Oxidation Reduction Potential	50.2				mV			04/05/24 09:00	1
Oxygen, Dissolved	7.75				mg/L			04/05/24 09:00	1
Field pH	7.43				SU			04/05/24 09:00	1
Field Conductivity	3020				umhos/cm			04/05/24 09:00	1
Field Temperature	11.7				Degrees C			04/05/24 09:00	1
Field Turbidity	7.57				NTU			04/05/24 09:00	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-311**  
 Date Collected: 04/05/24 09:55  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-8**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.24	J	0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:35	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:35	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	-				ft			04/05/24 09:55	1
Oxidation Reduction Potential	42.6				mV			04/05/24 09:55	1
Oxygen, Dissolved	0.29				mg/L			04/05/24 09:55	1
Field pH	6.78				SU			04/05/24 09:55	1
Field Conductivity	834				umhos/cm			04/05/24 09:55	1
Field Temperature	10.4				Degrees C			04/05/24 09:55	1
Field Turbidity	8.69				NTU			04/05/24 09:55	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-278397-9**

Date Collected: 04/05/24 10:30

Matrix: Water

Date Received: 04/05/24 16:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.44	J	0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:37	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:37	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	635.54				ft			04/05/24 10:30	1
Oxidation Reduction Potential	61.3				mV			04/05/24 10:30	1
Oxygen, Dissolved	2.18				mg/L			04/05/24 10:30	1
Field pH	7.64				SU			04/05/24 10:30	1
Field Conductivity	3244				umhos/cm			04/05/24 10:30	1
Field Temperature	11.5				Degrees C			04/05/24 10:30	1
Field Turbidity	7.40				NTU			04/05/24 10:30	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-312**  
 Date Collected: 04/04/24 15:10  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-10**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	170		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:40	1
Cobalt	8.5		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:40	1
Iron	420		100	36	ug/L		04/09/24 09:00	04/18/24 00:40	1
Magnesium	59000		500	150	ug/L		04/09/24 09:00	04/18/24 00:40	1
Manganese	910		10	3.6	ug/L		04/09/24 09:00	04/18/24 00:40	1
Potassium	5000		500	150	ug/L		04/09/24 09:00	04/18/24 00:40	1
Sodium	110000		1000	480	ug/L		04/09/24 09:00	04/19/24 13:02	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	280	B	100	36	ug/L		04/09/24 09:00	04/11/24 18:17	1
Manganese, Dissolved	730		10	3.6	ug/L		04/09/24 09:00	04/12/24 15:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	290		5.0	2.5	mg/L			04/08/24 18:16	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/08/24 18:16	1
Total Alkalinity as CaCO3 (SM 2320B)	290		5.0	2.5	mg/L			04/08/24 18:16	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	643.94				ft			04/04/24 15:10	1
Oxidation Reduction Potential	-11.7				mV			04/04/24 15:10	1
Oxygen, Dissolved	0.29				mg/L			04/04/24 15:10	1
Field pH	6.89				SU			04/04/24 15:10	1
Field Conductivity	1512				umhos/cm			04/04/24 15:10	1
Field Temperature	12.3				Degrees C			04/04/24 15:10	1
Field Turbidity	8.53				NTU			04/04/24 15:10	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-313**

**Lab Sample ID: 310-278397-11**

Date Collected: 04/04/24 16:30

Matrix: Water

Date Received: 04/05/24 16:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	140		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:42	1
Cobalt	2.9		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:42	1
Iron	580		100	36	ug/L		04/09/24 09:00	04/18/24 00:42	1
Magnesium	46000		500	150	ug/L		04/09/24 09:00	04/18/24 00:42	1
Manganese	2000		10	3.6	ug/L		04/09/24 09:00	04/18/24 00:42	1
Potassium	4300		500	150	ug/L		04/09/24 09:00	04/18/24 00:42	1
Sodium	120000		1000	480	ug/L		04/09/24 09:00	04/19/24 13:05	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	430	B	100	36	ug/L		04/09/24 09:00	04/11/24 18:19	1
Manganese, Dissolved	2200		10	3.6	ug/L		04/09/24 09:00	04/12/24 15:25	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	140		5.0	2.5	mg/L			04/08/24 18:24	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/08/24 18:24	1
Total Alkalinity as CaCO3 (SM 2320B)	140		5.0	2.5	mg/L			04/08/24 18:24	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	644.49				ft			04/04/24 16:30	1
Oxidation Reduction Potential	-27.9				mV			04/04/24 16:30	1
Oxygen, Dissolved	0.21				mg/L			04/04/24 16:30	1
Field pH	6.90				SU			04/04/24 16:30	1
Field Conductivity	1395				umhos/cm			04/04/24 16:30	1
Field Temperature	11.8				Degrees C			04/04/24 16:30	1
Field Turbidity	7.45				NTU			04/04/24 16:30	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-316**

**Lab Sample ID: 310-278397-12**

Date Collected: 04/05/24 09:30

Matrix: Water

Date Received: 04/05/24 16:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	82		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:45	1
Cobalt	0.20	J	0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:45	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:45	1
Magnesium	27000		500	150	ug/L		04/09/24 09:00	04/18/24 00:45	1
Manganese	15		10	3.6	ug/L		04/09/24 09:00	04/18/24 00:45	1
Potassium	930		500	150	ug/L		04/09/24 09:00	04/18/24 00:45	1
Sodium	53000		1000	480	ug/L		04/09/24 09:00	04/19/24 13:09	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	<36		100	36	ug/L		04/09/24 09:00	04/11/24 18:33	1
Manganese, Dissolved	<3.6		10	3.6	ug/L		04/09/24 09:00	04/12/24 15:29	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	95		5.0	2.5	mg/L			04/08/24 18:34	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/08/24 18:34	1
Total Alkalinity as CaCO3 (SM 2320B)	95		5.0	2.5	mg/L			04/08/24 18:34	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	644.09				ft			04/05/24 09:30	1
Oxidation Reduction Potential	81.3				mV			04/05/24 09:30	1
Oxygen, Dissolved	5.20				mg/L			04/05/24 09:30	1
Field pH	7.04				SU			04/05/24 09:30	1
Field Conductivity	763				umhos/cm			04/05/24 09:30	1
Field Temperature	9.2				Degrees C			04/05/24 09:30	1
Field Turbidity	3.95				NTU			04/05/24 09:30	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-316A**

**Lab Sample ID: 310-278397-13**

Date Collected: 04/05/24 10:05

Matrix: Water

Date Received: 04/05/24 16:40

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Calcium</b>	<b>51</b>		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:47	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:47	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/18/24 00:47	1
<b>Magnesium</b>	<b>29000</b>		500	150	ug/L		04/09/24 09:00	04/18/24 00:47	1
<b>Manganese</b>	<b>22</b>		10	3.6	ug/L		04/09/24 09:00	04/18/24 00:47	1
<b>Potassium</b>	<b>7800</b>		500	150	ug/L		04/09/24 09:00	04/18/24 00:47	1
<b>Sodium</b>	<b>470000</b>		4000	1900	ug/L		04/09/24 09:00	05/22/24 12:42	4

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	<36		100	36	ug/L		04/09/24 09:00	04/11/24 18:35	1
<b>Manganese, Dissolved</b>	<b>20</b>		10	3.6	ug/L		04/09/24 09:00	04/12/24 15:32	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Bicarbonate Alkalinity as CaCO3 (SM 2320B)</b>	<b>310</b>		5.0	2.5	mg/L			04/08/24 18:48	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/08/24 18:48	1
<b>Total Alkalinity as CaCO3 (SM 2320B)</b>	<b>310</b>		5.0	2.5	mg/L			04/08/24 18:48	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Groundwater Elevation</b>	<b>643.94</b>				ft			04/05/24 10:05	1
<b>Oxidation Reduction Potential</b>	<b>40.1</b>				mV			04/05/24 10:05	1
<b>Oxygen, Dissolved</b>	<b>3.57</b>				mg/L			04/05/24 10:05	1
<b>Field pH</b>	<b>7.36</b>				SU			04/05/24 10:05	1
<b>Field Conductivity</b>	<b>2189</b>				umhos/cm			04/05/24 10:05	1
<b>Field Temperature</b>	<b>10.6</b>				Degrees C			04/05/24 10:05	1
<b>Field Turbidity</b>	<b>4.46</b>				NTU			04/05/24 10:05	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-317**  
 Date Collected: 04/05/24 09:00  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278397-14**  
 Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	100		0.50	0.19	mg/L		04/09/24 09:00	04/18/24 00:49	1
Cobalt	1.7		0.50	0.17	ug/L		04/09/24 09:00	04/18/24 00:49	1
Iron	350		100	36	ug/L		04/09/24 09:00	04/18/24 00:49	1
Magnesium	28000		500	150	ug/L		04/09/24 09:00	04/18/24 00:49	1
Manganese	350		10	3.6	ug/L		04/09/24 09:00	04/18/24 00:49	1
Potassium	1600		500	150	ug/L		04/09/24 09:00	04/18/24 00:49	1
Sodium	68000		1000	480	ug/L		04/09/24 09:00	04/19/24 13:29	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron, Dissolved	<36		100	36	ug/L		04/09/24 09:00	04/11/24 18:37	1
Manganese, Dissolved	320		10	3.6	ug/L		04/09/24 09:00	04/12/24 15:43	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	270		5.0	2.5	mg/L			04/08/24 18:58	1
Carbonate Alkalinity as CaCO3 (SM 2320B)	<2.5		5.0	2.5	mg/L			04/08/24 18:58	1
Total Alkalinity as CaCO3 (SM 2320B)	270		5.0	2.5	mg/L			04/08/24 18:58	1

**Method: EPA Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Groundwater Elevation	644.11				ft			04/05/24 09:00	1
Oxidation Reduction Potential	93.4				mV			04/05/24 09:00	1
Oxygen, Dissolved	4.85				mg/L			04/05/24 09:00	1
Field pH	6.68				SU			04/05/24 09:00	1
Field Conductivity	898				umhos/cm			04/05/24 09:00	1
Field Temperature	9.9				Degrees C			04/05/24 09:00	1
Field Turbidity	3.98				NTU			04/05/24 09:00	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Qualifiers

### HPLC/IC

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.

### Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F3	Duplicate RPD exceeds the control limit
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.
α	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

Eurofins Cedar Falls



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## 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 310-418159/1-A**  
**Matrix: Water**  
**Analysis Batch: 419086**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

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	04/17/24 23:32	1
Arsenic	<0.53		2.0	0.53	ug/L		04/09/24 09:00	04/17/24 23:32	1
Barium	<0.66		2.0	0.66	ug/L		04/09/24 09:00	04/17/24 23:32	1
Beryllium	<0.33		1.0	0.33	ug/L		04/09/24 09:00	04/17/24 23:32	1
Magnesium	<0.15		0.50	0.15	mg/L		04/09/24 09:00	04/17/24 23:32	1
Manganese	<0.0036		0.010	0.0036	mg/L		04/09/24 09:00	04/17/24 23:32	1
Cadmium	<0.10		0.20	0.10	ug/L		04/09/24 09:00	04/17/24 23:32	1
Potassium	<0.15		0.50	0.15	mg/L		04/09/24 09:00	04/17/24 23:32	1
Calcium	<0.19		0.50	0.19	mg/L		04/09/24 09:00	04/17/24 23:32	1
Sodium	<0.48		1.0	0.48	mg/L		04/09/24 09:00	04/17/24 23:32	1
Chromium	<1.2		5.0	1.2	ug/L		04/09/24 09:00	04/17/24 23:32	1
Cobalt	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/17/24 23:32	1
Iron	<36		100	36	ug/L		04/09/24 09:00	04/17/24 23:32	1
Lead	<0.26		0.50	0.26	ug/L		04/09/24 09:00	04/17/24 23:32	1
Lithium	<2.5		10	2.5	ug/L		04/09/24 09:00	04/17/24 23:32	1
Molybdenum	<1.3		2.0	1.3	ug/L		04/09/24 09:00	04/17/24 23:32	1
Selenium	<1.4		5.0	1.4	ug/L		04/09/24 09:00	04/17/24 23:32	1
Thallium	<0.57		1.0	0.57	ug/L		04/09/24 09:00	04/17/24 23:32	1

**Lab Sample ID: MB 310-418159/1-A**  
**Matrix: Water**  
**Analysis Batch: 419341**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<76		100	76	ug/L		04/09/24 09:00	04/19/24 12:04	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

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

**Lab Sample ID: LCS 310-418159/2-A**  
**Matrix: Water**  
**Analysis Batch: 419086**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	208		ug/L		104	80 - 120
Arsenic	200	209		ug/L		104	80 - 120
Barium	100	107		ug/L		107	80 - 120
Beryllium	100	97.6		ug/L		98	80 - 120
Magnesium	2.00	1.92		mg/L		96	80 - 120
Manganese	0.100	0.104		mg/L		104	80 - 120
Cadmium	100	101		ug/L		101	80 - 120
Potassium	2.00	2.01		mg/L		100	80 - 120
Calcium	2.00	1.71		mg/L		85	80 - 120
Sodium	2.00	2.00		mg/L		100	80 - 120
Chromium	100	103		ug/L		103	80 - 120
Cobalt	100	105		ug/L		105	80 - 120
Iron	200	197		ug/L		98	80 - 120
Lead	200	211		ug/L		106	80 - 120
Lithium	200	203		ug/L		101	80 - 120
Molybdenum	200	198		ug/L		99	80 - 120
Selenium	400	394		ug/L		98	80 - 120
Thallium	100	98.9		ug/L		99	80 - 120

**Lab Sample ID: LCS 310-418159/2-A**  
**Matrix: Water**  
**Analysis Batch: 419341**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	214		ug/L		107	80 - 120

**Lab Sample ID: 310-278397-6 DU**  
**Matrix: Water**  
**Analysis Batch: 419086**

**Client Sample ID: MW-310**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	
			Result	Qualifier			RPD	Limit
Magnesium	60000		60.1	F3	mg/L		200	20
Manganese	36		0.0379	F3	mg/L		200	20
Potassium	7800		7.78	F3	mg/L		200	20
Calcium	140000		135	F3	mg/L		200	20
Sodium	75000		75.2	F3	mg/L		200	20
Cobalt	0.29	J	0.252	J	ug/L		14	20
Iron	<36		<36		ug/L		NC	20

**Lab Sample ID: 310-278397-6 DU**  
**Matrix: Water**  
**Analysis Batch: 419341**

**Client Sample ID: MW-310**  
**Prep Type: Total/NA**  
**Prep Batch: 418159**

Analyte	Sample Result	Sample Qualifier	DU		Unit	D	RPD	
			Result	Qualifier			RPD	Limit
Boron	350		344		ug/L		0.5	20
Sodium	86000		84.8	F3	mg/L		200	20

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

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

**Lab Sample ID: MB 310-418160/1-A**  
**Matrix: Water**  
**Analysis Batch: 418555**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 418160**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Manganese, Dissolved	<3.6		10	3.6	ug/L		04/09/24 09:00	04/11/24 17:33	1
Cobalt, Dissolved	<0.17		0.50	0.17	ug/L		04/09/24 09:00	04/11/24 17:33	1
Iron, Dissolved	74.4	J	100	36	ug/L		04/09/24 09:00	04/11/24 17:33	1

**Lab Sample ID: LCS 310-418160/2-A**  
**Matrix: Water**  
**Analysis Batch: 418555**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 418160**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt, Dissolved	100	105		ug/L		105	80 - 120
Iron, Dissolved	200	205		ug/L		103	80 - 120

**Lab Sample ID: 310-278397-11 DU**  
**Matrix: Water**  
**Analysis Batch: 418555**

**Client Sample ID: MW-313**  
**Prep Type: Dissolved**  
**Prep Batch: 418160**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Iron, Dissolved	430	B	402		ug/L		6	20

**Lab Sample ID: 310-278397-11 DU**  
**Matrix: Water**  
**Analysis Batch: 418695**

**Client Sample ID: MW-313**  
**Prep Type: Dissolved**  
**Prep Batch: 418160**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 310-422037/1-A**  
**Matrix: Water**  
**Analysis Batch: 422234**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 422037**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.11		0.20	0.11	ug/L		05/17/24 11:17	05/20/24 11:27	1

**Lab Sample ID: LCS 310-422037/2-A**  
**Matrix: Water**  
**Analysis Batch: 422234**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 422037**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits

**Lab Sample ID: 310-278397-1 MS**  
**Matrix: Water**  
**Analysis Batch: 422234**

**Client Sample ID: MW-303**  
**Prep Type: Total/NA**  
**Prep Batch: 422037**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 310-278397-1 MSD  
 Matrix: Water  
 Analysis Batch: 422234

Client Sample ID: MW-303  
 Prep Type: Total/NA  
 Prep Batch: 422037

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.11	H F1	1.67	1.29	F1	ug/L		77	80 - 120	12	20

## Method: SM 2320B - Alkalinity

Lab Sample ID: LCS 310-418207/25  
 Matrix: Water  
 Analysis Batch: 418207

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	918		mg/L		92	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 310-418076/1  
 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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Method: 903.0 - Radium-226 (GFPC) (Continued)

**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	
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
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	
<b>Carrier</b>	<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>			<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>			
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			

**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	
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
Barium	98.5		30 - 110							
Y Carrier	82.2		30 - 110							



# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## HPLC/IC

### Analysis Batch: 418758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	9056A	
310-278397-2	MW-304	Total/NA	Water	9056A	
310-278397-3	MW-305	Total/NA	Water	9056A	
310-278397-5	MW-306	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: 418159

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	3005A	
310-278397-2	MW-304	Total/NA	Water	3005A	
310-278397-3	MW-305	Total/NA	Water	3005A	
310-278397-4	MW-305A	Total/NA	Water	3005A	
310-278397-5	MW-306	Total/NA	Water	3005A	
310-278397-6	MW-310	Total/NA	Water	3005A	
310-278397-7	MW-310A	Total/NA	Water	3005A	
310-278397-8	MW-311	Total/NA	Water	3005A	
310-278397-9	MW-311A	Total/NA	Water	3005A	
310-278397-10	MW-312	Total/NA	Water	3005A	
310-278397-11	MW-313	Total/NA	Water	3005A	
310-278397-12	MW-316	Total/NA	Water	3005A	
310-278397-13	MW-316A	Total/NA	Water	3005A	
310-278397-14	MW-317	Total/NA	Water	3005A	
MB 310-418159/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418159/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-278397-6 DU	MW-310	Total/NA	Water	3005A	

### Prep Batch: 418160

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-3	MW-305	Dissolved	Water	3005A	
310-278397-5	MW-306	Dissolved	Water	3005A	
310-278397-10	MW-312	Dissolved	Water	3005A	
310-278397-11	MW-313	Dissolved	Water	3005A	
310-278397-12	MW-316	Dissolved	Water	3005A	
310-278397-13	MW-316A	Dissolved	Water	3005A	
310-278397-14	MW-317	Dissolved	Water	3005A	
MB 310-418160/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-418160/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-278397-11 DU	MW-313	Dissolved	Water	3005A	

### Analysis Batch: 418555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-3	MW-305	Dissolved	Water	6020B	418160
310-278397-5	MW-306	Dissolved	Water	6020B	418160
310-278397-10	MW-312	Dissolved	Water	6020B	418160
310-278397-11	MW-313	Dissolved	Water	6020B	418160
310-278397-12	MW-316	Dissolved	Water	6020B	418160
310-278397-13	MW-316A	Dissolved	Water	6020B	418160
310-278397-14	MW-317	Dissolved	Water	6020B	418160

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Metals (Continued)

### Analysis Batch: 418555 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-418160/1-A	Method Blank	Total/NA	Water	6020B	418160
LCS 310-418160/2-A	Lab Control Sample	Total/NA	Water	6020B	418160
310-278397-11 DU	MW-313	Dissolved	Water	6020B	418160

### Analysis Batch: 418695

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-10	MW-312	Dissolved	Water	6020B	418160
310-278397-11	MW-313	Dissolved	Water	6020B	418160
310-278397-12	MW-316	Dissolved	Water	6020B	418160
310-278397-13	MW-316A	Dissolved	Water	6020B	418160
310-278397-14	MW-317	Dissolved	Water	6020B	418160
310-278397-11 DU	MW-313	Dissolved	Water	6020B	418160

### Analysis Batch: 419086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	6020B	418159
310-278397-2	MW-304	Total/NA	Water	6020B	418159
310-278397-3	MW-305	Total/NA	Water	6020B	418159
310-278397-4	MW-305A	Total/NA	Water	6020B	418159
310-278397-5	MW-306	Total/NA	Water	6020B	418159
310-278397-6	MW-310	Total/NA	Water	6020B	418159
310-278397-7	MW-310A	Total/NA	Water	6020B	418159
310-278397-8	MW-311	Total/NA	Water	6020B	418159
310-278397-9	MW-311A	Total/NA	Water	6020B	418159
310-278397-10	MW-312	Total/NA	Water	6020B	418159
310-278397-11	MW-313	Total/NA	Water	6020B	418159
310-278397-12	MW-316	Total/NA	Water	6020B	418159
310-278397-13	MW-316A	Total/NA	Water	6020B	418159
310-278397-14	MW-317	Total/NA	Water	6020B	418159
MB 310-418159/1-A	Method Blank	Total/NA	Water	6020B	418159
LCS 310-418159/2-A	Lab Control Sample	Total/NA	Water	6020B	418159
310-278397-6 DU	MW-310	Total/NA	Water	6020B	418159

### Analysis Batch: 419341

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	6020B	418159
310-278397-2	MW-304	Total/NA	Water	6020B	418159
310-278397-3	MW-305	Total/NA	Water	6020B	418159
310-278397-5	MW-306	Total/NA	Water	6020B	418159
310-278397-10	MW-312	Total/NA	Water	6020B	418159
310-278397-11	MW-313	Total/NA	Water	6020B	418159
310-278397-12	MW-316	Total/NA	Water	6020B	418159
310-278397-14	MW-317	Total/NA	Water	6020B	418159
MB 310-418159/1-A	Method Blank	Total/NA	Water	6020B	418159
LCS 310-418159/2-A	Lab Control Sample	Total/NA	Water	6020B	418159
310-278397-6 DU	MW-310	Total/NA	Water	6020B	418159

### Prep Batch: 422037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	7470A	
310-278397-2	MW-304	Total/NA	Water	7470A	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Metals (Continued)

### Prep Batch: 422037 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-3	MW-305	Total/NA	Water	7470A	
310-278397-5	MW-306	Total/NA	Water	7470A	
MB 310-422037/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-422037/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-278397-1 MS	MW-303	Total/NA	Water	7470A	
310-278397-1 MSD	MW-303	Total/NA	Water	7470A	

### Analysis Batch: 422234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	7470A	422037
310-278397-2	MW-304	Total/NA	Water	7470A	422037
310-278397-3	MW-305	Total/NA	Water	7470A	422037
310-278397-5	MW-306	Total/NA	Water	7470A	422037
MB 310-422037/1-A	Method Blank	Total/NA	Water	7470A	422037
LCS 310-422037/2-A	Lab Control Sample	Total/NA	Water	7470A	422037
310-278397-1 MS	MW-303	Total/NA	Water	7470A	422037
310-278397-1 MSD	MW-303	Total/NA	Water	7470A	422037

### Analysis Batch: 422521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-13	MW-316A	Total/NA	Water	6020B	418159

## General Chemistry

### Analysis Batch: 418076

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	SM 4500 H+ B	
310-278397-2	MW-304	Total/NA	Water	SM 4500 H+ B	
310-278397-3	MW-305	Total/NA	Water	SM 4500 H+ B	
310-278397-5	MW-306	Total/NA	Water	SM 4500 H+ B	
LCS 310-418076/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 418207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-10	MW-312	Total/NA	Water	SM 2320B	
310-278397-11	MW-313	Total/NA	Water	SM 2320B	
310-278397-12	MW-316	Total/NA	Water	SM 2320B	
310-278397-13	MW-316A	Total/NA	Water	SM 2320B	
310-278397-14	MW-317	Total/NA	Water	SM 2320B	
LCS 310-418207/25	Lab Control Sample	Total/NA	Water	SM 2320B	

### Analysis Batch: 418249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	SM 2540C	
310-278397-2	MW-304	Total/NA	Water	SM 2540C	
310-278397-3	MW-305	Total/NA	Water	SM 2540C	
310-278397-5	MW-306	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	

Eurofins Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Rad

### Prep Batch: 656131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278397-1	MW-303	Total/NA	Water	PrecSep-21	
310-278397-2	MW-304	Total/NA	Water	PrecSep-21	
310-278397-3	MW-305	Total/NA	Water	PrecSep-21	
310-278397-5	MW-306	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
310-278397-1	MW-303	Total/NA	Water	PrecSep_0	
310-278397-2	MW-304	Total/NA	Water	PrecSep_0	
310-278397-3	MW-305	Total/NA	Water	PrecSep_0	
310-278397-5	MW-306	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
310-278397-1	MW-303	Total/NA	Water	Field Sampling	
310-278397-2	MW-304	Total/NA	Water	Field Sampling	
310-278397-3	MW-305	Total/NA	Water	Field Sampling	
310-278397-4	MW-305A	Total/NA	Water	Field Sampling	
310-278397-5	MW-306	Total/NA	Water	Field Sampling	
310-278397-6	MW-310	Total/NA	Water	Field Sampling	
310-278397-7	MW-310A	Total/NA	Water	Field Sampling	
310-278397-8	MW-311	Total/NA	Water	Field Sampling	
310-278397-9	MW-311A	Total/NA	Water	Field Sampling	
310-278397-10	MW-312	Total/NA	Water	Field Sampling	
310-278397-11	MW-313	Total/NA	Water	Field Sampling	
310-278397-12	MW-316	Total/NA	Water	Field Sampling	
310-278397-13	MW-316A	Total/NA	Water	Field Sampling	
310-278397-14	MW-317	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-303**  
**Date Collected: 04/04/24 10:25**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-1**  
**Matrix: Water**

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 15:16
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 12:41
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:07
Total/NA	Prep	7470A			422037	A6US	EET CF	05/17/24 11:17
Total/NA	Analysis	7470A		1	422234	A6US	EET CF	05/20/24 11:35
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 18:42
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	659501	SCB	EET SL	05/01/24 12:22
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/04/24 10:25

**Client Sample ID: MW-304**  
**Date Collected: 04/04/24 12:40**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-2**  
**Matrix: Water**

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 15:28
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 12:45
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:09
Total/NA	Prep	7470A			422037	A6US	EET CF	05/17/24 11:17
Total/NA	Analysis	7470A		1	422234	A6US	EET CF	05/20/24 11:41
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 18:45
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	659501	SCB	EET SL	05/01/24 12:22
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/04/24 12:40

**Client Sample ID: MW-305**  
**Date Collected: 04/04/24 13:40**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-3**  
**Matrix: Water**

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 16:04

Eurofins Cedar Falls



# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-305**  
**Date Collected: 04/04/24 13:40**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-3**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:12
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 12:48
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:12
Total/NA	Prep	7470A			422037	A6US	EET CF	05/17/24 11:17
Total/NA	Analysis	7470A		1	422234	A6US	EET CF	05/20/24 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	418076	D7CP	EET CF	04/05/24 18:48
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 12:46
Total/NA	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659501	SCB	EET SL	05/01/24 12:23
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/04/24 13:40

**Client Sample ID: MW-305A**  
**Date Collected: 04/05/24 08:10**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-4**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:14
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/05/24 08:10

**Client Sample ID: MW-306**  
**Date Collected: 04/04/24 15:05**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-5**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418758	QTZ5	EET CF	04/12/24 16:16
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:14
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 12:51
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:16
Total/NA	Prep	7470A			422037	A6US	EET CF	05/17/24 11:17
Total/NA	Analysis	7470A		1	422234	A6US	EET CF	05/20/24 11:45
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 18:51
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 12:46

Eurofins Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## Client Sample ID: MW-306

## Lab Sample ID: 310-278397-5

Date Collected: 04/04/24 15:05

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	Prep	PrecSep_0			656132	KAK	EET SL	04/10/24 10:27
Total/NA	Analysis	904.0		1	659501	SCB	EET SL	05/01/24 12:23
Total/NA	Analysis	Ra226_Ra228 Pos		1	660568	FLC	EET SL	05/07/24 14:23
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/04/24 15:05

## Client Sample ID: MW-310

## Lab Sample ID: 310-278397-6

Date Collected: 04/04/24 16:35

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	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:28
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/04/24 16:35

## Client Sample ID: MW-310A

## Lab Sample ID: 310-278397-7

Date Collected: 04/05/24 09:00

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	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:33
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/05/24 09:00

## Client Sample ID: MW-311

## Lab Sample ID: 310-278397-8

Date Collected: 04/05/24 09:55

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	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:35
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/05/24 09:55

## Client Sample ID: MW-311A

## Lab Sample ID: 310-278397-9

Date Collected: 04/05/24 10:30

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	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:37
Total/NA	Analysis	Field Sampling		1	418836	BJOR	EET CF	04/05/24 10:30

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-312**  
**Date Collected: 04/04/24 15:10**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-10**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:17
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 15:23
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 13:02
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:40
Total/NA	Analysis	SM 2320B		1	418207	MAQ3	EET CF	04/08/24 18:16
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 15:10

**Client Sample ID: MW-313**  
**Date Collected: 04/04/24 16:30**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-11**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:19
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 15:25
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 13:05
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:42
Total/NA	Analysis	SM 2320B		1	418207	MAQ3	EET CF	04/08/24 18:24
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/04/24 16:30

**Client Sample ID: MW-316**  
**Date Collected: 04/05/24 09:30**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-12**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:33
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 15:29
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 13:09
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:45
Total/NA	Analysis	SM 2320B		1	418207	MAQ3	EET CF	04/08/24 18:34
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/05/24 09:30

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

**Client Sample ID: MW-316A**  
**Date Collected: 04/05/24 10:05**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-13**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:35
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 15:32
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:47
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		4	422521	NFT2	EET CF	05/22/24 12:42
Total/NA	Analysis	SM 2320B		1	418207	MAQ3	EET CF	04/08/24 18:48
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/05/24 10:05

**Client Sample ID: MW-317**  
**Date Collected: 04/05/24 09:00**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278397-14**  
**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Batch Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418555	NFT2	EET CF	04/11/24 18:37
Dissolved	Prep	3005A			418160	QTZ5	EET CF	04/09/24 09:00
Dissolved	Analysis	6020B		1	418695	NFT2	EET CF	04/12/24 15:43
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419341	NFT2	EET CF	04/19/24 13:29
Total/NA	Prep	3005A			418159	QTZ5	EET CF	04/09/24 09:00
Total/NA	Analysis	6020B		1	419086	NFT2	EET CF	04/18/24 00:49
Total/NA	Analysis	SM 2320B		1	418207	MAQ3	EET CF	04/08/24 18:58
Total/NA	Analysis	Field Sampling		1	418836	BJ0R	EET CF	04/05/24 09:00

**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  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## 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

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16



# Method Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	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	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
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.

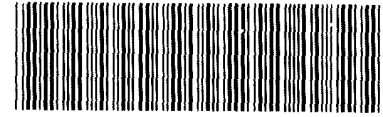
**Laboratory References:**

- 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





Environment Testing  
America



310-278397 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SLS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-5-24</u>	<u>1640</u>	<u>MU</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.8</u>	Corrected Temp (°C):	<u>2.8</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			





Environment Testing  
America

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WI</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-5-24</u>	<u>1640</u>	<u>MU</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>2</u>	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>3.8</u>	Corrected Temp (°C):	<u>3.8</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			







# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Fredrick, Sandie	Carrier Tracking No(s): 310-71058-1									
Client Contact: Shipping/Receiving		E-Mail: Sandra.Fredrick@et.eurofins.com	Page: Page 1 of 1									
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa, State Program - Iowa	Job #: 310-278397-1									
Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045 Phone: 314-298-9566(Tel) 314-298-8757(Fax) Email:		Due Date Requested: 4/18/2024 TAT Requested (days): PO #: WO #: Project #: 31011020 Ottumwa Generating Station 25224072.00 Site:	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 Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecylhydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify)									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/Oil, BT=Trace, AA=)	Field Filtered Sample (Yes or No)	Form MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFC)	904.0/PrecSep_0 Radium-228 (GFC)	Ra226_228GFC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:	
MW-303 (310-278397-1)	4/4/24	10:25 Central	Water	Water	X	X	X	X	X	1	DO NOT SHIP ON ICE TO ST. LOUIS	
MW-304 (310-278397-2)	4/4/24	12:40 Central	Water	Water	X	X	X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS	
MW-305 (310-278397-3)	4/4/24	13:40 Central	Water	Water	X	X	X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS	
MW-306 (310-278397-5)	4/4/24	15:05 Central	Water	Water	X	X	X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS	
<p>Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte &amp; 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/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.</p> <p><b>Possible Hazard Identification</b>                  Unconfirmed                  Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2</p> <p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements:</p>												
Empty Kit Relinquished by:		Date:	Method of Shipment:									
Relinquished by:	Date: 4/24/24	11:10	Company	Received by: <i>Sandra Washington</i>								
Relinquished by:	Date:		Company	Date/Time: APR 09 2024 08:35								
Relinquished by:	Date:		Company	Date/Time:								
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:										



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278397-1

SDG Number:

**Login Number: 278397**

**List Number: 1**

**Creator: Muehling, Angela C**

**List Source: Eurofins Cedar Falls**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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 <math><6\text{mm}</math> (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: 310-278397-1

SDG Number:

**Login Number: 278397**

**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  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278397-1

## 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)
310-278397-1	MW-303	87.6
310-278397-2	MW-304	98.5
310-278397-3	MW-305	94.2
310-278397-5	MW-306	99.7
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)

Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-278397-1	MW-303	87.6	75.9
310-278397-2	MW-304	98.5	81.1
310-278397-3	MW-305	94.2	82.6
310-278397-5	MW-306	99.7	81.9
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





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# 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

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

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



# Table of Contents

Cover Page . . . . .	1
Table of Contents . . . . .	3
Case Narrative . . . . .	4
Sample Summary . . . . .	5
Detection Summary . . . . .	6
Client Sample Results . . . . .	7
Definitions . . . . .	11
QC Sample Results . . . . .	12
QC Association . . . . .	16
Chronicle . . . . .	18
Certification Summary . . . . .	19
Method Summary . . . . .	20
Chain of Custody . . . . .	21
Receipt Checklists . . . . .	24
Tracer Carrier Summary . . . . .	26
Field Data Sheets . . . . .	27

# Case Narrative

Client: SCS Engineers  
Project: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**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 1.9° 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.

Eurofins Cedar Falls

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

---

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
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- 9
- 10
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- 12
- 13
- 14
- 15
- 16



# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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 Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**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
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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

Eurofins Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**Client Sample ID: MW-301**  
 Date Collected: 04/04/24 08:40  
 Date Received: 04/05/24 16:40

**Lab Sample ID: 310-278395-1**  
 Matrix: Water

**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 Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**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
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**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

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- 15
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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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.
α	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  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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
<b>Carrier</b>	<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
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
<b>Carrier</b>	<b>MB %Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
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

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

**Client Sample ID: MW-301**  
**Date Collected: 04/04/24 08:40**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278395-1**  
**Matrix: Water**

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	BJOR	EET CF	04/04/24 08:40

**Client Sample ID: Field Blank**  
**Date Collected: 04/04/24 16:45**  
**Date Received: 04/05/24 16:40**

**Lab Sample ID: 310-278395-2**  
**Matrix: Water**

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  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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  
 Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

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





Environment Testing  
America



310-278395 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SCS</u>			
City/State:	CITY	STATE	Project:
		<u>WP</u>	
<b>Receipt Information</b>			
Date/Time Received:	DATE	TIME	Received By:
	<u>4-5-24</u>	<u>1640</u>	<u>Mc</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # ____ of ____	
Cooler Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID:	<u>T</u>	Correction Factor (°C):	<u>0</u>
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>1.9</u>	Corrected Temp (°C):	<u>1.9</u>
• <b>Sample Container Temperature</b>			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> 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?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			







# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-278395-1

**Login Number: 278395**

**List Source: Eurofins Cedar Falls**

**List Number: 1**

**Creator: Costello, Mackenzie K**

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  
Project/Site: Ottumwa Generating Station 25224072.00

Job ID: 310-278395-1

## 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)							
310-278395-1	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)

Lab Sample ID	Client Sample ID	Ba (30-110)	Y (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







# Appendix D

## Historical Monitoring Results

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-302  
 Number of Sampling Dates: 24

Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/22/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	4/14/2020	10/8/2020
Boron	ug/L	1110	1130	1110	1180	1250	1200	1180	1250	1320	1200	1240	--	1100	--	1300	1200	1200	1300
Calcium	mg/L	193	177	171	184	188	184	175	179	183	177	185	--	146	--	200	180	180	180
Chloride	mg/L	258	258	276	270	259	281	253	264	254	246	--	259	214	--	240	220	220	230
Fluoride	mg/L	0.22	0.17	0.21	0.21	0.21	0.2	0.26	0.27	0.2	0.26	--	0.26	0.24	--	<0.23	<0.23	<0.23	<0.23
Field pH	Std. Units	6.82	6.46	8.72	6.45	6.62	6.78	6.67	6.75	6.55	6.47	6.76	6.77	6.37	6.58	6.61	6.55	6.7	7
Sulfate	mg/L	752	865	835	819	777	907	858	858	786	899	--	847	785	--	840	810	790	840
Total Dissolved Solids	mg/L	1680	1480	1770	1650	1660	1670	1670	1620	1620	1690	--	1840	1400	--	1600	1600	1500	1700
Antimony	ug/L	0.088	0.12	0.1	<0.058	0.11	<0.026	0.052	0.036	--	<0.026	<0.15	--	0.26	--	<0.53	<0.53	<0.58	<0.51
Arsenic	ug/L	1.7	0.69	0.17	<0.1	0.23	0.25	0.083	0.19	--	0.16	0.3	--	1.9	--	<0.75	<0.75	<0.88	<0.88
Barium	ug/L	31.5	23	20.7	21.2	20.4	19.4	18.2	18.5	--	17.7	18.3	--	28.9	--	19	21	23	18
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	--	0.22	--	<0.27	<0.27	<0.27	--
Cadmium	ug/L	0.25	0.21	0.28	0.24	0.15	0.2	0.19	0.21	--	0.22	0.21	--	0.67	--	0.21	0.2	0.23	0.2
Chromium	ug/L	2.1	0.82	0.64	0.64	0.58	1	0.58	0.7	--	0.46	0.48	--	1.6	--	<0.98	<0.98	1.4	<1.1
Cobalt	ug/L	2.6	1.4	1.1	1	0.94	0.95	0.86	0.88	--	0.9	1.5	--	4	--	1.2	2.7	5.3	1.5
Lead	ug/L	1.1	0.2	<0.19	<0.19	<0.19	0.2	0.081	<0.033	--	0.098	0.12	--	3.9	--	<0.27	0.29	1	<0.11
Lithium	ug/L	11.3	14.1	12.2	11.9	9.7	10.1	9.7	13.8	--	7.5	6.9	--	8.6	--	10	10	11	9.6
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	0.096	<0.083	--	--	<0.09	<0.1	<0.1	<0.1	--
Molybdenum	ug/L	0.68	0.6	0.46	0.46	0.5	0.44	0.38	0.51	--	0.59	0.54	--	<0.57	--	<1.1	<1.1	<1.1	<1.1
Selenium	ug/L	0.23	<0.18	<0.18	<0.18	<0.18	<0.086	<0.086	<0.086	--	<0.086	<0.16	--	0.84	--	<1	<1	<1	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.049	<0.036	<0.036	--	<0.036	<0.14	--	0.16	--	<0.27	<0.27	<0.26	<0.26
Total Radium	pCi/L	1.03	0.527	0.606	0.211	0.136	0.776	1.29	1.61	--	0.746	1.12	--	0.299	--	0.116	0.752	1.26	0.447
Radium-226	pCi/L	0.4	0.375	0.26	0.211	0.136	0.342	0.13	0.406	--	0.251	0.624	--	0.191	--	0.116	0.134	0.499	0.158
Radium-228	pCi/L	0.631	0.152	0.346	-0.0147	-0.0781	0.434	1.16	1.2	--	0.495	0.499	--	0.108	--	-0.0591	0.619	0.759	0.289
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1747	2228	2222	2279	2247	2220	2085	2991	2274	2248	2304	2357	1912	1473	2159	2184	1971	2100
Field Temperature	deg C	11.9	13.2	14.4	13.9	12.9	12.8	13.4	14	13.8	10.7	14.3	14.6	14.1	12.21	12.27	12.91	10.5	14.4
Groundwater Elevation	feet	655.63	655.65	655.52	655.67	655.46	656.35	655.65	655.13	655.4	655.71	656.05	655.89	656.91	656.03	657.23	660.14	656.45	655.8
Oxygen, Dissolved	mg/L	0.16	0.08	0.07	0.43	0.18	0.18	0.12	0.08	0.4	0.2	0.17	0.23	0.26	6.4	0.86	0.35	0.22	0.14
Turbidity	NTU	40.23	6.78	3.41	1.54	3.11	2.32	2.63	1.32	1.63	2.41	4.01	1.42	88.24	4.39	26.9	11.9	31.1	18.7
pH at 25 Degrees C	Std. Units	6.7	6.6	6.7	6.7	6.8	6.8	6.6	6.6	6.5	6.7	--	6.7	6.6	--	6.9	7.2	6.7	6.8
Field Oxidation Potential	millivolts	230.2	25	6.7	92.6	38.7	121.1	21	20.8	191.7	82.6	-336.6	--	114.2	70.2	68.3	-0.5	135.6	34.5
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<1.9
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	500	100
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50000	57000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	110	130
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1500	1900
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	250000	280000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.81	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	140

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-302  
 Number of Sampling Dates: 24

Parameter Name	Units	4/13/2021	10/7/2021	4/12/2022	10/26/2022	4/5/2023	4/4/2024
Boron	ug/L	1300	1200	1300	1700	1800	--
Calcium	mg/L	180	170	170	220	200	--
Chloride	mg/L	190	200	170	200	160	--
Fluoride	mg/L	0.33	<0.28	<0.22	<0.22	<0.22	--
Field pH	Std. Units	6.44	6.49	6.43	6.56	6.62	--
Sulfate	mg/L	360	850	750	920	820	--
Total Dissolved Solids	mg/L	1500	1300	1100	1600	1400	--
Antimony	ug/L	<1.1	<1.1	<0.69	<0.69	<1	--
Arsenic	ug/L	<0.75	<0.75	<0.75	<0.75	<0.53	--
Barium	ug/L	22	18	17	21	21	--
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.33	--
Cadmium	ug/L	0.26	0.23	0.21	0.28	0.17	--
Chromium	ug/L	3	1.3	1.4	8.8	1.6	--
Cobalt	ug/L	5.5	2.2	1.3	1.8	0.82	--
Lead	ug/L	0.59	0.22	<0.24	<0.24	<0.24	--
Lithium	ug/L	10	11	9.1	11	11	--
Mercury	ug/L	<0.15	<0.15	<0.11	<0.11	<0.14	--
Molybdenum	ug/L	<1.3	1.7	2.6	4.9	3	--
Selenium	ug/L	<0.96	1.2	2.4	<0.96	<1.4	--
Thallium	ug/L	<0.26	0.56	<0.26	<0.26	3.2	--
Total Radium	pCi/L	0.901	1.45	0.294	0.627	0.178	--
Radium-226	pCi/L	0.486	1.32	0.202	0.182	0.178	--
Radium-228	pCi/L	0.415	<0.744	0.0914	0.445	-0.215	--
Collected By		--	--	--	--	--	--
Field Specific Conductance	umhos/cm	2087	1920	1741	2051	1953	--
Field Temperature	deg C	11.9	14.9	11.4	12.8	11.2	--
Groundwater Elevation	feet	656.05	654.86	654.77	652.95	653.3	651.81
Oxygen, Dissolved	mg/L	0.37	0.3	0.41	2.13	1.86	--
Turbidity	NTU	22.9	15.6	5.13	8.02	2.03	--
pH at 25 Degrees C	Std. Units	7.5	6.6	6.6	6.9	6.8	--
Field Oxidation Potential	millivolts	198.2	211.5	145.2	-27.1	97	--
Bicarbonate Alkalinity as CaCO3	mg/L	72	120	100	87	--	--
Carbonate Alkalinity as CaCO3	mg/L	<3.2	<4.6	<4.6	<4.6	--	--
Total Alkalinity as CaCO3	mg/L	72	120	100	87	--	--
Iron, total	ug/L	350	65	45	80	<36	--
Magnesium, total	ug/L	50000	46000	49000	43000	--	--
Manganese, dissolved	ug/L	110	110	91	91	--	--
Potassium, total	ug/L	1500	1400	1600	1500	--	--
Sodium, total	ug/L	240000	220000	240000	210000	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--
Iron, dissolved	ug/L	<36	<36	<36	49	--	--
Manganese, total	ug/L	200	120	110	90	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-303  
 Number of Sampling Dates: 24

Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/22/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	4/14/2020	10/8/2020
Boron	ug/L	417	579	726	811	738	577	834	1180	1070	987	1010	--	549	--	290	440	420	1100
Calcium	mg/L	179	172	180	204	173	226	210	200	234	212	213	--	195	--	170	170	170	210
Chloride	mg/L	109	155	234	230	190	141	186	268	185	198	--	64.8	57	--	22	35	47	210
Fluoride	mg/L	0.21	0.17	0.42	0.23	0.21	0.19	0.23	0.3	0.19	0.22	--	0.31	0.24	--	<0.23	<0.23	<0.23	0.26
Field pH	Std. Units	7.08	7.08	6.51	6.62	6.77	7.02	6.81	6.53	6.6	6.63	6.83	7.03	6.66	6.83	7	6.83	6.98	8.28
Sulfate	mg/L	183	190	200	208	168	333	284	215	348	328	--	164	389	--	260	180	180	190
Total Dissolved Solids	mg/L	856	988	1170	1120	1030	1170	1210	1220	1290	1300	--	832	1150	--	890	810	810	1100
Antimony	ug/L	0.23	0.32	0.25	0.14	0.19	0.16	0.19	0.3	--	0.098	0.16	--	0.2	--	<0.53	<0.53	<0.58	<0.51
Arsenic	ug/L	0.89	0.91	0.51	0.46	0.54	0.47	0.33	0.61	--	0.43	0.6	--	0.55	--	<0.75	<0.75	<0.88	<0.88
Barium	ug/L	68.2	78.5	88.1	98.8	75.3	79.1	76.4	83.8	--	69.5	77.3	--	95.2	--	54	77	64	94
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	0.015	--	0.017	<0.12	--	<0.089	--	<0.27	<0.27	<0.27	--
Cadmium	ug/L	0.24	0.28	0.47	0.59	0.31	0.81	0.52	0.57	--	0.44	0.36	--	0.24	--	0.092	0.21	0.18	0.46
Chromium	ug/L	0.74	0.83	0.73	<0.34	0.52	0.27	0.37	0.61	--	0.12	0.19	--	0.15	--	<0.98	<0.98	<1.1	<1.1
Cobalt	ug/L	2.2	2.5	2.6	3.1	2.6	1.8	1.9	2.8	--	2.1	2.2	--	1.7	--	0.42	1.2	0.87	2.4
Lead	ug/L	0.31	<0.19	<0.19	0.2	<0.19	0.068	0.07	0.19	--	0.069	0.13	--	<0.13	--	<0.27	<0.27	<0.27	<0.11
Lithium	ug/L	<4.9	8.3	5	5.8	<4.9	<2.9	3.4	8.1	--	<4.6	6.9	--	<4.6	--	<2.7	<2.7	4.7	5.6
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	<0.1	--
Molybdenum	ug/L	3.3	3.6	0.77	0.87	0.64	3.9	0.81	0.64	--	0.61	0.98	--	5.5	--	7.5	5.2	3.6	<1.1
Selenium	ug/L	0.38	0.43	0.36	0.28	0.8	1.1	0.47	0.52	--	0.23	0.35	--	0.37	--	2.1	<1	5	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.16	<0.036	<0.036	--	<0.036	<0.14	--	<0.099	--	<0.27	<0.27	<0.26	<0.26
Total Radium	pCi/L	0.806	0.426	1.56	0.944	0.805	1.62	1.62	2.36	--	0.529	1.82	--	2.04	--	0.391	0.321	0.229	0.654
Radium-226	pCi/L	0.163	0.0636	0.716	0	0.145	1.06	0.556	1.4	--	-0.088	1.02	--	0.478	--	0.172	0.0551	0.149	0.147
Radium-228	pCi/L	0.643	0.362	0.842	0.944	0.66	0.556	1.06	0.958	--	0.529	0.799	--	1.56	--	0.22	0.265	0.0801	0.507
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	965	1176	1655	1730	1611	1687	1670	2474	1896	1862	1833	1161	1573	750	1181	1287	1097	1602
Field Temperature	deg C	9.7	14.4	17.7	16.3	10.6	10.6	14.1	16.8	15.2	8.2	17.2	18.7	17.1	9.11	8.51	15.34	8.9	17
Groundwater Elevation	feet	652.42	652.89	651.76	652.17	651.74	654.57	652.42	650.58	651.34	652.47	652.57	655.07	656.17	654.65	655.55	653.86	654.08	650.37
Oxygen, Dissolved	mg/L	0.07	0.05	0.05	0.42	0.17	0.56	0.08	0.08	0.48	0.17	0.19	1.92	0.29	3.19	2.29	0.28	1.94	0.13
Turbidity	NTU	27.66	4.48	4.42	2.32	3.3	2.2	2.77	14.62	3.67	3.69	1.51	10.13	5.99	14.2	3.49	4.24	12.1	30.2
pH at 25 Degrees C	Std. Units	7	6.8	6.8	6.9	7.1	7.2	6.8	6.8	6.7	6.9	--	7.1	6.9	--	7.5	7.5	6.9	7
Field Oxidation Potential	millivolts	181.1	-20.5	31.5	14.8	21.3	99.5	8.6	20.9	176.8	3.2	-307.9	--	32.8	73.7	51.7	-5.1	104.3	-0.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	310
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23000	31000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220	1600
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	960	1100
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100000	150000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	260	1600

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-303  
 Number of Sampling Dates: 24

Parameter Name	Units	4/13/2021	10/7/2021	4/12/2022	10/26/2022	4/5/2023	4/4/2024
Boron	ug/L	420	860	620	--	430	560
Calcium	mg/L	160	190	190	--	210	210
Chloride	mg/L	29	140	58	--	22	56
Fluoride	mg/L	<0.28	<0.28	<0.22	--	<0.22	<0.38
Field pH	Std. Units	6.67	6.7	6.71	6.7	6.65	6.82
Sulfate	mg/L	140	170	200	--	260	360
Total Dissolved Solids	mg/L	720	720	630	--	880	980
Antimony	ug/L	<1.1	<1.1	<0.69	--	<1	<1
Arsenic	ug/L	<0.75	<0.75	<0.75	--	<0.53	0.8
Barium	ug/L	63	80	64	--	48	44
Beryllium	ug/L	<0.27	<0.27	<0.27	--	<0.33	<0.33
Cadmium	ug/L	0.12	0.28	0.15	--	0.11	0.1
Chromium	ug/L	<1.1	<1.1	<1.1	--	<1.1	1.2
Cobalt	ug/L	0.43	4	1.6	--	0.41	3.8
Lead	ug/L	<0.21	<0.21	<0.24	--	<0.24	0.63
Lithium	ug/L	4.1	5.8	4	--	4.9	3.9
Mercury	ug/L	<0.15	<0.15	<0.11	--	<0.14	<0.11
Molybdenum	ug/L	2.9	1.4	2.7	--	2	3.2
Selenium	ug/L	5.1	<0.96	8.3	--	15	35
Thallium	ug/L	<0.26	<0.26	0.26	--	0.42	<0.57
Total Radium	pCi/L	0.51	0.916	0.619	--	0.145	1.38
Radium-226	pCi/L	0.178	0.639	0.156	--	-0.0263	0.066
Radium-228	pCi/L	0.333	<0.514	0.463	--	0.145	1.31
Collected By		--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1118	1343	1245	1660	1215	1456
Field Temperature	deg C	9.7	17.6	9	15.9	8.3	8.6
Groundwater Elevation	feet	653.82	649.8	652.95	648.22	652.57	649.52
Oxygen, Dissolved	mg/L	2.83	0.32	1.19	0.65	1.7	3
Turbidity	NTU	4.31	11.1	6.2	574.1	3.54	34.31
pH at 25 Degrees C	Std. Units	7	6.8	7	--	6.9	6.9
Field Oxidation Potential	millivolts	184.7	66.5	158.2	-40.9	62.9	78.4
Bicarbonate Alkalinity as CaCO3	mg/L	440	490	520	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	440	490	520	--	--	--
Iron, total	ug/L	44	120	<36	--	64	1200
Magnesium, total	ug/L	22000	26000	26000	--	--	--
Manganese, dissolved	ug/L	340	1800	410	--	--	--
Potassium, total	ug/L	800	800	930	--	--	--
Sodium, total	ug/L	89000	94000	110000	--	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--
Iron, dissolved	ug/L	<36	100	<36	--	--	--
Manganese, total	ug/L	330	1900	490	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-304  
 Number of Sampling Dates: 25

Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/22/2017	11/8/2017	4/18/2018	8/15/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	4/13/2020	10/8/2020
Boron	ug/L	965	968	911	991	995	1030	982	1040	1040	991	1000	--	930	--	1100	970	1000	1000
Calcium	mg/L	124	123	112	125	122	129	126	130	136	131	138	--	123	--	130	120	130	120
Chloride	mg/L	311	316	336	364	383	430	382	409	417	400	--	375	410	--	320	280	250	250
Fluoride	mg/L	0.84	0.77	0.95	0.89	0.82	0.88	1	0.89	0.96	0.92	--	1	1	--	1.3	0.74	1.1	1.1
Field pH	Std. Units	7.3	7.07	7.34	6.96	7.05	7.27	7.29	6.72	7	6.9	7.34	7.22	6.86	7.16	7.17	7.05	7.12	7.88
Sulfate	mg/L	230	234	225	241	204	208	254	194	194	198	--	185	184	--	180	190	220	230
Total Dissolved Solids	mg/L	1190	1160	1180	1270	1230	1310	1240	1250	1270	1300	--	3680	1180	--	1100	1100	1000	1200
Antimony	ug/L	0.069	0.13	0.1	<0.058	0.1	<0.026	0.06	0.035	--	<0.026	0.19	--	<0.078	--	<0.53	<0.53	<0.58	<0.51
Arsenic	ug/L	2.1	2.2	0.78	0.69	0.82	0.73	0.57	0.67	--	0.68	1.3	--	0.96	--	<0.75	0.83	0.96	<0.88
Barium	ug/L	104	106	86.4	97.6	92.4	94.9	87.1	91.5	--	88.5	87.4	--	91	--	80	80	80	74
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	0.026	0.21	--	<0.089	--	<0.27	<0.27	<0.27	--
Cadmium	ug/L	<0.029	<0.029	0.072	<0.029	<0.029	<0.018	<0.018	<0.018	--	<0.018	0.17	--	0.073	--	<0.077	<0.039	<0.039	<0.049
Chromium	ug/L	4.5	7.1	0.92	0.79	0.69	0.56	0.6	0.43	--	2	5.9	--	1.4	--	1.6	2	3.5	<1.1
Cobalt	ug/L	0.89	1.1	<0.5	<0.5	<0.5	0.37	0.36	0.3	--	0.39	0.92	--	0.45	--	0.4	0.5	0.57	0.41
Lead	ug/L	0.5	0.82	<0.19	<0.19	<0.19	0.13	0.081	0.041	--	0.37	0.81	--	0.66	--	<0.27	0.27	0.5	<0.11
Lithium	ug/L	5.1	7.5	<4.9	<4.9	<4.9	<2.9	<2.9	5.3	--	<4.6	<4.6	--	<4.6	--	3.3	2.8	4.8	3.1
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	<0.1	--
Molybdenum	ug/L	2.5	2.4	1.6	1.4	1.5	1.5	1.5	1.6	--	2	2.4	--	1.9	--	1.5	2.3	2	1.5
Selenium	ug/L	0.23	0.32	<0.18	0.19	<0.18	0.17	0.14	0.21	--	<0.086	0.5	--	0.26	--	<1	<1	<1	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.042	<0.036	<0.036	--	<0.036	0.15	--	<0.099	--	<0.27	<0.27	<0.26	<0.26
Total Radium	pCi/L	1.66	1.56	2.39	1.52	2.94	2.44	3.55	3.2	--	2.08	3.74	--	2.76	--	2.42	2.58	2.46	2.41
Radium-226	pCi/L	0.706	0.431	0.465	0.327	1.33	0.894	1.62	1.2	--	1.22	1.78	--	1.21	--	1.23	1.08	1.2	1.21
Radium-228	pCi/L	0.952	1.13	1.92	1.19	1.61	1.55	1.93	2	--	0.862	1.96	--	1.55	--	1.19	1.5	1.26	1.2
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1580	1958	1948	2057	2052	2139	2029	2881	2205	2141	2085	2123	2058	1368	1876	1871	1764	1675
Field Temperature	deg C	13	13.3	13.4	13	12.9	13.4	13.3	13.4	13.3	12.8	15.1	13.7	13.5	12.81	13.75	13.64	11.9	13.6
Groundwater Elevation	feet	655.37	656.53	653.79	655.03	654.5	657.48	654.75	652.39	653.03	655.55	656.35	657.82	658.2	656.28	659.33	657.71	656.42	652.95
Oxygen, Dissolved	mg/L	0.13	0.05	0.06	0.47	0.16	0.12	0.1	0.08	0.25	0.15	0.21	0.16	0.11	0.72	0.41	0.44	0.24	0.18
Turbidity	NTU	61.01	92.4	2.66	1.46	1.17	1.95	1.64	0.92	3.88	39.29	81.42	55.94	17.12	4.38	57.9	18.9	54.1	11.1
pH at 25 Degrees C	Std. Units	7	7	7.1	7	7.2	7.2	7.2	7	6.9	7	--	7.1	7	--	7.5	7.7	7.1	7.2
Field Oxidation Potential	millivolts	-97.5	-109	67.9	-105.1	-79.3	-40.5	-66.6	-10.1	162.7	137.5	35.5	--	-114.5	-62.1	-58.3	-57.5	-119.8	-113
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5200	4200
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	43000	40000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7700	7800
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4600	4200
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800



**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-304  
 Number of Sampling Dates: 25

Parameter Name	Units	4/14/2021	10/8/2021	4/12/2022	10/26/2022	4/6/2023	10/10/2023	4/4/2024
Boron	ug/L	990	990	940	750	930	870	970
Calcium	mg/L	120	120	130	110	110	110	110
Chloride	mg/L	240	260	270	270	260	230	240
Fluoride	mg/L	1.1	<0.28	1.7	1.1	0.93	0.79	0.97
Field pH	Std. Units	6.94	6.97	6.95	6.77	6.7	6.85	6.88
Sulfate	mg/L	200	230	260	280	270	230	240
Total Dissolved Solids	mg/L	1000	760	1700	1200	1200	1100	1000
Antimony	ug/L	<1.1	<1.1	<0.69	<0.69	<1	<1	<1
Arsenic	ug/L	<0.75	0.88	0.76	0.96	0.63	1	0.71
Barium	ug/L	80	79	78	85	75	77	77
Beryllium	ug/L	<0.27	<0.27	<0.27	<0.27	<0.33	<0.33	<0.33
Cadmium	ug/L	<0.051	<0.051	<0.055	0.15	<0.1	0.12	<0.1
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.2
Cobalt	ug/L	0.43	0.42	0.41	0.47	0.37	0.43	0.34
Lead	ug/L	<0.21	<0.21	<0.24	0.38	<0.24	0.35	<0.26
Lithium	ug/L	3.3	4	3.4	3.3	3.5	4.1	3.6
Mercury	ug/L	<0.15	<0.15	<0.11	<0.11	<0.14	<0.14	<0.11
Molybdenum	ug/L	1.7	2	1.9	1.9	1.8	1.9	1.9
Selenium	ug/L	<0.96	<0.96	1.3	0	<1.4	1.5	<1.4
Thallium	ug/L	<0.26	<0.26	<0.26	1.5	<0.26	<0.26	<0.57
Total Radium	pCi/L	2.49	3.49	2.87	2.66	2.1	3.18	2.54
Radium-226	pCi/L	1.24	1.84	1.29	1.25	0.863	1.1	1.03
Radium-228	pCi/L	1.25	1.65	1.58	1.41	1.23	2.08	1.51
Collected By		--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1797	1617	1772	1828	1888	1948	1744
Field Temperature	deg C	13.1	13.8	13.3	13.5	13.1	13.3	12.7
Groundwater Elevation	feet	654.34	649.53	652.14	647.26	650.29	646.02	648.39
Oxygen, Dissolved	mg/L	0.2	0.32	0.13	0	-0.13	0.18	1.71
Turbidity	NTU	16.9	7.3	3.7	3.6	0.02	7.07	6.08
pH at 25 Degrees C	Std. Units	7.1	7.1	7.2	7.1	7.1	7.7	6.9
Field Oxidation Potential	millivolts	-97.5	-78.7	-56.9	-86.3	-93.7	-105.1	-32
Bicarbonate Alkalinity as CaCO3	mg/L	360	470	380	390	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	360	470	380	390	--	--	--
Iron, total	ug/L	4500	3700	4800	4700	5400	4800	5300
Magnesium, total	ug/L	40000	36000	45000	34000	--	--	--
Manganese, dissolved	ug/L	3800	3400	3500	4100	--	--	--
Potassium, total	ug/L	8200	6800	8700	6700	--	--	--
Sodium, total	ug/L	210000	190000	240000	180000	--	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--
Iron, dissolved	ug/L	4500	3900	3800	5500	--	--	--
Manganese, total	ug/L	3600	3000	4200	3600	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-305  
 Number of Sampling Dates: 26

Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/23/2017	11/8/2017	4/18/2018	8/15/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	3/13/2020	4/13/2020	10/9/2020	4/16/2021
Boron	ug/L	888	906	832	878	956	907	889	903	925	886	911	835	--	1000	880	--	920	900	860
Calcium	mg/L	98.1	92.1	88.8	93.2	98.5	96.2	93.8	95.8	99.5	97.6	102	96.2	--	110	100	--	100	110	110
Chloride	mg/L	310	312	316	325	289	312	290	295	282	289	265	281	--	250	280	--	270	290	240
Fluoride	mg/L	0.35	0.29	0.33	0.37	0.35	0.38	0.4	0.48	0.4	0.4	0.44	0.4	--	0.75	<0.23	--	0.35	0.38	0.37
Field pH	Std. Units	7.23	6.94	7.18	6.94	6.96	7.3	7.06	6.88	7.01	6.9	7.21	6.86	6.99	7.06	6.91	7.02	7	7.44	6.92
Sulfate	mg/L	65.7	71.3	74	79.5	90	109	121	124	138	147	139	129	--	110	76	--	63	93	120
Total Dissolved Solids	mg/L	1040	982	1040	1010	1020	1040	1010	1040	1040	1070	1060	1070	--	1000	1000	--	960	1100	900
Antimony	ug/L	0.14	0.2	0.19	0.094	0.18	0.063	0.12	0.12	--	0.089	<0.15	0.096	--	<0.53	<0.53	--	<0.58	<0.51	<1.1
Arsenic	ug/L	2.4	1.7	0.57	0.52	0.57	0.61	0.37	0.51	--	0.51	0.72	0.66	--	<0.75	<0.75	--	<0.88	<0.88	<0.75
Barium	ug/L	131	120	108	115	117	115	110	114	--	116	118	125	--	120	110	--	110	120	130
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	--	<0.27	--	<0.27
Cadmium	ug/L	0.051	<0.029	0.1	<0.029	<0.029	0.052	0.039	0.034	--	0.054	0.086	0.044	--	<0.077	0.087	--	0.14	0.097	0.12
Chromium	ug/L	1.3	0.8	0.62	1.3	<0.34	0.36	0.22	0.45	--	0.26	0.41	0.3	--	<0.98	<0.98	--	<1.1	<1.1	<1.1
Cobalt	ug/L	14.8	15.1	13.7	14.8	15.2	14.6	14.4	14.7	--	14.5	15.6	17.2	16.4	17	17	18	16	17	18
Lead	ug/L	0.53	<0.19	<0.19	0.25	<0.19	0.093	<0.033	0.039	--	0.12	0.31	<0.13	--	<0.27	<0.27	--	0.27	<0.11	<0.21
Lithium	ug/L	<4.9	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	<2.9	--	<4.6	<4.6	<4.6	--	<2.7	<2.7	2.3	3.2	<2.5	2.6
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.09	--	<0.09	<0.1	<0.1	--	<0.1	--	<0.15
Molybdenum	ug/L	4.9	5.2	4.9	5.6	5.9	5.8	5.8	6	--	7.1	6.5	7.3	--	7.2	7.2	--	6.9	7.9	8.2
Selenium	ug/L	0.38	0.37	0.28	0.32	0.34	0.39	0.16	0.26	--	0.12	0.36	0.33	--	<1	<1	--	<1	<1	<0.96
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.34	0.29	0.36	--	0.32	0.33	0.33	--	0.33	0.38	--	0.35	0.35	0.36
Total Radium	pCi/L	0.693	0.716	2.17	1.3	1.46	0.673	0.996	1.08	--	0.676	1.33	1.56	--	0.685	0.383	--	0.909	0.483	0.327
Radium-226	pCi/L	0.281	0.127	0.583	0.714	0.162	0.494	0.301	0.291	--	0.278	0.96	0.635	--	0.339	0.186	--	0.42	0.217	0.279
Radium-228	pCi/L	0.412	0.589	1.59	0.589	1.3	0.179	0.695	0.793	--	0.398	0.366	0.921	--	0.347	0.197	--	0.489	0.265	0.0482
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1469	1796	1769	1831	1794	1822	1730	2422	1738	1840	1832	1836	1235	1728	1794	1788	1772	1810	1799
Field Temperature	deg C	13.1	13.2	13.1	13	12.8	13.2	13.3	13.3	13.2	12.8	14.8	13.9	12.43	13.8	13.2	12.4	9.1	14	12.9
Groundwater Elevation	feet	661.67	662.36	660.78	661.37	660.87	663.27	661.26	659	659.76	660.99	661.56	663.37	662.13	664.01	663.21	661.41	662.44	659.81	661.15
Oxygen, Dissolved	mg/L	0.11	0.05	0.07	0.47	0.09	0.15	0.06	0.12	0.2	0.15	0.18	0.09	0.81	0.59	0.42	0.2	0.28	0.13	0.16
Turbidity	NTU	35.09	5.77	1.32	0.84	0.5	0.51	1.9	0.58	2.68	7.37	14.9	6.96	4.76	21.7	6.21	42.68	21.7	12.9	8.17
pH at 25 Degrees C	Std. Units	7.1	7	7.1	7.2	7.3	7.4	7.1	7.1	7	7.3	7	7.1	--	7	7.5	--	7.2	7.2	7.1
Field Oxidation Potential	millivolts	52.5	-20.2	-38.9	5.8	24.2 mV	17.6	-4.5	-51.3	146.1	-32.7	31	-26.8	36.4	32.6	-6.7	192.6	6.6	-13	43.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300	470
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300	470
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	390	330	200	170
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47000	48000	47000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3100	3400	3600	3800
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7600	8300	7900
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000	200000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	16	17	20
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51	66	63	85
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3200	3300	3600	3500
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.3	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-305  
 Number of Sampling Dates: 26

Parameter Name	Units	10/6/2021	2/14/2022	4/11/2022	10/25/2022	4/4/2023	10/12/2023	4/4/2024
Boron	ug/L	880	--	850	640	830	750	840
Calcium	mg/L	110	--	120	99	120	110	110
Chloride	mg/L	230	--	200	220	220	220	240
Fluoride	mg/L	<0.28	--	<0.22	<0.22	0.39	0.42	<0.38
Field pH	Std. Units	6.94	7.2	6.9	6.76	6.7	6.88	6.9
Sulfate	mg/L	150	--	150	190	250	230	220
Total Dissolved Solids	mg/L	680	--	950	1000	1100	970	1000
Antimony	ug/L	<1.1	--	<0.69	<0.69	<1	<1	<1
Arsenic	ug/L	0.75	--	<0.75	<0.75	0.57	0.91	0.54
Barium	ug/L	120	--	120	120	120	110	110
Beryllium	ug/L	<0.27	--	<0.27	<0.27	<0.33	<0.33	<0.33
Cadmium	ug/L	<0.051	--	<0.055	<0.055	<0.1	0.13	<0.1
Chromium	ug/L	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.2
Cobalt	ug/L	18	20	21	17	21	17	17
Lead	ug/L	0.29	--	<0.24	<0.24	<0.24	0.26	<0.26
Lithium	ug/L	3.1	--	<2.5	<2.5	<2.5	2.7	<2.5
Mercury	ug/L	<0.15	--	<0.11	<0.11	<0.14	<0.14	<0.11
Molybdenum	ug/L	8.1	--	7.8	7.4	7.7	8.3	8.3
Selenium	ug/L	<0.96	--	1.1	<0.96	<1.4	1.9	<1.4
Thallium	ug/L	0.37	--	0.42	0.44	0.39	<0.26	<0.57
Total Radium	pCi/L	1.66	--	1.03	0.91	0.706	0.963	0.989
Radium-226	pCi/L	0.835	--	0.433	0.387	0.345	0.384	0.35
Radium-228	pCi/L	0.823	--	0.601	0.523	0.361	0.578	0.639
Collected By		--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1629	1500	1742	1633	1896	1869	1708
Field Temperature	deg C	13.7	12.38	12.8	13.2	13.6	13.7	12.2
Groundwater Elevation	feet	654.83	656.35	657.62	651.48	655.02	650.21	650.62
Oxygen, Dissolved	mg/L	0.44	4.8	0.23	0.35	0.63	0.26	6.11
Turbidity	NTU	3.8	0	4.97	2.59	0.02	3.25	6.22
pH at 25 Degrees C	Std. Units	7.1	--	7.1	7.3	7.1	7.8	6.9
Field Oxidation Potential	millivolts	46.9	50	134.8	-33	166.4	4.7	47.3
Bicarbonate Alkalinity as CaCO3	mg/L	500	--	520	440	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	<4.6	--	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	500	--	520	440	--	--	--
Iron, total	ug/L	75	--	76	76	72	73	51
Magnesium, total	ug/L	44000	--	53000	40000	--	--	--
Manganese, dissolved	ug/L	3300	--	3200	3800	--	--	--
Potassium, total	ug/L	7000	--	8700	6800	--	--	--
Sodium, total	ug/L	180000	--	210000	150000	--	--	--
Cobalt, dissolved	ug/L	17	--	17	21	21	17	18
Iron, dissolved	ug/L	150	--	55	66	--	--	--
Manganese, total	ug/L	3200	--	4000	3200	--	--	--
Lithium, dissolved	ug/L	--	--	--	--	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-306  
 Number of Sampling Dates: 27

Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/23/2017	11/8/2017	4/18/2018	8/15/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	4/14/2020	10/9/2020	2/23/2021	4/13/2021	7/6/2021	10/8/2021	2/14/2022	4/12/2022	10/25/2022	4/6/2023	10/12/2023
Boron	ug/L	540	575	574	702	809	814	784	822	881	919	915	862	--	1100	980	1000	1100	--	1000	--	730	--	760	560	780	850
Calcium	mg/L	101	88.5	85	90	85.9	81.3	75.6	73.9	73.1	74.1	78.9	80	--	95	77	73	80	--	74	--	130	--	110	93	100	91
Chloride	mg/L	85.8	77.6	67.9	64.9	57.2	58.5	56	54.4	50.4	54.4	58.2	83.3	--	98	47	41	43	--	35	--	180	--	260	300	310	290
Fluoride	mg/L	0.11	<0.073	0.086	0.11	0.087	0.11	<0.1	0.15	0.11	0.11	0.13	<0.19	--	0.27	<0.23	<0.23	<0.23	--	<0.28	--	<0.28	--	<0.22	<0.22	<0.22	<0.38
Field pH	Std. Units	7.08	6.17	6.72	6.44	6.51	6.79	6.71	6.46	6.49	6.42	6.74	6.42	6.65	6.66	6.74	6.68	6.54	6.34	6.42	7.44	6.66	7.07	6.66	6.53	6.61	6.63
Sulfate	mg/L	264	271	266	277	285	300	282	264	274	289	275	285	--	270	280	310	360	--	370	--	460	--	70	86	78	93
Total Dissolved Solids	mg/L	899	849	846	864	828	819	775	769	773	805	840	884	--	930	870	820	900	--	880	--	1100	--	710	1100	1000	980
Antimony	ug/L	0.2	0.25	0.18	0.12	0.18	0.051	0.13	0.1	--	0.094	<0.15	0.1	--	<0.53	<0.53	<0.58	<0.51	--	<1.1	--	<1.1	--	<0.69	<0.69	<1	<1
Arsenic	ug/L	2.2	1.7	0.44	0.4	0.47	0.42	0.41	0.38	--	0.38	0.65	0.6	--	<0.75	0.78	<0.88	<0.88	--	<0.75	--	<0.75	--	<0.75	<0.75	<0.53	0.62
Barium	ug/L	93	80.5	58	60.5	56.4	54.3	48.7	47.4	--	48.2	51.6	56	--	58	51	48	49	--	49	--	71	--	94	95	85	82
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	--	--	<0.27	--	<0.27	--	<0.27	<0.27	<0.33	<0.33
Cadmium	ug/L	0.87	0.98	0.93	0.91	0.74	0.72	0.65	0.72	--	0.88	0.76	0.96	--	1.1	0.89	0.83	0.92	--	0.95	--	1.1	--	1.3	1.1	1.2	1.1
Chromium	ug/L	1.9	2.3	0.82	0.6	0.68	0.52	0.57	0.58	--	0.37	0.7	0.46	--	<0.98	1	<1.1	<1.1	--	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	8.3	7.7	6.4	6.6	6	5.7	5.2	5	--	4.8	5.5	6.4	6.2	6.9	6.2	5.5	5.9	5.6	5.6	5.8	11	8.8	9.1	7	8.6	7.1
Lead	ug/L	0.74	0.74	<0.19	<0.19	<0.19	0.038	0.1	<0.033	--	0.04	0.2	<0.13	--	<0.27	0.34	0.37	<0.11	--	<0.21	--	<0.21	--	<0.24	<0.24	<0.24	<0.24
Lithium	ug/L	<4.9	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	<2.9	--	<4.6	<4.6	<4.6	--	<2.7	<2.7	<2.3	<2.5	--	<2.5	--	<2.5	--	<2.5	<2.5	<2.5	<2.5
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	<0.1	--	--	<0.15	--	<0.15	--	<0.11	<0.11	<0.14	<0.14
Molybdenum	ug/L	4.8	4.8	4.5	4.8	4.7	4.7	4.6	4.4	--	5.7	4.7	5.1	--	4.3	4.9	4.4	5.6	--	5.1	--	6.1	--	14	12	13	12
Selenium	ug/L	0.3	0.3	<0.18	0.24	0.2	<0.086	0.088	0.13	--	<0.086	0.21	0.22	--	<1	<1	<1	<1	--	<0.96	--	<0.96	--	<0.96	<0.96	<1.4	<1.4
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	0.082	<0.036	--	0.083	<0.14	0.12	--	<0.27	<0.27	<0.26	<0.26	--	<0.26	--	<0.26	--	<0.26	<0.26	<0.26	0.62
Total Radium	pCi/L	1.14	1.25	0.958	0.868	0.435	0.213	1.03	1.3	--	0.305	0.985	0.693	--	0.155	0.624	0.0738	0.889	--	0.334	--	0.794	--	2.03	1.03	0.455	0.661
Radium-226	pCi/L	0.179	0.475	0	0.253	-0.15	0.0761	0	0.517	--	0.305	0.482	0.263	--	0.0529	-0.00408	0.0738	0.163	--	0.0205	--	<0.439	--	0.115	0.12	0.19	0.0205
Radium-228	pCi/L	0.962	0.774	0.958	0.615	0.435	0.137	1.03	0.784	--	-0.109	0.503	0.43	--	0.102	0.624	-0.118	0.727	--	0.313	--	0.657	--	1.92	0.912	0.266	0.64
Collected By		--	--	0	--	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	960	1271	1228	1262	1215	1210	1151	1576	1186	1228	1271	1340	965	1350	1266	1158	1294	1277	1339	1357	1506	1770	1579	1597	1583	1794
Field Temperature	deg C	9.7	12.7	12.8	13.5	13.6	13.2	13.4	13.2	13.6	13.1	14.6	13.4	13.31	13.63	13.12	11.7	13.4	13.4	12.7	14.3	14.7	13.6	13.8	13.5	13.4	13.6
Groundwater Elevation	feet	670.86	670.64	670.35	670.21	669.89	670.69	669.94	668.77	669.04	668.92	668.66	670.24	669.84	670.96	671.28	670.71	670.18	669.86	670.27	661.87	662.27	663.66	664.61	657.11	659.12	655.4
Oxygen, Dissolved	mg/L	0.07	0.07	0.02	0.4	0.13	0.21	0.07	0.08	0.18	0.14	0.15	0.08	0.47	0.92	0.29	0.21	0.12	0.5	0.14	0.33	0.4	1.05	0.24	0.39	0.12	0.29
Turbidity	NTU	25.21	8.19	1.89	1	0.49	0.13	0.14	0.74	0.82	0.59	3.95	7.07	0.89	28.5	12.3	15.7	14	2.86	8.99	1.37	6.7	0	2.64	0	3.09	1.9
pH at 25 Degrees C	Std. Units	6.6	6.6	6.6	6.7	6.9	7	6.8	6.7	6.5	6.9	6.6	6.7	--	6.6	7.4	6.8	6.8	--	6.8	--	6.7	--	6.9	6.9	6.9	7.6
Field Oxidation Potential	millivolts	174.7	56	8.6	43.3	44.2	70.9	15.1	-10.5	174.1	14.2	22.8	13.3	59.5	49.1	-0.5	49.7	41.4	64.2	92	119.2	86	39	17.1	-37.7	103.1	25.3
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160	--	270	--	270	--	470	370	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	--	<4.6	--	<4.6	--	<4.6	<4.6	--	--
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160	--	270	--	270	--	470	370	--	--
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	340	--	220	--	<360	--	68	100	81	80
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26000	23000	--	25000	--	43000	--	44000	33000	--	--
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	15000	--	15000	--	31000	--	23000	30000	--	--
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	--	3500	--	3700	--	6000	4900	--	--
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	160000	170000	--	170000	--	170000	--	180000	150000	--	--
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4	5.1	--	6.1	--	9.9	--	7.6	8.2	7.7	7
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	100	--	110	--	100	--	<250	72	--	--
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	16000	--	15000	--	30000	--	26000	27000	--	--



**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-310  
Number of Sampling Dates: 14

Parameter Name	Units	10/24/2019	2/5/2020	3/12/2020	4/13/2020	10/12/2020	2/23/2021	4/13/2021	7/6/2021	10/6/2021	4/11/2022	10/25/2022	4/4/2023	10/10/2023	4/4/2024
Boron	ug/L	720	620	--	550	800	--	360	--	520	640	340	--	--	--
Calcium	mg/L	230	160	--	200	180	--	210	--	130	190	150	--	--	--
Chloride	mg/L	150	120	--	130	150	--	250	--	120	200	140	--	--	--
Fluoride	mg/L	0.31	0.85	--	1.1	1	--	1.3	--	<0.28	<0.22	0.8	--	--	--
Field pH	Std. Units	7.15	7.08	6.89	7	7.07	7.11	7.07	8.23	7.2	6.86	6.7	6.91	7.06	7.05
Sulfate	mg/L	610	530	--	590	570	--	720	--	470	630	480	--	--	--
Total Dissolved Solids	mg/L	260	1200	--	1300	1200	--	1600	--	930	1400	1200	--	--	--
Antimony	ug/L	<0.53	<0.58	--	<0.58	0.61	--	<1.1	--	<1.1	0.89	<0.69	--	--	--
Arsenic	ug/L	0.78	<0.88	--	<0.88	0.94	--	0.97	--	1.1	1	<0.75	--	--	--
Barium	ug/L	76	53	--	62	55	--	92	--	53	75	78	--	--	--
Beryllium	ug/L	<0.27	<0.27	--	<0.27	--	--	<0.27	--	<0.27	<0.27	<0.27	--	--	--
Cadmium	ug/L	0.22	0.12	--	0.16	0.29	--	0.51	--	0.21	0.23	0.24	--	--	--
Chromium	ug/L	<0.98	<1.1	--	<1.1	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	--	--	--
Cobalt	ug/L	0.57	0.32	0.32	0.24	0.38	--	0.75	--	0.72	0.93	0.75	0.24	<0.17	0.29
Lead	ug/L	<0.27	<0.27	--	<0.27	<0.11	--	<0.21	--	<0.21	<0.24	<0.24	--	--	--
Lithium	ug/L	35	42	46	48	42	37	58	52	52	54	36	--	--	--
Mercury	ug/L	<0.1	<0.1	--	<0.1	--	--	<0.15	--	<0.15	<0.11	<0.11	--	--	--
Molybdenum	ug/L	26	29	--	31	39	--	83	--	70	47	24	--	--	--
Selenium	ug/L	5	3.3	--	4.5	2.4	--	2.4	--	2.3	2.3	2.6	--	--	--
Thallium	ug/L	<0.27	<0.26	--	<0.26	<0.26	--	<0.26	--	<0.26	<0.26	<0.26	--	--	--
Total Radium	pCi/L	0.411	0.0344	--	0.271	0.429	--	0	--	0.539	0.316	0.827	--	--	--
Radium-226	pCi/L	-0.0393	0.0344	--	0.0494	0.0766	--	-0.0354	--	<0.511	-0.0361	0.061	--	--	--
Radium-228	pCi/L	0.411	-0.137	--	0.222	0.353	--	-0.0334	--	<0.462	0.316	0.766	--	--	--
Field Specific Conductance	umhos/cm	1906	1723	1902	1823	1709	962	2362	1852	1425	2007	1856	852	1344	1363
Field Temperature	deg C	13.74	12.49	12.8	10.3	13.9	13.6	12.6	13	15.4	12.6	13.3	11.8	14.7	11.3
Groundwater Elevation	feet	649.31	644.71	645.45	645.91	638.46	638.77	642.7	639.32	638.19	640.79	638.55	641.71	638.32	643.51
Oxygen, Dissolved	mg/L	0.41	0.68	0.3	0.22	0.16	0.09	0.46	0.21	0.48	0.3	0.03	4.34	0.45	7.89
Turbidity	NTU	2.29	0.9	2.77	0.87	0.02	0.02	2.38	0	1	4	0.73	0.02	6.05	5.97
pH at 25 Degrees C	Std. Units	7.2	7.1	--	7	7.3	--	7.4	--	7.1	7.1	7	--	--	--
Field Oxidation Potential	millivolts	-9.3	42.2	252.2	179.4	146.5	91.3	161	88.6	96.8	161.1	113.6	252.5	7.5	71.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	190	410	--	130	--	250	260	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	--	--	--	190	410	--	130	--	250	260	250	--	--	--
Iron, total	ug/L	--	--	--	<50	<50	--	<36	--	<36	<36	<36	<36	<36	<36
Magnesium, total	ug/L	--	--	--	86000	76000	--	100000	--	55000	90000	57000	--	--	--
Manganese, dissolved	ug/L	--	--	250	280	350	--	330	--	830	400	1300	--	--	--
Potassium, total	ug/L	--	--	--	12000	12000	--	17000	--	9900	16000	12000	--	--	--
Sodium, total	ug/L	--	--	--	100000	100000	--	150000	--	110000	170000	93000	--	--	--
Cobalt, dissolved	ug/L	--	--	0.31	0.23	--	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	--	--	<50	<50	<50	--	<36	--	<36	<36	<36	--	--	--
Manganese, total	ug/L	--	--	260	280	390	--	290	--	350	520	1100	--	--	--
Lithium, dissolved	ug/L	--	--	45	--	44	--	63	--	45	52	45	--	--	--



**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-310A  
 Number of Sampling Dates: 10

Parameter Name	Units	3/13/2020	4/14/2020	10/12/2020	4/15/2021	10/8/2021	4/12/2022	10/26/2022	4/5/2023	10/12/2023	4/5/2024
Boron	ug/L	1500	1600	1700	1500	1500	1500	1500	--	--	--
Calcium	mg/L	82	87	94	82	80	99	69	--	--	--
Chloride	mg/L	140	130	130	120	130	120	120	--	--	--
Fluoride	mg/L	1.7	1.8	2	1.9	0.28	0.4	2	--	--	--
Field pH	Std. Units	7.73	7.85	7.48	7.47	7.65	7.43	7.64	7.46	7.5	7.43
Sulfate	mg/L	1200	1100	1100	1100	1200	1200	1200	--	--	--
Total Dissolved Solids	mg/L	2300	2300	2200	2300	1800	2100	2200	--	--	--
Antimony	ug/L	<0.58	<0.58	<0.51	<1.1	<1.1	0.85	<0.69	--	--	--
Arsenic	ug/L	<0.88	<0.88	<0.88	<0.75	<0.75	<0.75	<0.75	--	--	--
Barium	ug/L	16	16	16	14	12	14	13	--	--	--
Beryllium	ug/L	<0.27	<0.27	--	<0.27	<0.27	<0.27	<0.27	--	--	--
Cadmium	ug/L	<0.039	<0.039	<0.049	<0.051	<0.051	<0.055	<0.055	--	--	--
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	--	--
Cobalt	ug/L	0.63	0.39	0.43	0.48	0.45	0.41	0.56	0.51	0.52	1.1
Lead	ug/L	<0.27	<0.27	<0.11	<0.21	<0.21	<0.24	<0.24	--	--	--
Lithium	ug/L	250	290	240	270	280	260	230	--	--	--
Mercury	ug/L	<0.1	<0.1	--	<0.15	<0.15	<0.11	<0.11	--	--	--
Molybdenum	ug/L	2.6	2.7	3	5	1.9	4.4	1.4	--	--	--
Selenium	ug/L	<1	<1	<1	<0.96	<0.96	1.4	<0.96	--	--	--
Thallium	ug/L	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	--	--
Total Radium	pCi/L	3.43	3.9	4.46	4.44	5.41	4.61	4.4	--	--	--
Radium-226	pCi/L	3.27	3.48	3.9	4.14	4.35	4.35	3.24	--	--	--
Radium-228	pCi/L	0.157	0.418	0.563	0.293	1.07	0.267	1.16	--	--	--
Field Specific Conductance	umhos/cm	3160	2915	3122	3106	2808	2920	2964	3045	3355	3020
Field Temperature	deg C	12.5	8.8	13.1	12.5	15.6	17.2	14.2	12.1	14.3	11.7
Groundwater Elevation	feet	--	--	640.2	644.88	639.57	640.83	639.49	643.11	640.13	628.24
Oxygen, Dissolved	mg/L	6.28	6.39	0.48	0.98	6.21	4.72	4.24	0.49	5.6	7.75
Turbidity	NTU	109	--	0	2.25	15	14.2	3.85	1.97	4.96	7.57
pH at 25 Degrees C	Std. Units	--	7.5	7.7	7.7	7.7	7.7	7.7	--	--	--
Field Oxidation Potential	millivolts	178.9	146.1	89.7	160.2	143.1	26.7	81.2	-15.5	46	50.2
Bicarbonate Alkalinity as CaCO3	mg/L	--	320	260	340	370	360	350	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8	<4.6	<4.6	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	--	320	260	340	370	360	350	--	--	--
Iron, total	ug/L	99	230	280	<36	<140	56	96	69	68	140
Magnesium, total	ug/L	--	41000	45000	37000	36000	42000	32000	--	--	--
Manganese, dissolved	ug/L	53	39	29	39	30	20	43	--	--	--
Potassium, total	ug/L	--	9900	11000	9200	8900	11000	8600	--	--	--
Sodium, total	ug/L	--	630000	620000	600000	570000	650000	620000	--	--	--
Cobalt, dissolved	ug/L	0.67	0.4	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	<50	220	<50	<36	38	<140	52	--	--	--
Manganese, total	ug/L	51	38	31	34	26	26	24	--	--	--
Lithium, dissolved	ug/L	250	--	230	300	240	260	270	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-311  
 Number of Sampling Dates: 11

Parameter Name	Units	10/24/2019	2/5/2020	3/13/2020	4/13/2020	10/12/2020	4/14/2021	4/11/2022	10/26/2022	4/4/2023	10/11/2023	4/5/2024
Boron	ug/L	<110	<100	--	<100	<80	64	79	75	--	--	--
Calcium	mg/L	170	130	--	170	160	160	150	130	--	--	--
Chloride	mg/L	13	14	--	13	14	11	17	17	--	--	--
Fluoride	mg/L	<0.23	<0.23	--	<0.23	<0.23	<0.28	<0.22	<0.22	--	--	--
Field pH	Std. Units	6.95	6.72	7.11	6.86	6.93	6.66	6.74	6.61	6.56	7.01	6.78
Sulfate	mg/L	47	54	--	54	70	75	78	76	--	--	--
Total Dissolved Solids	mg/L	530	520	--	570	640	590	480	550	--	--	--
Antimony	ug/L	<0.53	<0.58	--	<0.58	<0.51	<1.1	<0.69	<0.69	--	--	--
Arsenic	ug/L	<0.75	<0.88	--	<0.88	1.7	<0.75	<0.75	<0.75	--	--	--
Barium	ug/L	200	160	--	180	220	180	170	200	--	--	--
Beryllium	ug/L	<0.27	<0.27	--	<0.27	--	<0.27	<0.27	<0.27	--	--	--
Cadmium	ug/L	0.04	<0.039	--	<0.039	0.12	<0.051	<0.055	<0.055	--	--	--
Chromium	ug/L	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	--	--	--
Cobalt	ug/L	0.78	0.11	<0.091	<0.091	2.2	<0.091	<0.19	<0.19	0.38	0.25	0.24
Lead	ug/L	<0.27	<0.27	--	<0.27	1.8	<0.21	<0.24	<0.24	--	--	--
Lithium	ug/L	4.7	2.9	4.7	6.2	4.6	5.9	6.3	4.4	--	--	--
Mercury	ug/L	<0.1	<0.1	--	<0.1	--	<0.15	<0.11	<0.11	--	--	--
Molybdenum	ug/L	<1.1	<1.1	--	<1.1	<1.1	<1.3	<1.2	<1.2	--	--	--
Selenium	ug/L	<1	1.2	--	<1	<1	2.1	2	1.3	--	--	--
Thallium	ug/L	<0.27	<0.26	--	<0.26	<0.26	<0.26	<0.26	<0.26	--	--	--
Total Radium	pCi/L	0.386	0.108	--	0.17	0.738	0.194	0.224	--	--	--	--
Radium-226	pCi/L	0.0831	0.0368	--	0.0742	0.247	0.0364	0.0305	--	--	--	--
Radium-228	pCi/L	0.303	0.0711	--	0.0963	0.491	0.158	0.194	--	--	--	--
Field Specific Conductance	umhos/cm	926	891	877	912	1024	945	880	846	932	685	834
Field Temperature	deg C	13.88	10.21	10	8.8	14.4	9.3	10.1	14.6	10.5	19.6	10.4
Groundwater Elevation	feet	647.8	645	644.18	646.79	638.73	643.02	641.44	638.46	641.88	638.31	--
Oxygen, Dissolved	mg/L	0.29	2.11	0.23	0.29	7.12	1.18	0.51	0.68	0	7.69	0.29
Turbidity	NTU	3.88	1.89	3.44	0.44	0	0.78	3.57	0.84	0.02	--	8.69
pH at 25 Degrees C	Std. Units	7	7.1	--	6.9	6.9	6.9	7	7	--	--	--
Field Oxidation Potential	millivolts	-24.7	21	222.6	103.4	-53	179.8	125.4	52.8	257	37.9	42.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	460	290	450	440	490	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<1.9	<3.8	<4.6	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	--	--	--	460	290	450	440	490	--	--	--
Iron, total	ug/L	--	--	<50	<50	630	<36	<36	<36	<36	510	<36
Magnesium, total	ug/L	--	--	--	40000	40000	36000	37000	27000	--	--	--
Manganese, dissolved	ug/L	--	--	21	39	75	<4.4	<3.6	8.7	--	--	--
Potassium, total	ug/L	--	--	--	620	810	650	860	740	--	--	--
Sodium, total	ug/L	--	--	--	5000	5100	5200	6300	4800	--	--	--
Cobalt, dissolved	ug/L	--	--	0.11	<0.091	--	--	--	--	--	--	--
Iron, dissolved	ug/L	--	--	<50	<50	<50	<36	<36	<36	--	--	--
Manganese, total	ug/L	--	--	20	41	180	<4.4	4.6	7.4	--	--	--
Lithium, dissolved	ug/L	--	--	8	--	--	--	--	--	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-311A  
 Number of Sampling Dates: 13

Parameter Name	Units	3/13/2020	4/13/2020	6/30/2020	10/8/2020	2/25/2021	4/16/2021	7/7/2021	10/8/2021	4/14/2022	10/26/2022	4/6/2023	10/11/2023	4/5/2024
Boron	ug/L	1400	1500	--	1600	--	1500	--	1400	1500	1400	--	--	--
Calcium	mg/L	44	48	--	51	--	42	--	40	54	46	--	--	--
Chloride	mg/L	130	140	--	150	--	130	--	140	140	140	--	--	--
Fluoride	mg/L	3.4	4.1	3.7	4.4	3.9	4	3.8	2	2.4	4.3	--	--	--
Field pH	Std. Units	7.85	8.4	7.64	8.33	7.55	7.76	8.19	8.12	7.53	7.8	7.54	7.72	7.64
Sulfate	mg/L	1200	1200	--	1200	--	1100	--	1100	1200	1200	--	--	--
Total Dissolved Solids	mg/L	2300	2400	--	2400	--	2200	--	2000	2200	2300	--	--	--
Antimony	ug/L	<0.58	<0.58	--	<0.51	--	<1.1	--	<1.1	<0.69	0.83	--	--	--
Arsenic	ug/L	<0.88	<0.88	--	<0.88	--	<0.75	--	<0.75	<0.75	<0.75	--	--	--
Barium	ug/L	20	20	--	15	--	12	--	8.7	10	12	--	--	--
Beryllium	ug/L	<0.27	<0.27	--	--	--	<0.27	--	<0.27	<0.27	<0.27	--	--	--
Cadmium	ug/L	<0.039	<0.039	--	<0.049	--	<0.051	--	<0.051	<0.055	<0.055	--	--	--
Chromium	ug/L	<1.1	<1.1	--	<1.1	--	<1.1	--	<1.1	<1.1	<1.1	--	--	--
Cobalt	ug/L	0.19	0.13	--	0.12	--	0.13	--	<0.19	0.32	0.6	0.66	<0.17	0.44
Lead	ug/L	<0.27	<0.27	--	<0.11	--	<0.21	--	<0.21	<0.24	<0.24	--	--	--
Lithium	ug/L	260	310	--	240	--	290	--	290	280	230	--	--	--
Mercury	ug/L	<0.1	<0.1	--	--	--	<0.15	--	<0.15	<0.11	<0.11	--	--	--
Molybdenum	ug/L	1.2	2.8	--	3.1	--	<1.3	--	<1.3	1.6	2.2	--	--	--
Selenium	ug/L	<1	<1	--	<1	--	<0.96	--	<0.96	1.3	<0.96	--	--	--
Thallium	ug/L	<0.26	<0.26	--	<0.26	--	<0.26	--	<0.26	<0.26	<0.26	--	--	--
Total Radium	pCi/L	1.47	2.31	--	3.1	--	3.85	--	4.44	3.99	4.21	--	--	--
Radium-226	pCi/L	1.42	2.1	--	2.22	--	3.25	--	3.67	3.38	2.99	--	--	--
Radium-228	pCi/L	0.0555	0.214	--	0.88	--	0.6	--	0.774	0.61	1.22	--	--	--
Field Specific Conductance	umhos/cm	3336	3027	3391	3177	3243	3332	3381	2930	3211	3022	3037	3424	3244
Field Temperature	deg C	12.1	7.9	12.6	12.7	11.5	12.3	14.2	15.1	14.1	14.1	11.5	13.2	11.5
Groundwater Elevation	feet	--	--	647.73	641.09	641.16 ft	644.16	642.38	640.58	643.23	640.27	643.59	639.84	635.54
Oxygen, Dissolved	mg/L	2.29	3.87	1.51	0.44	3.23	0.77	0.42	1.68	4.66	4.68	2.47	3.15	2.18
Turbidity	NTU	7.74	3.19	1.43	0	0.02	0.02	0	9.6	9.61	5.88	0.02	14.16	7.4
pH at 25 Degrees C	Std. Units	--	7.9	--	7.9	--	7.8	--	7.9	7.7	7.9	--	--	--
Field Oxidation Potential	millivolts	206	115.8	23.4	39.6	129.7	146.9	80.8	140.7	54.6	-21.6	47.7	-4.2	61.3
Bicarbonate Alkalinity as CaCO3	mg/L	--	360	--	400	--	370	--	380	370	380	--	--	--
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	--	<3.8	--	<4.6	--	<4.6	<4.6	<4.6	--	--	--
Total Alkalinity as CaCO3	mg/L	--	360	--	400	--	370	--	380	370	380	--	--	--
Iron, total	ug/L	<50	<50	--	<50	--	<36	--	<140	<36	<36	<36	44	<36
Magnesium, total	ug/L	--	23000	--	25000	--	21000	--	20000	25000	18000	--	--	--
Manganese, dissolved	ug/L	20	22	--	5.8	--	6.2	--	5.5	<14	7	--	--	--
Potassium, total	ug/L	--	9000	--	10000	--	8300	--	7700	10000	7800	--	--	--
Sodium, total	ug/L	--	710000	--	700000	--	720000	--	670000	800000	720000	--	--	--
Cobalt, dissolved	ug/L	0.36	0.12	--	--	--	--	--	--	--	--	--	--	--
Iron, dissolved	ug/L	<50	<50	--	<50	--	<36	--	<36	<140	<36	--	--	--
Manganese, total	ug/L	20	13	--	8.3	--	6.1	--	<18	3.7	9.4	--	--	--
Lithium, dissolved	ug/L	250	--	--	230	--	330	--	250	310	280	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-312

Number of Sampling Dates: 9

Parameter Name	Units	1/12/2022	2/14/2022	2/15/2022	4/11/2022	8/25/2022	10/25/2022	4/5/2023	10/12/2023	4/4/2024
Boron	ug/L	380	--	420	560	--	580	--	--	--
Calcium	mg/L	180	--	180	200	180	160	170	180	170
Chloride	mg/L	150	--	150	170	--	170	--	--	--
Fluoride	mg/L	<0.28	--	0.37	<0.22	--	0.38	--	--	--
Field pH	Std. Units	7.18	--	7.24	7.07	7.14	7.1	7.11	6.96	6.89
Sulfate	mg/L	620	--	570	550	--	610	--	--	--
Total Dissolved Solids	mg/L	1200	--	930	1100	--	1300	--	--	--
Antimony	ug/L	<1.1	--	<0.69	<0.69	--	<0.69	--	--	--
Arsenic	ug/L	3.4	--	4.1	4.4	--	2.8	--	--	--
Barium	ug/L	87	--	63	50	--	45	--	--	--
Beryllium	ug/L	<0.27	--	<0.27	<0.27	--	<0.27	--	--	--
Cadmium	ug/L	0.053	--	<0.055	<0.055	--	<0.055	--	--	--
Chromium	ug/L	<1.1	--	<1.1	<1.1	--	<1.1	--	--	--
Cobalt	ug/L	4.9	--	6.1	9.1	11	11	11	10	8.5
Lead	ug/L	<0.21	--	<0.24	<0.24	--	<0.24	--	--	--
Lithium	ug/L	41	--	31	40	--	35	--	--	--
Mercury	ug/L	<0.15	--	<0.11	<0.11	--	<0.11	--	--	--
Molybdenum	ug/L	2.7	--	1.6	1.3	--	1.4	--	--	--
Selenium	ug/L	<0.96	--	<0.96	<0.96	--	<0.96	--	--	--
Thallium	ug/L	<0.26	--	<0.26	<0.26	--	<0.26	--	--	--
Total Radium	pCi/L	1.25	--	0.888	0.357	--	1.29	--	--	--
Radium-226	pCi/L	0.176	--	0.405	0.357	--	0.493	--	--	--
Radium-228	pCi/L	1.08	--	0.483	-0.907	--	0.802	--	--	--
Field Specific Conductance	umhos/cm	1762	--	1800	1855	1949	1985	1576	1827	1512
Field Temperature	deg C	12.62	--	13.01	12.3	13.2	13.1	12	14.6	12.3
Groundwater Elevation	feet	--	--	--	--	640.8	639.64	644.08	639.45	643.94
Oxygen, Dissolved	mg/L	0.32	--	1.34	0.15	0.18	0	0.28	0.23	0.29
Turbidity	NTU	0	--	0	8.39	1.47	1.68	1.32	5.45	8.53
pH at 25 Degrees C	Std. Units	7.4	--	7.3	7.3	--	7.3	--	--	--
Field Oxidation Potential	millivolts	-53.4	--	-67	112.1	116.7	11.3	0.5	-26.5	-11.7
Bicarbonate Alkalinity as CaCO3	mg/L	220	230	--	240	250	230	250	250	290
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	--	<4.6	<4.6	<4.6	<2.5	<2.5	<2.5
Total Alkalinity as CaCO3	mg/L	220	230	--	240	250	230	250	250	290
Iron, total	ug/L	--	440	--	350	330	260	370	540	420
Magnesium, total	ug/L	--	54000	--	65000	58000	52000	59000	62000	59000
Manganese, dissolved	ug/L	1300	1100	--	1200	1100	1200	--	1400	730
Potassium, total	ug/L	--	4300	--	4800	4600	4800	5700	5200	5000
Sodium, total	ug/L	--	130000	--	170000	140000	130000	140000	120000	110000
Cobalt, dissolved	ug/L	5.1	5.6	--	--	13	--	--	--	--
Iron, dissolved	ug/L	380	380	--	510	240	250	150	210	280
Manganese, total	ug/L	--	1300	--	1400	1200	1000	960	1500	910
Lithium, dissolved	ug/L	--	31	--	37	43	41	--	--	--
Aluminum, dissolved	ug/L	<17	--	--	--	--	--	--	--	--
Potassium, dissolved	ug/L	4300	--	--	--	--	--	--	--	--
Calcium, dissolved	ug/L	180000	--	--	--	--	--	--	--	--
Magnesium, dissolved	ug/L	52000	--	--	--	--	--	--	--	--
Sodium, dissolved	ug/L	120000	--	--	--	--	--	--	--	--

**Single Location**  
**Name: IPL - Ottumwa**  
**Generating Station**

Location ID: MW-313

Number of Sampling Dates: 9

Parameter Name	Units	1/12/2022	2/14/2022	2/15/2022	4/11/2022	8/25/2022	10/25/2022	4/5/2023	10/10/2023	4/4/2024
Boron	ug/L	530	--	510	570	--	540	--	--	--
Calcium	mg/L	190	--	200	200	180	170	220	210	140
Chloride	mg/L	180	--	170	170	--	170	--	--	--
Fluoride	mg/L	<0.28	--	<0.22	<0.22	--	<0.22	--	--	--
Field pH	Std. Units	7	--	7.01	6.94	7.09	6.95	6.93	6.89	6.9
Sulfate	mg/L	620	--	570	500	--	580	--	--	--
Total Dissolved Solids	mg/L	1300	--	1100	3200	--	1300	--	--	--
Antimony	ug/L	<1.1	--	<0.69	<0.69	--	<0.69	--	--	--
Arsenic	ug/L	1.2	--	1	1.2	--	1.1	--	--	--
Barium	ug/L	48	--	44	44	--	53	--	--	--
Beryllium	ug/L	<0.27	--	<0.27	<0.27	--	<0.27	--	--	--
Cadmium	ug/L	<0.051	--	<0.055	<0.055	--	<0.055	--	--	--
Chromium	ug/L	<1.1	--	<1.1	<1.1	--	<1.1	--	--	--
Cobalt	ug/L	5.9	--	5.7	5.7	3.9	3.8	5.5	4.4	2.9
Lead	ug/L	<0.21	--	<0.24	<0.24	--	<0.24	--	--	--
Lithium	ug/L	33	--	26	28	--	30	--	--	--
Mercury	ug/L	<0.15	--	<0.11	<0.11	--	<0.11	--	--	--
Molybdenum	ug/L	6.1	--	5.3	4.8	--	5.8	--	--	--
Selenium	ug/L	<0.96	--	<0.96	<0.96	--	<0.96	--	--	--
Thallium	ug/L	<0.26	--	<0.26	<0.26	--	<0.26	--	--	--
Total Radium	pCi/L	1.29	--	1.25	0.543	--	1.56	--	--	--
Radium-226	pCi/L	0.354	--	0.252	0.308	--	0.21	--	--	--
Radium-228	pCi/L	0.931	--	0.999	0.235	--	1.35	--	--	--
Field Specific Conductance	umhos/cm	1857	--	925	1788	1717	1937	1878	2106	1395
Field Temperature	deg C	14.6	--	13.89	13.2	13.2	14	11.5	13.9	11.8
Groundwater Elevation	feet	--	--	--	--	639.38	639.16	642.02	639.04	644.49
Oxygen, Dissolved	mg/L	0.15	--	1.22	0.09	0.16	0.22	0.09	0.23	0.21
Turbidity	NTU	0	--	0	7.44	4.86	2.75	5.09	6.85	7.45
pH at 25 Degrees C	Std. Units	7.1	--	7.1	7.2	--	7.2	--	--	--
Field Oxidation Potential	millivolts	-51	--	-29	126.5	133.3	-18.4	-14.5	-47.9	-27.9
Bicarbonate Alkalinity as CaCO3	mg/L	230	250	--	300	230	290	270	230	140
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	--	<4.6	<4.6	<4.6	<2.5	<2.5	<2.5
Total Alkalinity as CaCO3	mg/L	230	250	--	300	230	290	270	230	140
Iron, total	ug/L	--	380	--	920	1600	1100	810	1500	580
Magnesium, total	ug/L	--	58000	--	68000	52000	49000	72000	69000	46000
Manganese, dissolved	ug/L	3600	3200	--	3200	2400	3100	--	3600	2200
Potassium, total	ug/L	--	5900	--	6100	4500	4300	6100	5600	4300
Sodium, total	ug/L	--	120000	--	140000	110000	100000	150000	150000	120000
Cobalt, dissolved	ug/L	5.9	5.2	--	--	4.4	--	--	--	--
Iron, dissolved	ug/L	240	290	--	630	600	950	520	1100	430
Manganese, total	ug/L	--	3700	--	3800	2700	2600	3600	3700	2000
Lithium, dissolved	ug/L	--	26	--	26	29	32	--	--	--
Aluminum, dissolved	ug/L	<17	--	--	--	--	--	--	--	--
Potassium, dissolved	ug/L	5700	--	--	--	--	--	--	--	--
Calcium, dissolved	ug/L	190000	--	--	--	--	--	--	--	--
Magnesium, dissolved	ug/L	58000	--	--	--	--	--	--	--	--
Sodium, dissolved	ug/L	110000	--	--	--	--	--	--	--	--

## Single Location


Name: IPL - Ottumwa  
Generating Station

Location ID: MW-316

Number of Sampling Dates: 3

Parameter Name	Units	4/6/2023	10/12/2023	4/5/2024
Calcium	mg/L	210	190	82
Field pH	Std. Units	6.7	6.73	7.04
Cobalt	ug/L	2.1	0.69	0.2
Field Specific Conductance	umhos/cm	1694	1773	763
Field Temperature	deg C	10.6	16.1	9.2
Groundwater Elevation	feet	642.78	639.15	644.09
Oxygen, Dissolved	mg/L	-0.16	0.74	5.2
Turbidity	NTU	0.02	7.2	3.95
Field Oxidation Potential	millivolts	104.1	61	81.3
Bicarbonate Alkalinity as CaCO3	mg/L	340	310	95
Carbonate Alkalinity as CaCO3	mg/L	<2.5	<2.5	<2.5
Total Alkalinity as CaCO3	mg/L	340	310	95
Iron, total	ug/L	<36	74	<36
Magnesium, total	ug/L	65000	66000	27000
Manganese, dissolved	ug/L	--	110	<3.6
Potassium, total	ug/L	1900	2000	930
Sodium, total	ug/L	110000	100000	53000
Iron, dissolved	ug/L	<36	<36	<36
Manganese, total	ug/L	1200	110	15





# Appendix E

## Statistical Evaluation

## E1 LCL Evaluation – October 2023 Event

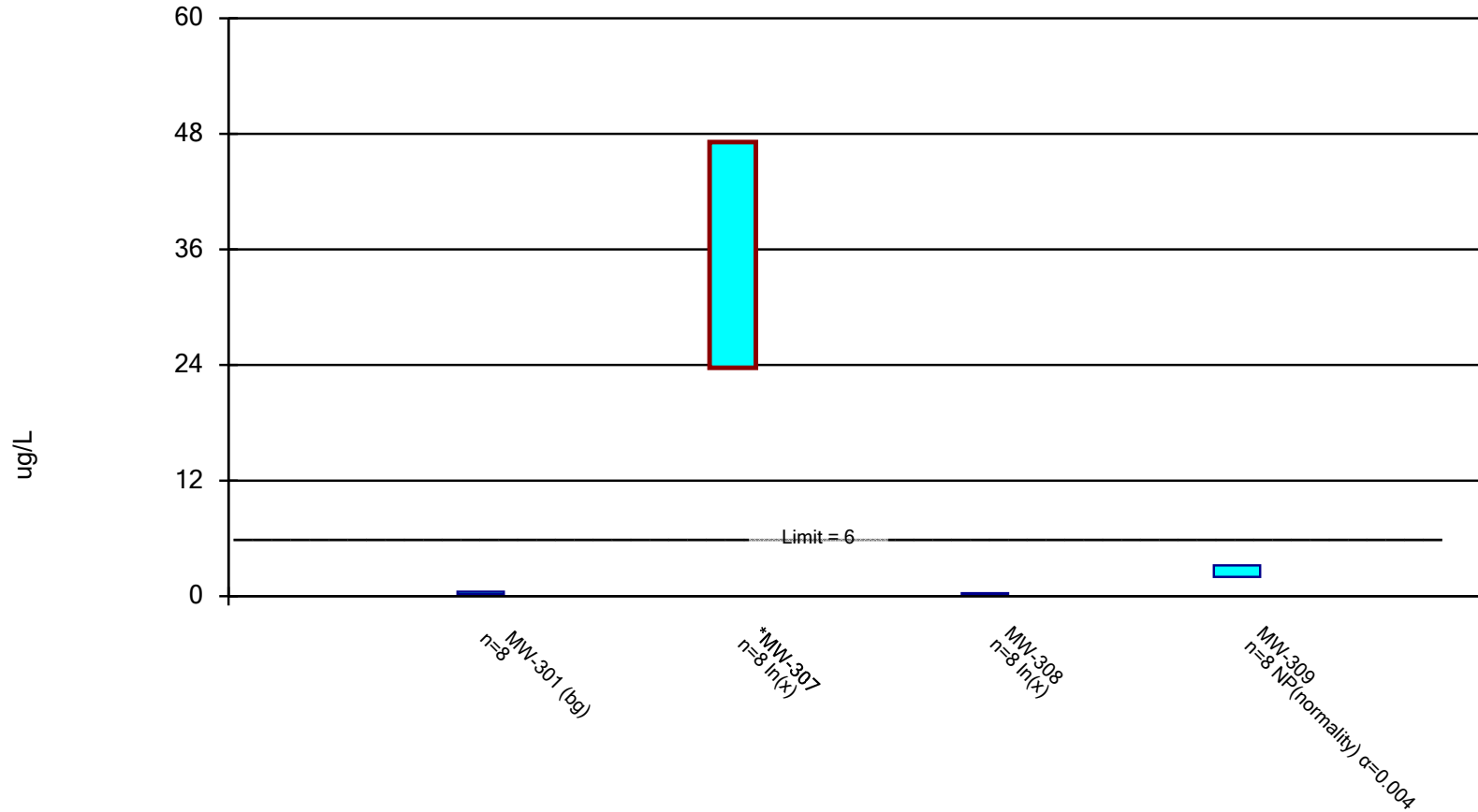
# Confidence Interval

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03] Printed 12/21/2024, 3:35 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (ug/L)	MW-301 (bg)	0.4613	0.1962	6	No	8	0	None	No	0.01	Param.
<b>Cobalt (ug/L)</b>	<b>MW-307</b>	<b>47.15</b>	<b>23.71</b>	<b>6</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>None</b>	<b>ln(x)</b>	<b>0.01</b>	<b>Param.</b>
Cobalt (ug/L)	MW-308	0.3087	0.1353	6	No	8	0	None	ln(x)	0.01	Param.
Cobalt (ug/L)	MW-309	3.2	2	6	No	8	0	None	No	0.004	NP (normality)

## 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 12/21/2024 3:35 PM View: OGS - Ash Pond

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03]

# Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 12/21/2024 3:35 PM View: OGS - Ash Pond

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03]

	MW-301 (bg)	MW-307	MW-308	MW-309
4/14/2020	0.52		0.14 (J)	3.2
10/7/2020			0.14 (J)	2
10/8/2020	0.41 (J)			
4/14/2021	0.29 (J)		0.16 (J)	2.3
7/6/2021		60		
10/7/2021	0.48 (J)	48	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
4/5/2023		30	0.45 (J)	2
4/6/2023	0.21 (J)			
10/10/2023		36	0.17 (J)	2.3
10/13/2023	0.2 (J)			
Mean	0.3288	35.13	0.22	2.25
Std. Dev.	0.1251	12.65	0.1018	0.4071
Upper Lim.	0.4613	47.15	0.3087	3.2
Lower Lim.	0.1962	23.71	0.1353	2

## E2 LCL Evaluation – April 2024 Event



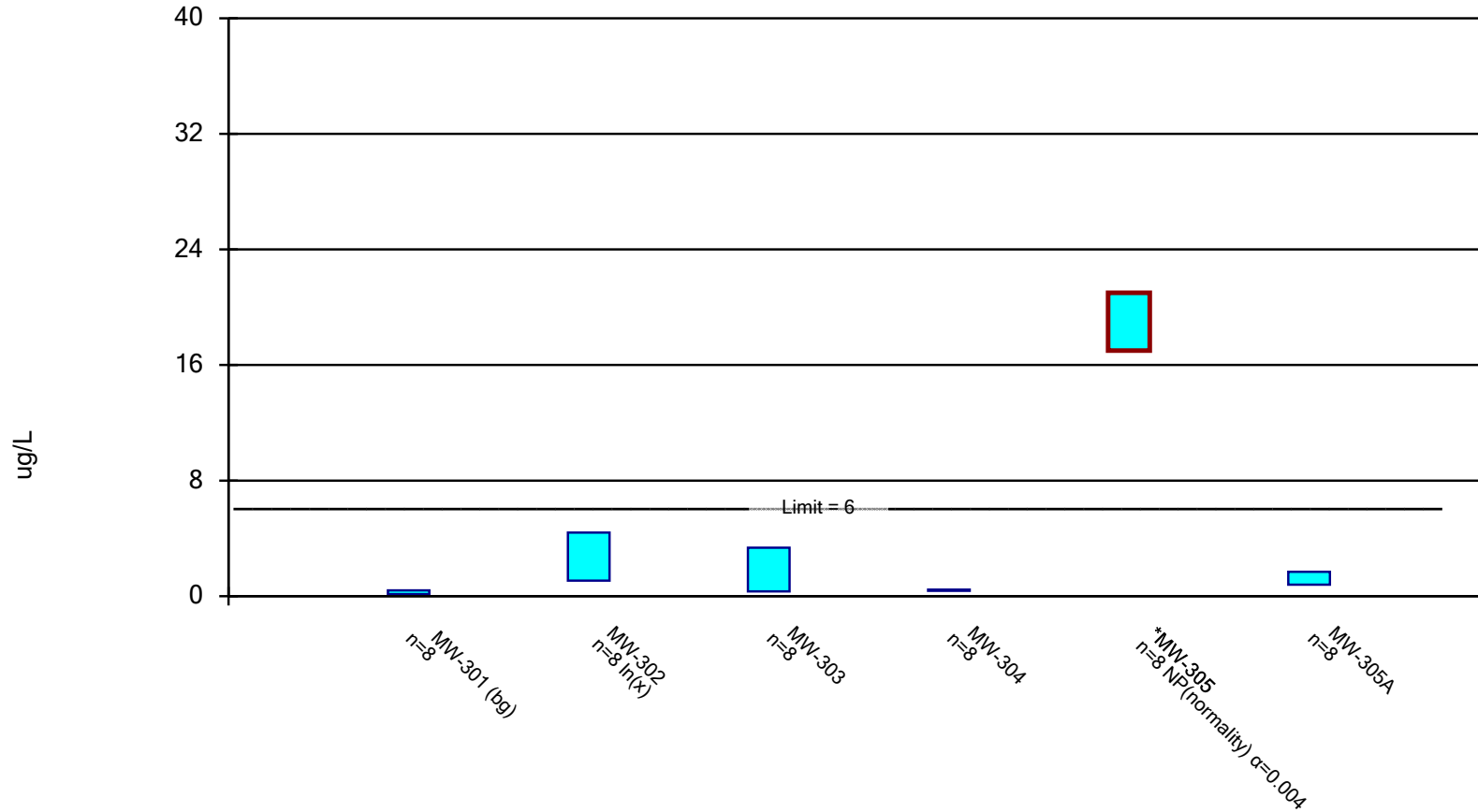
# Confidence Interval

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03] Printed 12/21/2024, 3:23 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (ug/L)	MW-301 (bg)	0.4064	0.1423	6	No	8	12.5	None	No	0.01	Param.
Cobalt (ug/L)	MW-302	4.396	1.075	6	No	8	0	None	ln(x)	0.01	Param.
Cobalt (ug/L)	MW-303	3.352	0.3258	6	No	8	0	None	No	0.01	Param.
Cobalt (ug/L)	MW-304	0.452	0.368	6	No	8	0	None	No	0.01	Param.
<b>Cobalt (ug/L)</b>	<b>MW-305</b>	<b>21</b>	<b>17</b>	<b>6</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.004</b>	<b>NP (normality)</b>
Cobalt (ug/L)	MW-305A	1.683	0.7925	6	No	8	0	None	No	0.01	Param.
<b>Cobalt (ug/L)</b>	<b>MW-306</b>	<b>9.811</b>	<b>6.439</b>	<b>6</b>	<b>Yes</b>	<b>8</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Cobalt (ug/L)	MW-310	0.8421	0.1941	6	No	8	12.5	None	No	0.01	Param.
Cobalt (ug/L)	MW-310A	1.1	0.41	6	No	8	0	None	No	0.004	NP (normality)
Cobalt (ug/L)	MW-311	2.2	0.091	6	No	8	50	None	No	0.004	NP (normality)

## 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 12/21/2024 3:13 PM View: OGS - Ash Pond

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03]

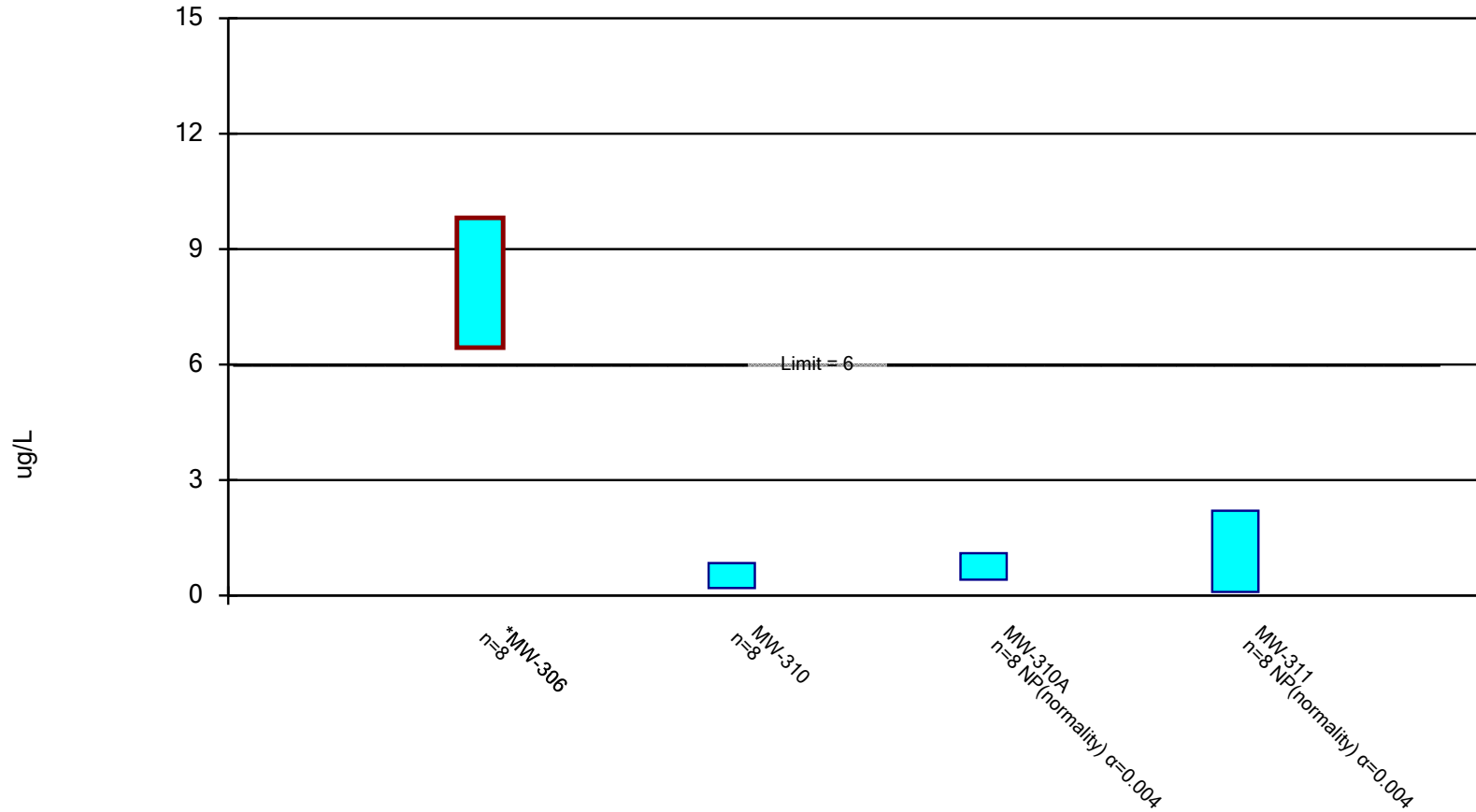
# Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 12/21/2024 3:23 PM View: OGS - Ash Pond  
 Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03]

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-305A
10/24/2019		2.7	1.2			
4/14/2020		5.3	0.87			
10/8/2020	0.41 (J)	1.5	2.4	0.41 (J)		
10/9/2020						1.5
4/13/2021		5.5	0.43 (J)			
4/14/2021	0.29 (J)			0.43 (J)		
4/15/2021						0.5
4/16/2021					18	
10/6/2021					18	
10/7/2021	0.48 (J)	2.2	4			
10/8/2021				0.42 (J)		0.94
2/14/2022					20	
4/11/2022					21	
4/12/2022	0.23 (J)	1.3	1.6	0.41 (J)		1.7
10/25/2022					17	
10/26/2022	0.29 (J)	1.8		0.47 (J)		1.7
4/4/2023					21	
4/5/2023		0.82	0.41 (J)			
4/6/2023	0.21 (J)			0.37 (J)		1.4
10/10/2023				0.43 (J)		
10/12/2023					17	1.2
10/13/2023	0.2 (J)					
4/4/2024	<0.17		3.8	0.34 (J)	17	
4/5/2024						0.96
Mean	0.2744	2.64	1.839	0.41	18.63	1.238
Std. Dev.	0.1246	1.795	1.427	0.03964	1.768	0.4199
Upper Lim.	0.4064	4.396	3.352	0.452	21	1.683
Lower Lim.	0.1423	1.075	0.3258	0.368	17	0.7925

## 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.



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# Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 12/21/2024 3:23 PM View: OGS - Ash Pond  
 Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122[IN USE BY MAD-APP03]

	MW-306	MW-310	MW-310A	MW-311
4/13/2020				<0.091 (U)
10/12/2020		0.38 (J)	0.43 (J)	2.2
4/13/2021		0.75		
4/14/2021				<0.091 (U)
4/15/2021			0.48 (J)	
7/6/2021	5.8			
10/6/2021		0.72		
10/8/2021	11		0.45 (J)	
2/14/2022	8.8			
4/11/2022		0.93		<0.19 (U)
4/12/2022	9.1		0.41 (J)	
10/25/2022	7	0.75		
10/26/2022			0.56	<0.19 (U)
4/4/2023		0.24 (J)		0.38 (J)
4/5/2023			0.51	
4/6/2023	7.7			
10/10/2023		<0.17 (U)		
10/11/2023				0.25 (J)
10/12/2023	7.1		0.52	
4/4/2024	8.5	0.29 (J)		
4/5/2024			1.1	0.24 (J)
Mean	8.125	0.5181	0.5575	0.454
Std. Dev.	1.591	0.3057	0.2247	0.7116
Upper Lim.	9.811	0.8421	1.1	2.2
Lower Lim.	6.439	0.1941	0.41	0.091