2022 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Generating Station – Ash Pond
Ottumwa, Iowa

Prepared for:

Alliant Energy

SCS ENGINEERS

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OVERVIEW OF CURRENT STATUS

Ottumwa Generating Station, Ash Pond
2022 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.

This report is a revision to the original 2022 Annual Report submitted on January 31, 2023. The report was revised to clarify that monitoring well MW-314 was installed as a water-level-only monitoring well and is not a downgradient compliance well. The clarifying edits were made to Section 2.2 of the report, and further referenced in Sections 3.2 and 3.5.1.

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Assessment
Statistically Significant Increases (SSIs)	(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	SSIs initially determined on January 15, 2018, based on November 2017 monitoring results. In 2022, SSIs for semiannual events for compliance wells at waste boundary included the following; see **Table 5A** and **Table 5B** for complete results. <u>October 2021</u> Boron: MW-302, MW-303, MW-304, MW-305 Calcium: MW-302, MW-303, MW-304, MW-305

Category	Rule Requirement	Site Status
		Chloride: MW-302, MW-303, MW-304, MW-305, MW-306 Field pH: MW-304, MW-305
		Sulfate: MW-302, MW-304, MW-306 Total Dissolved Solids: MW-302, MW-303, MW-304, MW-305, MW-306 <u>February 2022</u> Field pH: MW-305, MW-306, <u>April 2022</u> Boron: MW-302, MW-304, MW-305 Calcium: MW-302, MW-303, MW-304, MW-305, MW-306 Chloride: MW-304, MW-306 Fluoride: MW-304 Field pH: MW-304, MW-305 Sulfate: MW-302, MW-304 Total Dissolved Solids: MW-302, MW-304, MW-305, MW-306
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(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:	
	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	Cobalt: Initially determined to be at SSL above the GPS in January 2019 at compliance monitoring wells MW-305 and MW-306. In 2022, concentrations determined to be at SSL above the GPS as follows:

Category	Rule Requirement	Site Status
		October 2021 MW-305, MW-306 February 2022 MW-305 April 2022 MW-305 Lithium: Initially determined to be at SSL above the GPS on July 15, 2021 at delineation wells MW-310A and MW-311A. No SSLs at compliance wells. October 2021 alternative source demonstration indicated non-CCR source.
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	Cobalt: April 15, 2019 Lithium: No ACM required.
	(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.
	(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
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not Selected (In Progress)
Corrective Action	(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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1.0 INTRODUCTION

This 2022 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 2022 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, 2022, through December 31, 2022.

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 7 additional downgradient delineation monitoring wells.

Closure of the Ash Pond was initiated in 2022 and is anticipated to be completed in 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 2022 is 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.**

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 2022 water level measurements are shown on **Figures 3** and **4**. The shallow and deep potentiometric surfaces and groundwater flow patterns for the October 2022 water level measurements are shown on **Figures 5** and **6**. All four potentiometric surface maps show groundwater flow moving to the east, following the same flow patterns observed in regional flow maps of the area. The groundwater 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). 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 to the west of the site. The downgradient 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, and MW-309 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 new monitoring well MW-314, installed as a piezometer in the uppermost aquifer, will be 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 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;

Not applicable. There were no monitoring system changes in 2022. As discussed in Section 2.2, additional wells were installed to monitor water levels in support of ongoing ash pond closure activities, but these wells are not part of the CCR rule monitoring system.

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;

Five groundwater sampling events were completed in 2022. 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 2022. In addition to Appendix III and Appendix IV parameters, both semiannual events included parameters chosen to support the selection of remedy. Supplemental parameters included dissolved and total metals, general water quality parameters, and parameters used to evaluate feasibility of monitored natural attenuation (MNA).

Supplemental monitoring events performed in January, February, and August 2022 were limited to a subset of the wells and parameters. In January 2022, recently installed delineation wells MW-312 and MW-313 were sampled for Appendix III and Appendix IV parameters along with MNA parameters.

In the January event, as part of the ongoing analysis for the selection of a remedy for cobalt in groundwater, selected parameters at these two wells were sampled in the field using two different sized filters (0.2 µm and 0.45 µm) to better define the significance of suspended solids in the groundwater sampling results. Additional MNA parameters analyzed from these samples included

dissolved cobalt and iron to assess potential adsorption of cobalt to colloidal iron, and dissolved aluminum, iron, and cobalt to determine the degree to which the cobalt is associated with suspended solids. Additionally, laboratory analyses were conducted to determine the degree of iron precipitation and cobalt coprecipitation and adsorption from MW-305 groundwater with aeration (i.e., redox increase) to better understand the degree to which cobalt adsorption and coprecipitation contributes to attenuation.

In February 2022, compliance wells MW-305 and MW-306 were sampled for cobalt and field pH, and delineation wells MW-312 and MW-313 were sampled for Appendix III and Appendix IV parameters along with MNA parameters.

In August 2022, cobalt, field pH, and MNA parameters were analyzed in samples collected from MW-312 and MW-313.

The validation and evaluation of the April 2022 monitoring event data was completed and transmitted to IPL on August 15, 2022. The validation and evaluation of the supplemental January, February, and August 2022 monitoring events was also transmitted to IPL in 2022. The validation and evaluation of the October 2022 monitoring event data was in progress at the end of 2022 and will be transmitted to IPL in 2023; therefore, the October 2022 monitoring results will be included in the 2023 annual report. The October 2022 groundwater elevation data is included in this report.

The January, February, April, and August 2022 monitoring results are summarized in **Tables 5A** and **5B.** Field parameter results for the January, February, April, and August 2022 sampling events are provided in **Table 6**. The analytical laboratory reports for January, February, April, and August 2022 are provided in **Appendix C**. Historical results through August 2022 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 2022.

Assessment monitoring for the OGS Ash Pond was initiated in April 2018 and continued through 2022. 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. Cobalt is the only parameter that has been detected at a concentration exceeding the GPS in a compliance well installed at the waste boundary. In 2022, LCL evaluations were included additional Appendix IV parameters that have been detected at a concentration exceeding the GPS in at least one sample result at the delineation wells; however, an LCL above the GPS for these parameters/wells does not drive the initiation of an ACM. The 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 February and April 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 (February and April events)

Cobalt at MW-306 was previously identified as being at an SSL above the GPS, but in 2022 the LCL for the mean was below the GPS.

Lithium detections above the GPS at downgradient delineation wells have been attributed to sources other than the Ash Pond. An Alternative Source Demonstration (ASD) for the April 2021 monitoring event was completed in October 2021 and was included in the 2021 annual report. Lithium was determined to be at an SSL above the GPS in two deep piezometers downgradient from the Ash Pond, but was not detected above the GPS in wells installed at the waste boundary. Based on regional and site information, the lithium SSLs are attributed to naturally occurring lithium in the Mississippian aquifer.

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. 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 2022 will be included in the 2022 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 are included in **Appendix E**. The UPLs/UTLs calculated in April 2022 were applied to the evaluation of the April and August 2022 monitoring results.

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 2022 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.

- Performed laboratory analysis of soil and groundwater samples as part of the cobalt treatability and attenuation study (January-February 2022).
- Completed 2021 Annual Groundwater Monitoring and Corrective Action Report (January 2022).
- Collected first round of groundwater samples at MW-312 and MW-313. Samples analysis performed in support of cobalt treatability and attenuation study. Also measured water levels at all site monitoring wells (January 2022).
- Completed statistical evaluation and determination of any SSLs exceeding the GPS and prepared the groundwater monitoring results letter for the October 2021 monitoring event (February 2022).
- Collected second round of groundwater samples at MW-312 and MW-313 and obtained additional samples from monitoring wells MW-305, MW-306, and MW-307. Also performed an additional round of water level measurements at all site monitoring wells. (February 2022).
- Prepared Semiannual Progress Report for the Selection of Remedy (March 2022).
- Completed well installation documentation for MW-312 and MW-313 for the operating record (March 31, 2022).
- Installed one additional monitoring well (MW-314) and four water table wells (MW-302WT, MW-304WT, MW-306WT, MW-314WT) to provide additional information about groundwater levels surrounding the Ash Pond in support of pond closure activities (April – May, 2022).
- Collected samples for two semiannual assessment monitoring events (April and October 2022).

- Completed Treatability Study for Natural Attenuation of Cobalt in Groundwater (April – July 2022). The Treatability Study will be included in the SOR.

- Supplemental monitoring events in January, February, and August 2022 to characterize groundwater quality at selected wells installed to delineate the nature and extent of impacts.

- Collection of groundwater elevations from water table monitoring wells to monitoring groundwater conditions of the Ash Pond during the closure process (May – August 2022).

- Completed groundwater monitoring results letter for February 2022 sampling event (June 2022).

- Completed statistical evaluation and determination of any SSLs exceeding the GPS and prepared groundwater monitoring results letter for the April 2022 monitoring event (August 2022).

- Conducted groundwater sampling at MW-307, MW-312, and MW-313 (August 2022).

- Completed the ACM Addendum No. 2 for the OGS Ash Pond and Zero Liquid Discharge Pond (August 2022).

- Prepared Semiannual Progress Report for the Selection of Remedy (September 2022).

- Submittal of documentation for MW-314, MW-302WT, MW-304WT, MW-306WT, and MW-314WT into the operating record (September 26, 2022).

- Main Ash Pond Closure Related Key Actions:
  - Excavated CCR in Air Heater Wash Basin (AHWB) footprint, added clay / fill placement in AHWB footprint to subgrade, placed CCR / Stabilization of material in Main Ash Pond (April – July 2022).

  - Updated the closure notification for the OGS Ash Pond. The Ash Pond will be closed with CCR remaining within the footprint of the existing impoundment under the final cover system that meets the requirements of the 40 CFR 257.102(d)(3) (June 2022).

  - Continued grading of Ash Pond CCR material and moisture conditioning (July – December 2022).

  - Removed CCR to native soils in portions of the Main Ash Pond in order to remove CCR below groundwater elevation measured in adjacent water-table wells and placed clay material to replace CCR. Activities happened concurrently (September – November 2022).

Description of Any Problems Encountered.

- There were no problems encountered during 2022.

Discussion of Actions to Resolve the Problems.

- Not applicable. No issues were encountered during 2022.

Projection of Key Activities for the Upcoming Year (2023):

- Complete statistical evaluation and determination of any SSLs exceeding the GPS and prepare groundwater results letter for the October 2022 monitoring event (February 2023).
- Complete statistical evaluation and determination of any SSLs exceeding the GPS and prepare groundwater results letter for the April 2023 monitoring event (August 2023).
- Install and sample three additional delineation wells along the Des Moines River after receiving approval of Joint Permit from the US Army Corps of Engineers and IDNR.
- Continue work on the selection of remedy in accordance with § 257.97.
- Prepare two semiannual progress reports for the Selection of Remedy process (March and September 2023).
- Complete two semiannual assessment monitoring events (April and October 2023).
- Main Ash Pond Closure Activities
  - Continue moisture conditioning, stabilization, and grading of CCR to final cover subgrades
  - Place compacted soil cover (18-inches)
  - Place topsoil (6-inches)
  - Install 40-mil geomembrane and HydroTurf CS in drainage swales
  - Complete final cap and site restoration activities

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 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 2022 assessment monitoring results, background UPLs, and GPSs established for the Ash Pond are provided in **Tables 5A** and **5B**. The laboratory reports are provided in **Appendix C**. Historical monitoring results are summarized in **Appendix D**.

Supplemental groundwater quality parameters were included in the monitoring program in 2022 to support the selection of remedy process, including the evaluation of MNA. The results for the supplemental parameters are included in **Tables 5A** and **5B** 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 2022 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.

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 Network
4A Horizontal Gradients and Flow Velocity
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5A Groundwater Analytical Results Summary – Assessment Monitoring
5B Groundwater Analytical Results Summary – Assessment Monitoring
6 Groundwater Field Parameters - CCR Program – Assessment Monitoring

Table 1. Groundwater Monitoring Well Network
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25222072.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
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

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

Created by:	MDB	Date:	12/17/2021
Last revision by:	NDK	Date:	10/5/2022
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Table 2. CCR Rule Groundwater Samples Summary
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25222072.00

Sample Dates	Compliance Wells				Delineation Well	Compliance Well	Delineation Wells						Background Well
	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-301
1/12/2022	--	--	--	--	--	--	--	--	--	--	Add.	Add.	--
2/14-15/2022	--	--	--	Add.	--	Add.	--	--	--	--	Add.	Add.	--
4/11-14/2022	A	A	A	A	A	A	A	A	A	A	A	A	A
8/25/2022	--	--	--	--	--	--	--	--	--	--	Add.	Add.	--
10/26-28/2022	A	A	A	A	A	A	A	A	A	A	A	A	A
Total Samples	2	2	2	3	2	3	2	2	2	2	5	5	2

Abbreviations:
A = Assessment Monitoring Program
-- = Not sampled
NI = Not Installed
A-R = Assessment Resample
Add. = Additional sampling event for selected parameters

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Last revision by:	RM	Date:	1/9/2023
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I:\25222072.00\Deliverables\2022 Fed Annual Report - OGS AP\Tables\[Table 2 - GW_Samples_Summary_Table_OGS-AP.xlsx]GW Summary

Table 3. Groundwater Elevations - CCR Rule Monitoring Well Network
IPL - Ottumwa Generating Station / SCS Engineers Project #25222072.00

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-305**	**MW-305A**	**MW-306**	**MW-307**	**MW-308**	**MW-309**	**MW-310**	**MW-310A**	**MW-311**	**MW-311A**	**MW-312**	**MW-313**	**MW-314**	**River at Intake**
Top of Well Casing Elevation / Surface Water Reference Elevation (feet amsl)	686.63	673.90	674.53	661.07	682.84	683.91	684.03	683.47	657.56	655.39	654.94	658.63	657.93	654.18	653.54	655.36	655.84	684.71	656.31
Screen Length (ft)	10.0	5.0	10.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	NA
Total Depth (ft from top of casing)	17.0	25.8	19.23	17.5	52.3	51.5	81.91	36.6	28.0	25.0	27.5	25.9	55.55	17.9	47.68	29.87	23.82	33.24	NA
Top of Well Screen Elevation (ft)	679.63	653.10	665.3	648.57	635.54	637.41	607.12	651.87	634.56	635.39	632.44	637.76	607.38	641.24	610.86	NS	NS	656.47	NA
Measurement Date																			
April 26, 2016	682.80	655.63	NI	652.42	655.37	661.67	NI	670.86	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 23, 2016	682.58	655.65	NI	652.89	656.53	662.36	NI	670.64	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
August 9, 2016	682.27	655.52	NI	651.76	653.79	660.78	NI	670.35	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 26-27, 2016	682.04	655.67	NI	652.17	655.03	661.37	NI	670.21	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI	NI
January 18-19, 2017	681.67	655.46	NI	651.74	654.50	660.87	NI	669.89	648.81	647.42	646.66	NI	NI	NI	NI	NI	NI	NI	NI
April 19-20, 2017	682.15	656.35	NI	654.57	657.48	663.27	NI	670.69	653.62	651.09	650.16	NI	NI	NI	NI	NI	NI	NI	NI
June 20-21, 2017	681.91	655.65	NI	652.42	654.75	661.26	NI	669.94	649.85	648.26	647.60	NI	NI	NI	NI	NI	NI	NI	NI
August 21-23, 2017	681.28	655.13	NI	650.58	652.39	659.00	NI	668.77	645.78	643.12	641.82	NI	NI	NI	NI	NI	NI	NI	NI
November 8, 2017	681.54	655.40	NI	651.34	653.03	659.76	NI	669.04	647.37	644.99	644.20	NI	NI	NI	NI	NI	NI	NI	NI
April 18, 2018	681.53	655.71	NI	652.47	655.55	660.99	NI	668.92	649.66	647.91	647.65	NI	NI	NI	NI	NI	NI	NI	NI
May 30, 2018	NM	NM	NI	NM	NM	NM	NI	NM	652.45	651.05	650.98	NI	NI	NI	NI	NI	NI	NI	NI
June 28, 2018	NM	NM	NI	NM	NM	NM	NI	NM	652.87	651.43	651.47	NI	NI	NI	NI	NI	NI	NI	NI
July 18, 2018	NM	NM	NI	NM	NM	NM	NI	NM	652.27	650.67	650.69	NI	NI	NI	NI	NI	NI	NI	NI
August 14-15, 2018	680.91	656.05	NI	652.57	656.35	661.56	NI	668.66	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
August 29, 2018	681.09	655.89	NI	655.07	657.82	NM	NI	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
October 16, 2018	682.50	656.91	NI	656.17	658.20	663.37	NI	670.24	654.13	NM	651.61	NI	NI	NI	NI	NI	NI	NI	NI
January 8, 2019	682.22	656.03	NI	654.65	656.28	662.13	NI	669.84	NM	NM	NM	NI	NI	NI	NI	NI	NI	NI	NI
April 8, 2019	682.69	657.23	NI	655.55	659.33	664.01	NI	670.96	654.90	653.70	653.55	NI	NI	NI	NI	NI	NI	NI	NI
August 28, 2019	NM	NM	NI	NM	NM	NM	NI	NM	NM	NM	NM	640.98	NI	642.10	NI	NI	NI	NI	NI
October 23-24, 2019	683.07	660.14	NI	653.86	657.71	663.21	NI	671.28	651.89	651.31	651.28	649.31	NI	647.80	NI	NI	NI	NI	NI
December 11, 2019	NM	NM	NI	NM	NM	NM	NI	NM	649.59	647.39	647.24	NM	NI	NM	NI	NI	NI	NI	NI
February 5, 2020	683.30	NM	NI	NM	NM	NM	NI	NM	649.88	650.12	648.34	644.71	NI	645.00	NI	NI	NI	NI	NI
March 12-13, 2020	682.82	NM	NI	NM	NM	661.41	651.64	NM	NM	NM	NM	645.45	617.84	644.18	624.11	NI	NI	NI	NI
April 1, 2020	683.27	657.00	NI	655.89	658.57	660.59	655.05	671.13	653.76	651.88	651.23	651.09	649.16	649.35	648.27	NI	NI	NI	649.71
April 13-14, 2020	683.25	656.45	NI	654.08	656.42	662.44	653.69	670.71	650.66	650.09	649.19	645.91	647.50	646.79	648.42	NI	NI	NI	645.71
May 4, 2020	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NI	NI	NI	NM
June 30, 2020	NM	NM	NI	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	647.73	NI	NI	NI	NM
October 5-12, 2020	682.34	655.80	NI	650.37	652.95	659.81	648.01	670.18	646.18	642.85	641.50	638.46	640.20	638.73	641.09	NI	NI	NI	638.16
February 23, 2021	NM	NM	NI	NM	NM	NM	NM	669.86	646.80	NM	NM	638.77	NM	NM	641.16	NI	NI	NI	NM
April 12 - 16, 2021	682.94	656.05	NI	653.82	654.34	661.15	651.16	670.27	649.53	647.66	646.46	642.70	644.88	643.02	644.16	NI	NI	NI	640.91
July 6, 2021	NM	NM	NI	NM	NM	NM	NM	661.87	647.03	NM	NM	639.32	NM	NM	642.38	NI	NI	NI	NM
October 6-8, 2021	681.95	654.86	NI	649.80	649.53	654.83	645.57	662.27	644.49	641.81	640.71	638.19	639.57	Dry	640.58	NI	NI	NI	NM
January 11-12, 2022	681.58	NM	NI	NM	NM	656.55	NM	NM	646.24	NM	NM	NM	NM	NM	NM	642.17	641.22	NI	NM
January 31, 2022	681.56	654.56	NI	650.07	650.51	656.67	647.01	664.14	646.05	643.44	642.42	639.69	640.63	639.47	641.79	641.67	640.39	NI	642.96
February 14-15, 2022	681.43	654.42	NI	650.03	650.42	656.35	646.84	663.66	645.82	643.25	642.32	639.64	640.68	below pump	641.50	641.86	640.58	NI	642.01
April 11-14, 2022	682.08	654.77	NI	652.95	652.14	657.62	649.24	664.61	648.40	645.75	644.32	640.79	640.83	641.44	643.23	644.62	642.06	NI	643.21
May 3, 2022	682.27	654.51	<655.3	652.14	653.51	657.70	650.04	663.60	649.14	647.41	647.07	644.83	645.24	642.98	643.94	647.34	645.83	667.41	647.16
May 5, 2022	682.07	654.78	656.03	652.48	654.46	658.07	650.47	663.77	649.86	648.16	648.46	648.11	646.51	644.02	644.13	648.77	648.24	667.57	NM
May 10, 2022	NM	654.70	655.71	NM	654.09	NM	NM	663.71	NM	NM	NM	NM	NM	NM	NM	NM	NM	667.01	NM
May 17, 2022	681.75	654.56	655.69	652.47	653.60	657.78	650.77	663.45	649.70	648.06	647.45	644.67	650.07	644.22	645.13	647.57	646.08	667.07	NM
May 20, 2022	NM	654.63	655.66	NM	653.50	NM	NM	663.49	NM	NM	NM	NM	NM	NM	NM	NM	NM	667.44	NM
May 23, 2022	NM	NM	NM	NM	652.66	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
June 2, 2022	681.69	654.22	655.68	651.53	652.37	656.18	649.53	661.42	648.33	646.68	646.38	644.61	645.23	643.36	644.93	646.43	645.48	666.15	NM
June 9, 2022	681.80	654.24	655.70	651.44	654.18	656.34	649.80	661.25	648.90	647.05	647.32	648.23	646.20	644.14	644.61	647.78	648.65	665.82	NM
June 10, 2022	NM	NM	NM	NM	652.97	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
June 21, 2022	681.60	654.29	655.69	651.35	652.89	656.25	650.52	660.87	649.54	648.47	648.34	646.29	647.63	644.88	645.60	647.87	647.17	665.61	NM
June 27, 2022	681.60	654.06	655.68	651.14	652.16	656.15	649.70	661.41	648.61	647.13	646.34	643.87	644.85	643.64	645.37	646.42	644.80	665.16	NM
July 5, 2022	681.47	653.92	655.68	650.70	651.03	655.33	648.51	660.86	647.34	645.41	644.14	641.58	642.91	644.16	644.30	644.50	642.44	665.14	NM
July 12, 2022	681.46	653.78	655.66	651.39	650.62	655.03	647.95	660.62	646.83	644.85	644.17	641.75	642.89	644.26	641.00	644.17	642.65	664.69	NM
July 27, 2022	681.19	653.60	655.66	649.74	649.56	654.03	646.85	660.76	645.67	643.58	642.46	639.61	641.24	638.41	642.41	643.14	640.83	663.93	639.23
August 25, 2022	NM	NM	NM	NM	NM	NM	NM	NM	644.25	NM	NM	NM	NM	NM	NM	640.80	639.38	NM	NM
October 26-28, 2022	680.68	652.95	655.65	648.22	647.26	651.48	644.38	657.11	643.46	641.13	640.43	638.55	639.49	638.46	640.27	639.64	639.16	661.58	638.41
Bottom of Well Elevation (ft)	669.63	648.10	655.3	643.57	630.54	632.41	602.12	646.87	629.56	630.39	627.44	632.76	602.38	636.24	605.86	625.49	632.0	651.5	--

NM = not measured
NI = not installed
ND = Not surveyed

Created by: NDK Date: 1/15/20218
Last rev. by: RM Date: 10/28/2022
Checked by: DK Date: 10/28/2022
Proj Mgr QA/QC: TK Date: 1/20/2022

Note:
1. Monitoring Well MW-314 is used for water level measurement. Well MW-314 is not a CCR Rule Monitoring Well

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Table 4A. Horizontal Gradients and Flow Velocity
Ottumwa Generating Station - Ash Pond /
SCS Engineers Project #25222072.00
January - December 2022

	Northeast Flow Path - Shallow				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
April 11-14, 2022	657.62	650.00	387	0.02	0.20
April 11-14, 2022	652.14	645.00	410	0.02	
April 11-14, 2022	660.00	645.00	1691	0.01	
October 26-28, 2022	651.48	645.00	368	0.02	0.19
October 26-28, 2022	647.26	640.00	432	0.02	
October 26-28, 2022	655.00	640.00	1544	0.01	

	Northeast Flow Path - Deep				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
April 11-14, 2022	649.00	641.00	596	0.01	0.0002
October 26-28, 2022	644.00	640.00	520	0.01	0.0001

	Well	K Values (cm/sec)	K Values (ft/d)
Upgradient Well	MW-301	4.6E-03	13
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
	Geometric Mean	1.8E-03	5.1
Deep Wells	MW-305A	5.6E-06	0.02
	MW-310A	4.2E-07	0.001
	MW-311A	5.4E-07	0.002
	Geometric Mean	1.1E-06	3.1E-03

Assumed Unconsolidated Porosity, n
0.40

Assumed Dolomite Porosity, n
0.25

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

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

ft = feet
ft/d = feet per day
K = hydraulic conductivity
n = effective porosity
V = groundwater flow velocity
h1, h2 = point interpreted groundwater elevation
Δl = distance between location 1 and 2
Δh/Δl = hydraulic gradient

Note:
1. See Figures 3, 4, 5, and 6 for velocity calculation flow path locations.

Created by: RM Date: 12/29/2020
Last revision by: RM Date: 1/13/2022
Checked by: BR Date: 1/16/2023

Table 4B. Vertical Gradients
IPL - Ottumwa Generating Station / SCS Engineers Project #25222072.00

Vertical Hydraulic Gradients	MW-305/MW-305A		MW-310/MW-310A		MW-311/MW-311A	
Shallow Well	MW-305		MW-310		MW-311	
Screen midpoint (feet amsl)	634.91		635.26		638.74	
Deep Well	MW-305A		MW-310A		MW-311A	
Screen midpoint (feet amsl)	604.62		604.88		608.36	
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)**
April 11-14, 2022	30.3	-0.277	30.4	0.001	30.4	0.059
October 26-28, 2022	30.3	-0.234	30.4	0.031	30.4	0.060

Notes:
1: A positive vertical gradient indicates upward groundwater flow. A negative gradient indicates downward flow.

Last rev. by: RM Date: 7/28/2022
Checked by: MDB Date: 1/16/2023
Proj Mgr QA/QC: TK Date: 1/20/2023

Table 5A. Groundwater Analytical Results Summary - January and February 2022
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25222072.00

				Compliance Wells		Delineation Wells							
Parameter Name	UPL Method	UPL	GPS	MW-305	MW-306	MW-312				MW-313			
				2/14/2022	2/14/2022	1/12/2022	1/12/2022 0.2um filter	1/12/2022 0.45um filter	2/15/2022	1/12/2022	1/12/2022 0.45um filter	1/12/2022 0.2um filter	2/15/2022
Appendix III													
Boron, ug/L	P	820		--	--	380	--	--	420	530	--	--	510
Calcium, mg/L	P	78.7		--	--	180	--	--	180	190	--	--	200
Chloride, mg/L	P	86.8		--	--	150	--	--	150	180	--	--	170
Fluoride, mg/L	P	0.484		--	--	<0.28	--	--	0.37 J	<0.28	--	--	<0.22
Field pH, Std. Units	P	6.87		7.20	7.07	7.18	--	--	7.24	7.00	--	--	7.01
Sulfate, mg/L	P	199		--	--	620	--	--	570	620	--	--	570
Total Dissolved Solids, mg/L	P	628		--	--	1,200	--	--	930	1300	--	--	1,100
Appendix IV		**UPL**	**GPS**										
Antimony, ug/L	P*	0.22	6	--	--	<1.1	--	--	<0.69	<1.1	--	--	<0.69
Arsenic, ug/L	P*	0.53	10	--	--	3.4	--	--	4.1	1.2 J	--	--	1.0 J
Barium, ug/L	P	68.8	2,000	--	--	87	--	--	63	48	--	--	44
Beryllium, ug/L	DQ	DQ	4	--	--	<0.27	--	--	<0.27	<0.27	--	--	<0.27
Cadmium, ug/L	NP*	0.12	5	--	--	0.053 J	--	--	<0.055	<0.051	--	--	<0.055
Chromium, ug/L	P	1.07	100	--	--	<1.1	--	--	<1.1	<1.1	--	--	<1.1
Cobalt, ug/L	NP	4.1	6	20	8.8	4.9	--	--	6.1	5.9	--	--	5.7
Fluoride, mg/L	P	0.48	4	--	--	<0.28	--	--	0.37 J	<0.28	--	--	<0.22
Lead, ug/L	NP*	0.10	15	--	--	<0.21	--	--	<0.24	<0.21	--	--	<0.24
Lithium, ug/L	P	34.2	40	--	--	41	--	--	31	33	--	--	26
Mercury, ug/L	DQ	DQ	2	--	--	<0.15	--	--	<0.11	<0.15	--	--	<0.11
Molybdenum, ug/L	P	1.74	100	--	--	2.7	--	--	1.6 J	6.1	--	--	5.3
Selenium, ug/L	P	8.55	50	--	--	<0.96	--	--	<0.96	<0.96	--	--	<0.96
Thallium, ug/L	NP*	0.14	2	--	--	<0.26	--	--	<0.26	<0.26	--	--	<0.26
Radium 226/228 Combined, pCi/L	P	2.15	5	--	--	1.25	--	--	0.888	1.29	--	--	1.25
Additional Parameters Collected for Selection of Remedy													
Aluminum - dissolved, ug/L	UPL or GPS not applicable			--	--	--	<17	19 J	--	--	<17	<17	--
Calcium - dissolved, ug/L				--	--	--	180000	--	--	--	190000	--	--
Cobalt - dissolved, ug/L				--	--	--	3.4	5.1	5.6	--	5.9	6.0	5.2
Lithium - dissolved, ug/L				--	--	--	--	--	31	--	--	--	26
Iron, dissolved, ug/L				--	--	--	180	380	380	--	240	240	290
Iron, ug/L				--	--	--	--	--	440	--	--	--	380
Magnesium - dissolved, ug/L				--	--	--	52000	--	--	--	58000	--	--
Magnesium ug/L				--	--	--	--	--	54,000	--	--	--	58,000
Manganese, dissolved, ug/L				--	--	--	1300	--	1,100	--	3600	--	3,200
Manganese, ug/L				--	--	--	--	--	1,300	--	--	--	3,700
Potassium - dissolved, ug/L				--	--	--	4300	--	--	--	5700	--	--
Potassium, ug/L				--	--	--	--	--	4,300	--	--	--	5,900
Sodium - dissolved, ug/L				--	--	--	120000	--	--	--	110000	--	--
Sodium, ug/L				--	--	--	--	--	130,000	--	--	--	120,000
Bicarbonate Alkalinity, mg/L				--	--	--	220	--	230	--	230	--	250
Carbonate Alkalinity, mg/L				--	--	--	<4.6	--	<4.6	--	<4.6	--	<4.6
Total Alkalinity, mg/L				--	--	--	220	--	230	--	230	--	250

4.4	Blue highlighted cell indicates the compliance or delineation well result exceeds the UPL (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.

Abbreviations:

UPL = Upper Prediction Limit
GPS = Groundwater Protection Standard
MNA = Monitorized Natural Attenuation
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value)
P = Parametric UPL with 1-of-2 retesting
-- = Not Analyzed
mg/L = milligrams per liter
ug/L = micrograms per liter
LOD = Limit of Detection
LOQ = Limit of Quantitation

* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential SSIs above background.

Lab Notes:

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

Notes:

1. An individual result above the UPL 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 Level (MCLs), if established; otherwise, the values from 40 CFR 257.95(h)(2).
3. Interwell UPLs calculated based on results from background well MW-301.
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.

Created by: NDK Date: 5/1/2018
Last revision by: RM Date: 1/16/2023
Checked by: BR Date: 1/16/2023
Proj Mgr QA/QC: TK Date: 1/20/2023

I:\25222072.00\Deliverables\2022 Fed Annual Report - OGS AP\Tables\[Table 5A - GW Screening Summary_OGS AP.xlsx]Current Event Table

Table 5B. Groundwater Analytical Results Summary - April and August 2022
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25222072.00

Parameter Name	UPL Method	UPL	GPS	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	
				4/12/2022	4/12/2022	4/12/2022	4/12/2022	4/11/2022	4/12/2022	4/12/2022	4/11/2022	4/12/2022	4/11/2022	4/14/2022	4/11/2022	8/25/2022	4/11/2022	8/25/2022
Appendix III																		
Boron, ug/L	P	839		640	1,300	620	940	850	210	760	640	1,500	79 J	1500	560	--	570	--
Calcium, mg/L	P	103		92	170	190	130	120	180	110	190	99	150	54	200	--	200	--
Chloride, mg/L	P	210		140	170	58	270	200	160	260	200	120	17	140	170	--	170	--
Fluoride, mg/L	P	0.381		<0.22	<0.22	<0.22	1.7	<0.22	<0.22	<0.22	<0.22	0.40 J	<0.22	2.4	<0.22	--	<0.22	--
Field pH, Std. Units	P	6.74		6.37	6.43	6.71	6.95	6.90	7.19	6.66	6.86	7.43	6.74	7.53	7.07	7.14	6.94	7.09
Sulfate, mg/L	P	208		160	750	200	260	150	160	70	630	1,200	78	1,200	550	--	500	--
Total Dissolved Solids, mg/L	P	697		610	1,100	630	1,700	950	700	710	1,400	2,100	480	2,200	1,100	--	3,200	--
Appendix IV		**UTL**	**GPS**															
Antimony, ug/L	NP	1.10	6	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	<0.69	0.89 J	0.85 J	<0.69	<0.69	<0.69	--	<0.69	--
Arsenic, ug/L	NP	0.88	10	<0.75	<0.75	<0.75	0.76 J	<0.75	<0.75	<0.75	1.0 J	<0.75	<0.75	<0.75	4.4	--	1.2 J	--
Barium, ug/L	P	71.0	2,000	40	17	64	78	120	91	94	75	14	170	10	50	--	44	--
Beryllium, ug/L	NP	0.270	4	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	<0.27	--	<0.27	--
Cadmium, ug/L	P	0.149	5	<0.055	0.21	0.15	<0.055	<0.055	<0.055	1.3	0.23	<0.055	<0.055	<0.055	<0.055	--	<0.055	--
Chromium, ug/L	NP	1.10	100	<1.1	1.4 J	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	--
Cobalt, ug/L	P	5.26	6	0.23 J	1.3	1.6	0.41 J	21	1.7	9.1	0.93	0.41 J	<0.19	0.32 J	9.1	11	5.7	3.9
Fluoride, mg/L	P	0.417	4	<0.22	<0.22	<0.22	1.7	<0.22	<0.22	<0.22	<0.22	0.40 J	<0.22	2.4	<0.22	--	<0.22	--
Lead, ug/L	NP	0.270	15	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	--	<0.24	--
Lithium, ug/L	P	31.8	40	19	9.1 J	4.0 J	3.4 J	<2.5	17	<2.5	54	260	6.3 J	280	40	--	28	--
Mercury, ug/L	DQ	DQ	2	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	--	<0.11	--
Molybdenum, ug/L	NP	1.30	100	<1.2	2.6	2.7	1.9 J	7.8	4.5	14	47	4.4	<1.2	1.6 J	1.3 J	--	4.8	--
Selenium, ug/L	P	9.01	50	6.0	2.4 J	8.3	1.3 J	1.1 J	<0.96	<0.96	2.3 J	1.4 J	2.0 J	1.3 J	<0.96	--	<0.96	--
Thallium, ug/L	NP	0.500	2	<0.26	<0.26	0.26 J	<0.26	0.42 J	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.26	--
Radium 226/228 Combined, pCi/L	P	1.71	5	0.378	0.294	0.619	2.87	1.03	3.44	2.03	0.316	4.61	0.224	3.99	0.357	--	0.543	--
Additional Parameters Collected for Selection of Remedy																		
Cobalt, dissolved, ug/L	UPL or GPS not applicable			--	--	--	--	17	--	7.6	--	--	--	--	--	13	--	4.4
Lithium, dissolved, ug/L				--	--	--	--	--	--	--	52	260	--	310	37	43	26	29
Iron, dissolved, ug/L				<36	<36	<36	3,800	55 J	<36	<250	<36	<140	<36	<140	510	240	630	600
Iron, ug/L				<36	45 J	<36	4,800	76 J	<36	68 J	<36	56 J	<36	<36	350	330	920	1600
Magnesium, ug/L				36,000	49,000	26,000	45,000	53,000	32,000	44,000	90,000	42,000	37,000	25,000	65,000	58,000	68,000	52000
Manganese, dissolved, ug/L				5.0 J	91	410	3,500	3,200	120	23,000	400	20 J	<3.6	<14	1,200	1,100	3,200	2400
Manganese, ug/L				8.1 J	110	490	4,200	4,000	140	26,000	520	26	4.6 J	3.7 J	1,400	1,200	3,800	2700
Potassium, ug/L				1,100	1,600	930	8,700	8,700	4,200	6,000	16,000	11,000	860	10,000	4,800	4,600	6,100	4500
Sodium, ug/L				89,000	240,000	110,000	240,000	210,000	60,000	180,000	170,000	650,000	6,300	800,000	170,000	140,000	140,000	110000
Bicarbonate Alkalinity, mg/L				190	100	520	380	520	320	470	260	360	440	370	240	250	300	230
Carbonate Alkalinity, mg/L				<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6	<4.6
Total Alkalinity, mg/L				190	100	520	380	520	320	470	260	360	440	370	240	250	300	230

4.4	Blue highlighted cell indicates the compliance or delineation well result exceeds the UPL (background), UTL, 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 5B. Groundwater Analytical Results Summary - April and August 2022
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25222072.00

Abbreviations:

UPL = Upper Prediction Limit
NA = Not Analyzed
GPS = Groundwater Protection Standard
MNA = Monitorized Natural Attenuation
LOD = Limit of Detection
LOQ = Limit of Quantitation
-- = Not Analyzed
mg/L = milligrams per liter
ug/L = micrograms per liter
DQ = Double Quantification Rule (not detected in background)
NP = Nonparametric UPL (highest background value)
P = Parametric UPL with 1-of-2 retesting
UTL = Upper Tolerance Limits

Lab Notes:

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

Notes:

1. An individual result above the UPL 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 Level (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 April 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.

Created by:	NDK	Date:	5/1/2018
Last revision by:	RM	Date:	1/16/2023
Checked by:	BR	Date:	1/16/2023
Sci./PM QA/QC:	TK	Date:	1/20/2023

I:\25222072.00\Deliverables\2022 Fed Annual Report - OGS AP\Tables\[Table 5B - GW Screening Summary_OGS AP.xlsx]Current Event Table

Table 6. Groundwater Field Parameters
Ottumwa Generating Station - Ash Pond / SCS Project # 25222072.00

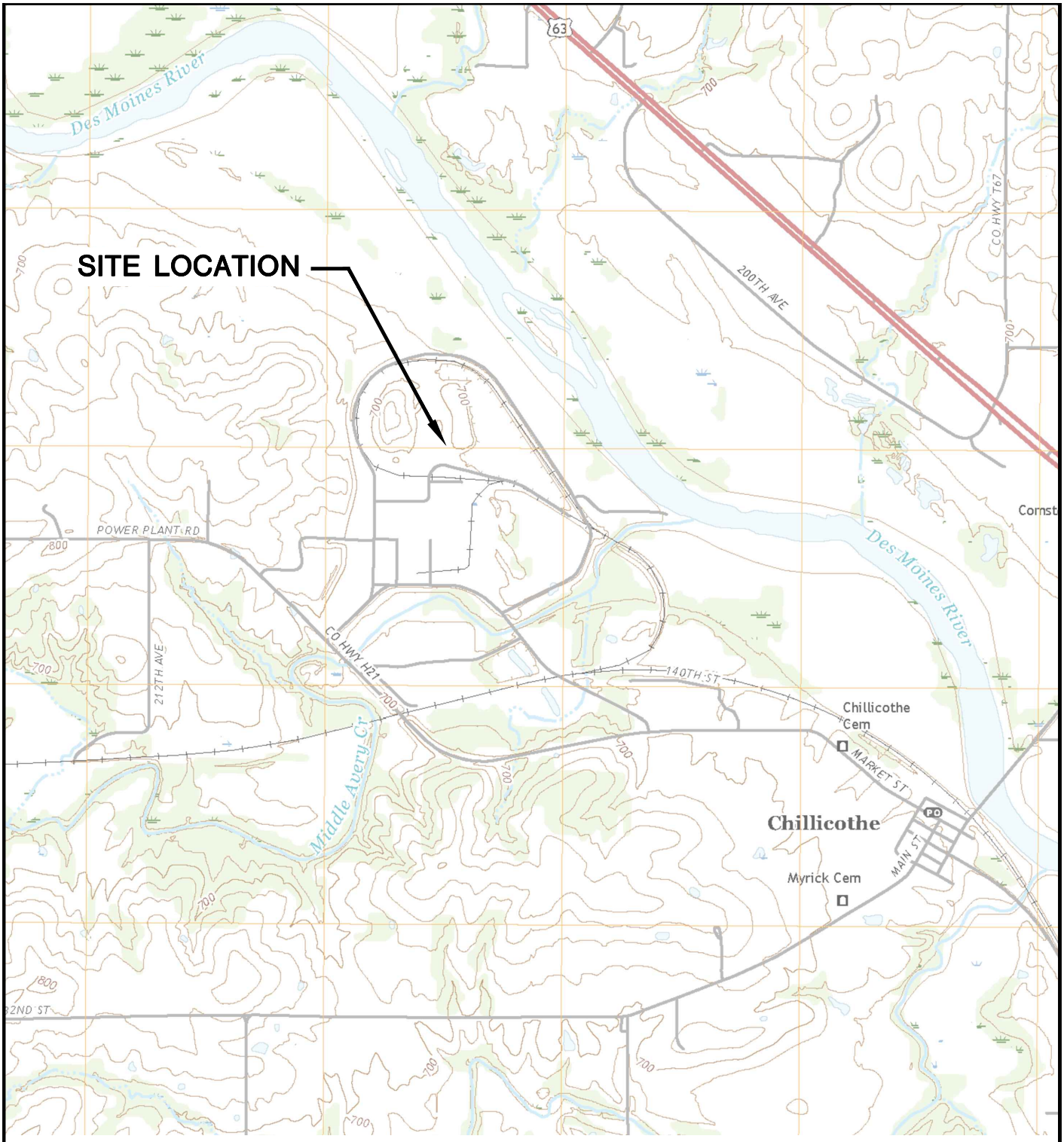
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	4/12/2022	682.08	7.4	6.37	3.26	976	117.6	5.03
MW-302	4/12/2022	654.77	11.4	6.43	0.41	1,741	145.2	5.13
MW-303	4/12/2022	652.95	9.0	6.71	1.19	1,245	158.2	6.20
MW-304	4/12/2022	652.14	13.3	6.95	0.13	1,772	-56.9	3.70
MW-305	2/14/2022	656.35	12.4	7.20	4.80	1500	50.0	0.00
	4/11/2022	657.62	12.8	6.90	0.23	1,742	134.8	4.97
MW-305A	4/12/2022	649.24	21.6	7.19	4.85	1,242	79.7	12.50
MW-306	2/14/2022	663.66	13.6	7.07	1.05	1,770	39.0	0.0
	4/12/2022	664.61	13.8	6.66	0.24	1,579	17.1	2.64
MW-310	4/11/2022	640.79	12.6	6.86	0.30	2,007	161.1	4.0
MW-310A	4/12/2022	640.83	17.2	7.43	4.72	2,920	26.7	14.2
MW-311	4/11/2022	641.44	10.1	6.74	0.51	880	125.4	3.57
MW-311A	4/14/2022	643.23	14.1	7.53	4.66	3,211	54.6	9.61
MW-312	1/12/2022	NM	12.6	7.18	0.32	1,762	-53.40	0.0
	2/15/2022	641.86	13.0	7.24	1.34	1,800	-67.0	0.0
	4/11/2022	644.62	12.3	7.07	0.15	1,855	112.1	8.39
	8/25/2022	640.80	13.2	7.14	0.18	1,949	116.7	1.47
MW-313	1/12/2022	NM	14.6	7.00	0.15	1857	-51.00	0.0
	2/15/2022	640.58	13.9	7.01	1.22	925	-29.0	0.0
	4/11/2022	642.06	13.2	6.94	0.09	1,788	126.5	7.44
	8/25/2022	639.38	13.2	7.09	0.16	1,717	133.3	4.86

NM = Not measured

Created: NDK Date: 10/5/2022
Updated: RM Date: 1/13/2023
QC Checked: MDB Date: 1/16/2023

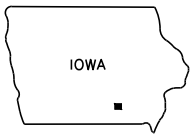
Figures

1 Site Location Map
2 Site Plan and Monitoring Well Locations—Ash Pond
3 Shallow Potentiometric Surface, April 11-14, 2022
4 Deep Potentiometric Surface, April 11-14, 2022
5 Shallow Potentiometric Surface, October 26-28, 2022
6 Deep Potentiometric Surface, October 26-28, 2022



N

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



CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA

SITE LOCATION MAP

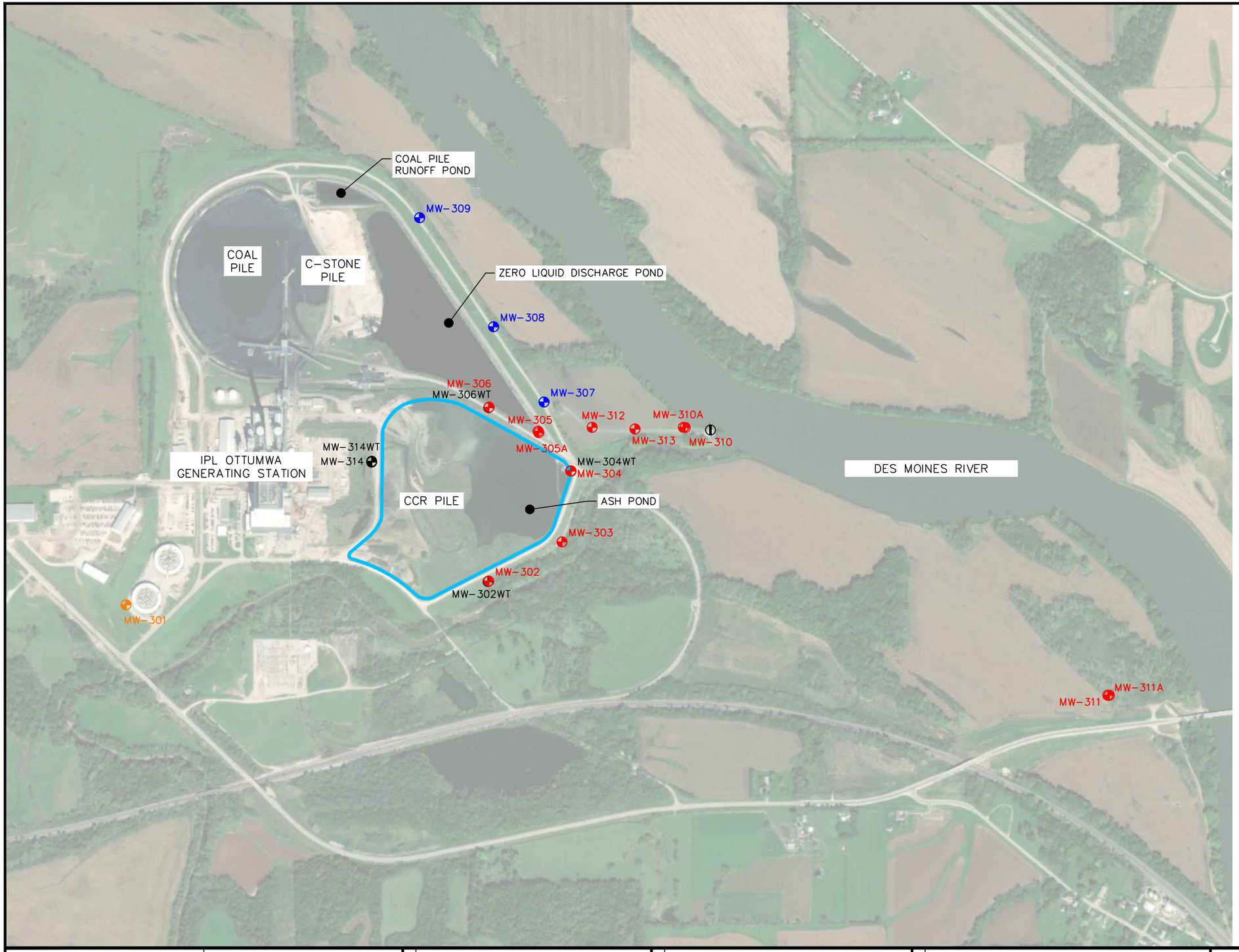
PROJECT NO.	25219072.00	DRAWN BY:	BSS
DRAWN:	11/15/2019	CHECKED BY:	MDB
REVISED:	01/10/2020	APPROVED BY:	TK 01/30/2020

ENGINEER

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

FIGURE
1

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



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

NOTES:

1. 2014 AERIAL PHOTOGRAPH SOURCES: ESRI, DIGITALGLOBE, GEOEYE, I-CUBED, USDA FSA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY.
2. MONITORING WELLS MW-301, MW-302, AND MW-304, WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM NOVEMBER 11-12, 2015.
3. MONITORING WELLS MW-303 AND MW-305 WERE INSTALLED BY CASCADE DRILLING LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 7-8, 2015.
4. MONITORING WELLS MW-307, MW-308, AND MW-309 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM OCTOBER 25-27, 2016.
5. MONITORING WELLS MW-310 AND MW-311 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING ON AUGUST 27, 2019.
6. MONITORING WELLS MW-305A, MW-310A, AND MW-311A WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING BETWEEN FEBRUARY 27, 2020 AND MARCH 3, 2020.
7. MONITORING WELLS MW-312 AND MW-313 WERE INSTALLED BY CASCADE DRILLING ON DECEMBER 14, 2021.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25222072.00	DRAWN BY:	KP
DRAWN:	07/07/2022	CHECKED BY:	SCC
REVISED:	01/27/2023	APPROVED BY:	TK 1/30/2023

ENGINEER

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

CLIENT

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

SITE

ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SITE PLAN
AND MONITORING WELL LOCATIONS

FIGURE
2

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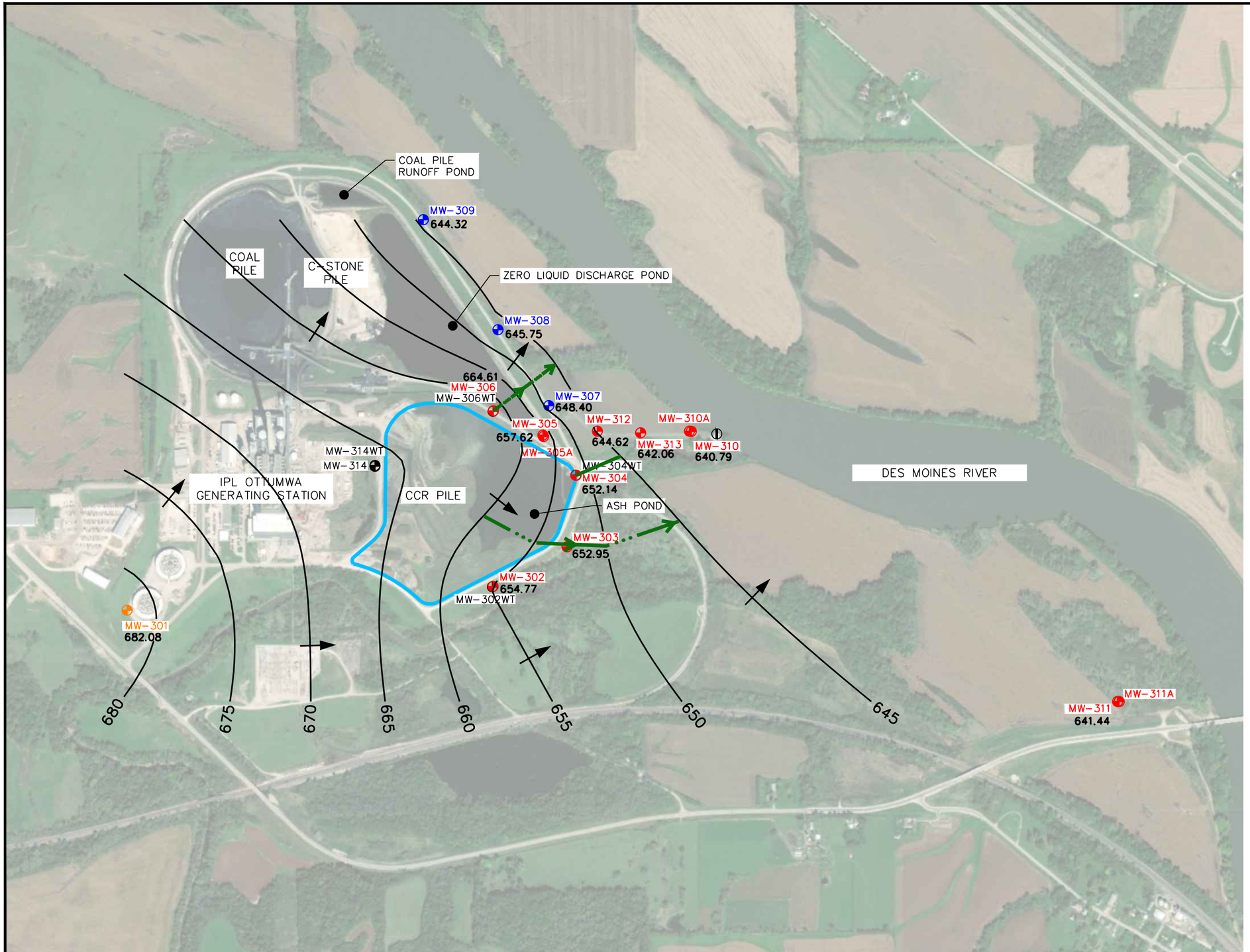

LEGEND

- 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
- **(640.91)** RIVER ELEVATION (APRIL 16, 2021)
- **651.09** POTENTIOMETRIC ELEVATION AT WELL (APRIL 11–14, 2022)
- POTENTIOMETRIC SURFACE CONTOUR
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25222072.00	DRAWN BY:	KP
DRAWN:	09/23/2022	CHECKED BY:	RM
REVISED:	01/27/2023	APPROVED BY:	TK 1/30/2023

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

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

SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SHALLOW POTENTIOMETRIC SURFACE APRIL 11–14, 2022

FIGURE 3

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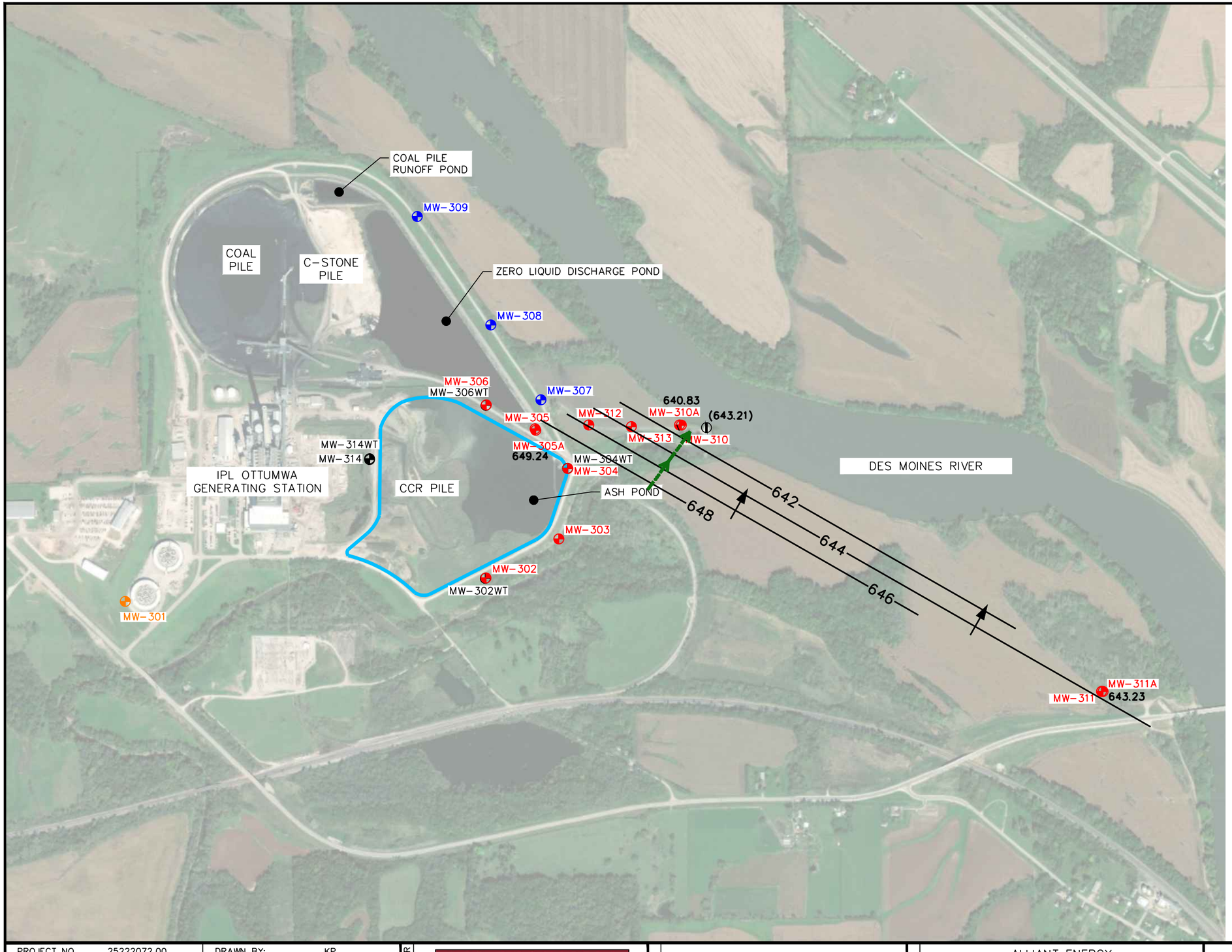

LEGEND

- CCR UNIT
- CCR ZLDP MONITORING WELL
- CCR ASH POND MONITORING WELL
- CCR BACKGROUND MONITORING WELL
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- POTENTIOMETRIC SURFACE CONTOUR
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25222072.00	DRAWN BY:	KP
DRAWN:	09/23/2022	CHECKED BY:	RM
REVISED:	01/27/2023	APPROVED BY:	TK 01/30/2023

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

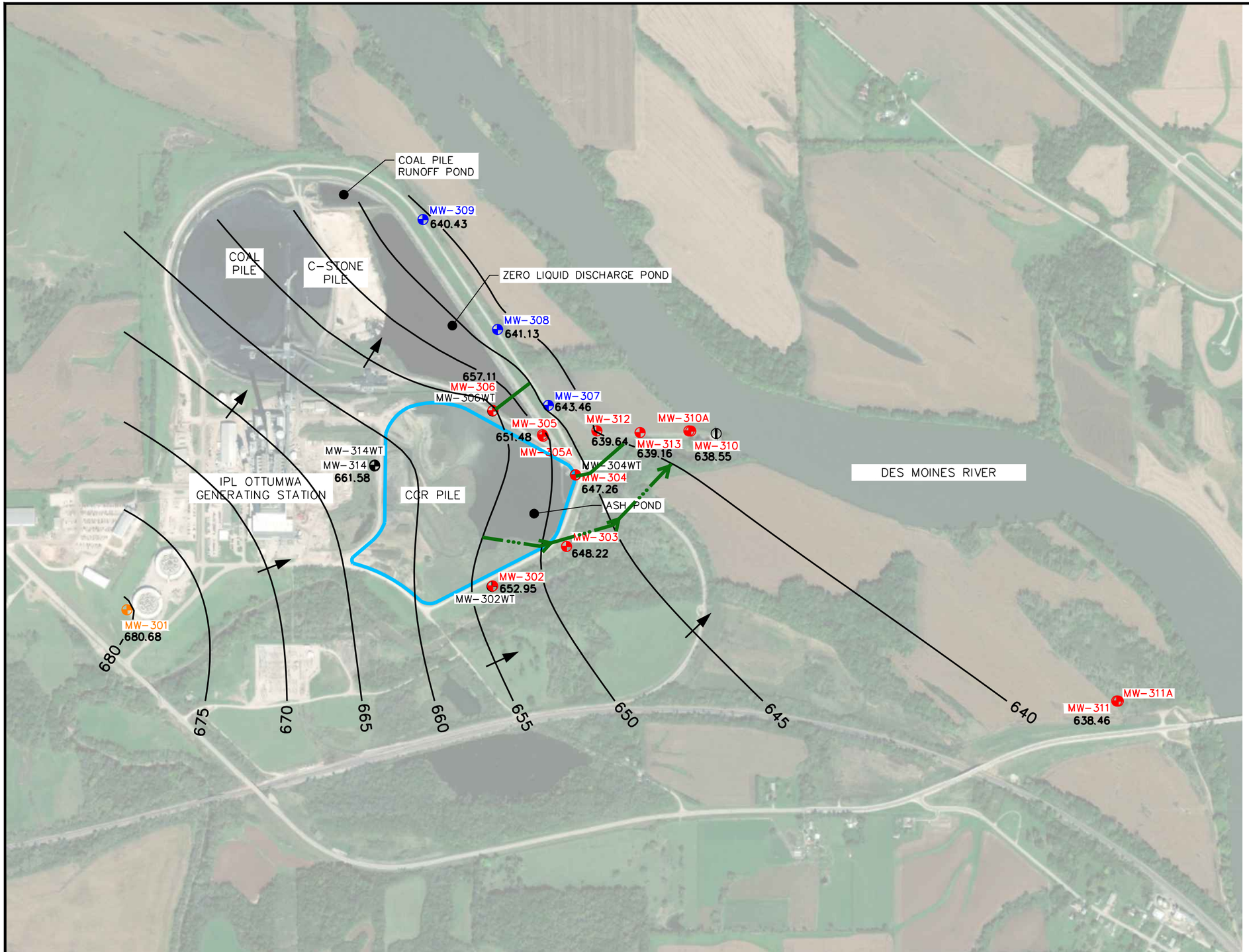
CLIENT: INTERSTATE POWER AND LIGHT CO.
20775 POWER PLANT ROAD
OTTUMWA, IA 52501

SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

DEEP POTENTIOMETRIC SURFACE
APRIL 11–14, 2022

FIGURE
4

I:\25222072.00\Drawings\Potentiometric Surface 2022 Ash Pond.dwg, 1/27/2023 7:21:24 AM



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
- (638.41) RIVER ELEVATION (OCTOBER 26, 2022)
- 651.09 POTENTIOMETRIC ELEVATION AT WELL (OCTOBER 26–28, 2022)
- POTENTIOMETRIC SURFACE CONTOUR
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25222072.00	DRAWN BY:	KP
DRAWN:	12/23/2022	CHECKED BY:	RM
REVISED:	01/27/2023	APPROVED BY:	TK 1/30/2023

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

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

SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

SHALLOW POTENTIOMETRIC SURFACE
OCTOBER 26–28, 2022

FIGURE 5

I:\25222072.00\Drawings\Potentiometric Surface 2022 Ash Pond.dwg, 1/27/2023 7:20:59 AM

COAL PILE RUNOFF POND
MW-309
COAL PILE
C-STONE PILE
ZERO LIQUID DISCHARGE POND
MW-308
MW-306
MW-306WT
MW-307
MW-305
MW-312
639.49
MW-310A
(638.41)
MW-313
MW-310
MW-314WT
MW-314
MW-305A
644.38
MW-304WT
MW-304
DES MOINES RIVER
IPL OTTUMWA GENERATING STATION
CCR PILE
ASH POND
640
644
642
MW-303
MW-302
MW-302WT
MW-301
MW-311A
MW-311
640.27

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
- **(638.41)** RIVER ELEVATION (OCTOBER 26, 2022)
- **651.09** POTENTIOMETRIC ELEVATION AT WELL (OCTOBER 26-28, 2022)
- POTENTIOMETRIC SURFACE CONTOUR
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4A)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.

N

800 0 800

SCALE: 1" = 800'

PROJECT NO.	25222072.00	DRAWN BY:	KP
DRAWN:	12/23/2022	CHECKED BY:	RM
REVISED:	01/27/2023	APPROVED BY:	KT 1/30/2023

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

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

SITE: ALLIANT ENERGY
OTTUMWA GENERATING STATION
OTTUMWA, IOWA

DEEP POTENTIOMETRIC SURFACE
OCTOBER 26-28, 2022

FIGURE 6

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

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

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

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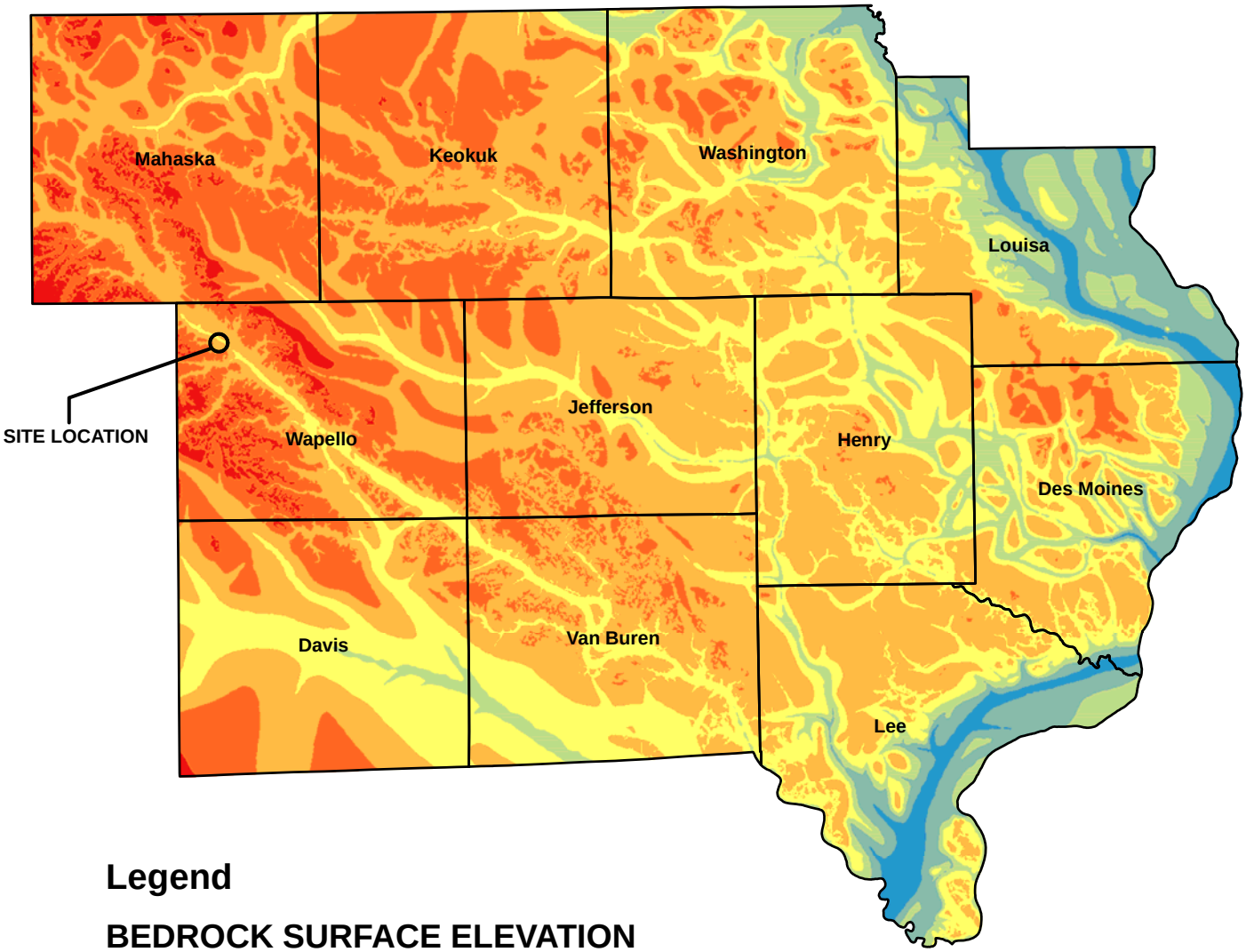

Legend

BEDROCK SURFACE ELEVATION

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

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

N

0 5 10 20 Miles

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

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

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

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

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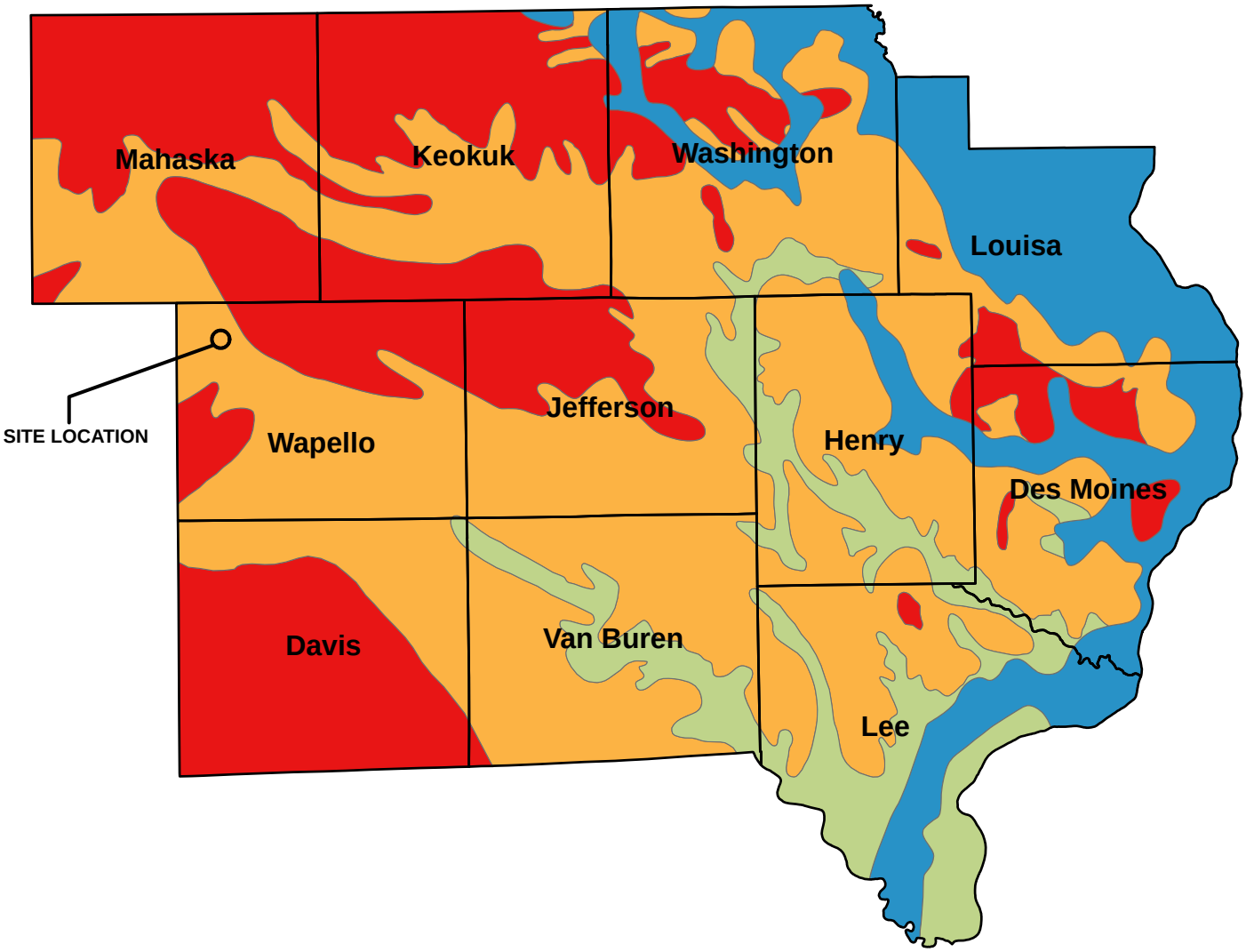

Legend

MISSISSIPIAN AQUIFER POTENTIOMETRIC SURFACE

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 550
- 650
- 750

N

0 5 10 20 Miles

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

CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE	OTTUMWA GENERATING STATION OTTUMWA, IOWA

SE IOWA
REGIONAL MISSISSIPIAN AQUIFER
POTENTIOMETRIC SURFACE ELEVATION

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

ENGINEER

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

FIGURE

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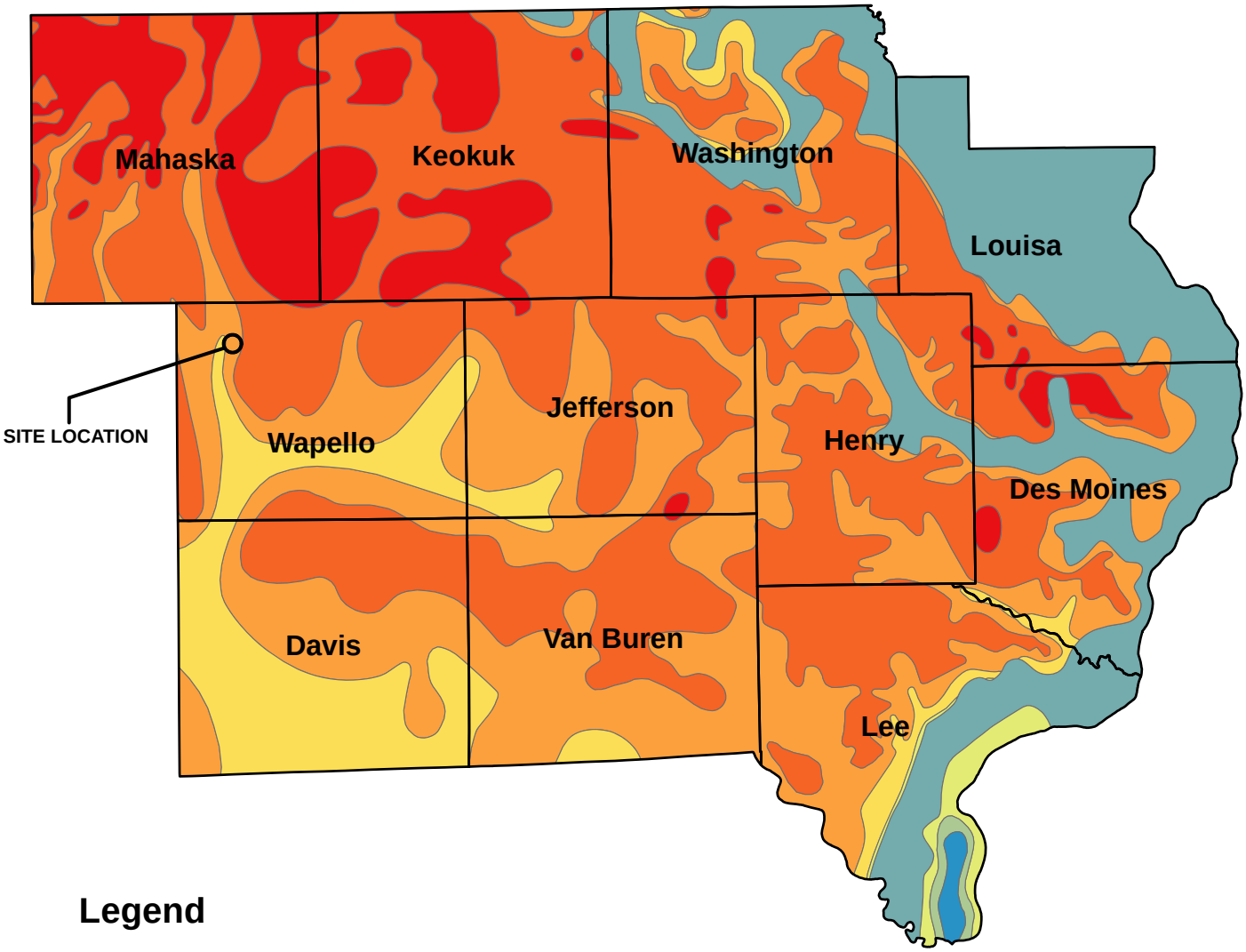

Legend

MISSISSIPIAN AQUIFER ELEVATION

ELEVATION ABOVE MEAN SEA LEVEL IN FEET

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

N

0 5 10 20 Miles

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

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

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

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Appendix B

Boring Logs and Well Construction Documentation

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

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

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

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

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

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

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

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

Signature for Kyle Kramer

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718

Tel: (608) 224-2830
Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-302

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

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-302	Feet	671.6 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 400,267 N, 1,902,625 E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL.	TOPSOIL									
			2	LEAN CLAY WITH SAND, dark gray (10YR 4/1).										
			3											
			4											
			5											
			6											
			7		CL									
			8											
			9											
			10											
S1	19	1 4 5 7	11							M				
			12											
S2	19	2 4 7 11	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 for Kyle Kramer
Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718
Tel: (608) 224-2830
Fax:

Boring Number MW-302 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S3	24	2 3 9 9	17	POORLY GRADED SAND, olive yellow (2.5Y 6/6).	SP					M				
			18	LEAN CLAY, dark grayish brown (10YR 4/2).	CL									
S4	24	4 4 4 4	19	POORLY GRADED GRAVEL, fine.	GP					W				saturation @ 18 ft bgs.
			20	LEAN CLAY, brownish yellow (10YR 6/8).	CL									
S5	15	2 3 3 6	21	POORLY GRADED GRAVEL WITH CLAY, gray (10YR 5/1), fine.	GP-GC					W				
			22											
S6	24	3 4 8 9	23							W				
			24	POORLY GRADED SAND, gray (10YR 5/1), medium grained.	SP									
			25											
S7	24	4 3 6 8	26							W				
			27											
			28	Same as above, but brown (10YR 5/3).										
S8	24	7 8 11 9	29	POORLY GRADED SAND, gray (10YR 5/1), fine grained, (weathered bedrock?).	SP					W				
			30	Medium grained.										
S9	23	5 14 33 50/.4	31							W				
			32											
			33											
S10	12	12 50/.3	34							W				
			35	POORLY GRADED SAND, olive yellow (2.5Y 7/1), fine grained, (weathered bedrock?).	SP									
S11	3	50/.3	36							W				
			37	End of Boring at 37 feet bgs.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-303

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Todd Schmalfeld Cascade Drilling	12/8/2015	12/8/2015	4-1/4 hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-303	Feet	659.0 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 400,583 N, 1,903,215 E S/C/N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–8	FILL, boring location was cleared to 9' bgs by hydrovac, then back filled.	FILL									
S1	1	50	9–11	WEATHERED SANDSTONE, medium grained, brown (10YR 5/4).	SANDSTONE					W				
S2	NR		12–14											
				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 for Kyle Kramer

Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718

Tel: (608) 224-2830
Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-304

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

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-304	Feet	680.1 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,152 N, 1,903,287 E S/C/N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	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

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: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
S3	12	3 3 4 5	17	FAT CLAY, yellowish brown (10YR 3/4). *(continued)*						M				
			18											
S4	22	4 3 7 12	19							M				
			20											
S5	23	2 7 8 9	21							M				
			22											
S6	23	3 4 8 6	23							M				
			24											
			25		CH									
S7	23	5 11 15 11	26							M				
			27											
S8	15	4 4 5 6	28							M				
			29											
			30											
S9	18	4 6 9 9	31							M				
			32											
			33											
S10	24	4 6 7 6	34							M				
			35	FAT CLAY, DARK OLIVE BROWN (2.5Y 3/3).										
S11	16	2 2 4 6	36							M				
			37											
			38											
S12	24	4 3 5 5	39		CH					M				
			40											
S13	18	2 3 3 3	41							M				
			42											

Boring Number MW-304

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

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-305

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Todd Schmalfeld Cascade Drilling	12/7/2015	12/8/2015	4-1/4 hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-305	Feet	681.5 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,473 N, 1,903,023 E S/C/N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	TOPSOIL	TOPSOIL									
				GRAVEL	GP									
			2	FAT CLAY										
			3											
			4											
			5											
			6											
			7											
			8											
			9		CH									
			10	FAT CLAY, very dark grayish brown (10YR 3/2).										
S1	18	3 6 9 11	11							W				
			12											
			13	same as above except, brown (10YR 4/3).										
S2	22	3 7 14 22	14							W				
			15											
			16											

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

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

Boring Number MW-305

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S3	22	5 15 14 15	17	FAT CLAY *(continued)*										
S4	20	3 5 13 15	18 19 20		CH									
S5	24	4 5 7 11	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 40	same as above except, very dark grayish brown (10YR 3/2).						W				
S13	6	3 9 11	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 Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S14	22	23 50	43	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4), (weathered bedrock). *(continued)*	SP					S				
			44											
			45											
S15	6	5 10 50	46		SP					S				
			47											
			48											
S16	6	50	49							S				
			50	End of Boring at 50 ft bgs.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL- Ottumwa Generating Station SCS#: 25215135.40		MW-306

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Todd Schmalfeld Cascade Drilling	11/12/2015	11/12/2015	4-1/4 hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-306	Feet	681.1 Feet	8.5 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,666 N, 1,902,629 E S/C/N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat ° ' "
Long ° ' "
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

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

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

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:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-306

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S3	22	5 10 10 14	17	FAT CLAY, gray (10YR 5/1). *(continued)* FAT CLAY, gray (10YR 5/1).	CH					M				
			18	FAT CLAY, dark olive brown (2.5Y 3/3).										
S4	13	5 8 14 17	19							M				
			20											
S5	15	5 6 13 16	21							W				
			22		CH									
			23											
S6	15	3 5 7 9	24							W				
			25											
S7	22	2 5 7 11	26	POORLY GRADED SAND, very dark grayish brown (10YR 3/2), medium to coarse grained, (weathered bedrock?).						W				
			27											
			28											
S8	NR	7 3 4 3	29							W				
			30		SP									
S9	18	1 1 2 2	31							W				
			32											
			33											
S10	13	WOR	34							W				
				End of Boring at 34.5 feet bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL - Ottumwa Generating Station SCS#: 25219028.00		MW-310

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Eric Wetzel Roberts Environmental Drilling, Inc.	8/27/2019	8/27/2019	4 1/4 hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-310	Feet MSL	655.76 Feet MSL	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,502 N, 1,904,206 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovac through clay for utility clearances.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	LEAN CLAY, brown, massive.										
S1	11	WOR 10 3 10	9							M				
			10	Some reddish brown and grey mottling, some silt.										
S2	15	2 2 3 2	11		CL					M				
			12											
S3	20	1 1 1 9	13							M/W				
			14	SILT, brown, with clay.	ML									
			15											

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

Signature [signature] Firm SCS Engineers
2830 Dairy Drive Madison, WI 53718 Tel: 608-224-2830 Fax

This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-310 Use only as an attachment to Form 4400-122.

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S4	24	WOR	16		ML					M/W				
S5	18	1 3 2 3	17	POORLY GRADED SAND, fine to medium, 1/2" coarse sand seam at 17.75'.						W				
S6	14	WOR WOR	18 19							W				
		2 3	20		SP									
S7	10	WOR 2	21							W				
		4 2	22	Trace small rounded gravel.										
S8	24	6 6 11 20	23							W				
			24	End of boring at 24'										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL - Ottumwa Generating Station SCS#: 25219028.00		MW-311

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Eric Wetzel Roberts Environmental Drilling, Inc.	8/27/2019	8/27/2019	4 1/4 hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-311	Feet MSL	651.24 Feet MSL	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 399,350 N, 1,907,603 E S/C/N
1/4 of 1/4 of Section , T N, R
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S1	14	2 3 4 6	1–2	LEAN CLAY, brown, massive, trace fine to medium sand, roots, 1" sand seam at 1.5'.						M				
S2	14	3 3 4 6	3–4		CL					M				
S3	6	2 3 4 6	5–6							M				
			7	SILT, brown, massive.	ML									
				LEAN CLAY, brown, massive.	CL									
S4	20	2 3 4 3	8–9	POORLY GRADED SAND, fine to medium, brown, massive.						M/W				
S5	12	2 3 4 5	10–11	2" clay seam at 10.5'.						W				
S6	14	1 2 4 2	12–13		SP					W				
S7	14	1 2 3 3	14–15							W				

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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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-311 Use only as an attachment to Form 4400-122.

Sample									Soil Properties						
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	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16	End of boring at 16'.	SP									

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220056.00		MW-305A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Jeff Crank Roberts Environmental Services	2/25/2020	2/27/2020	6 1/4" HSA and air/mud rotary

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	MW-305A	32.7 Feet	681.76 Feet	10" and 6" in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

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 ____ ° ____ ' ____ "

Long ____ ° ____ ' ____ "

Local Grid Location: Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–15	Hydrovaced to 9.5 feet for utility clearance. Blind drilled to 46 feet. See boring log MW-305 for lithology.										Drilled using hollow stem augers to 55 feet

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

Signature	Firm	Tel:
	scs engineers	Fax:

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-305A Use only as an attachment to Form 4400-122.

Sample									Soil Properties					
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	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			16											
			17											
			18											
			19											
			20											
			21											
			22											
			23											
			24											
			25											
			26											
			27											
			28											
			29											
			30											
			31											
			32											
			33											
			34											
			35											
			36											
			37											
			38											
			39											
			40											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-305A Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			40											Bagged auger samples to ~40 feet
			41											
			42											
			43											
			44											
			45											Switchched to mud rotary drilling at 45 feet
S1	5	50/5	46	POORLY GRADED SAND, fine, light brown, (weathered sandstone bedrock).	SP					W				
			47											
			48											
			49											
			50											
			51											
			52											
			53											
			54											
			55	Same as above but very fine, light brown to light gray, with pieces of rock.										Switched to air rotary drilling at 55 feet
			56											
			57											
			58											
			59											Driller noted rock became more compitant at 59' bgs.
			60	SANDSTONE, fine to medium, light brown, trace gravel and light gray to gray limestone, (bedrock).										
			61											
			62											
			63											
			64											
			65											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-305A Use only as an attachment to Form 4400-122.

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220056.00		MW-310A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Jeff Crank Roberts Environmental Services	2/27/2020	3/2/2020	6 1/4" HSA & air rotary

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	MW-310A	12.0 Feet	655.26 Feet	10" and 6" in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

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 ____ ° ____ ' ____ "

Long ____ ° ____ ' ____ "

Local Grid Location: Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0–15	Hydrovaced to 8 feet for utility clearance. Blind drilled to 24 feet. See boring log MW-310 for lithology.										Drilled using hollow stem augers to 40 feet

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

Signature	Firm	Tel: / Fax:
	scs engineers	

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State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16											
			17											
			18											
			19											
			20											
			21											
			22											
			23											
			24	POORLY GRADED SAND, fine to coarse, brown, trace gravel and lenses of lean clay.	SP									
S1	14	7 20 23 21	25							W				Began collecting split spoon samples at 24 feet
			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				Auger refusal at 39 fet
			40	Same as above but much more competent.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
					SP									
S9			41	LIMESTONE, light brownish gray, with fine to medium light gray sandstone, (bedrock).										
			42							W				Switching to air rotary drilling at 40 feet
			43	Same as above but with gravel and very little sand.										Intermittent gravel between 43 to 54 feet
			44											
			45											
			46											
			47											
			48											
			49											
			50											
			51											
			52											
			53											
			54	End of boring at 54 feet below ground surface.										

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220056.00		MW-311A

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Jeff Crank Roberts Environmental Services	3/2/2020	3/3/2020	6 1/4" auger & air rotary

DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
	MW-311A	8.9 Feet	651.16 Feet	10" and 6" in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒

State Plane 399,349 N, 1,907,615 E S / C / N

SW 1/4 of SE 1/4 of Section 25, T 73 N, R 15 W

Lat ____ ° ____ ' ____ "

Long ____ ° ____ ' ____ "

Local Grid Location: Feet ☐ N ☐ S Feet ☐ E ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1–15	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	Tel: / Fax:
	scs engineers	

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Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	POORLY GRADED SAND, fine to coarse, brown, with trace gravel and silt.										
S1	2		17							W				Began collecting split spoon samples at 16 feet
			18											
S2	11	4 5 6 7	19							W				
			20											
S3	12	5 5 6 7	21		SP					W				
			22											
S4		7 8 9 8	23							W				No return
			24											
S5		3 3 5 10	25							W				No return
			26											
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).										
			30											
			31	POORLY GRADED SAND, fine to medium, brown, with trace brown limestone, (bedrock).										
			32											
			33											
			34		SP									
			35											
			36											
			37	LIMESTONE, gray, with fine to medium browinsh gray sandstone, (bedrock).										
			38											
			39											
			40											

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample									Soil Properties					
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	Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			41											
			42											
			43											
			44											
			45											
			46	End of boring at 46 feet below ground surface.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220083.00		MW-302WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Brian Kinzer Direct Push Analytical	4/27/2022	4/27/2022	hollow stem auger

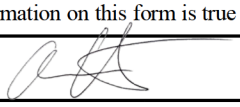
Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-302WT	Feet MSL	671.54 Feet MSL	8.25 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 400,264 N, 1,902,620 E S / C / N
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 16 W
Lat 41° 5' 40.9" Long -92° 32' 55.2"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

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

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 16.5 feet bgs. See boring log MW-302 for lithology.										
			16	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 SCS Engineers 2830 Dairy Drive, Madison, WI 608-224-2830 Tel: Fax:

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SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220083.00		MW-304WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Brian Kinzer Direct Push Analytical	4/27/2022	4/27/2022	hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-304WT	645.38 Feet MSL	679.69 Feet MSL	8.25 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,154 N, 1,903,286 E S / C / N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W

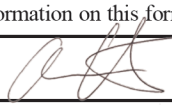
Lat 41 ° 5 ' 49.6 "
Long -92 ° 32 ' 46.4 "

Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

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

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 608-224-2830 Tel: Fax:

Boring Number MW-304WT

Sample										Soil Properties					
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	Standard Penetration	Moisure Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			26											
			28											
			30											
			32											
			34											
			36	End of boring at 36 feet below ground surface.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220083.00		MW-306WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Brian Kinzer Direct Push Analytical	4/27/2022	4/27/2022	hollow stem auger

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-306WT	655.25 Feet MSL	681.34 Feet MSL	8.25 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,662 N, 1,902,626 E S / C / N
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat 41° 5' 54.7"
Long -92° 32' 55.0"
Local Grid Location ☐ N ☐ S Feet ☐ E ☐ W Feet

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 22 feet bgs. See boring log MW-306 for lithology.										
			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		Tel:
	SCS Engineers	2830 Dairy Drive, Madison, WI 608-224-2830	Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220083.00		MW-314

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Brian Kinzer Direct Push Analytical	4/28/2022	4/28/2022	Geoprobe/HSA

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-314	667.67 Feet MSL	681.89 Feet MSL	8.25 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,224 N, 1,901,685 E S / C / N
SW 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W
Lat 41 ° 5 ' 50.5 "
Long -92 ° 33 ' 7.3 "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	Hydrovaced to 8 feet below ground surface (bgs).										
S1	20		6	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	Same as above but gray to brownish gray with trace organics, medium stiff.						M				
			12	Same as above but soft to medium stiff.										
S3	33		14		CL					M				
S4	48		18							M				
			20	Same as above but stiff to very stiff.										
S5	48		22							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		Tel:
	SCS Engineers	2830 Dairy Drive, Madison, WI 608-224-2830	Fax:

Boring Number MW-314 Page 2 of 2

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
S6	29		26	Same as above but with trace fine gravel.	SP					W				
			28											
S7	24		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.										

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
IPL-Ottumwa Generating Station SCS#: 25220083.00		MW-314WT

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Brian Kinzer Direct Push Analytical	4/28/2022	4/28/2022	hollow stem auger

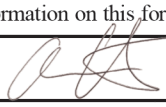
Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-314WT	667.85 Feet MSL	681.74 Feet MSL	8.25 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,232 N, 1,901,685 E S / C / N
SW 1/4 of NE 1/4 of Section 76, T 73 N, R 15 W
Lat 41 ° 5 ' 50.6 "
Long -92 ° 33 ' 7.3 "
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			0	Hydrovaced to 8 feet below ground surface (bgs) and blind drilled to 22.5 feet bgs. See boring log MW-314 for lithology.										
			22	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 SCS Engineers 2830 Dairy Drive, Madison, WI 608-224-2830 Tel: Fax:

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Ottumwa Generating Station SCS#: 25221162.00		MW-312

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	12/14/2021	12/14/2021	Roto-Sonic

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-312	642.2 Feet	655.4 Feet	6.0 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,504 N, 1,903,457 E Ⓢ/C/N
SE 1/4 of NE 1/4 of Section 26, T 72 N, R 15 W
Lat 41° 5' 53.1"
Long -92° 32' 44.1"
Local Grid Location ☐ N Feet ☐ S ☐ E Feet ☐ W

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

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 8' below ground surface through clay.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	LEAN CLAY, dark grayish brown (10YR 4/2) with trace roots, medium stiff.										
S1	21		9						1.0	M				
			10	Same as above but stiff to medium stiff with brown and black mottling.										
			11		CL									
			12											
S2	46		13						0.75-1.25	M/W				Water is at 11.5' bgs.
			14											
			15											

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

Signature	Firm		Tel:
	SCS Engineers	2830 Dairy Drive, Madison, WI 53718 608-224-2830	Fax:

Boring Number MW-312 Page 2 of 2

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

SCS ENGINEERS
Environmental Consultants and Contractors

SOIL BORING LOG INFORMATION

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Ottumwa Generating Station SCS#: 25221162.00		MW-313

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Mike Mueller Cascade Drilling	12/14/2021	12/14/2021	Roto-Sonic

Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
		MW-313	641.2 Feet	655.8 Feet	6.0 in

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 401,491 N, 1,903,802 E Ⓢ/C/N
SW 1/4 of NW 1/4 of Section 25, T 73 N, R 15 W
Lat 41° 5' 52.9"
Long -92° 32' 39.6"
Local Grid Location ☐ N ☐ E Feet ☐ S Feet ☐ W

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

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Hydrovaced to 8' below ground surface through clay.										
			2											
			3											
			4		CL									
			5											
			6											
			7											
			8	LEAN CLAY, dark grayish brown (10YR 4/2) with trace roots, stiff.										
S1	12		9						1.25	M				
			10		CL									
			11											
			12	SILT, dark grayish brown (10YR 4/2), with trace sand, soft.										
S2	55		13		ML				0.75/0.25	W				Water at 13' bgs.
			14											
			15	POORLY GRADED SAND, fine to coarse grained, brown (10YR 4/2) with trace fine gravel.	SP									

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

Signature	Firm		Tel:
	SCS Engineers	2830 Dairy Drive, Madison, WI 53718 608-224-2830	Fax:

Boring Number MW-313 Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	Same as above but ranging from dark grayish brown to red brown, gray, and tan.										
			17											
			18											
S3	85		19		SP					W				Sampled S3
			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.										

Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-301

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SE of Parcel 003052640340000

Distance & direction along boundary: 106' W

Distance & direction from boundary to wall: 306' N

Elevations (± 0.01 ft MSL):

Ground Surface: 684.28

Top of protective casing: 687.12

Top of well casing: 686.63

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 15 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 4 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 10 ft

Depth of well: 14 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 4 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8 inch bentonite chips

Placement method: Gravity

Volume: 8 cu. ft.

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 3.09 ft Stabilization Time: <5 minutes

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

Average depth of frostline: 3.5'

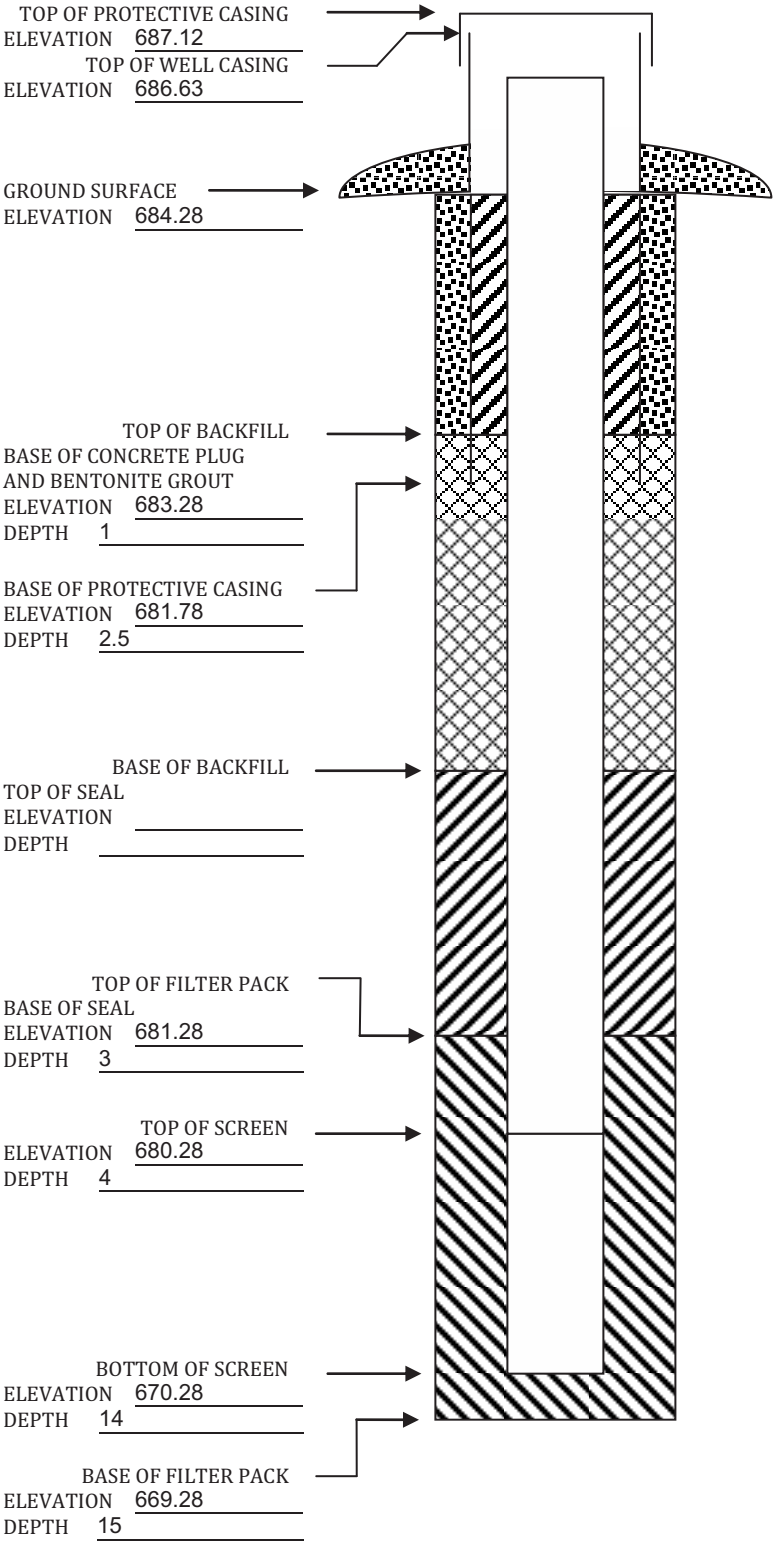
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-302

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NW of Parcel 003052630215000

Distance & direction along boundary: 844' NE

Distance & direction from boundary to wall: 4.5' S

Elevations (± 0.01 ft MSL):

Ground Surface: 671.55

Top of protective casing: 674.39

Top of well casing: 673.90

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 24 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 13 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010

Screen length: 10 ft

Depth of well: 23 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 3.5 cu. ft

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume: 2.6 cu. ft

Backfill (if different from seal):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume: 1 cu. ft.

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 18.19 Stabilization Time: < 5 min

Well development method: Surged with block and pumped to remove turbidity. 183 gallons purged

Average depth of frostline: 3.5'

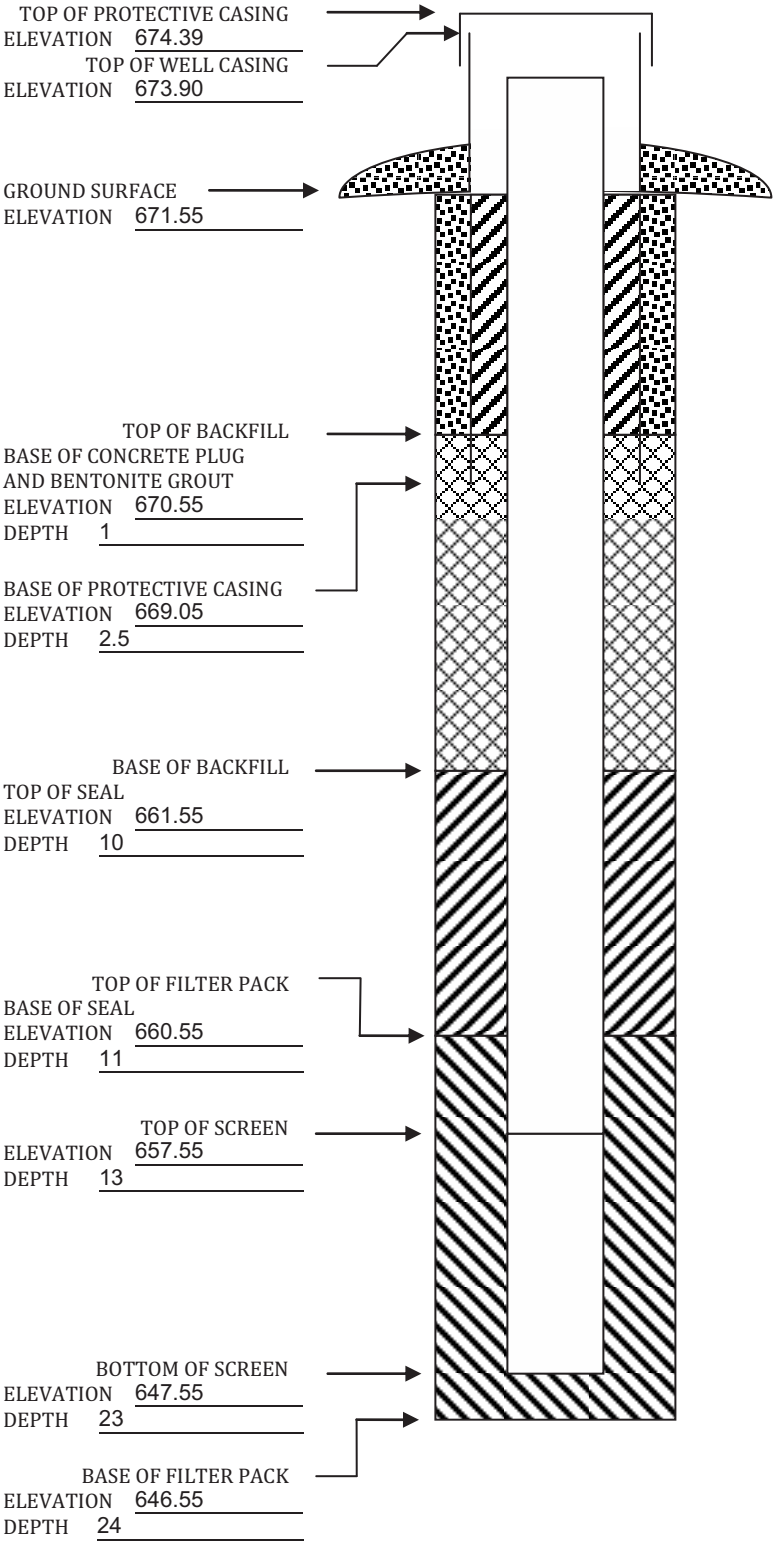
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-303

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SE of parcel 003052630207000

Distance & direction along boundary: 181' NW

Distance & direction from boundary to wall: 0

Elevations (± 0.01 ft MSL):

Ground Surface: 658.95

Top of protective casing: 661.67

Top of well casing: 661.07

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 14.5 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 80

Length of casing: 3 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010

Screen length: 10 ft

Depth of well: 14 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 7.5 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume: 10 cu. ft.

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel 6 inch

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 7.71' Stabilization Time: ~ 1 day (bails dry)

Well development method: Bailed dry 3 times to reduce turbidity

Average depth of frostline: 3.5'

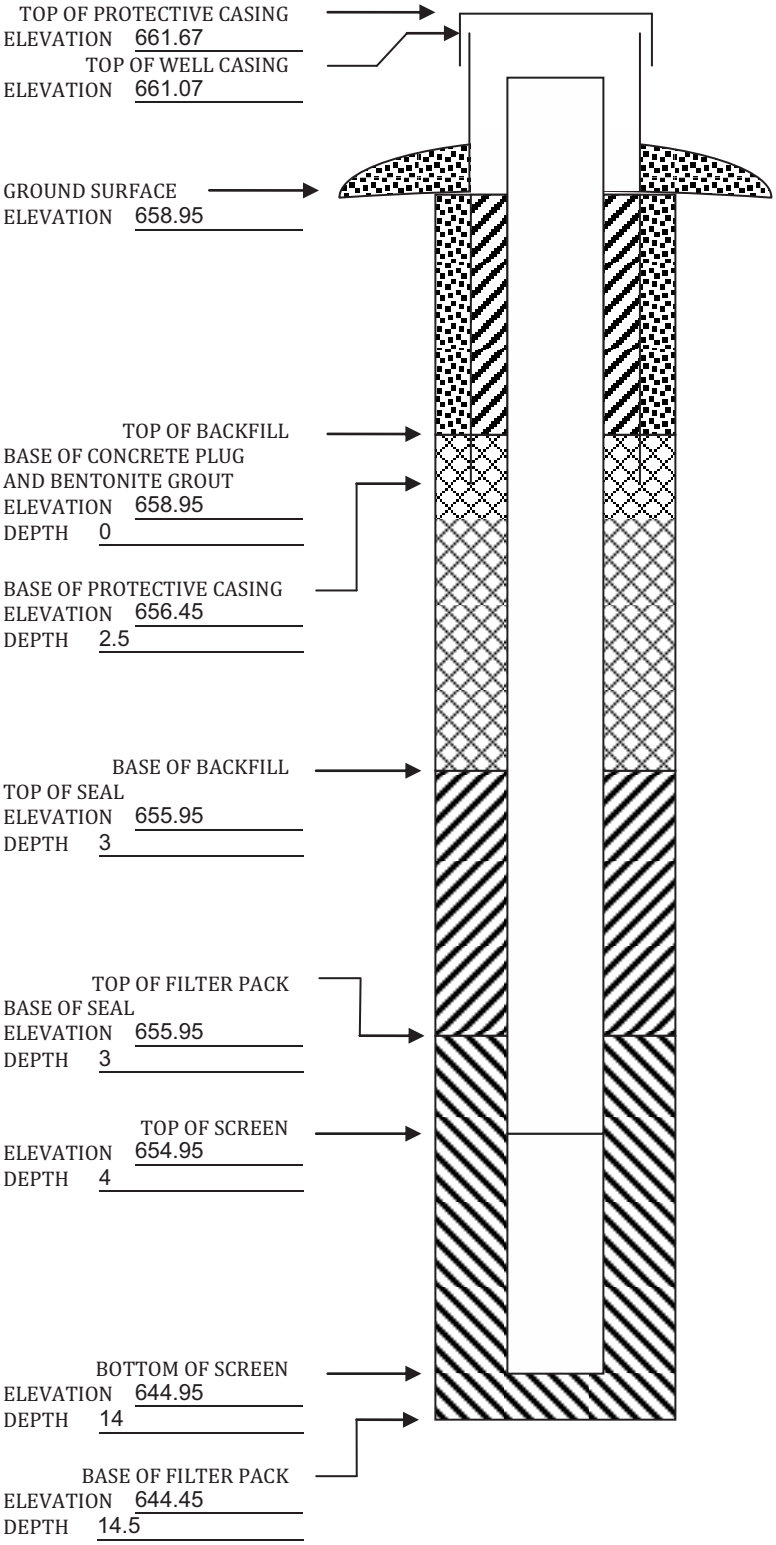
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-304

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SE of Parcel 003052620200000

Distance & direction along boundary: 502' W

Distance & direction from boundary to wall: 44' N

Elevations (± 0.01 ft MSL):

Ground Surface: 680.09

Top of protective casing: 683.36

Top of well casing: 682.84

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 52 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 40

Length of casing: 40 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 5 ft

Depth of well: 50 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 2 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: gravity

Volume: .3 cu. ft.

Backfill (if different from seal):

Material: AquaGuard Grout

Placement method: tremie

Volume: 75 gallons

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 24.5 ft Stabilization Time: ~1 day (bails dry)

Well development method: bailed dry 3 times to reduce turbidity

Average depth of frostline: 3.5'

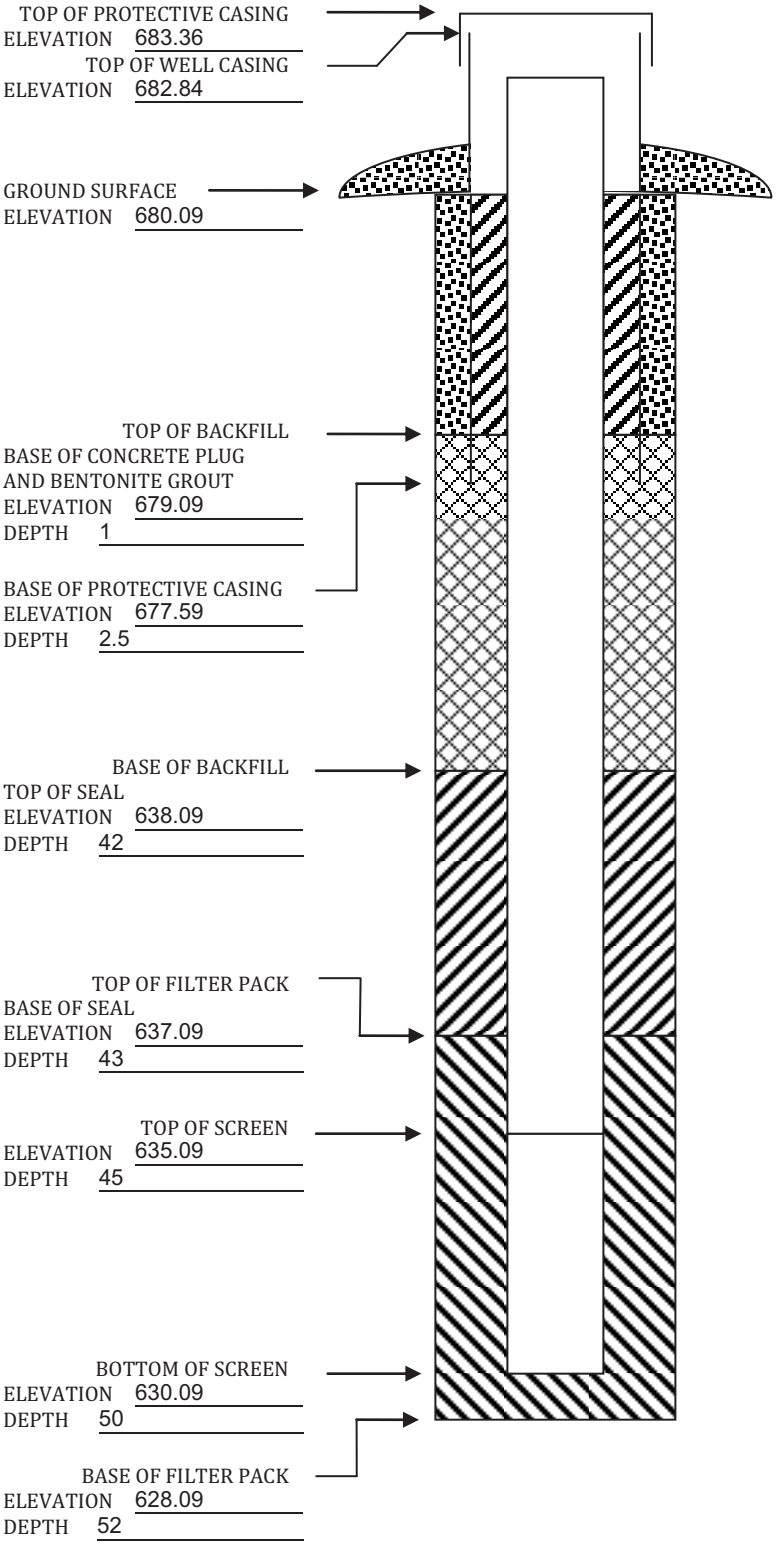
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-305

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: SW of Parcel 003052620200000

Distance & direction along boundary: 539' E

Distance & direction from boundary to wall: 404' N

Elevations (± 0.01 ft MSL):

Ground Surface: 681.54

Top of protective casing: 684.53

Top of well casing: 683.91

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 50 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 80

Length of casing: 44 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010

Screen length: 5 ft

Depth of well: 49 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 2 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: gravity

Volume: .3 cu. ft.

Backfill (if different from seal):

Material: AquaGuard grou

Placement method: tremie

Volume: 80 gallons

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 22.02 Stabilization Time: < 5 min

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

Average depth of frostline: 3.5'

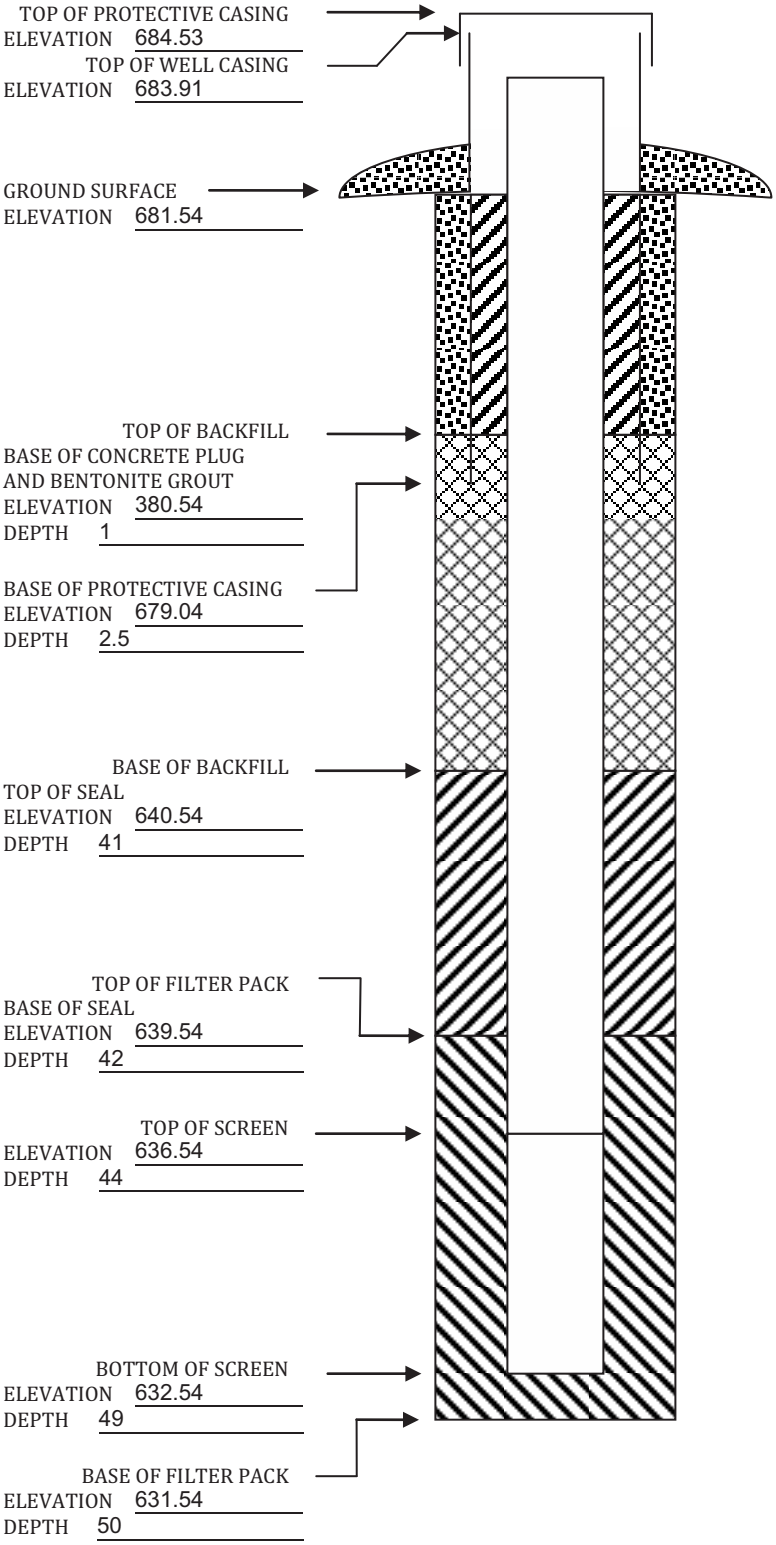
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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.)



Print Form

IOWA DEPARTMENT OF NATURAL RESOURCES

MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

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

Well or Piezometer No: MW-306

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

A. SURVEYED LOCATIONS AND ELEVATIONS

Locations (± 0.5 ft):

Specify corner of site: NW of Parcel 003052620200000

Distance & direction along boundary: 137.5' E

Distance & direction from boundary to wall: 321' S

Elevations (± 0.01 ft MSL):

Ground Surface: 681.05

Top of protective casing: 683.98

Top of well casing: 683.47

Benchmark elevation:

Benchmark description:

B. SOIL BORING INFORMATION

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

Name of Driller: Todd Schmalfeld

Drilling Method: HSA

Drilling Fluid: NA

Bore Hole Diameter: 8 inch

Soil Sampling Method: Spoon

Depth of Boring: 34.5 ft

C. MONITORING WELL INSTALLATION

Casing material: PVC sch 80

Length of casing: 29 ft

Outside casing diameter: 2.38"

Inside casing diameter: 2"

Casing joint type: threaded

Casing/screen joint type: threaded

Screen material: PVC

Screen opening size: 0.010"

Screen length: 5 ft

Depth of well: 34 ft

Filter Pack:

Material: Red Flint

Grain size: #40

Volume: 2 cu. ft.

Seal (minimum 3 ft length above filter pack):

Material: 3/8" bentonite chips

Placement method: Gravity

Volume: 10.5 cu. ft.

Backfill (if different from seal):

Material:

Placement method:

Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: sand

Protective cap:

Material: Steel, vented

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

Well Cap:

Material: PVC

Vented: ☐ Yes ☑ No

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

Water level: 12.96' Stabilization Time: < 5 min

Well development method: Surged with block and pumped. 193 gallons purged.

Average depth of frostline: 3.5'

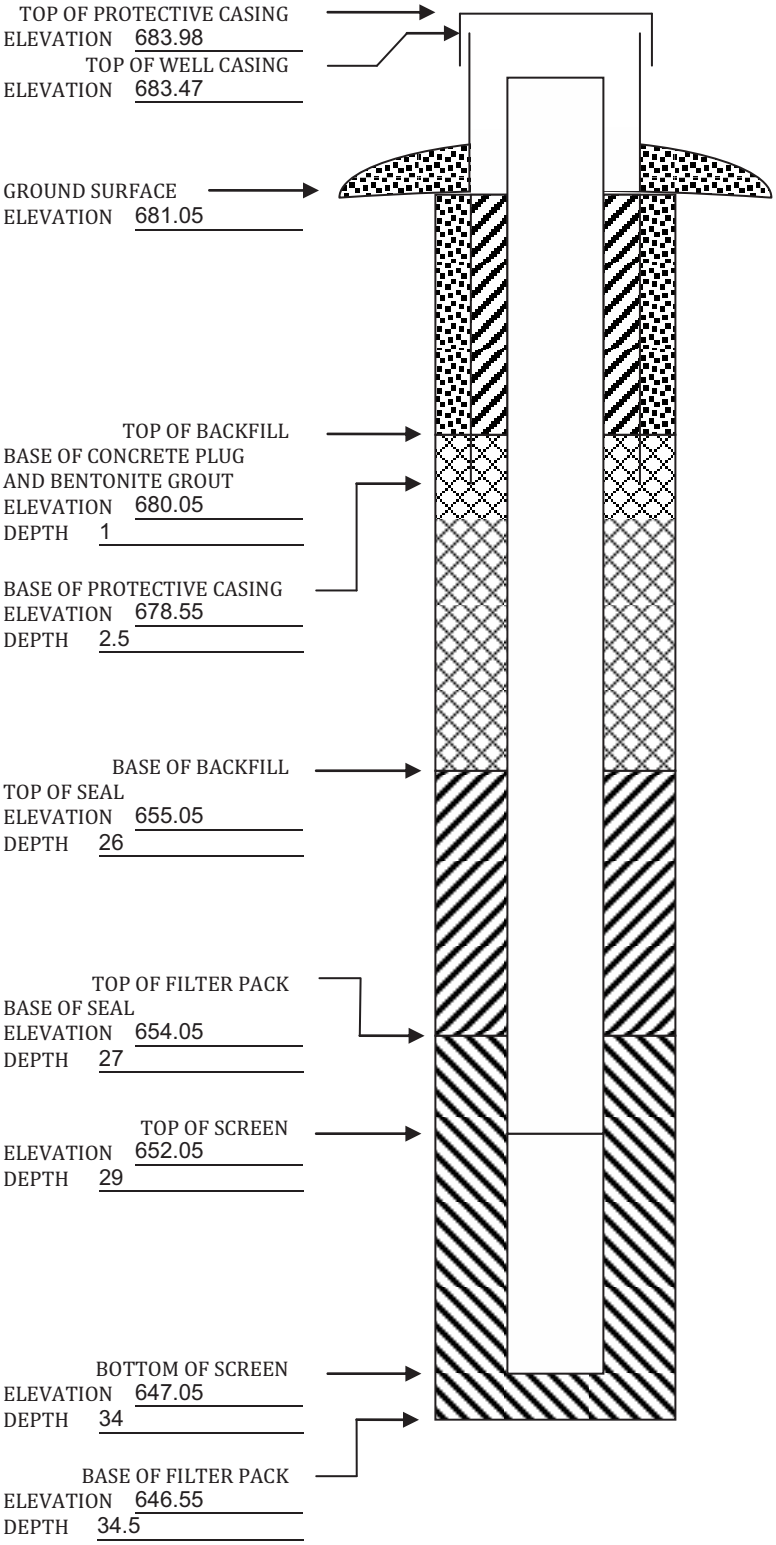
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½x11 inch map showing locations of all monitoring wells and piezometers.

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

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

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 @ Des Moines River | 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: 655.76 | 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 protective casing and well casing: Bentonite/Filter Sand
Screen length: 5'
Depth of Well: 23' | Protective cap:
Filter Pack: | Material: Steel
Material: Filter Sand | Vented?: [X] Y [ ] N | Locking?: [X] Y [ ] N
Grain Size: #5 | Well cap:
Volume: 1.25 cubic feet | Material: Plastic
Seal (minimum 3 ft. length above filter pack): | Vented?: [ ] Y [X] N
Material: 3/8" Bentonite Chips

D. GROUNDWATER MEASUREMENT (±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

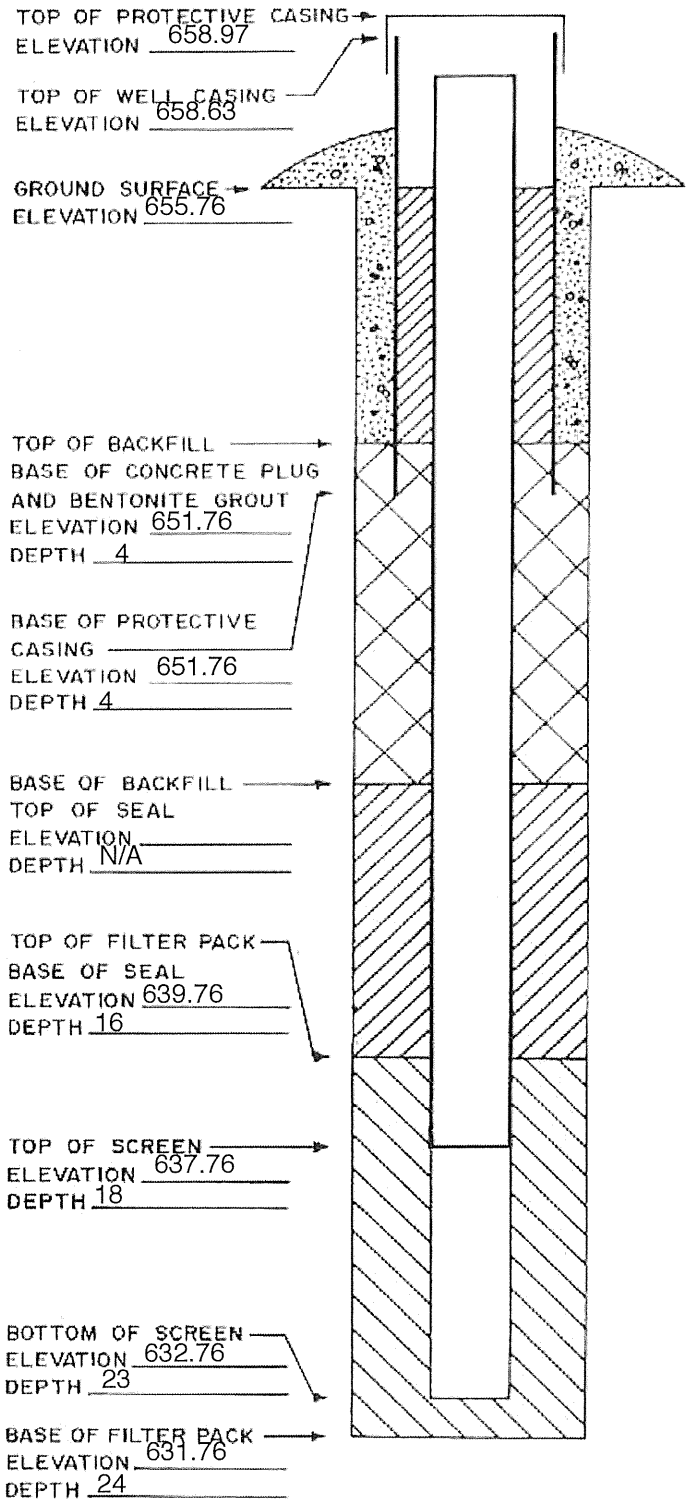
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: PVC - Sch. 40 | Placement method: Gravity
Length of casing: 12.94' | Volume: 2 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 protective casing and well casing: Bentonite/Filter Sand
Screen length: 5'
Depth of Well: 15' | Protective cap:
Filter Pack: | Material: Steel
Material: Filter Sand | Vented?: [X] Y [ ] N | Locking?: [X] Y [ ] N
Grain Size: #5 | Well cap:
Volume: 1.5 cubic feet | Material: Plastic
Seal (minimum 3 ft. length above filter pack): | Vented?: [ ] Y [X] N
Material: 3/8'' Bentonite Chips

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

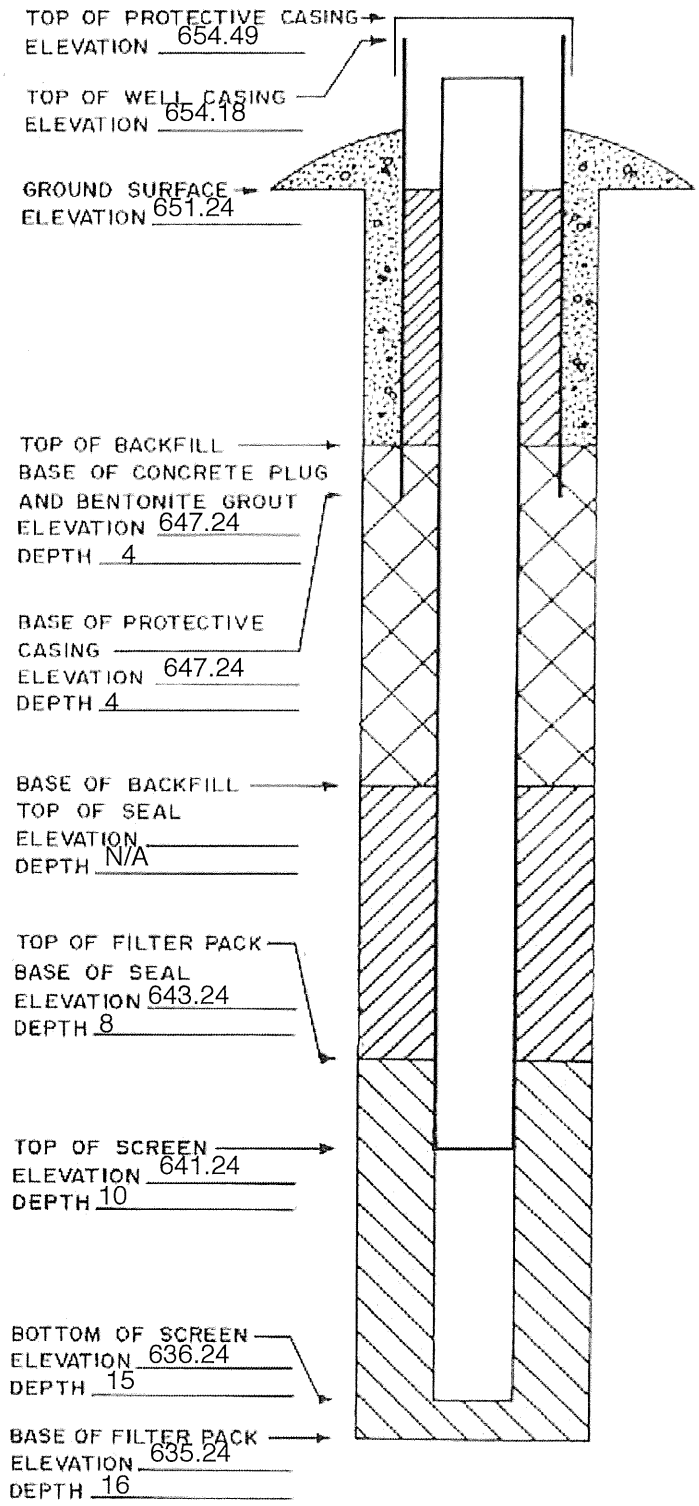
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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

Length of casing: 82'

Outside casing diameter: 2.4"

Inside casing diameter: 1.9

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC-Sch. 80

Screen opening size: 0.01"

Screen length: 5'

Depth of Well: 79'

Filter Pack:

Material: Filter sand

Grain Size: #18

Volume: 3 bags (50 lbs bags, Sil filter sand)

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

Material: 3/8" Bentonite chips

Placement method: Gravity

Volume: 2 cu. ft.

Backfill (if different from seal):

Material: Bentonite grout

Placement method: pumped

Volume: 300 gallons

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

Material: Steel

Vented?: ☒ Y ☐ N Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☒ Y ☐ N

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

Water level: 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 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

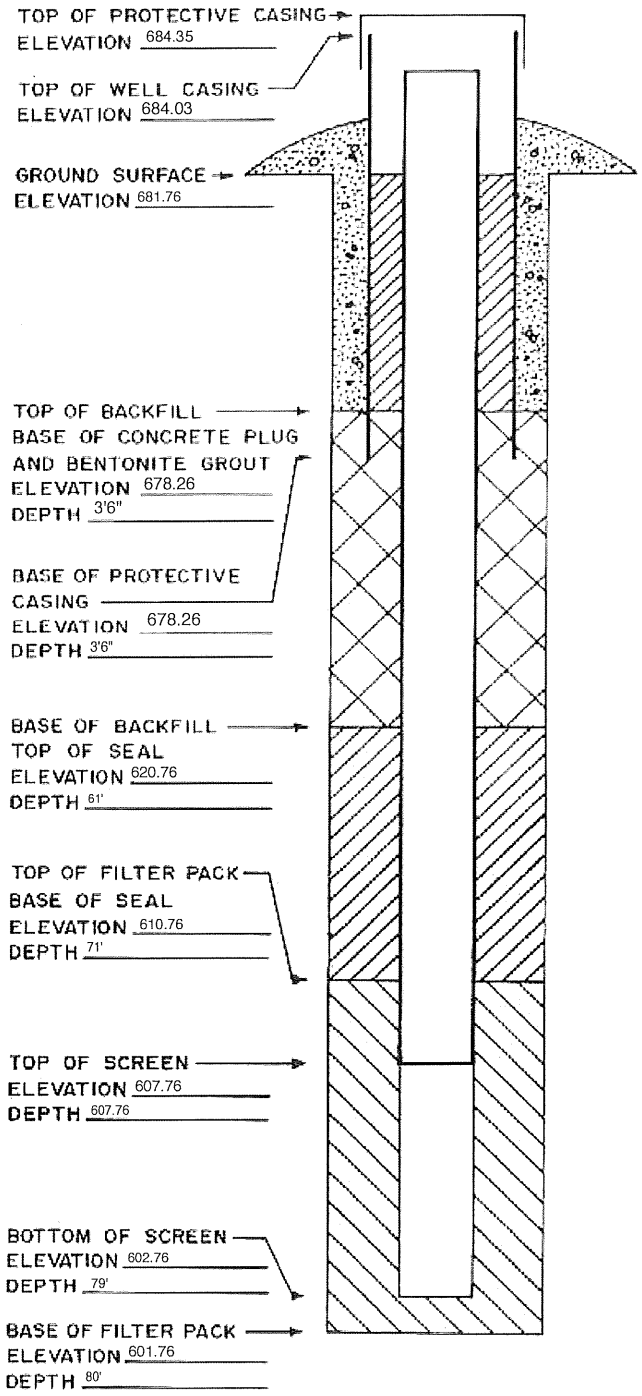
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: PVC-Sch. 80

Length of casing: 55.5'

Outside casing diameter: 2.4"

Inside casing diameter: 1.9"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC-Sch. 80

Screen opening size: 0.1

Screen length: 5'

Depth of Well: 53'

Filter Pack:

Material: Filter sand

Grain Size: #18

Volume: 3 bags (50 lbs bags, Sil filter sand)

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

Material: 3/8" Bentonite chips

Placement method: Gravity

Volume: 2 cu. ft.

Backfill (if different from seal):

Material: Bentonite grout

Placement method: pumped

Volume: 200 gallons

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

Material: Steel

Vented?: ☒ Y ☐ N Locking?: ☒ Y ☐ N

Well cap:

Material: Plastic

Vented?: ☐ Y ☒ N

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

Water level: 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 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

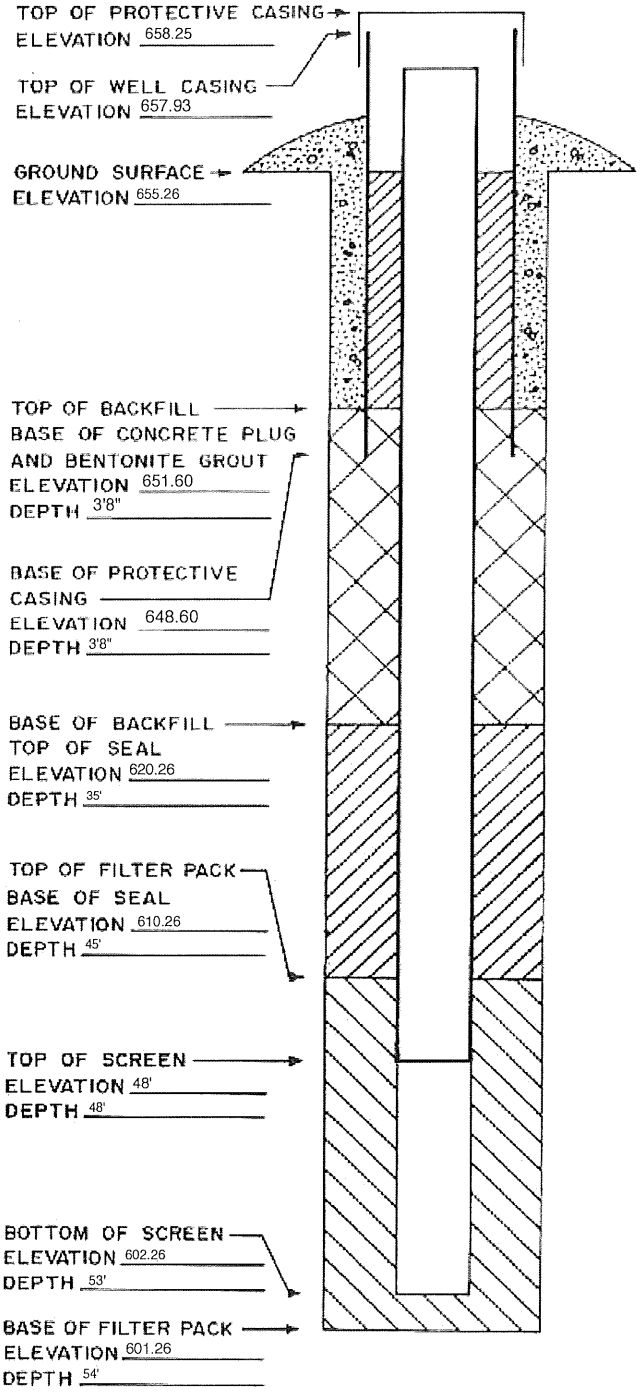
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: PVC-Sch. 40

Length of casing: 47.68'

Outside casing diameter: 2.4"

Inside casing diameter: 2.1"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: PVC-Sch. 40

Screen opening size: 0.1

Screen length: 5'

Depth of Well: 45'

Filter Pack:

- Material: Filter sand
- Grain Size: #18
- Volume: 3 bags (50 lbs bags, Sil filter sand)

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

- Material: 3/8" Bentonite chips

Placement method: Gravity

Volume: 2 cu. ft.

Backfill (if different from seal):

- Material: Bentonite grout
- Placement method: pumped
- Volume: 200 gallons

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☐ Y ☒ N

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

Water level: 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 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

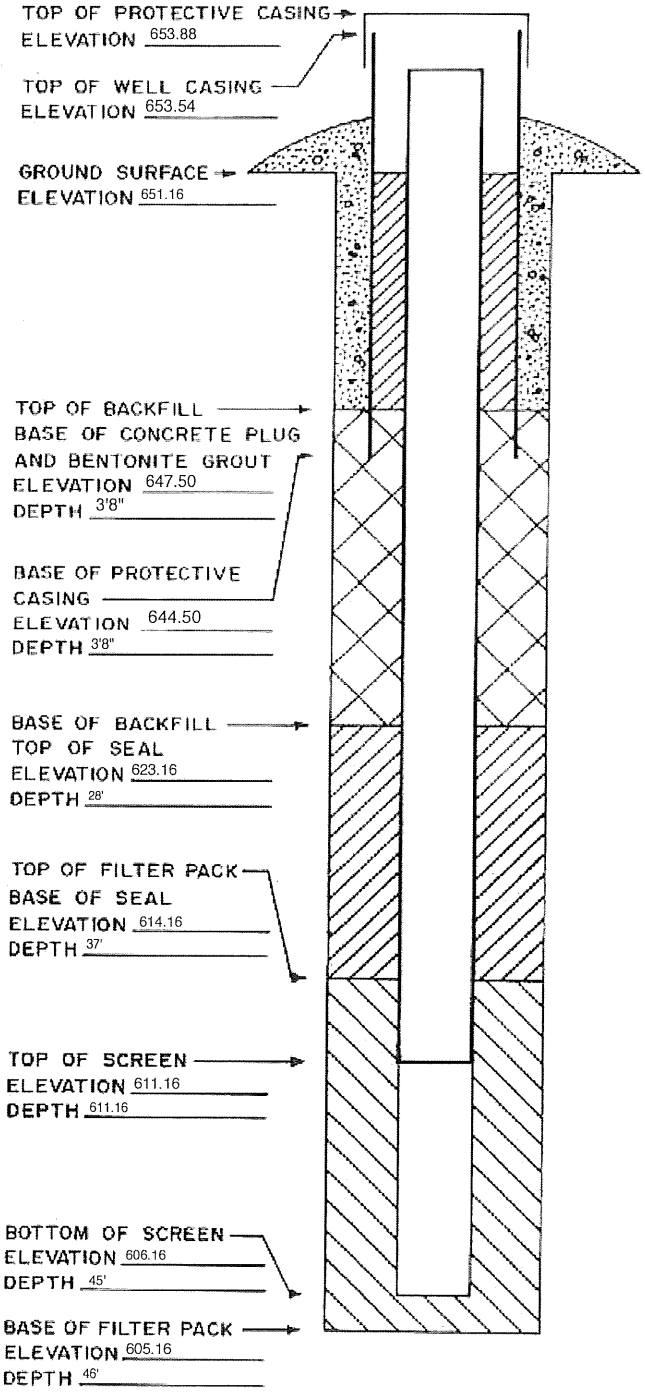
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: Sch. 40 PVC | Placement method: Poured

Length of casing: ~29.68' | Volume: 1 - 50 lbs bag

Outside casing diameter: 2.4" | Backfill (if different from seal):

Inside casing diameter: 2.05" | Material: Bentonite Grout

Casing joint type: Threaded | Placement method: Pumped

Casing/screen joint type: Threaded | Volume: 2.5 ft^3

Screen material: Sch. 40 PVC | Surface seal design:

Screen opening size: 0.001" | Material of protective casing: Steel

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

Screen length: 5'

Depth of Well: 27' | Protective cap:

Filter Pack: | Material: Aluminium

Material: Red Flint Sand | Vented?: ☒ Y ☐ N | Locking?: ☒ Y ☐ N

Grain Size: #40 | Well cap:

Volume: 1ft^3 | Material: Plastice

Seal (minimum 3 ft. length above filter pack): | Vented?: ☐ Y ☒ N

Material: Bentonite chips

D. GROUNDWATER MEASUREMENT (±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 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

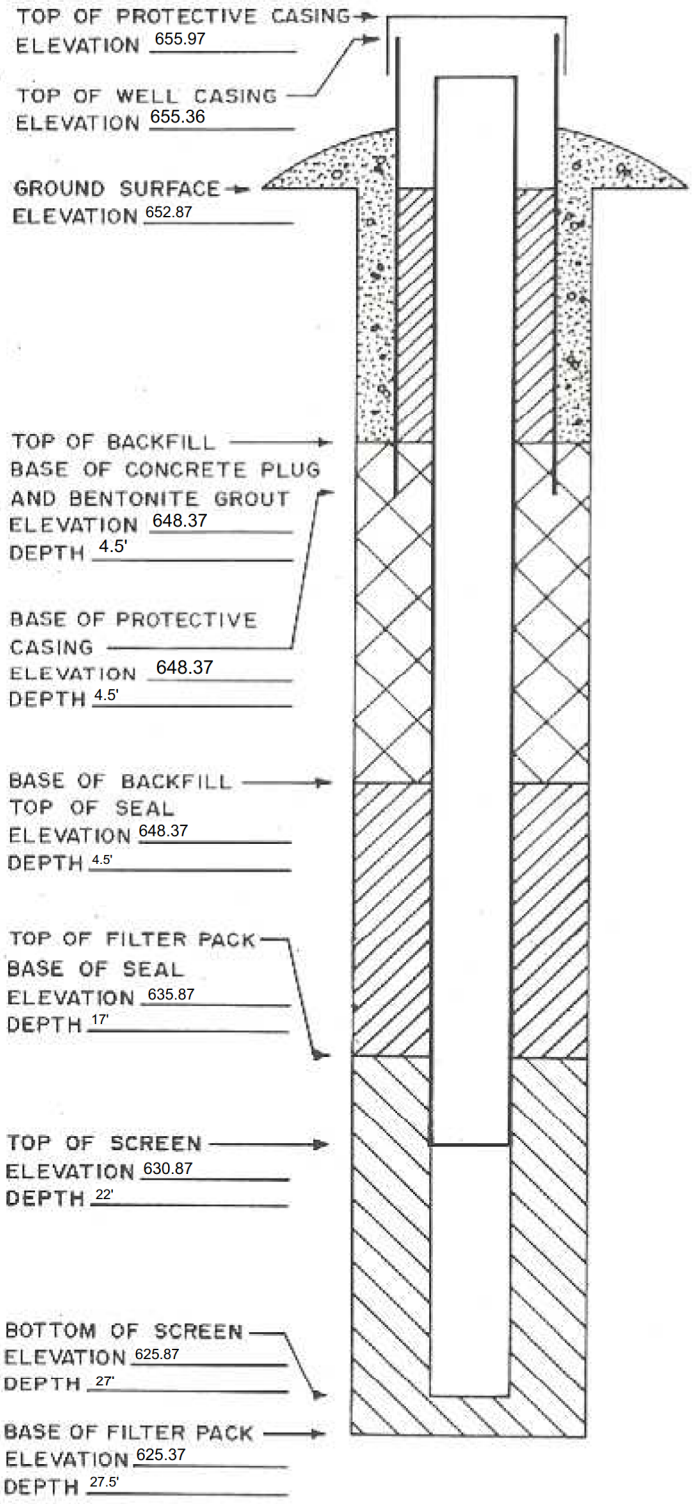
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: Sch. 40 PVC | Placement method: Poured

Length of casing: ~23.82' | Volume: 1 - 50 lbs bag

Outside casing diameter: 2.4" | Backfill (if different from seal):

Inside casing diameter: 2.05" | Material: Bentonite Grout

Casing joint type: Threaded | Placement method: Pumped

Casing/screen joint type: Threaded | Volume: 2.25 ft^3

Screen material: Sch. 40 PVC | Surface seal design:

Screen opening size: 0.001" | Material of protective casing: Steel

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

Screen length: 5'

Depth of Well: 21' | Protective cap:

Filter Pack: | Material: Aluminium

Material: Red Flint Sand | Vented?: ☒ Y ☐ N | Locking?: ☒ Y ☐ N

Grain Size: #40 | Well cap:

Volume: 1ft^3 | Material: Plastice

Seal (minimum 3 ft. length above filter pack): | Vented?: ☐ Y ☒ N

Material: Bentonite chips

D. GROUNDWATER MEASUREMENT (±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 ½ inch x 11 inch map showing locations of all monitoring wells and piezometers.

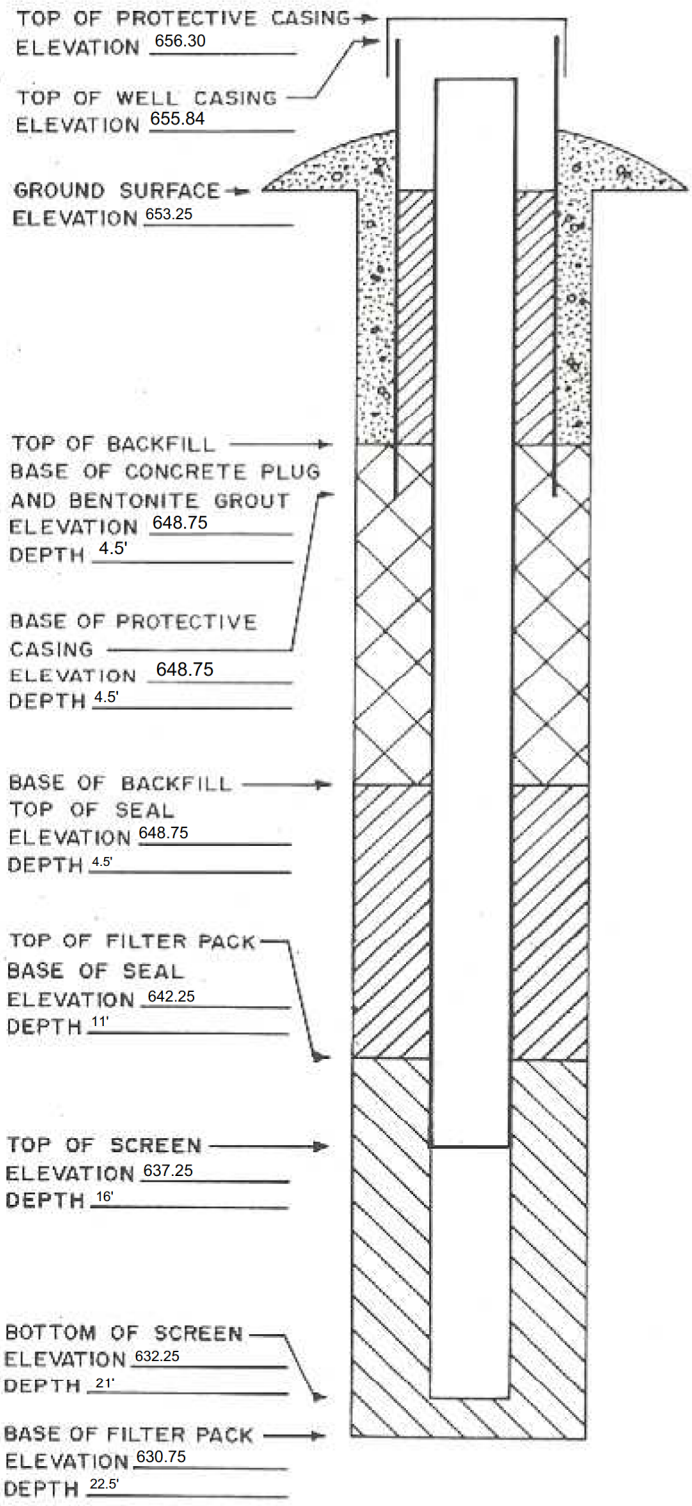
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9th St, Des Moines, IA 50319.

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

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: 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: 16.5'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 19.23'

Outside casing diameter: 2.4"

Inside casing diameter: 2.05"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 10'

Depth of Well: 16"

Filter Pack:

- Material: RW Sidley filter sand
- Grain Size: #5
- Volume: 3.5 ft^3 (7 bags)

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

- Material: 3/8" Bentonite chips

Placement method: Poured/Hydrated

Volume: 1, 50lbs bag

Backfill (if different from seal):

- Material:
- Placement method:
- Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N | Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☒ Y ☐ N

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

Water level: 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 #:** 6496 | **Date:** 6-13-22

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

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

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

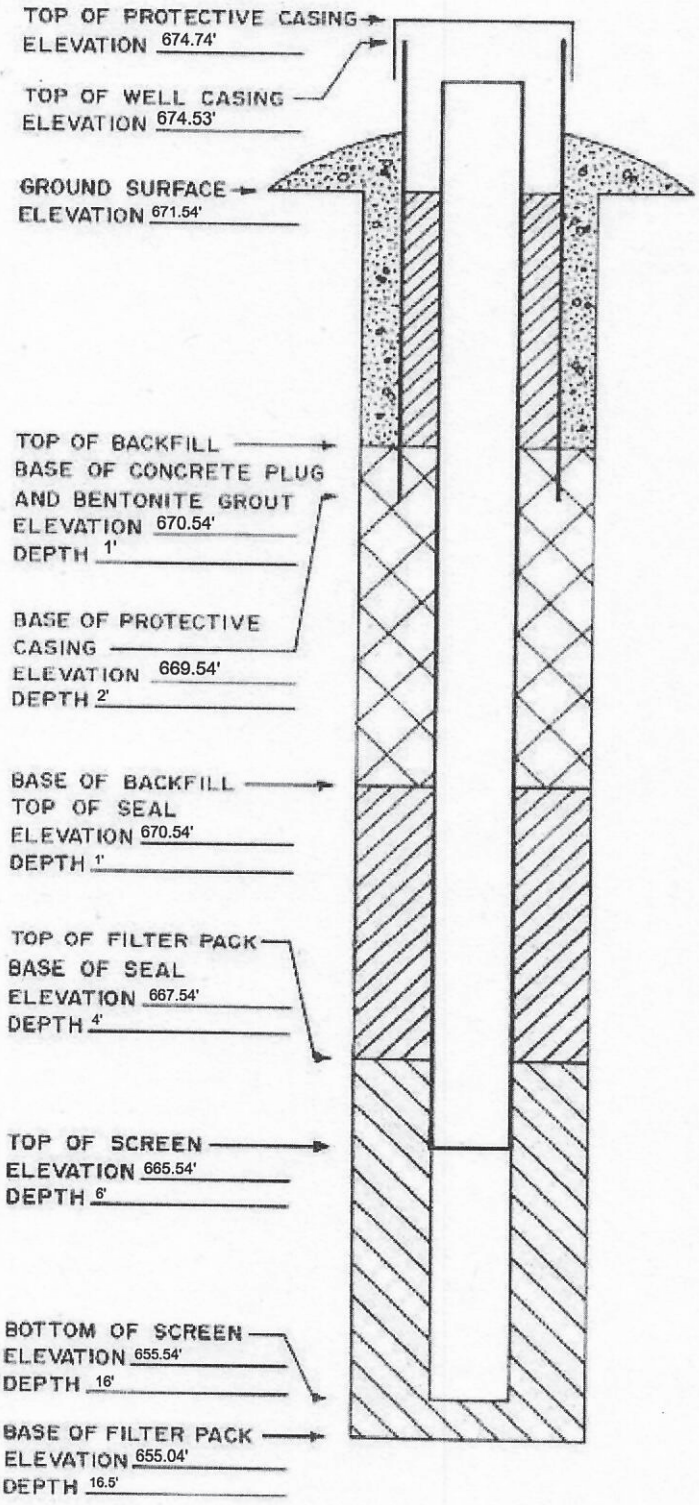
09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: 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: 36'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 37.76'

Outside casing diameter: 2.4"

Inside casing diameter: 2.05"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 10'

Depth of Well: 35'

Filter Pack:

- Material: RW Sidley filter sand
- Grain Size: #5
- Volume: 3.5 ft^3 (7 bags)

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

- Material: 3/8" Bentonite chips

Placement method: Poured/Hydrated

Volume: 10, 50lbs bags

Backfill (if different from seal):

- Material:
- Placement method:
- Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N | Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☒ Y ☐ N

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

Water level: 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 #:** 6490 | **Date:** 6-23-22

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

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

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

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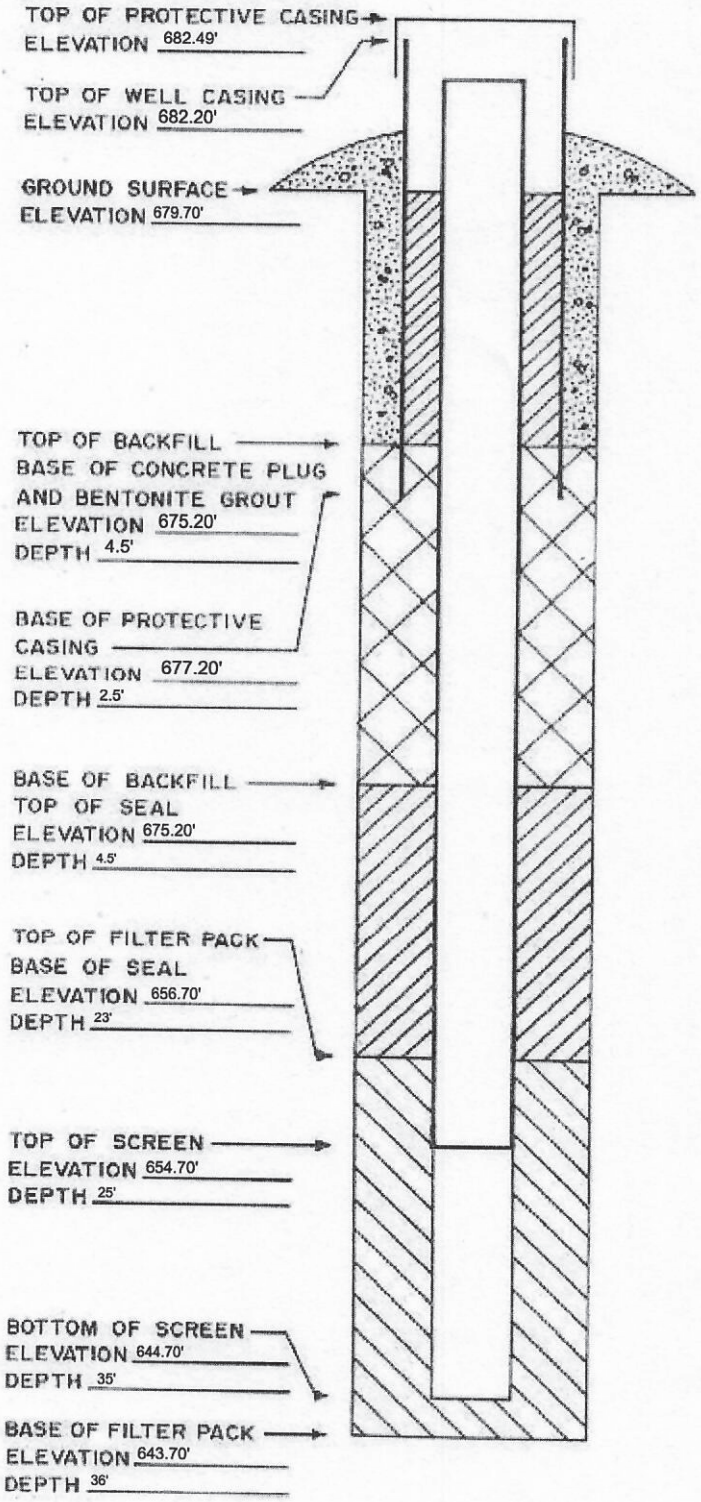
DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: 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: 22'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 24.05'

Outside casing diameter: 2.4"

Inside casing diameter: 2.05"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 10'

Depth of Well: 21'

Filter Pack:

- Material: RW Sidley filter sand
- Grain Size: #5
- Volume: 2.75 ft^3 (1.25 bags)

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

- Material: 3/8" Bentonite chips

Placement method: Poured/Hydrated

Volume: 2, 50lbs bags

Backfill (if different from seal):

- Material:
- Placement method:
- Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☒ Y ☐ N

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

Water level: 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:** 9-23-22

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

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

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

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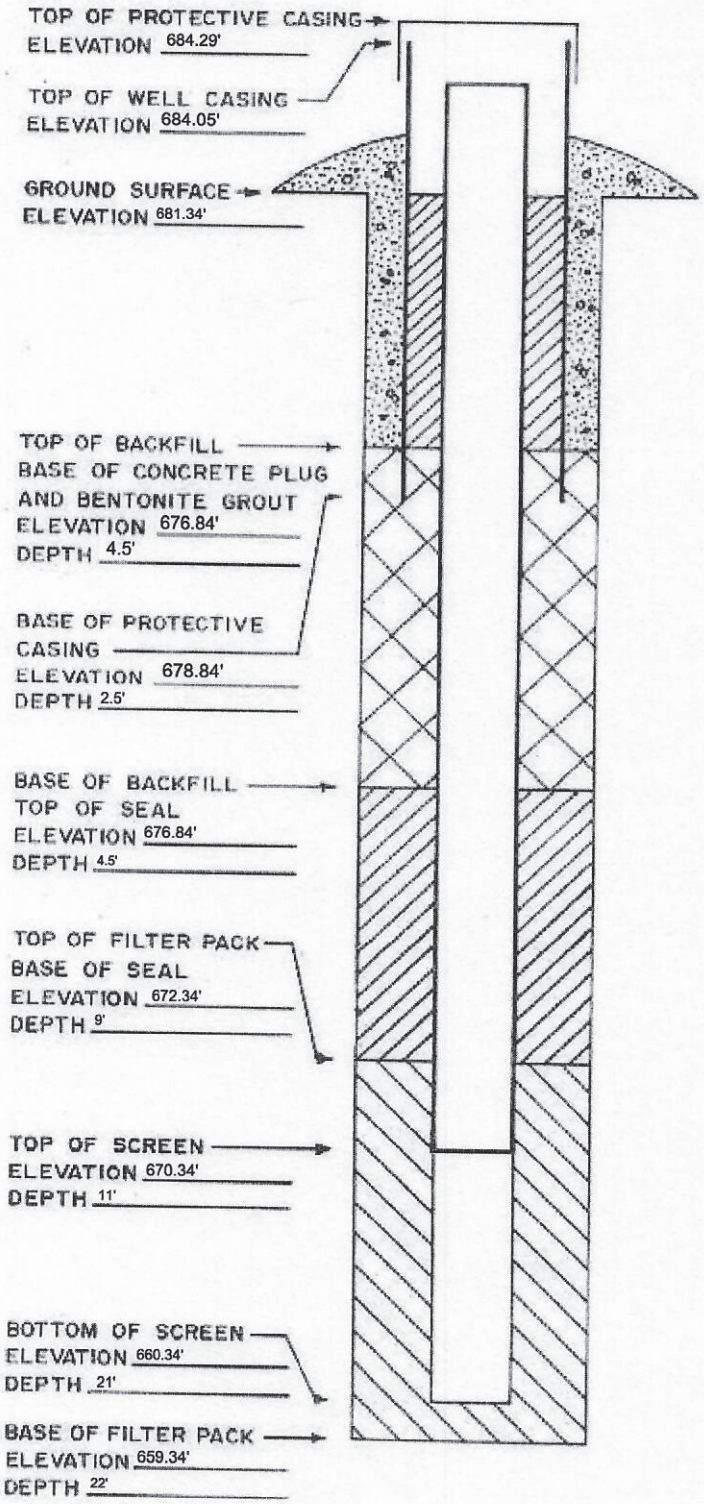
DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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: Sch. 40 PVC

Length of casing: 33.24'

Outside casing diameter: 2.4"

Inside casing diameter: 2.05"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 5'

Depth of Well: 30.4'

Filter Pack:

- Material: RW Sidley filter sand
- Grain Size: #5
- Volume: 1.5 ft^3 (3 bags)

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

- Material: 3/8" Bentonite chips

Placement method: Poured/Hydrated

Volume: 6, 50lbs bags

Backfill (if different from seal):

- Material:
- Placement method:
- Volume:

Surface seal design:

Material of protective casing: Steel

Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☒ Y ☐ N

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

Water level: 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: [signature] — **Certification #:** 8498 — **Date:** 8-23-22

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

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

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

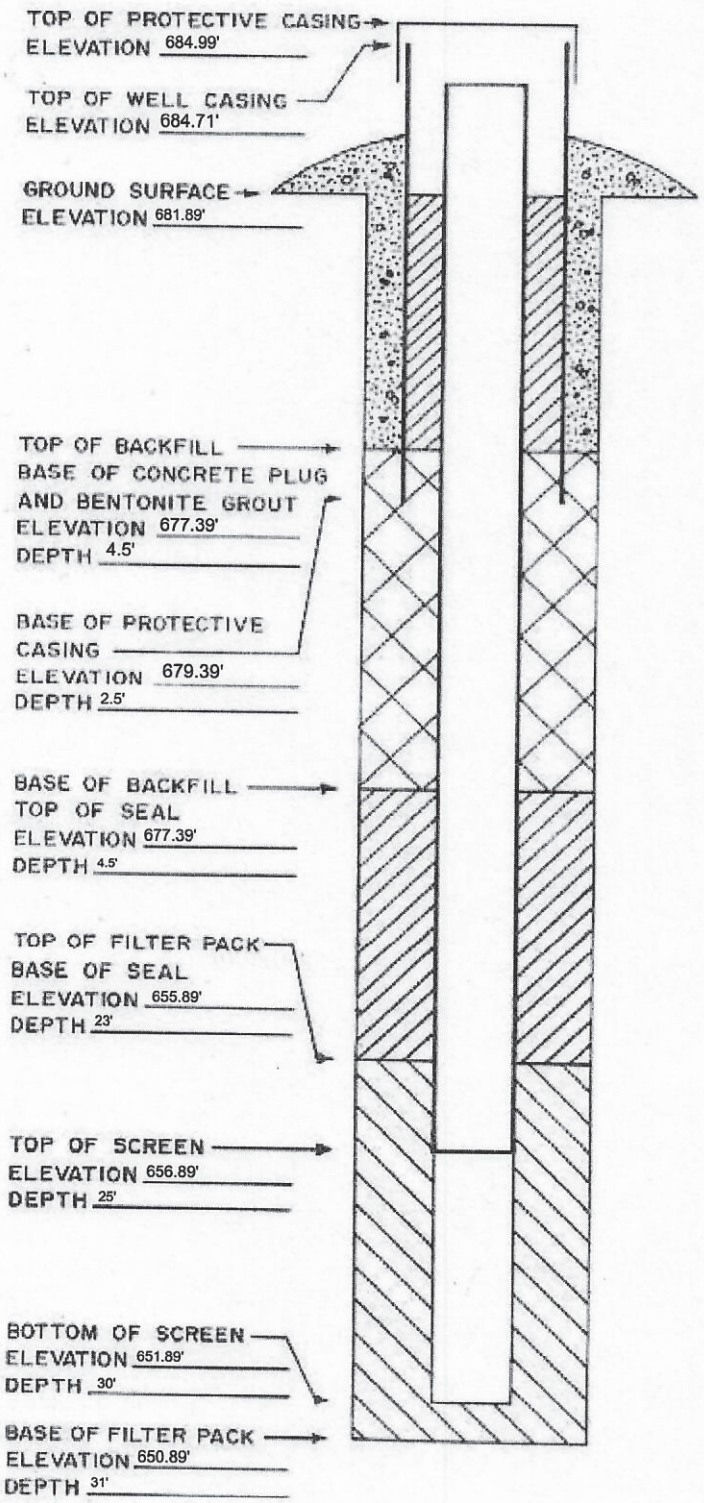
09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



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 Wilson 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: 22.5'

C. MONITORING WELL INSTALLATION

Casing material: Sch. 40 PVC

Length of casing: 24.81'

Outside casing diameter: 2.4"

Inside casing diameter: 2.05"

Casing joint type: Threaded

Casing/screen joint type: Threaded

Screen material: Sch. 40 PVC

Screen opening size: 0.01"

Screen length: 10'

Depth of Well: 21.9'

Filter Pack:

- Material: RW Sidley filter sand
- Grain Size: #5
- Volume: 3.6 ft^3 (7.25 bags)

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

- Material: 3/8" Bentonite chips

Placement method: Poured/Hydrated

Volume: 3.75, 50lbs bags

Backfill (if different from seal):

- Material:
- Placement method:
- Volume:

Surface seal design:

- Material of protective casing: Steel
- Material of grout between protective casing and well casing: Sand

Protective cap:

- Material: Steel
- Vented?: ☒ Y ☐ N — Locking?: ☒ Y ☐ N

Well cap:

- Material: Plastic
- Vented?: ☒ Y ☐ N

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

Water level: 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 #:** 8496 — **Date:** 6-23-22

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

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

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

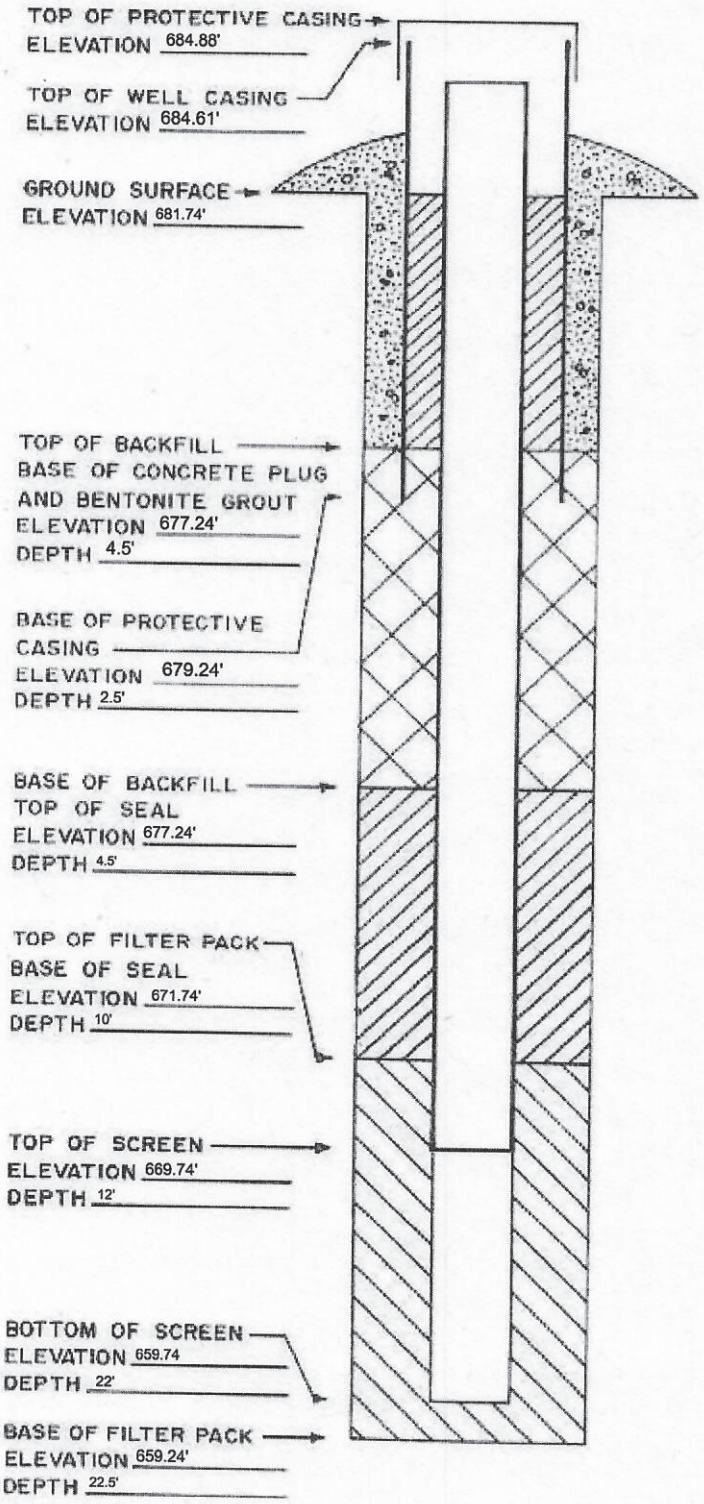
09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM GROUND SERFACE

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



Appendix C

Laboratory Reports

C1 Supplemental Assessment Monitoring, January 2022
C2 Supplemental Assessment Monitoring, February 2022
C3 Assessment Monitoring, April 2022
C4 Supplemental Assessment Monitoring, August 2022

C1 Supplemental Assessment Monitoring, January 2022

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-223431-1
Laboratory Sample Delivery Group: 25221072
Client Project/Site: Ottumwa Generating Station - 25221072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
2/15/2022 11:08:31 AM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

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Case Narrative

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Job ID: 310-223431-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-223431-1

Comments
No additional comments.

Receipt
The samples were received on 1/13/2022 6:30 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 4.4º C.

RAD
Method 903.0: Radium 226 batch 547131
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-312 (310-223431-1), MW-313 (310-223431-2), Field Blank (310-223431-3), (LCS 160-547131/1-A), (LCSD 160-547131/2-A) and (MB 160-547131/8-A)

Method 904.0: Radium 228 batch 547135
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-312 (310-223431-1), MW-313 (310-223431-2), Field Blank (310-223431-3), (LCS 160-547135/1-A), (LCSD 160-547135/2-A) and (MB 160-547135/8-A)

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

Sample Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-223431-1	MW-312	Water	01/12/22 11:40	01/13/22 18:30
310-223431-2	MW-313	Water	01/12/22 15:30	01/13/22 18:30
310-223431-3	Field Blank	Water	01/12/22 16:20	01/13/22 18:30

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Client Sample ID: MW-312 — Lab Sample ID: 310-223431-1

No Detections.

Client Sample ID: MW-313 — Lab Sample ID: 310-223431-2

No Detections.

Client Sample ID: Field Blank — Lab Sample ID: 310-223431-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Client Sample ID: MW-312

Date Collected: 01/12/22 11:40
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-1

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.176	U	0.136	0.137	1.00	0.201	pCi/L	01/19/22 10:48	02/11/22 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.9*		*40 - 110*	*01/19/22 10:48*	*02/11/22 07:58*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**1.08**		0.317	0.332	1.00	0.403	pCi/L	01/19/22 11:26	02/08/22 12:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*89.9*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*
Y Carrier	*85.6*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*

Method: 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	**1.25**		0.345	0.359	5.00	0.403	pCi/L		02/15/22 10:33	1

Client Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Client Sample ID: MW-313

Date Collected: 01/12/22 15:30
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-2

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.354		0.180	0.183	1.00	0.237	pCi/L	01/19/22 10:48	02/11/22 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.9*		*40 - 110*	*01/19/22 10:48*	*02/11/22 07:58*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.931		0.293	0.306	1.00	0.375	pCi/L	01/19/22 11:26	02/08/22 12:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*88.9*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*
Y Carrier	*85.6*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*

Method: 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	1.29		0.344	0.357	5.00	0.375	pCi/L		02/15/22 10:33	1

Client Sample ID: Field Blank

Date Collected: 01/12/22 16:20
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-3

Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.0635	U	0.120	0.120	1.00	0.257	pCi/L	01/19/22 10:48	02/11/22 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.9*		*40 - 110*	*01/19/22 10:48*	*02/11/22 07:58*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.0995	U	0.229	0.229	1.00	0.396	pCi/L	01/19/22 11:26	02/08/22 12:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*85.9*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*
Y Carrier	*85.6*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:35*	*1*

Method: 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	0.0995	U	0.259	0.259	5.00	0.396	pCi/L		02/15/22 10:33	1

Definitions/Glossary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Qualifiers

Rad

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

Glossary

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

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-547131/8-A
Matrix: Water
Analysis Batch: 550030

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 547131

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.02690	U	0.0988	0.0988	1.00	0.208	pCi/L	01/19/22 10:48	02/11/22 07:59	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.2*		*40 - 110*	*01/19/22 10:48*	*02/11/22 07:59*	*1*

Lab Sample ID: LCS 160-547131/1-A
Matrix: Water
Analysis Batch: 550030

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 547131

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium 226			11.3	10.76		1.22	1.00	0.214	pCi/L	95	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*90.4*		*40 - 110*

Lab Sample ID: LCSD 160-547131/2-A
Matrix: Water
Analysis Batch: 550030

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 547131

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium 226			11.3	11.07		1.22	1.00	0.159	pCi/L	98	75 - 125	0.13	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*96.7*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-547135/8-A
Matrix: Water
Analysis Batch: 549760

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 547135

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.2014	U	0.229	0.230	1.00	0.377	pCi/L	01/19/22 11:26	02/08/22 12:36	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*90.2*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:36*	*1*
Y Carrier	*85.2*		*40 - 110*	*01/19/22 11:26*	*02/08/22 12:36*	*1*

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

Lab Sample ID: LCS 160-547135/1-A
Matrix: Water
Analysis Batch: 549760

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 547135

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium 228			8.89	10.22		1.18	1.00	0.353	pCi/L	115	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba	*90.4*		*40 - 110*
Y Carrier	*85.6*		*40 - 110*

Lab Sample ID: LCSD 160-547135/2-A
Matrix: Water
Analysis Batch: 549760

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 547135

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium 228			8.89	10.51		1.19	1.00	0.359	pCi/L	118	75 - 125	0.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba	*96.7*		*40 - 110*
Y Carrier	*85.6*		*40 - 110*

QC Association Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Rad

Prep Batch: 547131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223431-1	MW-312	Total/NA	Water	PrecSep-21	
310-223431-2	MW-313	Total/NA	Water	PrecSep-21	
310-223431-3	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-547131/8-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-547131/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-547131/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 547135

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223431-1	MW-312	Total/NA	Water	PrecSep_0	
310-223431-2	MW-313	Total/NA	Water	PrecSep_0	
310-223431-3	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-547135/8-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-547135/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-547135/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Client Sample ID: MW-312
Date Collected: 01/12/22 11:40
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			547131	01/19/22 10:48	LPS	TAL SL
Total/NA	Analysis	903.0		1	550030	02/11/22 07:58	JCB	TAL SL
Total/NA	Prep	PrecSep_0			547135	01/19/22 11:26	LPS	TAL SL
Total/NA	Analysis	904.0		1	549760	02/08/22 12:35	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	550644	02/15/22 10:33	CAH	TAL SL

Client Sample ID: MW-313
Date Collected: 01/12/22 15:30
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			547131	01/19/22 10:48	LPS	TAL SL
Total/NA	Analysis	903.0		1	550030	02/11/22 07:58	JCB	TAL SL
Total/NA	Prep	PrecSep_0			547135	01/19/22 11:26	LPS	TAL SL
Total/NA	Analysis	904.0		1	549760	02/08/22 12:35	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	550644	02/15/22 10:33	CAH	TAL SL

Client Sample ID: Field Blank
Date Collected: 01/12/22 16:20
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223431-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			547131	01/19/22 10:48	LPS	TAL SL
Total/NA	Analysis	903.0		1	550030	02/11/22 07:58	JCB	TAL SL
Total/NA	Prep	PrecSep_0			547135	01/19/22 11:26	LPS	TAL SL
Total/NA	Analysis	904.0		1	549760	02/08/22 12:35	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	550644	02/15/22 10:33	CAH	TAL SL

Laboratory References:
TAL 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 - 25221072

Job ID: 310-223431-1
SDG: 25221072

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	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	06-30-21 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-22
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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

Method Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

eurofins | Environment Testing TestAmerica

310-223431 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 1-13-22 TIME 1830 | Received By: PL

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

Condition of Cooler/Containers

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

Temperature Record

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

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

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

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

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	P1 250	
Uncorrected Temp (°C):	4.4	
Corrected Temp (°C):	4.4	

Exceptions Noted

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

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

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

Additional Comments

eurofins

Cedar Falls Division
3019 Venture Way
Cedar Falls, IA 50613

TestAmerica Des Moines SC
214

Phone 319 - 277 - 2401 or 1 - 800 - 750 - 2401
Fax 319 - 277 - 2425

Company SCS engineers
Send Report To Meghan Blodgett
Address 2830 dairy drive
City/State/Zip Code Madison WI, 53718
Telephone Number Fax:
Sampled by (Print Name) Rosa Cruz
(Signature)

Your PO # 25221072
Invoice To
Project Name Ottumwa generating Station
Project Number: 25221072
Email Address mblodgett@scsengineers.com
CC

Sample ID	Date Sampled	Time Sampled	# of containers shipped	Grab	Composite	Field Filtered	Preservative: Ice	HNO_3 (Red & White Label)	HCl (Blue & White Label)	NaOH (Orange & White Label)	H_2SO_4 Plastic (Yellow & White La	H_2SO_4 Glass(Yellow & White Labe	None (Black & White Label)	Other (Specify)	Matrix: Groundwater	Wastewater	Drinking Water	Sludge	Soil	Other Specify Stormwater	Analyze For: Radium - 226 - 9030	Radium - 228 - 9320	RUSH TAT (Must call ahea	Standard TAT	E mail results	Fax Results	Send QC with report
MW-312	1-12-22	1140		X			X	X							X						X	X					
MW-313	1-12-22	1530		X			X	X							X						X	X					
~~Dup~~ Field blank	1-12-22	1620		X			X	X							X						X	X					

NOTE: All turn around times are calculated from the time of receipt at TestAmerica.
NOTICE: **Pre-Arrangements must be made *AT LEAST 48 Hours in ADVANCE* to receive results with RUSH turn around time commitments; *additional charges* may be assessed.**
NOTE: There may be a charge assessed for TestAmerica disposing of sample remainders

NOTES: Please fill in shaded areas

Relinquished by	Date	Time	Received by	Date	Time	Relinquished by	Date	Time
Rosa Cruz	1-13-22	8 12						
Relinquished by	Date	Time	Received by	Date	Time	Relinquished by	Date	Time
Shipped Via			Comments			Shipped Via		
Received for TestAmerica by	Date	Time	Temperature Upon Receipt	Laboratory Comments				
	1-13-22	1830						

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

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-45565.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: sandra.fredrick@eurofinset.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-223431-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 2/13/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station - 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered	Perform MS	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Num	Special Instructions/Note:
			Preservation Code:								
MW-312 (310-223431-1)	1/12/22	11:40 Central		Water			X	X	X		DO NOT SHIP ON ICE TO ST. LOUIS
MW-313 (310-223431-2)	1/12/22	15:30 Central		Water			X	X	X		DO NOT SHIP ON ICE TO ST. LOUIS
Field Blank (310-223431-3)	1/12/22	16:20 Central		Water			X	X	X		DO NOT SHIP ON ICE TO ST. LOUIS

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

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

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

Relinquished by:	Date/Time: 1/14/22 11:00	Company	Received by: FED EX	Date/Time:	Company
Relinquished by: FED EX	Date/Time:	Company	Received by: Sierra Worthington	Date/Time: 1-18-22 0920	Company ETASL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-223431-1
SDG Number: 25221072

Login Number: 223431
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

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

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-223431-1
SDG Number: 25221072

Login Number: 223431
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 01/18/22 09:52 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.	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	

Tracer/Carrier Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223431-1
SDG: 25221072

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (40-110)
310-223431-1	MW-312	89.9
310-223431-2	MW-313	88.9
310-223431-3	Field Blank	85.9
LCS 160-547131/1-A	Lab Control Sample	90.4
LCSD 160-547131/2-A	Lab Control Sample Dup	96.7
MB 160-547131/8-A	Method Blank	90.2

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
310-223431-1	MW-312	89.9	85.6
310-223431-2	MW-313	88.9	85.6
310-223431-3	Field Blank	85.9	85.6
LCS 160-547135/1-A	Lab Control Sample	90.4	85.6
LCSD 160-547135/2-A	Lab Control Sample Dup	96.7	85.6
MB 160-547135/8-A	Method Blank	90.2	85.2

Tracer/Carrier Legend

Ba = Ba
Y = Y Carrier

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-223428-1
Client Project/Site: Ottumwa Generating Station - 25221072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
1/24/2022 11:00:32 AM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

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Case Narrative

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223428-1

Job ID: 310-223428-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-223428-1

Comments
No additional comments.

Receipt
The samples were received on 1/13/2022 6:30 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 4.4º C.

HPLC/IC
Methods 300.0, 9056A: The following samples were diluted due to the nature of the sample matrix: MW-312 (310-223428-1) and MW-313 (310-223428-2). 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.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-223428-1	MW-312	Water	01/12/22 11:40	01/13/22 18:30
310-223428-2	MW-313	Water	01/12/22 15:30	01/13/22 18:30
310-223428-3	Field Blank	Water	01/12/22 16:20	01/13/22 18:30

Detection Summary

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Client Sample ID: MW-312 — Lab Sample ID: 310-223428-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.2	mg/L	5		9056A	Total/NA
Sulfate	620		20	9.8	mg/L	20		9056A	Total/NA
Arsenic	3.4		2.0	0.75	ug/L	1		6020A	Total/NA
Barium	87		2.0	0.37	ug/L	1		6020A	Total/NA
Boron	380		100	58	ug/L	1		6020A	Total/NA
Cadmium	0.053	J	0.10	0.051	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	4.9		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	41		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	2.7		2.0	1.3	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1200		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Oxidation Reduction Potential	-53.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.32				mg/L	1		Field Sampling	Total/NA
pH, Field	7.18				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1762				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.62				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-223428-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	180		5.0	2.2	mg/L	5		9056A	Total/NA
Sulfate	620		20	9.8	mg/L	20		9056A	Total/NA
Arsenic	1.2	J	2.0	0.75	ug/L	1		6020A	Total/NA
Barium	48		2.0	0.37	ug/L	1		6020A	Total/NA
Boron	530		100	58	ug/L	1		6020A	Total/NA
Calcium	190		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	5.9		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	33		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	6.1		2.0	1.3	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1300		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Oxidation Reduction Potential	-51.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.15				mg/L	1		Field Sampling	Total/NA
pH, Field	7.00				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1857				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14.60				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: Field Blank — Lab Sample ID: 310-223428-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Client Sample ID: MW-312
Date Collected: 01/12/22 11:40
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223428-1
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**150**		5.0	2.2	mg/L			01/17/22 20:08	5
Fluoride	<0.28		0.50	0.28	mg/L			01/17/22 20:08	5
Sulfate	**620**		20	9.8	mg/L			01/18/22 11:36	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.1		2.0	1.1	ug/L		01/18/22 09:00	01/21/22 18:03	1
Arsenic	**3.4**		2.0	0.75	ug/L		01/18/22 09:00	01/20/22 01:29	1
Barium	**87**		2.0	0.37	ug/L		01/18/22 09:00	01/20/22 01:29	1
Beryllium	<0.27		1.0	0.27	ug/L		01/18/22 09:00	01/20/22 01:29	1
Boron	**380**		100	58	ug/L		01/18/22 09:00	01/20/22 01:29	1
Cadmium	**0.053**	**J**	0.10	0.051	ug/L		01/18/22 09:00	01/20/22 01:29	1
Calcium	**180**		0.50	0.19	mg/L		01/18/22 09:00	01/20/22 01:29	1
Chromium	<1.1		5.0	1.1	ug/L		01/18/22 09:00	01/20/22 01:29	1
Cobalt	**4.9**		0.50	0.19	ug/L		01/18/22 09:00	01/20/22 01:29	1
Lead	<0.21		0.50	0.21	ug/L		01/18/22 09:00	01/20/22 01:29	1
Lithium	**41**		10	2.5	ug/L		01/18/22 09:00	01/20/22 01:29	1
Molybdenum	**2.7**		2.0	1.3	ug/L		01/18/22 09:00	01/20/22 01:29	1
Selenium	<0.96		5.0	0.96	ug/L		01/18/22 09:00	01/20/22 01:29	1
Thallium	<0.26		1.0	0.26	ug/L		01/18/22 09:00	01/20/22 01:29	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.15		0.20	0.15	ug/L		01/20/22 15:02	01/21/22 13:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1200**		50	26	mg/L			01/14/22 13:57	1
pH	**7.4**	**HF**	0.1	0.1	SU			01/13/22 21:22	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	**-53.4**				millivolts			01/12/22 11:40	1
Oxygen, Dissolved, Client Supplied	**0.32**				mg/L			01/12/22 11:40	1
pH, Field	**7.18**				SU			01/12/22 11:40	1
Specific Conductance, Field	**1762**				umhos/cm			01/12/22 11:40	1
Temperature, Field	**12.62**				Degrees C			01/12/22 11:40	1
Turbidity, Field	**0.00**				NTU			01/12/22 11:40	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Client Sample ID: MW-313
Date Collected: 01/12/22 15:30
Date Received: 01/13/22 18:30

Lab Sample ID: 310-223428-2
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**180**		5.0	2.2	mg/L			01/17/22 20:24	5
Fluoride	<0.28		0.50	0.28	mg/L			01/17/22 20:24	5
Sulfate	**620**		20	9.8	mg/L			01/18/22 11:52	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.1		2.0	1.1	ug/L		01/18/22 09:00	01/21/22 18:06	1
Arsenic	**1.2**	**J**	2.0	0.75	ug/L		01/18/22 09:00	01/20/22 01:32	1
Barium	**48**		2.0	0.37	ug/L		01/18/22 09:00	01/20/22 01:32	1
Beryllium	<0.27		1.0	0.27	ug/L		01/18/22 09:00	01/20/22 01:32	1
Boron	**530**		100	58	ug/L		01/18/22 09:00	01/20/22 01:32	1
Cadmium	<0.051		0.10	0.051	ug/L		01/18/22 09:00	01/20/22 01:32	1
Calcium	**190**		0.50	0.19	mg/L		01/18/22 09:00	01/20/22 01:32	1
Chromium	<1.1		5.0	1.1	ug/L		01/18/22 09:00	01/20/22 01:32	1
Cobalt	**5.9**		0.50	0.19	ug/L		01/18/22 09:00	01/20/22 01:32	1
Lead	<0.21		0.50	0.21	ug/L		01/18/22 09:00	01/20/22 01:32	1
Lithium	**33**		10	2.5	ug/L		01/18/22 09:00	01/20/22 01:32	1
Molybdenum	**6.1**		2.0	1.3	ug/L		01/18/22 09:00	01/20/22 01:32	1
Selenium	<0.96		5.0	0.96	ug/L		01/18/22 09:00	01/20/22 01:32	1
Thallium	<0.26		1.0	0.26	ug/L		01/18/22 09:00	01/20/22 01:32	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.15		0.20	0.15	ug/L		01/20/22 15:02	01/21/22 13:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1300**		50	26	mg/L			01/14/22 13:57	1
pH	**7.1**	**HF**	0.1	0.1	SU			01/13/22 21:27	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	**-51.0**				millivolts			01/12/22 15:30	1
Oxygen, Dissolved, Client Supplied	**0.15**				mg/L			01/12/22 15:30	1
pH, Field	**7.00**				SU			01/12/22 15:30	1
Specific Conductance, Field	**1857**				umhos/cm			01/12/22 15:30	1
Temperature, Field	**14.60**				Degrees C			01/12/22 15:30	1
Turbidity, Field	**0.00**				NTU			01/12/22 15:30	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Client Sample ID: Field Blank
Lab Sample ID: 310-223428-3
Date Collected: 01/12/22 16:20
Matrix: Water
Date Received: 01/13/22 18:30

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.43		1.0	0.43	mg/L			01/17/22 21:10	1
Fluoride	<0.055		0.10	0.055	mg/L			01/17/22 21:10	1
Sulfate	<0.49		1.0	0.49	mg/L			01/17/22 21:10	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.1		2.0	1.1	ug/L		01/18/22 09:00	01/21/22 18:09	1
Arsenic	<0.75		2.0	0.75	ug/L		01/18/22 09:00	01/20/22 01:36	1
Barium	<0.37		2.0	0.37	ug/L		01/18/22 09:00	01/21/22 18:09	1
Beryllium	<0.27		1.0	0.27	ug/L		01/18/22 09:00	01/20/22 01:36	1
Boron	<58		100	58	ug/L		01/18/22 09:00	01/20/22 01:36	1
Cadmium	<0.051		0.10	0.051	ug/L		01/18/22 09:00	01/20/22 01:36	1
Calcium	<0.19		0.50	0.19	mg/L		01/18/22 09:00	01/21/22 18:09	1
Chromium	<1.1		5.0	1.1	ug/L		01/18/22 09:00	01/20/22 01:36	1
Cobalt	<0.19		0.50	0.19	ug/L		01/18/22 09:00	01/20/22 01:36	1
Lead	<0.21		0.50	0.21	ug/L		01/18/22 09:00	01/20/22 01:36	1
Lithium	<2.5		10	2.5	ug/L		01/18/22 09:00	01/20/22 01:36	1
Molybdenum	<1.3		2.0	1.3	ug/L		01/18/22 09:00	01/20/22 01:36	1
Selenium	<0.96		5.0	0.96	ug/L		01/18/22 09:00	01/20/22 01:36	1
Thallium	<0.26		1.0	0.26	ug/L		01/18/22 09:00	01/20/22 01:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.15		0.20	0.15	ug/L		01/20/22 15:02	01/21/22 13:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		50	26	mg/L			01/14/22 13:57	1
pH	**6.4**	**HF**	0.1	0.1	SU			01/13/22 21:29	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

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	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-341731/3
Matrix: Water
Analysis Batch: 341731

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.43		1.0	0.43	mg/L			01/17/22 14:42	1
Fluoride	<0.055		0.10	0.055	mg/L			01/17/22 14:42	1
Sulfate	<0.49		1.0	0.49	mg/L			01/17/22 14:42	1

Lab Sample ID: LCS 310-341731/4
Matrix: Water
Analysis Batch: 341731

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	10.4		mg/L		104	90 - 110
Fluoride	2.00	2.00		mg/L		100	90 - 110
Sulfate	10.0	10.5		mg/L		105	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-341483/1-A
Matrix: Water
Analysis Batch: 341846

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 341483

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<1.1		2.0	1.1	ug/L		01/18/22 09:00	01/19/22 23:58	1
Arsenic	<0.75		2.0	0.75	ug/L		01/18/22 09:00	01/19/22 23:58	1
Barium	<0.37		2.0	0.37	ug/L		01/18/22 09:00	01/19/22 23:58	1
Beryllium	<0.27		1.0	0.27	ug/L		01/18/22 09:00	01/19/22 23:58	1
Boron	<58		100	58	ug/L		01/18/22 09:00	01/19/22 23:58	1
Cadmium	<0.051		0.10	0.051	ug/L		01/18/22 09:00	01/19/22 23:58	1
Chromium	<1.1		5.0	1.1	ug/L		01/18/22 09:00	01/19/22 23:58	1
Cobalt	<0.19		0.50	0.19	ug/L		01/18/22 09:00	01/19/22 23:58	1
Lead	<0.21		0.50	0.21	ug/L		01/18/22 09:00	01/19/22 23:58	1
Lithium	<2.5		10	2.5	ug/L		01/18/22 09:00	01/19/22 23:58	1
Molybdenum	<1.3		2.0	1.3	ug/L		01/18/22 09:00	01/19/22 23:58	1
Selenium	<0.96		5.0	0.96	ug/L		01/18/22 09:00	01/19/22 23:58	1
Thallium	<0.26		1.0	0.26	ug/L		01/18/22 09:00	01/19/22 23:58	1

Lab Sample ID: MB 310-341483/1-A
Matrix: Water
Analysis Batch: 342037

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 341483

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	<0.19		0.50	0.19	mg/L		01/18/22 09:00	01/21/22 12:21	1

Lab Sample ID: LCS 310-341483/2-A
Matrix: Water
Analysis Batch: 341846

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	200	205		ug/L		102	80 - 120
Arsenic	200	183		ug/L		92	80 - 120
Barium	100	95.7		ug/L		96	80 - 120
Beryllium	100	94.7		ug/L		95	80 - 120

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

Lab Sample ID: LCS 310-341483/2-A
Matrix: Water
Analysis Batch: 341846

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	200	187		ug/L		94	80 - 120
Cadmium	100	88.1		ug/L		88	80 - 120
Chromium	100	89.9		ug/L		90	80 - 120
Cobalt	100	98.4		ug/L		98	80 - 120
Lead	200	190		ug/L		95	80 - 120
Lithium	200	204		ug/L		102	80 - 120
Molybdenum	200	196		ug/L		98	80 - 120
Selenium	400	343		ug/L		86	80 - 120
Thallium	200	194		ug/L		97	80 - 120

Lab Sample ID: LCS 310-341483/2-A
Matrix: Water
Analysis Batch: 342037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341483

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	2.00	1.94		mg/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-341908/1-A
Matrix: Water
Analysis Batch: 342046

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 341908

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.15		0.20	0.15	ug/L		01/20/22 15:02	01/21/22 12:58	1

Lab Sample ID: LCS 310-341908/2-A
Matrix: Water
Analysis Batch: 342046

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341908

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.75		ug/L		105	80 - 120

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

Lab Sample ID: MB 310-341366/1
Matrix: Water
Analysis Batch: 341366

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	<26		50	26	mg/L			01/14/22 13:57	1

Lab Sample ID: LCS 310-341366/2
Matrix: Water
Analysis Batch: 341366

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	928		mg/L		93	90 - 110

QC Sample Results

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25221072

Job ID: 310-223428-1

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-341328/1
Matrix: Water
Analysis Batch: 341328

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

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

Lab Sample ID: 310-223428-1 DU
Matrix: Water
Analysis Batch: 341328

Client Sample ID: MW-312
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.4	HF		7.3		SU				0.5	20

HPLC/IC

Analysis Batch: 341731

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	9056A	
310-223428-1	MW-312	Total/NA	Water	9056A	
310-223428-2	MW-313	Total/NA	Water	9056A	
310-223428-2	MW-313	Total/NA	Water	9056A	
310-223428-3	Field Blank	Total/NA	Water	9056A	
MB 310-341731/3	Method Blank	Total/NA	Water	9056A	
LCS 310-341731/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 341483

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	3005A	
310-223428-2	MW-313	Total/NA	Water	3005A	
310-223428-3	Field Blank	Total/NA	Water	3005A	
MB 310-341483/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-341483/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 341846

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	6020A	341483
310-223428-2	MW-313	Total/NA	Water	6020A	341483
310-223428-3	Field Blank	Total/NA	Water	6020A	341483
MB 310-341483/1-A	Method Blank	Total/NA	Water	6020A	341483
LCS 310-341483/2-A	Lab Control Sample	Total/NA	Water	6020A	341483

Prep Batch: 341908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	7470A	
310-223428-2	MW-313	Total/NA	Water	7470A	
310-223428-3	Field Blank	Total/NA	Water	7470A	
MB 310-341908/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-341908/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 342037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-341483/1-A	Method Blank	Total/NA	Water	6020A	341483
LCS 310-341483/2-A	Lab Control Sample	Total/NA	Water	6020A	341483

Analysis Batch: 342046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	7470A	341908
310-223428-2	MW-313	Total/NA	Water	7470A	341908
310-223428-3	Field Blank	Total/NA	Water	7470A	341908
MB 310-341908/1-A	Method Blank	Total/NA	Water	7470A	341908
LCS 310-341908/2-A	Lab Control Sample	Total/NA	Water	7470A	341908

Analysis Batch: 342091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	6020A	341483
310-223428-2	MW-313	Total/NA	Water	6020A	341483

Metals (Continued)

Analysis Batch: 342091 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-3	Field Blank	Total/NA	Water	6020A	341483

General Chemistry

Analysis Batch: 341328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	SM 4500 H+ B	
310-223428-2	MW-313	Total/NA	Water	SM 4500 H+ B	
310-223428-3	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-341328/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-223428-1 DU	MW-312	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 341366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	SM 2540C	
310-223428-2	MW-313	Total/NA	Water	SM 2540C	
310-223428-3	Field Blank	Total/NA	Water	SM 2540C	
MB 310-341366/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-341366/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 341806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223428-1	MW-312	Total/NA	Water	Field Sampling	
310-223428-2	MW-313	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Client Sample ID: MW-312
Lab Sample ID: 310-223428-1
Date Collected: 01/12/22 11:40
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	341731	01/17/22 20:08	JNR	TAL CF
Total/NA	Analysis	9056A		20	341731	01/18/22 11:36	JNR	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	341846	01/20/22 01:29	SAP	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	342091	01/21/22 18:03	SAP	TAL CF
Total/NA	Prep	7470A			341908	01/20/22 15:02	EAM	TAL CF
Total/NA	Analysis	7470A		1	342046	01/21/22 13:52	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	341366	01/14/22 13:57	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	341328	01/13/22 21:22	JWH	TAL CF
Total/NA	Analysis	Field Sampling		1	341806	01/12/22 11:40	SLD	TAL CF

Client Sample ID: MW-313
Lab Sample ID: 310-223428-2
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	341731	01/17/22 20:24	JNR	TAL CF
Total/NA	Analysis	9056A		20	341731	01/18/22 11:52	JNR	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	341846	01/20/22 01:32	SAP	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	342091	01/21/22 18:06	SAP	TAL CF
Total/NA	Prep	7470A			341908	01/20/22 15:02	EAM	TAL CF
Total/NA	Analysis	7470A		1	342046	01/21/22 13:54	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	341366	01/14/22 13:57	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	341328	01/13/22 21:27	JWH	TAL CF
Total/NA	Analysis	Field Sampling		1	341806	01/12/22 15:30	SLD	TAL CF

Client Sample ID: Field Blank
Lab Sample ID: 310-223428-3
Date Collected: 01/12/22 16:20
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	341731	01/17/22 21:10	JNR	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	341846	01/20/22 01:36	SAP	TAL CF
Total/NA	Prep	3005A			341483	01/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	342091	01/21/22 18:09	SAP	TAL CF
Total/NA	Prep	7470A			341908	01/20/22 15:02	EAM	TAL CF
Total/NA	Analysis	7470A		1	342046	01/21/22 13:56	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	341366	01/14/22 13:57	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	341328	01/13/22 21:29	JWH	TAL CF

Lab Chronicle

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-223428-1
Project/Site: Ottumwa Generating Station - 25221072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

EPA = US Environmental Protection Agency

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.

Laboratory References:

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

eurofins | Environment Testing TestAmerica

310-223428 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 1-13-22 TIME 1830 Received By: PR

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

Condition of Cooler/Containers

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

Temperature Record

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

Thermometer ID: N Correction Factor (°C): 0

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

Uncorrected Temp (°C): — Corrected Temp (°C): —

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	P1 250	
Uncorrected Temp (°C):	4.4	
Corrected Temp (°C):	4.4	

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

eurofins
TestAmerica Des Moines SC

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-66793-17485
Client Contact: Meghan Blodgett	Phone: 608-509-8215	E-Mail: sandra.fredrick@eurofinset.com	State of Origin:	Page: Page 1 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station - 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Rad um-226 (GFPC) D	904.0 - Radium-228 (GFPC) D	9056A ORGFM_28D Chloride, Fluoride & Sulfate N	6020A, 7470A D	2540C_Calcd, SM4500_H+ N	TDS/pH	2320B - Alkalinity/TDS N	6020A - D Metals D	9056A_ORGFM_28D Chloride/Sulfate N	Total Number of containers	Special Instructions/Note:
			Preservation Code:														
MW-305				Water													TSS/pH should be
MW-310				Water													TDS/pH
MW-312	1-12-22	1140	G	Water					X	X	X						
MW-313	1-12-22	1145	G	Water					X	X	X						
~~Field Blank~~		1530		Water													
Field blank	1-12-22	1620	G	Water					X	X	X						
MW-305				Water													
MW-310				Water													
MW-312				Water													
MW-313				Water													
Field Blank				Water													

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

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by	Date	Time	Method of Shipment

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	1-13-22 8 12				
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
			PJL	1-13-22 1530	

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

Ver: 06/08/2021

Eurofins Samples - January 2022
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25221072

					OGS - Ash Pond														
		COC #	Parameter	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	Field Blank	TOTAL
Appendix III Parameters	Unfiltered	1	Boron												x	x	x	3
			Calcium												x	x	x	3
			Chloride												x	x	x	3
			Fluoride												x	x	x	3
			Sulfate												x	x	x	3
			pH												x	x	x	3
			TDS												x	x	x	3
Appendix IV Parameters	Unfiltered	1	Antimony												x	x	x	3
			Arsenic												x	x	x	3
			Barium												x	x	x	3
			Beryllium												x	x	x	3
			Cadmium												x	x	x	3
			Chromium												x	x	x	3
			Cobalt												x	x	x	3
			Lead												x	x	x	3
			Lithium												x	x	x	3
			Mercury												x	x	x	3
			Molybdenum												x	x	x	3
			Selenium												x	x	x	3
			Thallium												x	x	x	3
		2	Radium (report separately)												x	x	x	3
Field Parameters	Unfiltered	1	Ferrous Iron (CHEMets)												x	x		2
			Sulfide (CHEMets)												x	x		2
			Groundwater Elevation												x	x		2
			pH (field)												x	x		2
			Specific Conductance												x	x		2
			Dissolved Oxygen												x	x		2
			ORP												x	x		2
			Temperature												x	x		2
			Turbidity												x	x		2
			Color												x	x		2
			Odor												x	x		2
Additional Lab Parameters - REQUIRES SEPARATE COC	Unfiltered	3	Alkalinity (as CaCO3)												x	x		2
	0.45 µm		Aluminum												x	x		2
			Calcium												x	x		2
			Cobalt												x	x		2
			Iron												x	x		2
			Magnesium												x	x		2
			Manganese												x	x		2
			Sodium												x	x		2
			Potassium												x	x		2
	0.20 µm		Aluminum												x	x		2
			Cobalt												x	x		2
			Iron												x	x		2

Notes: All samples are unfiltered (total) unless otherwise noted.

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Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-223428-1

Login Number: 223428
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

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

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25221072.00
January 2022

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-312	1/12/2022 11:40	NS	12.62	7.18	0.32	1762	-53.4	0.00
MW-313	1/12/2022 15:30	NS	14.60	7.00	0.15	1857	-51.0	0.00

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

Notes:
none

Created by: ACW Date: 1/14/2022
Last revision by: ACW Date: 1/14/2022
Checked by: RM Date: 1/14/2022

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eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-223429-1
Client Project/Site: Ottumwa Generating Station 25221072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
1/24/2022 5:24:29 PM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Job ID: 310-223429-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-223429-1

Comments
No additional comments.

Receipt
The samples were received on 1/13/2022 6:30 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 4.4º C.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-223429-1	MW-312 0.45um	Water	01/12/22 11:40	01/13/22 18:30
310-223429-2	MW-313 0.45um	Water	01/12/22 15:30	01/13/22 18:30
310-223429-4	MW-312 0.2um	Water	01/12/22 11:40	01/13/22 18:30
310-223429-5	MW-313 0.2um	Water	01/12/22 15:30	01/13/22 18:30

Detection Summary

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-312 0.45um — Lab Sample ID: 310-223429-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180000		500	190	ug/L	1		6020A	Dissolved
Cobalt	3.4		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	180		100	36	ug/L	1		6020A	Dissolved
Magnesium	52000		500	100	ug/L	1		6020A	Dissolved
Manganese	1300		10	4.4	ug/L	1		6020A	Dissolved
Potassium	4300		500	150	ug/L	1		6020A	Dissolved
Sodium	120000		1000	610	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	220		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	220		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-313 0.45um — Lab Sample ID: 310-223429-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	190000		500	190	ug/L	1		6020A	Dissolved
Cobalt	5.9		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	240		100	36	ug/L	1		6020A	Dissolved
Magnesium	58000		500	100	ug/L	1		6020A	Dissolved
Manganese	3600		10	4.4	ug/L	1		6020A	Dissolved
Potassium	5700		500	150	ug/L	1		6020A	Dissolved
Sodium	110000		1000	610	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-312 0.2um — Lab Sample ID: 310-223429-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Aluminum	19	J	50	17	ug/L	1		6020A	Dissolved
Cobalt	5.1		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	380		100	36	ug/L	1		6020A	Dissolved

Client Sample ID: MW-313 0.2um — Lab Sample ID: 310-223429-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	6.0		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	240		100	36	ug/L	1		6020A	Dissolved

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-312 0.45um
Lab Sample ID: 310-223429-1
Date Collected: 01/12/22 11:40
Matrix: Water
Date Received: 01/13/22 18:30

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<17		50	17	ug/L		01/19/22 08:15	01/22/22 00:11	1
Calcium	**180000**		500	190	ug/L		01/19/22 08:15	01/24/22 14:16	1
Cobalt	**3.4**		0.50	0.19	ug/L		01/19/22 08:15	01/22/22 00:11	1
Iron	**180**		100	36	ug/L		01/19/22 08:15	01/22/22 00:11	1
Magnesium	**52000**		500	100	ug/L		01/19/22 08:15	01/24/22 14:16	1
Manganese	**1300**		10	4.4	ug/L		01/19/22 08:15	01/24/22 14:16	1
Potassium	**4300**		500	150	ug/L		01/19/22 08:15	01/22/22 00:11	1
Sodium	**120000**		1000	610	ug/L		01/19/22 08:15	01/24/22 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**220**		10	4.6	mg/L			01/17/22 08:01	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			01/17/22 08:01	1
Total Alkalinity as CaCO3	**220**		10	4.6	mg/L			01/17/22 08:01	1

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-313 0.45um
Lab Sample ID: 310-223429-2
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/13/22 18:30

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<17		50	17	ug/L		01/19/22 08:15	01/22/22 00:18	1
Calcium	**190000**		500	190	ug/L		01/19/22 08:15	01/24/22 14:22	1
Cobalt	**5.9**		0.50	0.19	ug/L		01/19/22 08:15	01/22/22 00:18	1
Iron	**240**		100	36	ug/L		01/19/22 08:15	01/22/22 00:18	1
Magnesium	**58000**		500	100	ug/L		01/19/22 08:15	01/24/22 14:22	1
Manganese	**3600**		10	4.4	ug/L		01/19/22 08:15	01/24/22 14:22	1
Potassium	**5700**		500	150	ug/L		01/19/22 08:15	01/22/22 00:18	1
Sodium	**110000**		1000	610	ug/L		01/19/22 08:15	01/24/22 14:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**230**		10	4.6	mg/L			01/17/22 08:01	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			01/17/22 08:01	1
Total Alkalinity as CaCO3	**230**		10	4.6	mg/L			01/17/22 08:01	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-312 0.2um
Lab Sample ID: 310-223429-4

Date Collected: 01/12/22 11:40
Matrix: Water
Date Received: 01/13/22 18:30

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	19	J	50	17	ug/L		01/19/22 08:15	01/22/22 00:34	1
Cobalt	5.1		0.50	0.19	ug/L		01/19/22 08:15	01/22/22 00:34	1
Iron	380		100	36	ug/L		01/19/22 08:15	01/22/22 00:34	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-313 0.2um
Lab Sample ID: 310-223429-5
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/13/22 18:30

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<17		50	17	ug/L		01/19/22 08:15	01/22/22 00:37	1
Cobalt	**6.0**		0.50	0.19	ug/L		01/19/22 08:15	01/22/22 00:37	1
Iron	**240**		100	36	ug/L		01/19/22 08:15	01/22/22 00:37	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

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.

Glossary

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

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-341631/1-A
Matrix: Water
Analysis Batch: 342091

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 341631

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Aluminum	<17		50	17	ug/L		01/19/22 08:15	01/21/22 23:15	1
Calcium	<190		500	190	ug/L		01/19/22 08:15	01/21/22 23:15	1
Cobalt	<0.19		0.50	0.19	ug/L		01/19/22 08:15	01/21/22 23:15	1
Iron	<36		100	36	ug/L		01/19/22 08:15	01/21/22 23:15	1
Magnesium	<100		500	100	ug/L		01/19/22 08:15	01/21/22 23:15	1
Manganese	<4.4		10	4.4	ug/L		01/19/22 08:15	01/21/22 23:15	1
Potassium	<150		500	150	ug/L		01/19/22 08:15	01/21/22 23:15	1
Sodium	<610		1000	610	ug/L		01/19/22 08:15	01/21/22 23:15	1

Lab Sample ID: LCS 310-341631/2-A
Matrix: Water
Analysis Batch: 342091

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	200	194		ug/L		97	80 - 120
Cobalt	100	104		ug/L		104	80 - 120
Iron	200	213		ug/L		106	80 - 120
Potassium	2000	2130		ug/L		106	80 - 120

Lab Sample ID: LCS 310-341631/2-A
Matrix: Water
Analysis Batch: 342195

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 341631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Aluminum	200	196		ug/L		98	80 - 120
Calcium	2000	1940		ug/L		97	80 - 120
Cobalt	100	104		ug/L		104	80 - 120
Iron	200	207		ug/L		103	80 - 120
Magnesium	2000	2050		ug/L		103	80 - 120
Manganese	100	96.6		ug/L		97	80 - 120
Potassium	2000	2020		ug/L		101	80 - 120
Sodium	2000	1990		ug/L		99	80 - 120

Lab Sample ID: 310-223429-1 DU
Matrix: Water
Analysis Batch: 342091

Client Sample ID: MW-312 0.45um
Prep Type: Dissolved
Prep Batch: 341631

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Aluminum	<17		<17		ug/L		NC	20
Calcium	170000	^2	169000		ug/L		0.3	20
Cobalt	3.4		3.42		ug/L		0.4	20
Iron	180		187		ug/L		1	20
Magnesium	50000	^2	50400		ug/L		0.4	20
Manganese	1300	^2	1290		ug/L		1	20
Potassium	4300		3850		ug/L		11	20
Sodium	110000	^2	115000		ug/L		1	20

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

Lab Sample ID: 310-223429-1 DU
Matrix: Water
Analysis Batch: 342195

Client Sample ID: MW-312 0.45um
Prep Type: Dissolved
Prep Batch: 341631

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Calcium	180000		177000		ug/L		0.3	20
Magnesium	52000		50800		ug/L		2	20
Manganese	1300		1270		ug/L		1	20
Sodium	120000		113000		ug/L		2	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-341405/1
Matrix: Water
Analysis Batch: 341405

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			01/17/22 08:01	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			01/17/22 08:01	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			01/17/22 08:01	1

Lab Sample ID: LCS 310-341405/2
Matrix: Water
Analysis Batch: 341405

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	987		mg/L		99	90 - 110

QC Association Summary

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Metals

Prep Batch: 341631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223429-1	MW-312 0.45um	Dissolved	Water	3005A	
310-223429-2	MW-313 0.45um	Dissolved	Water	3005A	
310-223429-4	MW-312 0.2um	Dissolved	Water	3005A	
310-223429-5	MW-313 0.2um	Dissolved	Water	3005A	
MB 310-341631/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-341631/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-223429-1 DU	MW-312 0.45um	Dissolved	Water	3005A	

Analysis Batch: 342091

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223429-1	MW-312 0.45um	Dissolved	Water	6020A	341631
310-223429-2	MW-313 0.45um	Dissolved	Water	6020A	341631
310-223429-4	MW-312 0.2um	Dissolved	Water	6020A	341631
310-223429-5	MW-313 0.2um	Dissolved	Water	6020A	341631
MB 310-341631/1-A	Method Blank	Total/NA	Water	6020A	341631
LCS 310-341631/2-A	Lab Control Sample	Total/NA	Water	6020A	341631
310-223429-1 DU	MW-312 0.45um	Dissolved	Water	6020A	341631

Analysis Batch: 342195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223429-1	MW-312 0.45um	Dissolved	Water	6020A	341631
310-223429-2	MW-313 0.45um	Dissolved	Water	6020A	341631
LCS 310-341631/2-A	Lab Control Sample	Total/NA	Water	6020A	341631
310-223429-1 DU	MW-312 0.45um	Dissolved	Water	6020A	341631

General Chemistry

Analysis Batch: 341405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-223429-1	MW-312 0.45um	Total/NA	Water	SM 2320B	
310-223429-2	MW-313 0.45um	Total/NA	Water	SM 2320B	
MB 310-341405/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-341405/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Client Sample ID: MW-312 0.45um
Lab Sample ID: 310-223429-1
Date Collected: 01/12/22 11:40
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342091	01/22/22 00:11	SAP	TAL CF
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342195	01/24/22 14:16	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	341405	01/17/22 08:01	JMH2	TAL CF

Client Sample ID: MW-313 0.45um
Lab Sample ID: 310-223429-2
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342091	01/22/22 00:18	SAP	TAL CF
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342195	01/24/22 14:22	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	341405	01/17/22 08:01	JMH2	TAL CF

Client Sample ID: MW-312 0.2um
Lab Sample ID: 310-223429-4
Date Collected: 01/12/22 11:40
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342091	01/22/22 00:34	SAP	TAL CF

Client Sample ID: MW-313 0.2um
Lab Sample ID: 310-223429-5
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/13/22 18:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			341631	01/19/22 08:15	ACM2	TAL CF
Dissolved	Analysis	6020A		1	342091	01/22/22 00:37	SAP	TAL CF

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-223429-1
Project/Site: Ottumwa Generating Station 25221072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25221072

Job ID: 310-223429-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF

Protocol References:

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.

Laboratory References:

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

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310-223429 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 1-13-22 TIME 1830 | Received By: PR

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

Condition of Cooler/Containers

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

Temperature Record

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

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

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

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

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	P1 250	
Uncorrected Temp (°C):	4.4	
Corrected Temp (°C):	4.4	

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

TestAmerica Des Moines SC
214

eurofins

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-66793-17485 2
Client Contact: Meghan Blodgett	Phone: 608-509-8245	E-Mail: sandra.fredrick@eurofinset.com	State of Origin:	Page: Page 2 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: W , 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station - 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Radium-226 (GFPC)	904.0 - Radium-228 (GFPC)	9056A ORGFM_28D Chloride Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	2320B - Alkalinity/TDS	6020A - D Metals	9056A_ORGFM_28D - Chloride/Sulfate				Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N	N	D	N					
MW-312	1-12-22	1140	G	Water								X	X						D-Metals is
MW-313	1-12-22	1530	G	water								X	X						field filtered
Field blank	1-12-22	1626	G	water								X	X						

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

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	1-13-22 812				
2						
3				[signature]	1-13-22 1830	

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

Ver: 06/08/2021

Fredrick, Sandie

From: Blodgett, Meghan <mblodgett@scsengineers.com>
Sent: Friday, January 14, 2022 4:35 PM
To: Fredrick, Sandie; Kron, Nicole; Matzuk, Ryan; Clark, Sherren; Karwoski, Thomas
Cc: Cruz, Rosa; Watson, Adam
Subject: RE: Eurofins North Central Sample Login Confirmation files from 310-223429 Ottumwa Generating Station 25221072
Attachments: OGS_CCR_Rule_ Sampling_2112_rev2_split by COC.xls

EXTERNAL EMAIL*

Sandie,

We submitted two filtered bottles per well, one for each filter size. The filter size was added to each bottle's label (e.g. filtered – 0.45 µm).

Unless there's a way for you to specify the filter size in your tracking & reporting system, I think it makes sense to add the filter size to the sample name for these samples.

So for the samples on COC #3, we will have these updated sample names:

- MW-312, run for alkalinity (unfiltered)
- MW-312 - 0.20 µm, run for the metals listed on the attached spreadsheet under that filter size
- MW-312 – 0.45 µm, run for the metals listed on the attached spreadsheet under that filter size
- MW-313, run for alkalinity (unfiltered)
- MW-313 - 0.20 µm, run for the metals listed on the attached spreadsheet under that filter size
- MW-313 – 0.45 µm, run for the metals listed on the attached spreadsheet under that filter size

Feel free to give me a call to discuss if this doesn't make sense. I'm heading out for daycare pickup now, but could be available first thing Monday.

Meghan Blodgett
SCS Engineers
Madison, WI
608-345-9221 (C)
mblodgett@scsengineers.com

www.scsengineers.com

From: Sandie Fredrick <sandra.fredrick@eurofinset.com>
Sent: Friday, January 14, 2022 3:41 PM
To: Blodgett, Meghan <mblodgett@scsengineers.com>; Kron, Nicole <NKron@scsengineers.com>; Matzuk, Ryan <RMatzuk@scsengineers.com>; Clark, Sherren <SClark@scsengineers.com>; Karwoski, Thomas <TKarwoski@scsengineers.com>
Subject: Eurofins North Central Sample Login Confirmation files from 310-223429 Ottumwa Generating Station 25221072

Hello All,

To confirm, you sent 2 filtered bottles for metals specified as 0.2 & 0.45 for both metals runs correct?
Thanks
Sandie

Attached, please find the Sample Confirmation files for job 310-223429; Ottumwa Generating Station 25221072

Please feel free to contact me if you have any questions.

Thank you.

Sandie Fredrick
Project Manager

Eurofins Environment Testing North Central, LLC
Phone: 920-261-1660

E-mail: sandra.fredrick@eurofinset.com
www.eurofinsus.com/env

Reference: [310-545174]
Attachments: 3

Fredrick, Sandie

From: Blodgett, Meghan <mblodgett@scsengineers.com>
Sent: Friday, January 14, 2022 9:11 PM
To: Fredrick, Sandie
Cc: Jeffrey Maxted; Kron, Nicole; Matzuk, Ryan; Clark, Sherren; Karwoski, Thomas; Radunzel, Ashley
Subject: RE: Eurofins North Central sample confirmation files from 310-223429-1 Ottumwa Generating Station 25221072 REVISED CONFIRMATIONS

EXTERNAL EMAIL*

Sandie,

We need a couple edits – see below. Thanks for the follow-up to make sure these unusual samples are set up correctly!

- We do not need alkalinity or dissolved metals run on the field blanks, so you can cancel those (samples 3 & 6 in this batch)
- Just to make the sample labels crystal clear, please change the name of sample 1 to "MW-312 0.45 um" and sample 2 to "MW-313 0.45 um"

Thanks and have a great weekend,

Meghan Blodgett
SCS Engineers
Madison, WI
608-345-9221 (C)
mblodgett@scsengineers.com

www.scsengineers.com

From: Sandie Fredrick <sandra.fredrick@eurofinset.com>
Sent: Friday, January 14, 2022 5:55 PM
To: Radunzel, Ashley <ARadunzel@scsengineers.com>; Jeffrey Maxted <jeffreymaxted@alliantenergy.com>; Blodgett, Meghan <mblodgett@scsengineers.com>; Kron, Nicole <NKron@scsengineers.com>; Matzuk, Ryan <RMatzuk@scsengineers.com>; Clark, Sherren <SClark@scsengineers.com>; Karwoski, Thomas <TKarwoski@scsengineers.com>
Subject: Eurofins North Central sample confirmation files from 310-223429-1 Ottumwa Generating Station 25221072 REVISED CONFIRMATIONS

Hello Meg,

We received 2 bottles not marked for 0.2 & 0.45 for metals for the field blank. The form notes to not analyze. I have them logged, pleae let me know if you need them cancelled.

Thanks
Sandie

Attached please find the sample confirmation files for job 310-223429-1; Ottumwa Generating Station 25221072

Please feel free to contact me if you have any questions.

Thank you.

Sandie Fredrick
Project Manager

Eurofins Chicago
Phone: 920-261-1660

E-mail: sandra.fredrick@eurofinset.com
www.eurofinsus.com/env

Reference: [500-635466]
Attachments: 4

Eurofins Samples - January 2022
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25221072

					OGS - Ash Pond														
		COC #	Parameter	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	Field Blank	TOTAL
Appendix III Parameters	Unfiltered	1	Boron												x	x	x	3
			Calcium												x	x	x	3
			Chloride												x	x	x	3
			Fluoride												x	x	x	3
			Sulfate												x	x	x	3
			pH												x	x	x	3
			TDS												x	x	x	3
Appendix IV Parameters	Unfiltered	1	Antimony												x	x	x	3
			Arsenic												x	x	x	3
			Barium												x	x	x	3
			Beryllium												x	x	x	3
			Cadmium												x	x	x	3
			Chromium												x	x	x	3
			Cobalt												x	x	x	3
			Lead												x	x	x	3
			Lithium												x	x	x	3
			Mercury												x	x	x	3
			Molybdenum												x	x	x	3
			Selenium												x	x	x	3
			Thallium												x	x	x	3
		2	Radium (report separately)												x	x	x	3
Field Parameters	Unfiltered	1	Ferrous Iron (CHEMets)												x	x		2
			Sulfide (CHEMets)												x	x		2
			Groundwater Elevation												x	x		2
			pH (field)												x	x		2
			Specific Conductance												x	x		2
			Dissolved Oxygen												x	x		2
			ORP												x	x		2
			Temperature												x	x		2
			Turbidity												x	x		2
			Color												x	x		2
			Odor												x	x		2
Additional Lab Parameters - REQUIRES SEPARATE COC	Unfiltered	3	Alkalinity (as CaCO3)												x	x		2
	0.45 µm		Aluminum												x	x		2
			Calcium												x	x		2
			Cobalt												x	x		2
			Iron												x	x		2
			Magnesium												x	x		2
			Manganese												x	x		2
			Sodium												x	x		2
			Potassium												x	x		2
	0.20 µm		Aluminum												x	x		2
			Cobalt												x	x		2
			Iron												x	x		2

Notes: All samples are unfiltered (total) unless otherwise noted.

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\D84274O8\[OGS_CCR_Rule_ Sampling_2112_rev2_split by COC.xls]Sheet1

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-223429-1

Login Number: 223429
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

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

C2 Supplemental Assessment Monitoring, February 2022

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-225356-1
Client Project/Site: Ottumwa Generating Station - 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
3/17/2022 3:09:12 PM
Jim Knapp, Project Manager II
(630)758-0262
Jim.Knapp@Eurofinset.com

Designee for

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

Table of Contents

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Case Narrative

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-225356-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-225356-1

Comments
No additional comments.

Receipt
The samples were received on 2/16/2022 4:45 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 -0.1° C.

RAD
Methods 903.0, 9315: Radium 226 batch 551815
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Field Blank (310-225356-1), MW-312 (310-225356-2), MW-313 (310-225356-3), (LCS 160-551815/1-A), (LCSD 160-551815/2-A) and (MB 160-551815/23-A)

Methods 904.0, 9320: Radium 228 batch 551822
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Field Blank (310-225356-1), MW-312 (310-225356-2), MW-313 (310-225356-3), (LCS 160-551822/1-A), (LCSD 160-551822/2-A) and (MB 160-551822/23-A)

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

Sample Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-225356-1	Field Blank	Water	02/15/22 12:25	02/16/22 16:45
310-225356-2	MW-312	Water	02/15/22 12:03	02/16/22 16:45
310-225356-3	MW-313	Water	02/15/22 11:06	02/16/22 16:45

Detection Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-225356-1

No Detections.

Client Sample ID: MW-312
Lab Sample ID: 310-225356-2

No Detections.

Client Sample ID: MW-313
Lab Sample ID: 310-225356-3

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: Field Blank
Lab Sample ID: 310-225356-1

Date Collected: 02/15/22 12:25
Matrix: Water

Date Received: 02/16/22 16:45

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.0506	U	0.0839	0.0840	1.00	0.145	pCi/L	02/22/22 09:42	03/16/22 09:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.0*		*40 - 110*	*02/22/22 09:42*	*03/16/22 09:37*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.130	U	0.233	0.233	1.00	0.395	pCi/L	02/22/22 10:29	03/08/22 14:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*93.0*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*
Y Carrier	*90.1*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*

Method: 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	0.180	U	0.248	0.248	5.00	0.395	pCi/L		03/16/22 17:24	1

Client Sample ID: MW-312
Lab Sample ID: 310-225356-2

Date Collected: 02/15/22 12:03
Matrix: Water

Date Received: 02/16/22 16:45

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.405		0.130	0.135	1.00	0.126	pCi/L	02/22/22 09:42	03/16/22 09:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.8*		*40 - 110*	*02/22/22 09:42*	*03/16/22 09:38*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.483		0.273	0.277	1.00	0.411	pCi/L	02/22/22 10:29	03/08/22 14:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*88.8*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*
Y Carrier	*89.0*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*

Method: 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	0.888		0.302	0.308	5.00	0.411	pCi/L		03/16/22 17:24	1

Client Sample ID: MW-313
Lab Sample ID: 310-225356-3

Date Collected: 02/15/22 11:06
Matrix: Water

Date Received: 02/16/22 16:45

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.252		0.120	0.122	1.00	0.153	pCi/L	02/22/22 09:42	03/16/22 09:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.5*		*40 - 110*	*02/22/22 09:42*	*03/16/22 09:38*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.999		0.312	0.325	1.00	0.408	pCi/L	02/22/22 10:29	03/08/22 14:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*86.5*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*
Y Carrier	*91.6*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*

Method: 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	1.25		0.334	0.347	5.00	0.408	pCi/L		03/16/22 17:24	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Qualifiers

Rad

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

Glossary

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

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-551815/23-A
Matrix: Water
Analysis Batch: 555611

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 551815

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.01263	U	0.0885	0.0886	1.00	0.170	pCi/L	02/22/22 09:42	03/16/22 09:41	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*68.3*		*40 - 110*	*02/22/22 09:42*	*03/16/22 09:41*	*1*

Lab Sample ID: LCS 160-551815/1-A
Matrix: Water
Analysis Batch: 555612

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 551815

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium 226			11.3	11.11		1.16	1.00	0.120	pCi/L	98	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.3*		*40 - 110*

Lab Sample ID: LCSD 160-551815/2-A
Matrix: Water
Analysis Batch: 555612

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 551815

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium 226			11.3	11.28		1.18	1.00	0.116	pCi/L	99	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*87.8*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-551822/23-A
Matrix: Water
Analysis Batch: 554090

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 551822

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.2687	U	0.333	0.334	1.00	0.551	pCi/L	02/22/22 10:29	03/08/22 14:08	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*68.3*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*
Y Carrier	*87.9*		*40 - 110*	*02/22/22 10:29*	*03/08/22 14:08*	*1*

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

Lab Sample ID: LCS 160-551822/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 554285
Prep Batch: 551822

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium 228			8.81	8.981		1.06	1.00	0.334	pCi/L	102	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba	*91.3*		*40 - 110*
Y Carrier	*84.9*		*40 - 110*

Lab Sample ID: LCSD 160-551822/2-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 554285
Prep Batch: 551822

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium 228			8.81	9.123		1.08	1.00	0.363	pCi/L	104	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba	*87.8*		*40 - 110*
Y Carrier	*85.6*		*40 - 110*

QC Association Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Rad

Prep Batch: 551815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225356-1	Field Blank	Total/NA	Water	PrecSep-21	
310-225356-2	MW-312	Total/NA	Water	PrecSep-21	
310-225356-3	MW-313	Total/NA	Water	PrecSep-21	
MB 160-551815/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-551815/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-551815/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 551822

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225356-1	Field Blank	Total/NA	Water	PrecSep_0	
310-225356-2	MW-312	Total/NA	Water	PrecSep_0	
310-225356-3	MW-313	Total/NA	Water	PrecSep_0	
MB 160-551822/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-551822/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-551822/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-225356-1
Date Collected: 02/15/22 12:25
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			551815	02/22/22 09:42	LPS	TAL SL
Total/NA	Analysis	903.0		1	555612	03/16/22 09:37	FLC	TAL SL
Total/NA	Prep	PrecSep_0			551822	02/22/22 10:29	LPS	TAL SL
Total/NA	Analysis	904.0		1	554090	03/08/22 14:08	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	555653	03/16/22 17:24	EMH	TAL SL

Client Sample ID: MW-312
Lab Sample ID: 310-225356-2
Date Collected: 02/15/22 12:03
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			551815	02/22/22 09:42	LPS	TAL SL
Total/NA	Analysis	903.0		1	555612	03/16/22 09:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			551822	02/22/22 10:29	LPS	TAL SL
Total/NA	Analysis	904.0		1	554090	03/08/22 14:08	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	555653	03/16/22 17:24	EMH	TAL SL

Client Sample ID: MW-313
Lab Sample ID: 310-225356-3
Date Collected: 02/15/22 11:06
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			551815	02/22/22 09:42	LPS	TAL SL
Total/NA	Analysis	903.0		1	555612	03/16/22 09:38	FLC	TAL SL
Total/NA	Prep	PrecSep_0			551822	02/22/22 10:29	LPS	TAL SL
Total/NA	Analysis	904.0		1	554090	03/08/22 14:08	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	555653	03/16/22 17:24	EMH	TAL SL

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

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	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-07-23
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	06-30-21 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-22
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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

Method Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

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310-225356 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: SCS			
City/State: CITY Madison	STATE WI	Project:	
Receipt Information			
Date/Time Received:	DATE 2-16-22	TIME 1645	Received By: AL

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

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

Temperature Record				
Coolant:	☑ Wet ice	☐ Blue ice	☐ Dry ice	☐ Other:_____ ☐ NONE
Thermometer ID:	0	Correction Factor (°C):	0	
Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature				
Uncorrected Temp (°C):	-0.1	Corrected Temp (°C):	-0.1	

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

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Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-67928-19580.1
Client Contact: Meghan Blodgett	Phone:	E-Mail: sandra.fredrick@eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:

Address: 2830 Dairy Drive	Due Date Requested:
City: Madison	TAT Requested (days):
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No
Phone:	PO #: 25221072
Email: mblodgett@scsengineers.com	WO #:
Project Name: Ottumwa Generating Station - 25221072	Project #: 31011020
Site:	SSOW#:

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 - Radium-226 (GFPC)	904.0 - Radium-228 (GFPC)	9056A_ORGFM_28D - Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	2320B - Alkalinity	6020A - D. Metals (4)	6020A - Metals (5))	9056A_ORGFM_28D - Fluoride	6020A - Metals (1)				Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N	N	D	D	N	D					
Field blank	2-15-22	12:25	G	Water			X	X													
MW-312	2-15-22	12:03	G	Water			X	X													
MW-313	2-15-22	11:06	G	Water			X	X													
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	
				Water																	

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

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by: Rosa Cruz	Date/Time: 2-16-22	Company	Received by:	Date/Time.	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time.	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 2-16 22 1645	Company

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

Ver: 06/08/2021

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

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-46707.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: sandra.fredrick@eurofinset.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-225356-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 3/17/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station - 25222072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
Field Blank (310-225356-1)	2/15/22	12:25 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-312 (310-225356-2)	2/15/22	12:03 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-313 (310-225356-3)	2/15/22	11:06 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

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

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

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	2/17/22 1445		FED EX		
2	Relinquished by: FED EX	Date/Time:	Company	Received by: Sierra Worthington	Date/Time: 2-18-22 1050	Company GTMSR
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 06/08/2021

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-225356-1
Project/Site: Ottumwa Generating Station - 25222072

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
310-225356-1	Field Blank	93.0
310-225356-2	MW-312	88.8
310-225356-3	MW-313	86.5
LCS 160-551815/1-A	Lab Control Sample	91.3
LCSD 160-551815/2-A	Lab Control Sample Dup	87.8
MB 160-551815/23-A	Method Blank	68.3

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
310-225356-1	Field Blank	93.0	90.1
310-225356-2	MW-312	88.8	89.0
310-225356-3	MW-313	86.5	91.6
LCS 160-551822/1-A	Lab Control Sample	91.3	84.9
LCSD 160-551822/2-A	Lab Control Sample Dup	87.8	85.6
MB 160-551822/23-A	Method Blank	68.3	87.9

Tracer/Carrier Legend

Ba = Ba
Y = Y Carrier

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-225359-1
Client Project/Site: Ottumwa Generating Station - 25222072
Revision: 1

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
3/24/2022 11:23:02 AM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-225359-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-225359-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 3/8/2022. The report (revision 1) is being revised due to: Updated sample dates for MW-312 & 313 and Field Blank.

Receipt
The samples were received on 2/16/2022 4:45 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 -0.1° C.

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

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-225359-1	MW-305	Water	02/14/22 11:24	02/16/22 16:45
310-225359-2	MW-306	Water	02/14/22 13:39	02/16/22 16:45
310-225359-3	MW-312	Water	02/15/22 12:03	02/16/22 16:45
310-225359-4	MW-313	Water	02/15/22 11:06	02/16/22 16:45
310-225359-5	Field Blank	Water	02/15/22 12:25	02/16/22 16:45

Detection Summary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-305 — Lab Sample ID: 310-225359-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	20		0.50	0.19	ug/L	1		6020A	Total/NA
Ground Water Elevation	656.35				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	50.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	4.80				mg/L	1		Field Sampling	Total/NA
pH, Field	7.20				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1500				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.38				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-306 — Lab Sample ID: 310-225359-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	8.8		0.50	0.19	ug/L	1		6020A	Total/NA
Ground Water Elevation	663.66				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	39.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.05				mg/L	1		Field Sampling	Total/NA
pH, Field	7.07				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1770				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.6				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-312 — Lab Sample ID: 310-225359-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.37	J	0.50	0.22	mg/L	5		9056A	Total/NA
Sulfate	570		20	8.0	mg/L	20		9056A	Total/NA
Arsenic	4.1		2.0	0.75	ug/L	1		6020A	Total/NA
Barium	63		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	420		100	58	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	6.1		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	31		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	1.6	J	2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	930		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	-				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-67.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.34				mg/L	1		Field Sampling	Total/NA
pH, Field	7.24				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1800				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.01				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-225359-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	170		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	570		20	8.0	mg/L	20		9056A	Total/NA
Arsenic	1.0	J	2.0	0.75	ug/L	1		6020A	Total/NA
Barium	44		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	510		100	58	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-313 (Continued) — Lab Sample ID: 310-225359-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	200		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	5.7		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	26		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	5.3		2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1100		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	-				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-29.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.22				mg/L	1		Field Sampling	Total/NA
pH, Field	7.01				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	925				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.89				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: Field Blank — Lab Sample ID: 310-225359-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	0.25	J	0.50	0.19	mg/L	1		6020A	Total/NA
pH	6.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-305
Date Collected: 02/14/22 11:24
Date Received: 02/16/22 16:45

Lab Sample ID: 310-225359-1
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	20		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 21:09	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	656.35				ft			02/14/22 11:24	1
Oxidation Reduction Potential	50.0				millivolts			02/14/22 11:24	1
Oxygen, Dissolved, Client Supplied	4.80				mg/L			02/14/22 11:24	1
pH, Field	7.20				SU			02/14/22 11:24	1
Specific Conductance, Field	1500				umhos/cm			02/14/22 11:24	1
Temperature, Field	12.38				Degrees C			02/14/22 11:24	1
Turbidity, Field	0.00				NTU			02/14/22 11:24	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-306
Lab Sample ID: 310-225359-2
Date Collected: 02/14/22 13:39
Matrix: Water
Date Received: 02/16/22 16:45

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	8.8		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 21:12	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	663.66				ft			02/14/22 13:39	1
Oxidation Reduction Potential	39.0				millivolts			02/14/22 13:39	1
Oxygen, Dissolved, Client Supplied	1.05				mg/L			02/14/22 13:39	1
pH, Field	7.07				SU			02/14/22 13:39	1
Specific Conductance, Field	1770				umhos/cm			02/14/22 13:39	1
Temperature, Field	13.6				Degrees C			02/14/22 13:39	1
Turbidity, Field	0.00				NTU			02/14/22 13:39	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Date Collected: 02/15/22 12:03
Date Received: 02/16/22 16:45

Lab Sample ID: 310-225359-3
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		5.0	2.3	mg/L			02/23/22 20:54	5
Fluoride	0.37	J	0.50	0.22	mg/L			02/23/22 20:54	5
Sulfate	570		20	8.0	mg/L			02/23/22 21:10	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		02/18/22 09:00	02/21/22 21:15	1
Arsenic	4.1		2.0	0.75	ug/L		02/18/22 09:00	02/21/22 21:15	1
Barium	63		2.0	0.88	ug/L		02/18/22 09:00	02/21/22 21:15	1
Beryllium	<0.27		1.0	0.27	ug/L		02/18/22 09:00	02/21/22 21:15	1
Boron	420		100	58	ug/L		02/18/22 09:00	02/21/22 21:15	1
Cadmium	<0.055		0.10	0.055	ug/L		02/18/22 09:00	02/21/22 21:15	1
Calcium	180		0.50	0.19	mg/L		02/18/22 09:00	02/21/22 21:15	1
Chromium	<1.1		5.0	1.1	ug/L		02/18/22 09:00	02/21/22 21:15	1
Cobalt	6.1		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 21:15	1
Lead	<0.24		0.50	0.24	ug/L		02/18/22 09:00	02/21/22 21:15	1
Lithium	31		10	2.5	ug/L		02/18/22 09:00	02/21/22 21:15	1
Molybdenum	1.6	J	2.0	1.2	ug/L		02/18/22 09:00	02/21/22 21:15	1
Selenium	<0.96		5.0	0.96	ug/L		02/18/22 09:00	02/21/22 21:15	1
Thallium	<0.26		1.0	0.26	ug/L		02/18/22 09:00	02/21/22 21:15	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		02/21/22 15:33	02/23/22 17:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	930		250	130	mg/L			02/17/22 14:46	1
pH	7.3	HF	0.1	0.1	SU			02/16/22 20:19	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	-				ft			02/14/22 12:03	1
Oxidation Reduction Potential	-67.0				millivolts			02/14/22 12:03	1
Oxygen, Dissolved, Client Supplied	1.34				mg/L			02/14/22 12:03	1
pH, Field	7.24				SU			02/14/22 12:03	1
Specific Conductance, Field	1800				umhos/cm			02/14/22 12:03	1
Temperature, Field	13.01				Degrees C			02/14/22 12:03	1
Turbidity, Field	0.00				NTU			02/14/22 12:03	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-313
Date Collected: 02/15/22 11:06
Date Received: 02/16/22 16:45

Lab Sample ID: 310-225359-4
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		5.0	2.3	mg/L			02/23/22 21:26	5
Fluoride	<0.22		0.50	0.22	mg/L			02/23/22 21:26	5
Sulfate	**570**		20	8.0	mg/L			02/23/22 21:41	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		02/18/22 09:00	02/21/22 21:18	1
Arsenic	**1.0**	**J**	2.0	0.75	ug/L		02/18/22 09:00	02/21/22 21:18	1
Barium	**44**		2.0	0.88	ug/L		02/18/22 09:00	02/21/22 21:18	1
Beryllium	<0.27		1.0	0.27	ug/L		02/18/22 09:00	02/21/22 21:18	1
Boron	**510**		100	58	ug/L		02/18/22 09:00	02/21/22 21:18	1
Cadmium	<0.055		0.10	0.055	ug/L		02/18/22 09:00	02/21/22 21:18	1
Calcium	**200**		0.50	0.19	mg/L		02/18/22 09:00	02/21/22 21:18	1
Chromium	<1.1		5.0	1.1	ug/L		02/18/22 09:00	02/21/22 21:18	1
Cobalt	**5.7**		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 21:18	1
Lead	<0.24		0.50	0.24	ug/L		02/18/22 09:00	02/21/22 21:18	1
Lithium	**26**		10	2.5	ug/L		02/18/22 09:00	02/21/22 21:18	1
Molybdenum	**5.3**		2.0	1.2	ug/L		02/18/22 09:00	02/21/22 21:18	1
Selenium	<0.96		5.0	0.96	ug/L		02/18/22 09:00	02/21/22 21:18	1
Thallium	<0.26		1.0	0.26	ug/L		02/18/22 09:00	02/21/22 21:18	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		02/21/22 15:33	02/23/22 17:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		250	130	mg/L			02/17/22 14:46	1
pH	**7.1**	**HF**	0.1	0.1	SU			02/16/22 20:26	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**-**				ft			02/14/22 11:06	1
Oxidation Reduction Potential	**-29.0**				millivolts			02/14/22 11:06	1
Oxygen, Dissolved, Client Supplied	**1.22**				mg/L			02/14/22 11:06	1
pH, Field	**7.01**				SU			02/14/22 11:06	1
Specific Conductance, Field	**925**				umhos/cm			02/14/22 11:06	1
Temperature, Field	**13.89**				Degrees C			02/14/22 11:06	1
Turbidity, Field	**0.00**				NTU			02/14/22 11:06	1

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-225359-5
Date Collected: 02/15/22 12:25
Matrix: Water
Date Received: 02/16/22 16:45

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			02/23/22 21:57	1
Fluoride	<0.044		0.10	0.044	mg/L			02/23/22 21:57	1
Sulfate	<0.40		1.0	0.40	mg/L			02/23/22 21:57	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		02/18/22 09:00	02/21/22 21:22	1
Arsenic	<0.75		2.0	0.75	ug/L		02/18/22 09:00	02/21/22 21:22	1
Barium	<0.88		2.0	0.88	ug/L		02/18/22 09:00	02/21/22 21:22	1
Beryllium	<0.27		1.0	0.27	ug/L		02/18/22 09:00	02/21/22 21:22	1
Boron	<58		100	58	ug/L		02/18/22 09:00	02/21/22 21:22	1
Cadmium	<0.055		0.10	0.055	ug/L		02/18/22 09:00	02/21/22 21:22	1
Calcium	**0.25**	**J**	0.50	0.19	mg/L		02/18/22 09:00	02/21/22 21:22	1
Chromium	<1.1		5.0	1.1	ug/L		02/18/22 09:00	02/21/22 21:22	1
Cobalt	<0.19		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 21:22	1
Lead	<0.24		0.50	0.24	ug/L		02/18/22 09:00	02/21/22 21:22	1
Lithium	<2.5		10	2.5	ug/L		02/18/22 09:00	02/21/22 21:22	1
Molybdenum	<1.2		2.0	1.2	ug/L		02/18/22 09:00	02/21/22 21:22	1
Selenium	<0.96		5.0	0.96	ug/L		02/18/22 09:00	02/21/22 21:22	1
Thallium	<0.26		1.0	0.26	ug/L		02/18/22 09:00	02/21/22 21:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		50	26	mg/L			02/17/22 14:46	1
pH	**6.7**	**HF**	0.1	0.1	SU			02/16/22 20:24	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

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
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	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-344880/3
Matrix: Water
Analysis Batch: 344880

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			02/23/22 16:45	1
Fluoride	<0.044		0.10	0.044	mg/L			02/23/22 16:45	1
Sulfate	<0.40		1.0	0.40	mg/L			02/23/22 16:45	1

Lab Sample ID: LCS 310-344880/4
Matrix: Water
Analysis Batch: 344880

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	10.5		mg/L		105	90 - 110
Fluoride	2.00	2.03		mg/L		101	90 - 110
Sulfate	10.0	10.7		mg/L		107	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-344287/1-A
Matrix: Water
Analysis Batch: 344583

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 344287

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		02/18/22 09:00	02/21/22 20:38	1
Arsenic	<0.75		2.0	0.75	ug/L		02/18/22 09:00	02/21/22 20:38	1
Barium	<0.88		2.0	0.88	ug/L		02/18/22 09:00	02/21/22 20:38	1
Beryllium	<0.27		1.0	0.27	ug/L		02/18/22 09:00	02/21/22 20:38	1
Boron	<58		100	58	ug/L		02/18/22 09:00	02/21/22 20:38	1
Cadmium	<0.055		0.10	0.055	ug/L		02/18/22 09:00	02/21/22 20:38	1
Calcium	<0.19		0.50	0.19	mg/L		02/18/22 09:00	02/21/22 20:38	1
Chromium	<1.1		5.0	1.1	ug/L		02/18/22 09:00	02/21/22 20:38	1
Cobalt	<0.19		0.50	0.19	ug/L		02/18/22 09:00	02/21/22 20:38	1
Lead	<0.24		0.50	0.24	ug/L		02/18/22 09:00	02/21/22 20:38	1
Lithium	<2.5		10	2.5	ug/L		02/18/22 09:00	02/21/22 20:38	1
Molybdenum	<1.2		2.0	1.2	ug/L		02/18/22 09:00	02/21/22 20:38	1
Selenium	<0.96		5.0	0.96	ug/L		02/18/22 09:00	02/21/22 20:38	1
Thallium	<0.26		1.0	0.26	ug/L		02/18/22 09:00	02/21/22 20:38	1

Lab Sample ID: LCS 310-344287/2-A
Matrix: Water
Analysis Batch: 344583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 344287

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	200	205		ug/L		102	80 - 120
Arsenic	200	190		ug/L		95	80 - 120
Barium	100	104		ug/L		104	80 - 120
Beryllium	100	98.1		ug/L		98	80 - 120
Boron	200	176		ug/L		88	80 - 120
Cadmium	100	96.7		ug/L		97	80 - 120
Calcium	2.00	1.86		mg/L		93	80 - 120
Chromium	100	94.5		ug/L		94	80 - 120
Cobalt	100	97.1		ug/L		97	80 - 120

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

Lab Sample ID: LCS 310-344287/2-A
Matrix: Water
Analysis Batch: 344583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 344287

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	200	196		ug/L		98	80 - 120
Lithium	200	193		ug/L		96	80 - 120
Molybdenum	200	201		ug/L		100	80 - 120
Selenium	400	361		ug/L		90	80 - 120
Thallium	200	202		ug/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 310-344541/2-A
Matrix: Water
Analysis Batch: 344758

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 344541

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.50		ug/L		90	80 - 120

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

Lab Sample ID: MB 310-344280/1
Matrix: Water
Analysis Batch: 344280

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	<26		50	26	mg/L			02/17/22 14:46	1

Lab Sample ID: LCS 310-344280/2
Matrix: Water
Analysis Batch: 344280

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	902		mg/L		90	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-344161/1
Matrix: Water
Analysis Batch: 344161

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

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

Lab Sample ID: 310-225359-3 DU
Matrix: Water
Analysis Batch: 344161

Client Sample ID: MW-312
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.3	HF	7.3		SU		0.3	20

HPLC/IC

Analysis Batch: 344880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-3	MW-312	Total/NA	Water	9056A	
310-225359-3	MW-312	Total/NA	Water	9056A	
310-225359-4	MW-313	Total/NA	Water	9056A	
310-225359-4	MW-313	Total/NA	Water	9056A	
310-225359-5	Field Blank	Total/NA	Water	9056A	
MB 310-344880/3	Method Blank	Total/NA	Water	9056A	
LCS 310-344880/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 344287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-1	MW-305	Total/NA	Water	3005A	
310-225359-2	MW-306	Total/NA	Water	3005A	
310-225359-3	MW-312	Total/NA	Water	3005A	
310-225359-4	MW-313	Total/NA	Water	3005A	
310-225359-5	Field Blank	Total/NA	Water	3005A	
MB 310-344287/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-344287/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 344541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-3	MW-312	Total/NA	Water	7470A	
310-225359-4	MW-313	Total/NA	Water	7470A	
LCS 310-344541/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 344583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-1	MW-305	Total/NA	Water	6020A	344287
310-225359-2	MW-306	Total/NA	Water	6020A	344287
310-225359-3	MW-312	Total/NA	Water	6020A	344287
310-225359-4	MW-313	Total/NA	Water	6020A	344287
310-225359-5	Field Blank	Total/NA	Water	6020A	344287
MB 310-344287/1-A	Method Blank	Total/NA	Water	6020A	344287
LCS 310-344287/2-A	Lab Control Sample	Total/NA	Water	6020A	344287

Analysis Batch: 344758

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-3	MW-312	Total/NA	Water	7470A	344541
310-225359-4	MW-313	Total/NA	Water	7470A	344541
LCS 310-344541/2-A	Lab Control Sample	Total/NA	Water	7470A	344541

General Chemistry

Analysis Batch: 344161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-3	MW-312	Total/NA	Water	SM 4500 H+ B	
310-225359-4	MW-313	Total/NA	Water	SM 4500 H+ B	
310-225359-5	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-344161/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-225359-3 DU	MW-312	Total/NA	Water	SM 4500 H+ B	

QC Association Summary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

General Chemistry

Analysis Batch: 344280

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-3	MW-312	Total/NA	Water	SM 2540C	
310-225359-4	MW-313	Total/NA	Water	SM 2540C	
310-225359-5	Field Blank	Total/NA	Water	SM 2540C	
MB 310-344280/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-344280/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 345848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-1	MW-305	Total/NA	Water	Field Sampling	
310-225359-2	MW-306	Total/NA	Water	Field Sampling	
310-225359-3	MW-312	Total/NA	Water	Field Sampling	

Analysis Batch: 345919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225359-4	MW-313	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-305
Lab Sample ID: 310-225359-1
Date Collected: 02/14/22 11:24
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:09	SAP	TAL CF
Total/NA	Analysis	Field Sampling		1	345848	02/14/22 11:24	SLD	TAL CF

Client Sample ID: MW-306
Lab Sample ID: 310-225359-2
Date Collected: 02/14/22 13:39
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:12	SAP	TAL CF
Total/NA	Analysis	Field Sampling		1	345848	02/14/22 13:39	SLD	TAL CF

Client Sample ID: MW-312
Lab Sample ID: 310-225359-3
Date Collected: 02/15/22 12:03
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	344880	02/23/22 20:54	JNR	TAL CF
Total/NA	Analysis	9056A		20	344880	02/23/22 21:10	JNR	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:15	SAP	TAL CF
Total/NA	Prep	7470A			344541	02/21/22 15:33	EAM	TAL CF
Total/NA	Analysis	7470A		1	344758	02/23/22 17:41	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	344280	02/17/22 14:46	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	344161	02/16/22 20:19	JWH	TAL CF
Total/NA	Analysis	Field Sampling		1	345848	02/14/22 12:03	SLD	TAL CF

Client Sample ID: MW-313
Lab Sample ID: 310-225359-4
Date Collected: 02/15/22 11:06
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	344880	02/23/22 21:26	JNR	TAL CF
Total/NA	Analysis	9056A		20	344880	02/23/22 21:41	JNR	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:18	SAP	TAL CF
Total/NA	Prep	7470A			344541	02/21/22 15:33	EAM	TAL CF
Total/NA	Analysis	7470A		1	344758	02/23/22 17:43	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	344280	02/17/22 14:46	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	344161	02/16/22 20:26	JWH	TAL CF
Total/NA	Analysis	Field Sampling		1	345919	02/14/22 11:06	SLD	TAL CF

Lab Chronicle

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-225359-5
Date Collected: 02/15/22 12:25
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	344880	02/23/22 21:57	JNR	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:22	SAP	TAL CF
Total/NA	Analysis	SM 2540C		1	344280	02/17/22 14:46	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	344161	02/16/22 20:24	JWH	TAL CF

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-225359-1
Project/Site: Ottumwa Generating Station - 25222072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

EPA = US Environmental Protection Agency

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.

Laboratory References:

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

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310-225359 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 2-16-22 TIME 1645 Received By: PL

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

Condition of Cooler/Containers

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

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

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

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

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

Temperature Record

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

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

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

Uncorrected Temp (°C): -0.1 Corrected Temp (°C): -0.1

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

Chain of Custody Record 458916

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Address _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other: TAL-8210

Client Contact	Project Manager: Meghan Blodgett	Site Contact:	Date:	COC No 2
Company Name SCS Engineers	Tel/Email: MBlodgett@SCSengineers.com	Lab Contact:	Carrier:	2 of 4 COCs
Address 8456 Hickman RD Suite 27	Analysis Turnaround Time			Sampler
City/State/Zip Clive IA, 50325	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone 608-509-8245	TAT if different from Below _____			Walk-in Client
Fax	☐ 2 weeks			Lab Sampling
Project Name	☐ 1 week			
Site Ottumwa Generating Station	☐ 2 days			Job / SDG No.
PO# 23221072	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	6020A-Metals (S)	6020B-D-Metals (4)	9056A_Oregon_28D	TDS/PH	2320B	7470A, 6020 (W)	Sample Specific Notes
MW-305	2-14-22	11:24	G	W				X						6020A-D. Metals (4) is
MW-306	2-14-22	13:39	G	W				X						field filtered
MW-312	2-15-22	12:03	G	W		Y		X	X	X	X	X	X	
MW-313	2-15-22	11:06	G	W		Y		X	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact ☐ Yes ☐ No | Custody Seal No | Cooler Temp (°C). Obs'd _____ Corr'd._____ Therm ID No _____

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	SCS Engineers	2-16-22			
Relinquished by	Company	Date/Time	Received by:	Company	Date/Time
Relinquished by	Company	Date/Time	Received in Laboratory by. MC	Company.	Date/Time 2-16 22 1645

3/24/2022 (Rev. 1)

Chain of Custody Record 458917

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Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: Meghan Blodgett	Site Contact:	Date:	COC No 1
Company Name: SCS Engineers	Tel/Email: MBlodgett@scsengineers.com	Lab Contact:	Carrier:	1 of 4 COCs
Address: 8450 Hickman RD suite 27	Analysis Turnaround Time			Sampler: Rosa Cruz
City/State/Zip: Clive, IA 50325	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 608-509-8245	TAT if different from Below _____			Walk-in Client
Fax:	☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day			Lab Sampling
Project Name				Job / SDG No
Site: Ottumwa Generating Station				
PO# 2522 6072				

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	7470A_6020A	Radium 226	Radium 228	9056A_9056FM_28D	TDS/PH	Sample Specific Notes:
Field blank	2-15-22	12:25	G	W	5			X	X	X	X	X	FB = field blank

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact ☐ Yes ☐ No | Custody Seal No | Cooler Temp (°C) Obs'd _____ Corr'd _____ Therm ID No _____

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	SCS Engineers	2-16-22			
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Relinquished by	Company	Date/Time	Received in Laboratory by [signature]	Company	Date/Time
					2-16 22 1645

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

		COC Set #1 (Blank & Background)		COC Set #2 (Ash Pond)											COC Set #3 (ZLDP)			River gauge point (near MW-310 nest)	
	Parameter	MW-301	Field Blank	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-307	MW-308	MW-309		TOTAL
Appendix III Parameters	Boron		x											x	x					3
	Calcium		x											x	x					3
	Chloride		x											x	x					3
	Fluoride		x											x	x					3
	pH		x											x	x					3
	Sulfate		x											x	x					3
	TDS		x											x	x					3
Appendix IV Parameters	Antimony		x											x	x					3
	Arsenic		x											x	x					3
	Barium		x											x	x					3
	Beryllium		x											x	x					3
	Cadmium		x											x	x					3
	Chromium		x											x	x					3
	Cobalt		x				x		x					x	x	x				6
	Fluoride		x											x	x					3
	Lead		x											x	x					3
	Lithium		x											x	x					3
	Mercury		x											x	x					3
	Molybdenum		x											x	x					3
	Selenium		x											x	x					3
	Thallium		x											x	x					3
	Radium (separate COCs)		x											x	x					3
Additional Lab Parameters - REQUIRES SEPARATE COC	Bicarbonate (total)													x	x					2
	Carbonate (total)													x	x					2
	Iron (total)													x	x					2
	Magnesium (total)													x	x					2
	Manganese (total)													x	x					2
	Potassium (total)													x	x					2
	Sodium (total)													x	x					2
	Cobalt (di													x	x					2
	Iron (di													x	x					2
	Lithium (di													x	x					2
	Manganese (di													x	x					2
Field Parameters	Ferrous Iron (CHEMets)									x				x	x					3
	Sulfide (CHEMets)									x				x	x					3
	Groundwater Elevation	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		16
	Surface Water Elevation																		x	1
	Well Depth																			0
	pH (field)									x				x	x	x				4
	Specific Conductance									x				x	x	x				4
	Dissolved Oxygen									x				x	x	x				4
	ORP									x				x	x	x				4
	Temperature									x				x	x	x				4
	Turbidity									x				x	x	x				4
	Color									x				x	x	x				4
	Odor									x				x	x	x				4

Notes All samples are unfiltered (total)

I \25221072.00\Data and Calculations\Field Work Requests\[OGS_CCR_Rule_ Sampling_2202.xls]Sheet1

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-225359-1
SDG Number:

Login Number: 225359
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

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

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25222072.00
February 2022

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-305	2/14/2022 1124	656.35	12.38	7.20	4.80	1500	50.0	0.00
MW-306	2/14/2022 1339	663.66	13.6	7.07	1.05	1770	39.0	0.00
MW-312	2/15/2022 1203	--	13.01	7.24	1.34	1800	-67.0	0.00
MW-313	2/15/2022 1106	--	13.89	7.01	1.22	925	-29.0	0.00

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

Created by: MDB Date: 5/1/2017
Last revision by: RM Date: 3/21/2022
Checked by: NDK Date: 3/21/2022

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\D84274O8\[2022_February - OGS AP_CCR_Field.xlsx]GW Field Parameters

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-225360-1
Client Project/Site: Ottumwa Generating Station - 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
2/24/2022 4:20:14 PM

Sandie Fredrick, Project Manager II
(920)261-1660
sandra.fredrick@eurofinset.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-225360-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-225360-1

Comments
No additional comments.

Receipt
The samples were received on 2/16/2022 4:45 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 -0.1° C.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-225360-1	MW-312	Water	02/14/22 12:03	02/16/22 16:45
310-225360-2	MW-313	Water	02/14/22 11:06	02/16/22 16:45

Detection Summary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312 — Lab Sample ID: 310-225360-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	440		100	36	ug/L	1		6020A	Total/NA
Magnesium	54000		500	150	ug/L	1		6020A	Total/NA
Manganese	1300		10	3.6	ug/L	1		6020A	Total/NA
Potassium	4300		500	150	ug/L	1		6020A	Total/NA
Sodium	130000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	5.6		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	380		100	36	ug/L	1		6020A	Dissolved
Lithium	31		10	2.5	ug/L	1		6020A	Dissolved
Manganese	1100		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-225360-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	380		100	36	ug/L	1		6020A	Total/NA
Magnesium	58000		500	150	ug/L	1		6020A	Total/NA
Manganese	3700		10	3.6	ug/L	1		6020A	Total/NA
Potassium	5900		500	150	ug/L	1		6020A	Total/NA
Sodium	120000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	5.2		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	290		100	36	ug/L	1		6020A	Dissolved
Lithium	26		10	2.5	ug/L	1		6020A	Dissolved
Manganese	3200		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	250		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	250		10	4.6	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Lab Sample ID: 310-225360-1
Date Collected: 02/14/22 12:03
Matrix: Water
Date Received: 02/16/22 16:45

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	440		100	36	ug/L		02/18/22 09:00	02/21/22 21:25	1
Magnesium	54000		500	150	ug/L		02/18/22 09:00	02/21/22 21:25	1
Manganese	1300		10	3.6	ug/L		02/18/22 09:00	02/21/22 21:25	1
Potassium	4300		500	150	ug/L		02/18/22 09:00	02/21/22 21:25	1
Sodium	130000		1000	610	ug/L		02/18/22 09:00	02/21/22 21:25	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	5.6		0.50	0.19	ug/L		02/18/22 09:00	02/22/22 15:54	1
Iron	380		100	36	ug/L		02/18/22 09:00	02/22/22 15:54	1
Lithium	31		10	2.5	ug/L		02/18/22 09:00	02/22/22 15:54	1
Manganese	1100		10	3.6	ug/L		02/18/22 09:00	02/22/22 15:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	230		10	4.6	mg/L			02/18/22 10:47	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			02/18/22 10:47	1
Total Alkalinity as CaCO3	230		10	4.6	mg/L			02/18/22 10:47	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-313
Date Collected: 02/14/22 11:06
Date Received: 02/16/22 16:45

Lab Sample ID: 310-225360-2
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	380		100	36	ug/L		02/18/22 09:00	02/24/22 14:25	1
Magnesium	58000		500	150	ug/L		02/18/22 09:00	02/21/22 21:34	1
Manganese	3700		10	3.6	ug/L		02/18/22 09:00	02/24/22 14:25	1
Potassium	5900		500	150	ug/L		02/18/22 09:00	02/21/22 21:34	1
Sodium	120000		1000	610	ug/L		02/18/22 09:00	02/21/22 21:34	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	5.2		0.50	0.19	ug/L		02/18/22 09:00	02/22/22 15:57	1
Iron	290		100	36	ug/L		02/18/22 09:00	02/22/22 15:57	1
Lithium	26		10	2.5	ug/L		02/18/22 09:00	02/22/22 15:57	1
Manganese	3200		10	3.6	ug/L		02/18/22 09:00	02/22/22 15:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	250		10	4.6	mg/L			02/18/22 10:47	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			02/18/22 10:47	1
Total Alkalinity as CaCO3	250		10	4.6	mg/L			02/18/22 10:47	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Glossary

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

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-344284/1-A
Matrix: Water
Analysis Batch: 344699

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 344284

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.19		0.50	0.19	ug/L		02/18/22 09:00	02/22/22 15:10	1
Iron	<36		100	36	ug/L		02/18/22 09:00	02/22/22 15:10	1
Lithium	<2.5		10	2.5	ug/L		02/18/22 09:00	02/22/22 15:10	1
Manganese	<3.6		10	3.6	ug/L		02/18/22 09:00	02/22/22 15:10	1

Lab Sample ID: LCS 310-344284/2-A
Matrix: Water
Analysis Batch: 344699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 344284

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	100	96.9		ug/L		97	80 - 120
Iron	200	191		ug/L		96	80 - 120
Lithium	200	199		ug/L		100	80 - 120
Manganese	100	95.2		ug/L		95	80 - 120

Lab Sample ID: MB 310-344287/1-A
Matrix: Water
Analysis Batch: 344583

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 344287

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		02/18/22 09:00	02/21/22 20:38	1
Magnesium	<150		500	150	ug/L		02/18/22 09:00	02/21/22 20:38	1
Manganese	<3.6		10	3.6	ug/L		02/18/22 09:00	02/21/22 20:38	1
Potassium	<150		500	150	ug/L		02/18/22 09:00	02/21/22 20:38	1
Sodium	<610		1000	610	ug/L		02/18/22 09:00	02/21/22 20:38	1

Lab Sample ID: LCS 310-344287/2-A
Matrix: Water
Analysis Batch: 344583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 344287

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	200	206		ug/L		103	80 - 120
Magnesium	2000	2030		ug/L		102	80 - 120
Manganese	100	98.8		ug/L		99	80 - 120
Potassium	2000	2010		ug/L		101	80 - 120
Sodium	2000	2090		ug/L		105	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-344371/1
Matrix: Water
Analysis Batch: 344371

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			02/18/22 10:47	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			02/18/22 10:47	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			02/18/22 10:47	1

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 310-344371/2
Matrix: Water
Analysis Batch: 344371

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	990		mg/L		99	90 - 110

QC Association Summary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Metals

Prep Batch: 344284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-1	MW-312	Dissolved	Water	3005A	
310-225360-2	MW-313	Dissolved	Water	3005A	
MB 310-344284/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-344284/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 344287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-1	MW-312	Total/NA	Water	3005A	
310-225360-2	MW-313	Total/NA	Water	3005A	
MB 310-344287/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-344287/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 344583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-1	MW-312	Total/NA	Water	6020A	344287
310-225360-2	MW-313	Total/NA	Water	6020A	344287
MB 310-344287/1-A	Method Blank	Total/NA	Water	6020A	344287
LCS 310-344287/2-A	Lab Control Sample	Total/NA	Water	6020A	344287

Analysis Batch: 344699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-1	MW-312	Dissolved	Water	6020A	344284
310-225360-2	MW-313	Dissolved	Water	6020A	344284
MB 310-344284/1-A	Method Blank	Total/NA	Water	6020A	344284
LCS 310-344284/2-A	Lab Control Sample	Total/NA	Water	6020A	344284

Analysis Batch: 344893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-2	MW-313	Total/NA	Water	6020A	344287

General Chemistry

Analysis Batch: 344371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-225360-1	MW-312	Total/NA	Water	SM 2320B	
310-225360-2	MW-313	Total/NA	Water	SM 2320B	
MB 310-344371/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-344371/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Lab Sample ID: 310-225360-1
Date Collected: 02/14/22 12:03
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			344284	02/18/22 09:00	ACM2	TAL CF
Dissolved	Analysis	6020A		1	344699	02/22/22 15:54	SAP	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:25	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	344371	02/18/22 10:47	JMH2	TAL CF

Client Sample ID: MW-313
Lab Sample ID: 310-225360-2
Date Collected: 02/14/22 11:06
Matrix: Water
Date Received: 02/16/22 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			344284	02/18/22 09:00	ACM2	TAL CF
Dissolved	Analysis	6020A		1	344699	02/22/22 15:57	SAP	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344583	02/21/22 21:34	SAP	TAL CF
Total/NA	Prep	3005A			344287	02/18/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	344893	02/24/22 14:25	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	344371	02/18/22 10:47	JMH2	TAL CF

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-225360-1
Project/Site: Ottumwa Generating Station - 25222072

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF

Protocol References:

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.

Laboratory References:

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

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310-225360 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 2-16-22 TIME 1645 Received By: AL

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

Condition of Cooler/Containers

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

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

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

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

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

Temperature Record

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

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

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

Uncorrected Temp (°C): -0.1 Corrected Temp (°C): -0.1

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

Chain of Custody Record 458916

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Address: _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TAL-8210

Client Contact	Project Manager: Meghan Blodgett	Site Contact:	Date:	COC No: 2
Company Name: SCS Engineers	Tel/Email: mblodgett@scsengineers.com	Lab Contact:	Carrier:	2 of 4 COCs
Address: 8450 Hickman RD Suite 27	Analysis Turnaround Time			Sampler:
City/State/Zip: Clive IA, 50325	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 608-509-8245	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling:
Project Name:	☐ 1 week			
Site: Ottumwa Generating Station	☐ 2 days			Job / SDG No.:
PO # 23221072	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	6020A - Metals (5)	6020B - D. Metals (4)	9056A_OKGFM_28D	TDS/pH	2320B	7470A, 6020A (4)	Sample Specific Notes:
MW-305	2-14-22	11:24	G	W				X						6020A - D. Metals (4) is
MW-306	2-14-22	13:39	G	W				X						field filtered
MW-312	2-15-22	12:03	G	W		Y		X	X	X	X	X	X	
MW-313	2-15-22	11:06	G	W		Y		X	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments:

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ | Therm ID No.:_____

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[signature]	SCS Engineers	2-16-22			
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by: [signature]	Company:	Date/Time: 2-16-22 1645

2/24/2022

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

		COC Set #1 (Blank & Background)		COC Set #2 (Ash Pond)											COC Set #3 (ZLDP)			River gauge point (near MW-310 nest)	
	Parameter	MW-301	Field Blank	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-307	MW-308	MW-309		TOTAL
Appendix III Parameters	Boron		x											x	x					3
	Calcium		x											x	x					3
	Chloride		x											x	x					3
	Fluoride		x											x	x					3
	pH		x											x	x					3
	Sulfate		x											x	x					3
	TDS		x											x	x					3
Appendix IV Parameters	Antimony		x											x	x					3
	Arsenic		x											x	x					3
	Barium		x											x	x					3
	Beryllium		x											x	x					3
	Cadmium		x											x	x					3
	Chromium		x											x	x					3
	Cobalt		x				x		x					x	x	x				6
	Fluoride		x											x	x					3
	Lead		x											x	x					3
	Lithium		x											x	x					3
	Mercury		x											x	x					3
	Molybdenum		x											x	x					3
	Selenium		x											x	x					3
	Thallium		x											x	x					3
	Radium (separate COCs)		x											x	x					3
Additional Lab Parameters - REQUIRES SEPARATE COC	Bicarbonate (total)													x	x					2
	Carbonate (total)													x	x					2
	Iron (total)													x	x					2
	Magnesium (total)													x	x					2
	Manganese (total)													x	x					2
	Potassium (total)													x	x					2
	Sodium (total)													x	x					2
	Cobalt (filtered)													x	x					2
	Iron (filtered)													x	x					2
	Lithium (filtered)													x	x					2
	Manganese (filtered)													x	x					2
Field Parameters	Ferrous Iron (CHEMets)									x				x	x					3
	Sulfide (CHEMets)									x				x	x					3
	Groundwater Elevation	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		16
	Surface Water Elevation																		x	1
	Well Depth																			0
	pH (field)									x				x	x	x				4
	Specific Conductance									x				x	x	x				4
	Dissolved Oxygen									x				x	x	x				4
	ORP									x				x	x	x				4
	Temperature									x				x	x	x				4
	Turbidity									x				x	x	x				4
	Color									x				x	x	x				4
	Odor									x				x	x	x				4

Notes All samples are unfiltered (total)

I:\25221072.00\Data and Calculations\Field Work Requests\[OGS_CCR_Rule_Sampling_2202.xls]Sheet1

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-225360-1
SDG Number:

Login Number: 225360
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

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

C3 Assessment Monitoring, April 2022

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229324-1
Client Project/Site: Ottumwa Generating Station-25222072
Revision: 1

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
6/20/2022 5:27:32 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Job ID: 310-229324-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229324-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 5/11/2022. The report (revision 1) is being revised due to: Client added GWE to samples MW-312 & 313.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 1.7º C, 2.1º C, 2.3º C, 2.4º C, 2.6º C and 2.7º C.

HPLC/IC
Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-305A (310-229324-5), MW-306 (310-229324-6), MW-310 (310-229324-7), MW-310A (310-229324-8), MW-311 (310-229324-9), MW-312 (310-229324-11) and MW-313 (310-229324-12). 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.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229324-1	MW-302	Water	04/12/22 09:48	04/15/22 17:10
310-229324-2	MW-303	Water	04/12/22 11:24	04/15/22 17:10
310-229324-3	MW-304	Water	04/12/22 13:46	04/15/22 17:10
310-229324-4	MW-305	Water	04/11/22 10:26	04/15/22 17:10
310-229324-5	MW-305A	Water	04/12/22 18:09	04/15/22 17:10
310-229324-6	MW-306	Water	04/12/22 15:20	04/15/22 17:10
310-229324-7	MW-310	Water	04/11/22 14:11	04/15/22 17:10
310-229324-8	MW-310A	Water	04/12/22 17:37	04/15/22 17:10
310-229324-9	MW-311	Water	04/11/22 12:08	04/15/22 17:10
310-229324-10	MW-311A	Water	04/14/22 15:00	04/15/22 17:10
310-229324-11	MW-312	Water	04/11/22 16:59	04/15/22 17:10
310-229324-12	MW-313	Water	04/11/22 15:54	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-302 — Lab Sample ID: 310-229324-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	170		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	750		20	8.0	mg/L	20		9056A	Total/NA
Barium	17		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	1300		100	58	ug/L	1		6020A	Total/NA
Cadmium	0.21		0.10	0.055	ug/L	1		6020A	Total/NA
Calcium	170		0.50	0.19	mg/L	1		6020A	Total/NA
Chromium	1.4	J	5.0	1.1	ug/L	1		6020A	Total/NA
Cobalt	1.3		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	9.1	J	10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	2.6		2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	2.4	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1100		250	130	mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	654.77				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	145.2				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.41				mg/L	1		Field Sampling	Total/NA
pH, Field	6.43				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1741				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	5.13				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-303 — Lab Sample ID: 310-229324-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	58		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	200		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	64		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	620		100	58	ug/L	1		6020A	Total/NA
Cadmium	0.15		0.10	0.055	ug/L	1		6020A	Total/NA
Calcium	190		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	1.6		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	4.0	J	10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	2.7		2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	8.3		5.0	0.96	ug/L	1		6020A	Total/NA
Thallium	0.26	J	1.0	0.26	ug/L	1		6020A	Total/NA
Total Dissolved Solids	630		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	652.95				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	158.2				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.19				mg/L	1		Field Sampling	Total/NA
pH, Field	6.71				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1245				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	9.0				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	6.20				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-304 — Lab Sample ID: 310-229324-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	270		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	1.7		0.50	0.22	mg/L	5		9056A	Total/NA
Sulfate	260		5.0	2.0	mg/L	5		9056A	Total/NA
Arsenic	0.76	J	2.0	0.75	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-304 (Continued) — Lab Sample ID: 310-229324-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	78		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	940		100	58	ug/L	1		6020A	Total/NA
Calcium	130		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.41	J	0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	3.4	J	10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	1.9	J	2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	1.3	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1700		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	652.14				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-56.9				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.13				mg/L	1		Field Sampling	Total/NA
pH, Field	6.95				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1772				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.3				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	3.70				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-305 — Lab Sample ID: 310-229324-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	200		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	150		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	120		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	850		100	58	ug/L	1		6020A	Total/NA
Calcium	120		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	21		0.50	0.19	ug/L	1		6020A	Total/NA
Molybdenum	7.8		2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	1.1	J	5.0	0.96	ug/L	1		6020A	Total/NA
Thallium	0.42	J	1.0	0.26	ug/L	1		6020A	Total/NA
Total Dissolved Solids	950		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	657.62				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	134.8				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.23				mg/L	1		Field Sampling	Total/NA
pH, Field	6.90				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1742				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.8				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	4.97				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-305A — Lab Sample ID: 310-229324-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	160		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	160		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	91		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	210		100	58	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	1.7		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	17		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	4.5		2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	700		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-305A (Continued) — Lab Sample ID: 310-229324-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ground Water Elevation	649.24				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	79.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	4.85				mg/L	1		Field Sampling	Total/NA
pH, Field	7.19				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1242				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	21.6				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	12.50				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-306 — Lab Sample ID: 310-229324-6

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	70		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	94		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	760		100	58	ug/L	1		6020A	Total/NA
Cadmium	1.3		0.10	0.055	ug/L	1		6020A	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	9.1		0.50	0.19	ug/L	1		6020A	Total/NA
Molybdenum	14		2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	710		250	130	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	664.61				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	17.1				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.24				mg/L	1		Field Sampling	Total/NA
pH, Field	6.66				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1579				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.8				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	2.64				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-310 — Lab Sample ID: 310-229324-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	200		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	630		20	8.0	mg/L	20		9056A	Total/NA
Antimony	0.89	J	2.0	0.69	ug/L	1		6020A	Total/NA
Arsenic	1.0	J	2.0	0.75	ug/L	1		6020A	Total/NA
Barium	75		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	640		100	58	ug/L	1		6020A	Total/NA
Cadmium	0.23		0.10	0.055	ug/L	1		6020A	Total/NA
Calcium	190		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.93		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	54		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	47		2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	2.3	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1400		50	26	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	640.79				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	161.1				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.3				mg/L	1		Field Sampling	Total/NA
pH, Field	6.86				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	2007				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.6				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-310 (Continued) — Lab Sample ID: 310-229324-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Turbidity, Field	4.00				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-310A — Lab Sample ID: 310-229324-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	120		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	0.40	J	0.50	0.22	mg/L	5		9056A	Total/NA
Sulfate	1200		20	8.0	mg/L	20		9056A	Total/NA
Antimony	0.85	J	2.0	0.69	ug/L	1		6020A	Total/NA
Barium	14		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	1500		100	58	ug/L	1		6020A	Total/NA
Calcium	99		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.41	J	0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	260		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	4.4		2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	1.4	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2100		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	640.83				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	26.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	4.72				mg/L	1		Field Sampling	Total/NA
pH, Field	7.43				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	2920				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	17.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	14.20				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-311 — Lab Sample ID: 310-229324-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	17		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	78		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	170		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	79	J	100	58	ug/L	1		6020A	Total/NA
Calcium	150		0.50	0.19	mg/L	1		6020A	Total/NA
Lithium	6.3	J	10	2.5	ug/L	1		6020A	Total/NA
Selenium	2.0	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	480		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	641.44				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	125.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.51				mg/L	1		Field Sampling	Total/NA
pH, Field	6.74				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	880				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	10.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	3.57				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-311A — Lab Sample ID: 310-229324-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	140		5.0	2.3	mg/L	5		9056A	Total/NA
Fluoride	2.4		0.50	0.22	mg/L	5		9056A	Total/NA
Sulfate	1200		20	8.0	mg/L	20		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-311A (Continued) — Lab Sample ID: 310-229324-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	10		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	1500		100	58	ug/L	1		6020A	Total/NA
Calcium	54		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.32	J	0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	280		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	1.6	J	2.0	1.2	ug/L	1		6020A	Total/NA
Selenium	1.3	J	5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2200		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	643.23				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	54.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	4.66				mg/L	1		Field Sampling	Total/NA
pH, Field	7.53				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3211				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	9.61				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-312 — Lab Sample ID: 310-229324-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	170		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	550		20	8.0	mg/L	20		9056A	Total/NA
Arsenic	4.4		2.0	0.75	ug/L	1		6020A	Total/NA
Barium	50		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	560		100	58	ug/L	1		6020A	Total/NA
Calcium	200		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	9.1		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	40		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	1.3	J	2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1100		250	130	mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	644.62				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	112.1				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.15				mg/L	1		Field Sampling	Total/NA
pH, Field	7.07				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1855				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.3				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	8.39				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-229324-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	170		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	500		5.0	2.0	mg/L	5		9056A	Total/NA
Arsenic	1.2	J	2.0	0.75	ug/L	1		6020A	Total/NA
Barium	44		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	570		100	58	ug/L	1		6020A	Total/NA
Calcium	200		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	5.7		0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	28		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	4.8		2.0	1.2	ug/L	1		6020A	Total/NA
Total Dissolved Solids	3200		250	130	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-313 (Continued)
Lab Sample ID: 310-229324-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	642.06				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	126.5				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.09				mg/L	1		Field Sampling	Total/NA
pH, Field	6.94				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1788				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	7.44				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-302

Date Collected: 04/12/22 09:48
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-1

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		5.0	2.3	mg/L			04/21/22 22:49	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 22:49	5
Sulfate	**750**		20	8.0	mg/L			04/21/22 16:33	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:01	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:01	1
Barium	**17**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:01	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:01	1
Boron	**1300**		100	58	ug/L		04/25/22 09:00	05/10/22 17:01	1
Cadmium	**0.21**		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:01	1
Calcium	**170**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:01	1
Chromium	**1.4**	**J**	5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:01	1
Cobalt	**1.3**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:01	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:01	1
Lithium	**9.1**	**J**	10	2.5	ug/L		04/25/22 09:00	05/10/22 17:01	1
Molybdenum	**2.6**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:01	1
Selenium	**2.4**	**J**	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:01	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:01	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:36	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		250	130	mg/L			04/18/22 16:57	1
pH	**6.6**	**HF**	0.1	0.1	SU			04/15/22 19:32	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**654.77**				ft			04/12/22 09:48	1
Oxidation Reduction Potential	**145.2**				millivolts			04/12/22 09:48	1
Oxygen, Dissolved, Client Supplied	**0.41**				mg/L			04/12/22 09:48	1
pH, Field	**6.43**				SU			04/12/22 09:48	1
Specific Conductance, Field	**1741**				umhos/cm			04/12/22 09:48	1
Temperature, Field	**11.4**				Degrees C			04/12/22 09:48	1
Turbidity, Field	**5.13**				NTU			04/12/22 09:48	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-303

Date Collected: 04/12/22 11:24
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-2

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**58**		5.0	2.3	mg/L			04/21/22 23:04	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 23:04	5
Sulfate	**200**		5.0	2.0	mg/L			04/21/22 23:04	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:16	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:16	1
Barium	**64**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:16	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:16	1
Boron	**620**		100	58	ug/L		04/25/22 09:00	05/10/22 17:16	1
Cadmium	**0.15**		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:16	1
Calcium	**190**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:16	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:16	1
Cobalt	**1.6**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:16	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:16	1
Lithium	**4.0**	**J**	10	2.5	ug/L		04/25/22 09:00	05/10/22 17:16	1
Molybdenum	**2.7**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:16	1
Selenium	**8.3**		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:16	1
Thallium	**0.26**	**J**	1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:16	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**630**		50	26	mg/L			04/18/22 16:57	1
pH	**7.0**	**HF**	0.1	0.1	SU			04/15/22 19:35	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**652.95**				ft			04/12/22 11:24	1
Oxidation Reduction Potential	**158.2**				millivolts			04/12/22 11:24	1
Oxygen, Dissolved, Client Supplied	**1.19**				mg/L			04/12/22 11:24	1
pH, Field	**6.71**				SU			04/12/22 11:24	1
Specific Conductance, Field	**1245**				umhos/cm			04/12/22 11:24	1
Temperature, Field	**9.0**				Degrees C			04/12/22 11:24	1
Turbidity, Field	**6.20**				NTU			04/12/22 11:24	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-304

Date Collected: 04/12/22 13:46
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-3

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**270**		5.0	2.3	mg/L			04/21/22 23:20	5
Fluoride	**1.7**		0.50	0.22	mg/L			04/21/22 23:20	5
Sulfate	**260**		5.0	2.0	mg/L			04/21/22 23:20	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:20	1
Arsenic	**0.76**	**J**	2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:20	1
Barium	**78**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:20	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:20	1
Boron	**940**		100	58	ug/L		04/25/22 09:00	05/10/22 17:20	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:20	1
Calcium	**130**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:20	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:20	1
Cobalt	**0.41**	**J**	0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:20	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:20	1
Lithium	**3.4**	**J**	10	2.5	ug/L		04/25/22 09:00	05/10/22 17:20	1
Molybdenum	**1.9**	**J**	2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:20	1
Selenium	**1.3**	**J**	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:20	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:20	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:40	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1700**		50	26	mg/L			04/18/22 16:57	1
pH	**7.2**	**HF**	0.1	0.1	SU			04/15/22 19:37	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**652.14**				ft			04/12/22 13:46	1
Oxidation Reduction Potential	**-56.9**				millivolts			04/12/22 13:46	1
Oxygen, Dissolved, Client Supplied	**0.13**				mg/L			04/12/22 13:46	1
pH, Field	**6.95**				SU			04/12/22 13:46	1
Specific Conductance, Field	**1772**				umhos/cm			04/12/22 13:46	1
Temperature, Field	**13.3**				Degrees C			04/12/22 13:46	1
Turbidity, Field	**3.70**				NTU			04/12/22 13:46	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-305

Date Collected: 04/11/22 10:26
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-4

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**200**		5.0	2.3	mg/L			04/21/22 23:35	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 23:35	5
Sulfate	**150**		5.0	2.0	mg/L			04/21/22 23:35	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:24	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:24	1
Barium	**120**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:24	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:24	1
Boron	**850**		100	58	ug/L		04/25/22 09:00	05/10/22 17:24	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:24	1
Calcium	**120**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:24	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:24	1
Cobalt	**21**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:24	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:24	1
Lithium	<2.5		10	2.5	ug/L		04/25/22 09:00	05/10/22 17:24	1
Molybdenum	**7.8**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:24	1
Selenium	**1.1**	**J**	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:24	1
Thallium	**0.42**	**J**	1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:24	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:43	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**950**		50	26	mg/L			04/18/22 16:57	1
pH	**7.1**	**HF**	0.1	0.1	SU			04/15/22 19:39	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**657.62**				ft			04/11/22 10:26	1
Oxidation Reduction Potential	**134.8**				millivolts			04/11/22 10:26	1
Oxygen, Dissolved, Client Supplied	**0.23**				mg/L			04/11/22 10:26	1
pH, Field	**6.90**				SU			04/11/22 10:26	1
Specific Conductance, Field	**1742**				umhos/cm			04/11/22 10:26	1
Temperature, Field	**12.8**				Degrees C			04/11/22 10:26	1
Turbidity, Field	**4.97**				NTU			04/11/22 10:26	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-305A

Date Collected: 04/12/22 18:09
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-5

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**160**		5.0	2.3	mg/L			04/21/22 00:22	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 00:22	5
Sulfate	**160**		5.0	2.0	mg/L			04/21/22 00:22	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:28	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:28	1
Barium	**91**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:28	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:28	1
Boron	**210**		100	58	ug/L		04/25/22 09:00	05/10/22 17:28	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:28	1
Calcium	**180**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:28	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:28	1
Cobalt	**1.7**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:28	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:28	1
Lithium	**17**		10	2.5	ug/L		04/25/22 09:00	05/10/22 17:28	1
Molybdenum	**4.5**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:28	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:28	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:28	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:45	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**700**		50	26	mg/L			04/18/22 16:57	1
pH	**7.2**	**HF**	0.1	0.1	SU			04/15/22 19:40	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**649.24**				ft			04/12/22 18:09	1
Oxidation Reduction Potential	**79.7**				millivolts			04/12/22 18:09	1
Oxygen, Dissolved, Client Supplied	**4.85**				mg/L			04/12/22 18:09	1
pH, Field	**7.19**				SU			04/12/22 18:09	1
Specific Conductance, Field	**1242**				umhos/cm			04/12/22 18:09	1
Temperature, Field	**21.6**				Degrees C			04/12/22 18:09	1
Turbidity, Field	**12.50**				NTU			04/12/22 18:09	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-306

Date Collected: 04/12/22 15:20
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-6

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**260**		5.0	2.3	mg/L			04/21/22 00:38	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 00:38	5
Sulfate	**70**		5.0	2.0	mg/L			04/21/22 00:38	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:32	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:32	1
Barium	**94**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:32	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:32	1
Boron	**760**		100	58	ug/L		04/25/22 09:00	05/10/22 17:32	1
Cadmium	**1.3**		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:32	1
Calcium	**110**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:32	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:32	1
Cobalt	**9.1**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:32	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:32	1
Lithium	<2.5		10	2.5	ug/L		04/25/22 09:00	05/10/22 17:32	1
Molybdenum	**14**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:32	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:32	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:32	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**710**		250	130	mg/L			04/18/22 16:57	1
pH	**6.9**	**HF**	0.1	0.1	SU			04/15/22 19:42	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**664.61**				ft			04/12/22 15:20	1
Oxidation Reduction Potential	**17.1**				millivolts			04/12/22 15:20	1
Oxygen, Dissolved, Client Supplied	**0.24**				mg/L			04/12/22 15:20	1
pH, Field	**6.66**				SU			04/12/22 15:20	1
Specific Conductance, Field	**1579**				umhos/cm			04/12/22 15:20	1
Temperature, Field	**13.8**				Degrees C			04/12/22 15:20	1
Turbidity, Field	**2.64**				NTU			04/12/22 15:20	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-310

Date Collected: 04/11/22 14:11
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-7

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	200		5.0	2.3	mg/L			04/21/22 00:53	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 00:53	5
Sulfate	630		20	8.0	mg/L			04/21/22 16:48	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.89	J	2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:52	1
Arsenic	1.0	J	2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:52	1
Barium	75		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:52	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:52	1
Boron	640		100	58	ug/L		04/25/22 09:00	05/10/22 17:52	1
Cadmium	0.23		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:52	1
Calcium	190		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:52	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:52	1
Cobalt	0.93		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:52	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:52	1
Lithium	54		10	2.5	ug/L		04/25/22 09:00	05/10/22 17:52	1
Molybdenum	47		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:52	1
Selenium	2.3	J	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:52	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:52	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1400		50	26	mg/L			04/18/22 16:57	1
pH	7.1	HF	0.1	0.1	SU			04/15/22 19:44	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	640.79				ft			04/11/22 14:11	1
Oxidation Reduction Potential	161.1				millivolts			04/11/22 14:11	1
Oxygen, Dissolved, Client Supplied	0.3				mg/L			04/11/22 14:11	1
pH, Field	6.86				SU			04/11/22 14:11	1
Specific Conductance, Field	2007				umhos/cm			04/11/22 14:11	1
Temperature, Field	12.6				Degrees C			04/11/22 14:11	1
Turbidity, Field	4.00				NTU			04/11/22 14:11	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-310A
Lab Sample ID: 310-229324-8
Date Collected: 04/12/22 17:37
Matrix: Water
Date Received: 04/15/22 17:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		5.0	2.3	mg/L			04/21/22 01:09	5
Fluoride	0.40	J	0.50	0.22	mg/L			04/21/22 01:09	5
Sulfate	1200		20	8.0	mg/L			04/21/22 17:04	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.85	J	2.0	0.69	ug/L		04/25/22 09:00	05/10/22 17:56	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 17:56	1
Barium	14		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 17:56	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 17:56	1
Boron	1500		100	58	ug/L		04/25/22 09:00	05/10/22 17:56	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 17:56	1
Calcium	99		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 17:56	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 17:56	1
Cobalt	0.41	J	0.50	0.19	ug/L		04/25/22 09:00	05/10/22 17:56	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 17:56	1
Lithium	260		10	2.5	ug/L		04/25/22 09:00	05/10/22 17:56	1
Molybdenum	4.4		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 17:56	1
Selenium	1.4	J	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 17:56	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 17:56	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2100		250	130	mg/L			04/18/22 16:57	1
pH	7.7	HF	0.1	0.1	SU			04/15/22 19:45	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	640.83				ft			04/12/22 17:37	1
Oxidation Reduction Potential	26.7				millivolts			04/12/22 17:37	1
Oxygen, Dissolved, Client Supplied	4.72				mg/L			04/12/22 17:37	1
pH, Field	7.43				SU			04/12/22 17:37	1
Specific Conductance, Field	2920				umhos/cm			04/12/22 17:37	1
Temperature, Field	17.2				Degrees C			04/12/22 17:37	1
Turbidity, Field	14.20				NTU			04/12/22 17:37	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-311

Date Collected: 04/11/22 12:08
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-9

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**17**		5.0	2.3	mg/L			04/21/22 01:21	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 01:21	5
Sulfate	**78**		5.0	2.0	mg/L			04/21/22 01:21	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 18:00	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 18:00	1
Barium	**170**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 18:00	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 18:00	1
Boron	**79**	**J**	100	58	ug/L		04/25/22 09:00	05/10/22 18:00	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 18:00	1
Calcium	**150**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 18:00	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 18:00	1
Cobalt	<0.19		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 18:00	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 18:00	1
Lithium	**6.3**	**J**	10	2.5	ug/L		04/25/22 09:00	05/10/22 18:00	1
Molybdenum	<1.2		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 18:00	1
Selenium	**2.0**	**J**	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 18:00	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 18:00	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 13:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**480**		250	130	mg/L			04/18/22 16:57	1
pH	**7.0**	**HF**	0.1	0.1	SU			04/15/22 19:47	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**641.44**				ft			04/11/22 12:08	1
Oxidation Reduction Potential	**125.4**				millivolts			04/11/22 12:08	1
Oxygen, Dissolved, Client Supplied	**0.51**				mg/L			04/11/22 12:08	1
pH, Field	**6.74**				SU			04/11/22 12:08	1
Specific Conductance, Field	**880**				umhos/cm			04/11/22 12:08	1
Temperature, Field	**10.1**				Degrees C			04/11/22 12:08	1
Turbidity, Field	**3.57**				NTU			04/11/22 12:08	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-311A

Date Collected: 04/14/22 15:00
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-10

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		5.0	2.3	mg/L			04/21/22 01:42	5
Fluoride	2.4		0.50	0.22	mg/L			04/21/22 01:42	5
Sulfate	1200		20	8.0	mg/L			04/21/22 17:19	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 18:03	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 18:03	1
Barium	10		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 18:03	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 18:03	1
Boron	1500		100	58	ug/L		04/25/22 09:00	05/10/22 18:03	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 18:03	1
Calcium	54		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 18:03	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 18:03	1
Cobalt	0.32	J	0.50	0.19	ug/L		04/25/22 09:00	05/10/22 18:03	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 18:03	1
Lithium	280		10	2.5	ug/L		04/25/22 09:00	05/10/22 18:03	1
Molybdenum	1.6	J	2.0	1.2	ug/L		04/25/22 09:00	05/10/22 18:03	1
Selenium	1.3	J	5.0	0.96	ug/L		04/25/22 09:00	05/10/22 18:03	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 18:03	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2200		250	130	mg/L			04/21/22 15:21	1
pH	7.7	HF	0.1	0.1	SU			04/15/22 19:52	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	643.23				ft			04/14/22 15:00	1
Oxidation Reduction Potential	54.6				millivolts			04/14/22 15:00	1
Oxygen, Dissolved, Client Supplied	4.66				mg/L			04/14/22 15:00	1
pH, Field	7.53				SU			04/14/22 15:00	1
Specific Conductance, Field	3211				umhos/cm			04/14/22 15:00	1
Temperature, Field	14.1				Degrees C			04/14/22 15:00	1
Turbidity, Field	9.61				NTU			04/14/22 15:00	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-312

Date Collected: 04/11/22 16:59
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-11

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		5.0	2.3	mg/L			04/21/22 01:59	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 01:59	5
Sulfate	**550**		20	8.0	mg/L			04/21/22 02:15	20

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 18:07	1
Arsenic	**4.4**		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 18:07	1
Barium	**50**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 18:07	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 18:07	1
Boron	**560**		100	58	ug/L		04/25/22 09:00	05/10/22 18:07	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 18:07	1
Calcium	**200**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 18:07	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 18:07	1
Cobalt	**9.1**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 18:07	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 18:07	1
Lithium	**40**		10	2.5	ug/L		04/25/22 09:00	05/10/22 18:07	1
Molybdenum	**1.3**	**J**	2.0	1.2	ug/L		04/25/22 09:00	05/10/22 18:07	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 18:07	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 18:07	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**1100**		250	130	mg/L			04/18/22 16:57	1
pH	**7.3**	**HF**	0.1	0.1	SU			04/15/22 19:56	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**644.62**				ft			04/11/22 16:59	1
Oxidation Reduction Potential	**112.1**				millivolts			04/11/22 16:59	1
Oxygen, Dissolved, Client Supplied	**0.15**				mg/L			04/11/22 16:59	1
pH, Field	**7.07**				SU			04/11/22 16:59	1
Specific Conductance, Field	**1855**				umhos/cm			04/11/22 16:59	1
Temperature, Field	**12.3**				Degrees C			04/11/22 16:59	1
Turbidity, Field	**8.39**				NTU			04/11/22 16:59	1

Client: SCS Engineers
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-1

Client Sample ID: MW-313

Date Collected: 04/11/22 15:54
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-12

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**170**		5.0	2.3	mg/L			04/21/22 02:31	5
Fluoride	<0.22		0.50	0.22	mg/L			04/21/22 02:31	5
Sulfate	**500**		5.0	2.0	mg/L			04/21/22 02:31	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 18:15	1
Arsenic	**1.2**	**J**	2.0	0.75	ug/L		04/25/22 09:00	05/10/22 18:15	1
Barium	**44**		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 18:15	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 18:15	1
Boron	**570**		100	58	ug/L		04/25/22 09:00	05/10/22 18:15	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 18:15	1
Calcium	**200**		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 18:15	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 18:15	1
Cobalt	**5.7**		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 18:15	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 18:15	1
Lithium	**28**		10	2.5	ug/L		04/25/22 09:00	05/10/22 18:15	1
Molybdenum	**4.8**		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 18:15	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 18:15	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 18:15	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**3200**		250	130	mg/L			04/18/22 16:57	1
pH	**7.2**	**HF**	0.1	0.1	SU			04/15/22 19:57	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**642.06**				ft			04/11/22 15:54	1
Oxidation Reduction Potential	**126.5**				millivolts			04/11/22 15:54	1
Oxygen, Dissolved, Client Supplied	**0.09**				mg/L			04/11/22 15:54	1
pH, Field	**6.94**				SU			04/11/22 15:54	1
Specific Conductance, Field	**1788**				umhos/cm			04/11/22 15:54	1
Temperature, Field	**13.2**				Degrees C			04/11/22 15:54	1
Turbidity, Field	**7.44**				NTU			04/11/22 15:54	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

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
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.
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	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-351056/3
Matrix: Water
Analysis Batch: 351056

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			04/21/22 19:27	1
Fluoride	<0.044		0.10	0.044	mg/L			04/21/22 19:27	1
Sulfate	<0.40		1.0	0.40	mg/L			04/21/22 19:27	1

Lab Sample ID: LCS 310-351056/4
Matrix: Water
Analysis Batch: 351056

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	9.38		mg/L		94	90 - 110
Fluoride	2.00	1.94		mg/L		97	90 - 110
Sulfate	10.0	9.64		mg/L		96	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-350698/1-A
Matrix: Water
Analysis Batch: 352699

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350698

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/10/22 16:37	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	05/10/22 16:37	1
Barium	<0.88		2.0	0.88	ug/L		04/25/22 09:00	05/10/22 16:37	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	05/10/22 16:37	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	05/10/22 16:37	1
Calcium	<0.19		0.50	0.19	mg/L		04/25/22 09:00	05/10/22 16:37	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	05/10/22 16:37	1
Cobalt	<0.19		0.50	0.19	ug/L		04/25/22 09:00	05/10/22 16:37	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	05/10/22 16:37	1
Lithium	<2.5		10	2.5	ug/L		04/25/22 09:00	05/10/22 16:37	1
Molybdenum	<1.2		2.0	1.2	ug/L		04/25/22 09:00	05/10/22 16:37	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	05/10/22 16:37	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	05/10/22 16:37	1

Lab Sample ID: MB 310-350698/1-A
Matrix: Water
Analysis Batch: 352783

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350698

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<58		100	58	ug/L		04/25/22 09:00	05/11/22 14:00	1

Lab Sample ID: LCS 310-350698/2-A
Matrix: Water
Analysis Batch: 352699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350698

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	216		ug/L		108	80 - 120
Arsenic	200	202		ug/L		101	80 - 120
Barium	100	109		ug/L		109	80 - 120
Beryllium	100	111		ug/L		111	80 - 120

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

Lab Sample ID: LCS 310-350698/2-A
Matrix: Water
Analysis Batch: 352699

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350698

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	100	106		ug/L		106	80 - 120
Calcium	2.00	1.81		mg/L		90	80 - 120
Chromium	100	104		ug/L		104	80 - 120
Cobalt	100	105		ug/L		105	80 - 120
Lead	200	211		ug/L		106	80 - 120
Lithium	200	203		ug/L		101	80 - 120
Molybdenum	200	208		ug/L		104	80 - 120
Selenium	400	399		ug/L		100	80 - 120
Thallium	200	212		ug/L		106	80 - 120

Lab Sample ID: LCS 310-350698/2-A
Matrix: Water
Analysis Batch: 352783

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350698

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	200	184		ug/L		92	80 - 120

Lab Sample ID: 310-229324-1 MS
Matrix: Water
Analysis Batch: 352699

Client Sample ID: MW-302
Prep Type: Total/NA
Prep Batch: 350698

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.69		200	210		ug/L		105	75 - 125
Arsenic	<0.75		200	213		ug/L		106	75 - 125
Barium	17		100	122		ug/L		105	75 - 125
Beryllium	<0.27		100	108		ug/L		108	75 - 125
Boron	1300		200	1460	4	ug/L		102	75 - 125
Cadmium	0.21		100	99.9		ug/L		100	75 - 125
Calcium	170		2.00	175	4	mg/L		78	75 - 125
Chromium	1.4	J	100	105		ug/L		104	75 - 125
Cobalt	1.3		100	102		ug/L		100	75 - 125
Lead	<0.24		200	201		ug/L		101	75 - 125
Lithium	9.1	J	200	204		ug/L		97	75 - 125
Molybdenum	2.6		200	216		ug/L		107	75 - 125
Selenium	2.4	J	400	429		ug/L		107	75 - 125
Thallium	<0.26		200	199		ug/L		99	75 - 125

Lab Sample ID: 310-229324-1 MSD
Matrix: Water
Analysis Batch: 352699

Client Sample ID: MW-302
Prep Type: Total/NA
Prep Batch: 350698

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<0.69		200	205		ug/L		103	75 - 125	2	20
Arsenic	<0.75		200	208		ug/L		104	75 - 125	2	20
Barium	17		100	120		ug/L		104	75 - 125	1	20
Beryllium	<0.27		100	106		ug/L		106	75 - 125	2	20
Boron	1300		200	1450	4	ug/L		97	75 - 125	1	20
Cadmium	0.21		100	97.8		ug/L		98	75 - 125	2	20
Calcium	170		2.00	172	4	mg/L		-59	75 - 125	2	20

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

Lab Sample ID: 310-229324-1 MSD — **Client Sample ID: MW-302**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 352699 — **Prep Batch: 350698**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chromium	1.4	J	100	103		ug/L		101	75 - 125	2	20
Cobalt	1.3		100	100		ug/L		99	75 - 125	1	20
Lead	<0.24		200	200		ug/L		100	75 - 125	1	20
Lithium	9.1	J	200	202		ug/L		96	75 - 125	1	20
Molybdenum	2.6		200	213		ug/L		105	75 - 125	1	20
Selenium	2.4	J	400	420		ug/L		104	75 - 125	2	20
Thallium	<0.26		200	198		ug/L		99	75 - 125	1	20

Lab Sample ID: 310-229324-11 DU — **Client Sample ID: MW-312**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 352699 — **Prep Batch: 350698**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.69		<0.69		ug/L		NC	20
Arsenic	4.4		4.34		ug/L		1	20
Barium	50		48.9		ug/L		2	20
Beryllium	<0.27		<0.27		ug/L		NC	20
Boron	560		547		ug/L		3	20
Cadmium	<0.055		<0.055		ug/L		NC	20
Calcium	200		196		mg/L		2	20
Chromium	<1.1		<1.1		ug/L		NC	20
Cobalt	9.1		9.03		ug/L		0.5	20
Lead	<0.24		<0.24		ug/L		NC	20
Lithium	40		37.2		ug/L		7	20
Molybdenum	1.3	J	1.27	J	ug/L		4	20
Selenium	<0.96		<0.96		ug/L		NC	20
Thallium	<0.26		<0.26		ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-351089/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 351259 — **Prep Batch: 351089**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/26/22 13:41	04/27/22 12:56	1

Lab Sample ID: LCS 310-351089/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 351259 — **Prep Batch: 351089**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.61		ug/L		97	80 - 120

Lab Sample ID: MB 310-351241/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 351414 — **Prep Batch: 351241**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:09	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 310-351241/2-A
Matrix: Water
Analysis Batch: 351414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 351241

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			1.67	1.65		ug/L		99	80 - 120		

Lab Sample ID: 310-229324-10 MS
Matrix: Water
Analysis Batch: 351414

Client Sample ID: MW-311A
Prep Type: Total/NA
Prep Batch: 351241

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	<0.11		1.67	1.54		ug/L		93	80 - 120		

Lab Sample ID: 310-229324-10 MSD
Matrix: Water
Analysis Batch: 351414

Client Sample ID: MW-311A
Prep Type: Total/NA
Prep Batch: 351241

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	<0.11		1.67	1.59		ug/L		95	80 - 120	3	20

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

Lab Sample ID: MB 310-350268/1
Matrix: Water
Analysis Batch: 350268

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	<26		50	26	mg/L			04/18/22 16:57	1

Lab Sample ID: LCS 310-350268/2
Matrix: Water
Analysis Batch: 350268

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	934		mg/L		93	90 - 110		

Lab Sample ID: 310-229324-2 DU
Matrix: Water
Analysis Batch: 350268

Client Sample ID: MW-303
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	630			604		mg/L				5	20

Lab Sample ID: MB 310-350674/1
Matrix: Water
Analysis Batch: 350674

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	<26		50	26	mg/L			04/21/22 15:21	1

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

Lab Sample ID: LCS 310-350674/2
Matrix: Water
Analysis Batch: 350674

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	958		mg/L		96	90 - 110		

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-350071/1
Matrix: Water
Analysis Batch: 350071

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	7.1		SU		101	98 - 102		

Lab Sample ID: 310-229324-1 DU
Matrix: Water
Analysis Batch: 350071

Client Sample ID: MW-302
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.6	HF		6.6		SU				0.6	20

Lab Sample ID: 310-229324-10 DU
Matrix: Water
Analysis Batch: 350071

Client Sample ID: MW-311A
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	7.7	HF		7.6		SU				0.4	20

HPLC/IC

Analysis Batch: 351056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	9056A	
310-229324-1	MW-302	Total/NA	Water	9056A	
310-229324-2	MW-303	Total/NA	Water	9056A	
310-229324-3	MW-304	Total/NA	Water	9056A	
310-229324-4	MW-305	Total/NA	Water	9056A	
310-229324-5	MW-305A	Total/NA	Water	9056A	
310-229324-6	MW-306	Total/NA	Water	9056A	
310-229324-7	MW-310	Total/NA	Water	9056A	
310-229324-7	MW-310	Total/NA	Water	9056A	
310-229324-8	MW-310A	Total/NA	Water	9056A	
310-229324-8	MW-310A	Total/NA	Water	9056A	
310-229324-9	MW-311	Total/NA	Water	9056A	
310-229324-10	MW-311A	Total/NA	Water	9056A	
310-229324-10	MW-311A	Total/NA	Water	9056A	
310-229324-11	MW-312	Total/NA	Water	9056A	
310-229324-11	MW-312	Total/NA	Water	9056A	
310-229324-12	MW-313	Total/NA	Water	9056A	
MB 310-351056/3	Method Blank	Total/NA	Water	9056A	
LCS 310-351056/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 350698

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	3005A	
310-229324-2	MW-303	Total/NA	Water	3005A	
310-229324-3	MW-304	Total/NA	Water	3005A	
310-229324-4	MW-305	Total/NA	Water	3005A	
310-229324-5	MW-305A	Total/NA	Water	3005A	
310-229324-6	MW-306	Total/NA	Water	3005A	
310-229324-7	MW-310	Total/NA	Water	3005A	
310-229324-8	MW-310A	Total/NA	Water	3005A	
310-229324-9	MW-311	Total/NA	Water	3005A	
310-229324-10	MW-311A	Total/NA	Water	3005A	
310-229324-11	MW-312	Total/NA	Water	3005A	
310-229324-12	MW-313	Total/NA	Water	3005A	
MB 310-350698/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350698/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-229324-1 MS	MW-302	Total/NA	Water	3005A	
310-229324-1 MSD	MW-302	Total/NA	Water	3005A	
310-229324-11 DU	MW-312	Total/NA	Water	3005A	

Prep Batch: 351089

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	7470A	
310-229324-2	MW-303	Total/NA	Water	7470A	
310-229324-3	MW-304	Total/NA	Water	7470A	
310-229324-4	MW-305	Total/NA	Water	7470A	
310-229324-5	MW-305A	Total/NA	Water	7470A	
310-229324-6	MW-306	Total/NA	Water	7470A	
310-229324-7	MW-310	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 351089 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-8	MW-310A	Total/NA	Water	7470A	
310-229324-9	MW-311	Total/NA	Water	7470A	
MB 310-351089/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-351089/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 351241

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-10	MW-311A	Total/NA	Water	7470A	
310-229324-11	MW-312	Total/NA	Water	7470A	
310-229324-12	MW-313	Total/NA	Water	7470A	
MB 310-351241/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-351241/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-229324-10 MS	MW-311A	Total/NA	Water	7470A	
310-229324-10 MSD	MW-311A	Total/NA	Water	7470A	

Analysis Batch: 351259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	7470A	351089
310-229324-2	MW-303	Total/NA	Water	7470A	351089
310-229324-3	MW-304	Total/NA	Water	7470A	351089
310-229324-4	MW-305	Total/NA	Water	7470A	351089
310-229324-5	MW-305A	Total/NA	Water	7470A	351089
310-229324-6	MW-306	Total/NA	Water	7470A	351089
310-229324-7	MW-310	Total/NA	Water	7470A	351089
310-229324-8	MW-310A	Total/NA	Water	7470A	351089
310-229324-9	MW-311	Total/NA	Water	7470A	351089
MB 310-351089/1-A	Method Blank	Total/NA	Water	7470A	351089
LCS 310-351089/2-A	Lab Control Sample	Total/NA	Water	7470A	351089

Analysis Batch: 351414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-10	MW-311A	Total/NA	Water	7470A	351241
310-229324-11	MW-312	Total/NA	Water	7470A	351241
310-229324-12	MW-313	Total/NA	Water	7470A	351241
MB 310-351241/1-A	Method Blank	Total/NA	Water	7470A	351241
LCS 310-351241/2-A	Lab Control Sample	Total/NA	Water	7470A	351241
310-229324-10 MS	MW-311A	Total/NA	Water	7470A	351241
310-229324-10 MSD	MW-311A	Total/NA	Water	7470A	351241

Analysis Batch: 352699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	6020A	350698
310-229324-2	MW-303	Total/NA	Water	6020A	350698
310-229324-3	MW-304	Total/NA	Water	6020A	350698
310-229324-4	MW-305	Total/NA	Water	6020A	350698
310-229324-5	MW-305A	Total/NA	Water	6020A	350698
310-229324-6	MW-306	Total/NA	Water	6020A	350698
310-229324-7	MW-310	Total/NA	Water	6020A	350698
310-229324-8	MW-310A	Total/NA	Water	6020A	350698
310-229324-9	MW-311	Total/NA	Water	6020A	350698
310-229324-10	MW-311A	Total/NA	Water	6020A	350698

Metals (Continued)

Analysis Batch: 352699 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-11	MW-312	Total/NA	Water	6020A	350698
310-229324-12	MW-313	Total/NA	Water	6020A	350698
MB 310-350698/1-A	Method Blank	Total/NA	Water	6020A	350698
LCS 310-350698/2-A	Lab Control Sample	Total/NA	Water	6020A	350698
310-229324-1 MS	MW-302	Total/NA	Water	6020A	350698
310-229324-1 MSD	MW-302	Total/NA	Water	6020A	350698
310-229324-11 DU	MW-312	Total/NA	Water	6020A	350698

Analysis Batch: 352783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-350698/1-A	Method Blank	Total/NA	Water	6020A	350698
LCS 310-350698/2-A	Lab Control Sample	Total/NA	Water	6020A	350698

General Chemistry

Analysis Batch: 350071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	SM 4500 H+ B	
310-229324-2	MW-303	Total/NA	Water	SM 4500 H+ B	
310-229324-3	MW-304	Total/NA	Water	SM 4500 H+ B	
310-229324-4	MW-305	Total/NA	Water	SM 4500 H+ B	
310-229324-5	MW-305A	Total/NA	Water	SM 4500 H+ B	
310-229324-6	MW-306	Total/NA	Water	SM 4500 H+ B	
310-229324-7	MW-310	Total/NA	Water	SM 4500 H+ B	
310-229324-8	MW-310A	Total/NA	Water	SM 4500 H+ B	
310-229324-9	MW-311	Total/NA	Water	SM 4500 H+ B	
310-229324-10	MW-311A	Total/NA	Water	SM 4500 H+ B	
310-229324-11	MW-312	Total/NA	Water	SM 4500 H+ B	
310-229324-12	MW-313	Total/NA	Water	SM 4500 H+ B	
LCS 310-350071/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-229324-1 DU	MW-302	Total/NA	Water	SM 4500 H+ B	
310-229324-10 DU	MW-311A	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 350268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	SM 2540C	
310-229324-2	MW-303	Total/NA	Water	SM 2540C	
310-229324-3	MW-304	Total/NA	Water	SM 2540C	
310-229324-4	MW-305	Total/NA	Water	SM 2540C	
310-229324-5	MW-305A	Total/NA	Water	SM 2540C	
310-229324-6	MW-306	Total/NA	Water	SM 2540C	
310-229324-7	MW-310	Total/NA	Water	SM 2540C	
310-229324-8	MW-310A	Total/NA	Water	SM 2540C	
310-229324-9	MW-311	Total/NA	Water	SM 2540C	
310-229324-11	MW-312	Total/NA	Water	SM 2540C	
310-229324-12	MW-313	Total/NA	Water	SM 2540C	
MB 310-350268/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-350268/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-229324-2 DU	MW-303	Total/NA	Water	SM 2540C	

QC Association Summary

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

General Chemistry

Analysis Batch: 350674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-10	MW-311A	Total/NA	Water	SM 2540C	
MB 310-350674/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-350674/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 351494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	Field Sampling	
310-229324-2	MW-303	Total/NA	Water	Field Sampling	
310-229324-3	MW-304	Total/NA	Water	Field Sampling	
310-229324-4	MW-305	Total/NA	Water	Field Sampling	
310-229324-5	MW-305A	Total/NA	Water	Field Sampling	
310-229324-6	MW-306	Total/NA	Water	Field Sampling	
310-229324-7	MW-310	Total/NA	Water	Field Sampling	
310-229324-8	MW-310A	Total/NA	Water	Field Sampling	
310-229324-9	MW-311	Total/NA	Water	Field Sampling	
310-229324-10	MW-311A	Total/NA	Water	Field Sampling	
310-229324-11	MW-312	Total/NA	Water	Field Sampling	
310-229324-12	MW-313	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-302
Lab Sample ID: 310-229324-1
Date Collected: 04/12/22 09:48
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		20	351056	04/21/22 16:33	J7CK	TAL CF
Total/NA	Analysis	9056A		5	351056	04/21/22 22:49	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:01	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:36	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:32	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 09:48	BJ0R	TAL CF

Client Sample ID: MW-303
Lab Sample ID: 310-229324-2
Date Collected: 04/12/22 11:24
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 23:04	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:16	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:38	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:35	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 11:24	BJ0R	TAL CF

Client Sample ID: MW-304
Lab Sample ID: 310-229324-3
Date Collected: 04/12/22 13:46
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 23:20	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:20	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:40	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:37	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 13:46	BJ0R	TAL CF

Client Sample ID: MW-305
Lab Sample ID: 310-229324-4
Date Collected: 04/11/22 10:26
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 23:35	J7CK	TAL CF

Client Sample ID: MW-305
Lab Sample ID: 310-229324-4
Date Collected: 04/11/22 10:26
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:24	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:43	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:39	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/11/22 10:26	BJ0R	TAL CF

Client Sample ID: MW-305A
Lab Sample ID: 310-229324-5
Date Collected: 04/12/22 18:09
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 00:22	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:28	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:45	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:40	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 18:09	BJ0R	TAL CF

Client Sample ID: MW-306
Lab Sample ID: 310-229324-6
Date Collected: 04/12/22 15:20
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 00:38	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:32	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:47	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:42	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 15:20	BJ0R	TAL CF

Client Sample ID: MW-310
Lab Sample ID: 310-229324-7
Date Collected: 04/11/22 14:11
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 00:53	J7CK	TAL CF
Total/NA	Analysis	9056A		20	351056	04/21/22 16:48	J7CK	TAL CF

Client Sample ID: MW-310
Lab Sample ID: 310-229324-7
Date Collected: 04/11/22 14:11
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:52	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:49	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:44	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/11/22 14:11	BJ0R	TAL CF

Client Sample ID: MW-310A
Lab Sample ID: 310-229324-8
Date Collected: 04/12/22 17:37
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 01:09	J7CK	TAL CF
Total/NA	Analysis	9056A		20	351056	04/21/22 17:04	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 17:56	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:51	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:45	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 17:37	BJ0R	TAL CF

Client Sample ID: MW-311
Lab Sample ID: 310-229324-9
Date Collected: 04/11/22 12:08
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 01:21	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 18:00	DHM5	TAL CF
Total/NA	Prep	7470A			351089	04/26/22 13:41	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351259	04/27/22 13:53	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:47	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/11/22 12:08	BJ0R	TAL CF

Client Sample ID: MW-311A
Lab Sample ID: 310-229324-10
Date Collected: 04/14/22 15:00
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 01:42	J7CK	TAL CF
Total/NA	Analysis	9056A		20	351056	04/21/22 17:19	J7CK	TAL CF

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-311A
Lab Sample ID: 310-229324-10
Date Collected: 04/14/22 15:00
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 18:03	DHM5	TAL CF
Total/NA	Prep	7470A			351241	04/27/22 13:20	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351414	04/28/22 14:15	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350674	04/21/22 15:21	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:52	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/14/22 15:00	BJ0R	TAL CF

Client Sample ID: MW-312
Lab Sample ID: 310-229324-11
Date Collected: 04/11/22 16:59
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 01:59	J7CK	TAL CF
Total/NA	Analysis	9056A		20	351056	04/21/22 02:15	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 18:07	DHM5	TAL CF
Total/NA	Prep	7470A			351241	04/27/22 13:20	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351414	04/28/22 14:26	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:56	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/11/22 16:59	BJ0R	TAL CF

Client Sample ID: MW-313
Lab Sample ID: 310-229324-12
Date Collected: 04/11/22 15:54
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351056	04/21/22 02:31	J7CK	TAL CF
Total/NA	Prep	3005A			350698	04/25/22 09:00	QTZ5	TAL CF
Total/NA	Analysis	6020A		1	352699	05/10/22 18:15	DHM5	TAL CF
Total/NA	Prep	7470A			351241	04/27/22 13:20	XXW3	TAL CF
Total/NA	Analysis	7470A		1	351414	04/28/22 14:28	XXW3	TAL CF
Total/NA	Analysis	SM 2540C		1	350268	04/18/22 16:57	ENB7	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350071	04/15/22 19:57	DN3P	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/11/22 15:54	BJ0R	TAL CF

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-229324-1
Project/Site: Ottumwa Generating Station-25222072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

EPA = US Environmental Protection Agency

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.

Laboratory References:

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

eurofins | Environment Testing America

310-229324 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes*	Cooler ID
Multiple Coolers?	☒ Yes	☐ No	*If yes*	Cooler # 1 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes*	Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes*	Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 0 ~~8~~ MRH 4/15/22 | Correction Factor (°C): 0.0

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

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

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client	SCS Engineers		
City/State	CITY Madison	STATE WI	Project
Receipt Information			
Date/Time Received	DATE 4/15/22	TIME 1710	Received By MRH
Delivery Type	☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:________		
Condition of Cooler/Containers			
Sample(s) received in Cooler?	☒ Yes ☐ No	*If yes* Cooler ID	
Multiple Coolers?	☒ Yes ☐ No	*If yes* Cooler # 2 of 6	
Cooler Custody Seals Present?	☒ Yes ☐ No	*If yes* Cooler custody seals intact? ☒ Yes ☐ No	
Sample Custody Seals Present?	☐ Yes ☒ No	*If yes* Sample custody seals intact? ☐ Yes ☐ No	
Trip Blank Present?	☐ Yes ☒ No	*If yes* Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant	☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:________ ☐ NONE		
Thermometer ID	0-8 MRH 4/15/22	Correction Factor (°C) 0.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C)	2.6	Corrected Temp (°C) 2.6	
• Sample Container Temperature			
Container(s) used	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C)			
Corrected Temp (°C)			

Exceptions Noted

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

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

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

Additional Comments

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

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes*	Cooler ID
Multiple Coolers?	☑ Yes	☐ No	*If yes*	Cooler # 3 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? No	☐ Yes	☑ No	*If yes*	Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes*	Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 08 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.4 | Corrected Temp (°C): 2.4

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes.* Cooler # 4 of 6

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

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

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

Temperature Record

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

Thermometer ID: 0.8 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.1 | Corrected Temp (°C): 2.1

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes* Cooler # 5 of 6

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

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

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

Temperature Record

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

Thermometer ID: 08 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.7 | Corrected Temp (°C): 1.7

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes* Cooler # 6 of 6

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

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

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

Temperature Record

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

Thermometer ID: 0 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.7 | Corrected Temp (°C): 2.7

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

eurofins | mer Test America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70156-17487 1
Client Contact: Meghan Blodgett	Phone: 515-864-4340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-302	4-12-22	9 48	G	Water			X	X	X	X	X		
MW-303	4-12-22	11 24	G	Water			X	X	X	X	X		
MW-304	4-12 22	13 46	G	Water			X	X	X	X	X		
MW-305	4-11- 22	10.26	G	Water			X	X	X	X	X		
MW-305A	4-12-22	18 09	G	Water			X	X	X	X	X		
MW-306	4-12-22	15 20	G	Water			X	X	X	X	X		
MW-310	4-11- 22	14.11	G	Water			X	X	X	X	X		
MW-310A	4-12- 22	17 37	G	Water			X	X	X	X	X		
MW-311	4-11-22	12:08	G	Water			X	X	X	X	X		
MW-311A	4-14-22	15 00	G	Water			X	X	X	X	X		
MW-312	4-11-22	16.59	G	Water			X	X	X	Y	X		

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	4-13-22 1358	SCS	James Vaux	4/15/22 1358	Eurofins/IA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 4-15-22 1710	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

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

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70156-17487.2
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-313	4-11-22	15:54	6	Water			Y	X	X	X	X		
				Water									

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

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

Deliverable Requested: I, II, III IV Other (specify)

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Rosa Cruz	4-15-22 1358	SCS	James Voux	4/15/22 1358	Eurofins/TA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229324-1

Login Number: 229324
List Number: 1
Creator: Kizer, Preston V

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25222072.00
April 2022

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	4/12/2022 841	682.08	7.4	6.37	3.26	976	117.6	5.03
MW-302	4/12/2022 948	654.77	11.4	6.43	0.41	1741	145.2	5.13
MW-303	4/12/2022 1124	652.95	9.0	6.71	1.19	1245	158.2	6.20
MW-304	4/12/2022 1346	652.14	13.3	6.95	0.13	1772	-56.9	3.70
MW-305	4/11/2022 1026	657.62	12.8	6.90	0.23	1742	134.8	4.97
MW-305A	4/12/2022 1809	649.24	21.6	7.19	4.85	1242	79.7	12.50
MW-306	4/12/2022 1520	664.61	13.8	6.66	0.24	1579	17.1	2.64
MW-310	4/11/2022 1411	640.79	12.6	6.86	0.3	2007	161.1	4.00
MW-310A	4/12/2022 1737	640.83	17.2	7.43	4.72	2920	26.7	14.20
MW-311	4/11/2022 1208	641.44	10.1	6.74	0.51	880	125.4	3.57
MW-311A	4/14/2022 1500	643.23	14.1	7.53	4.66	3211	54.6	9.61
MW-312	4/11/2022 1659	--	12.3	7.07	0.15	1855	112.1	8.39
MW-313	4/11/2022 1554	--	13.2	6.94	0.09	1788	126.5	7.44

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

Created by: MDB Date: 5/1/2017
Last revision by: RM Date: 4/20/2022
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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229343-1
Client Project/Site: Ottumwa Generating Station 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Sandra Fredrick

Authorized for release by:
5/9/2022 12:17:02 PM

Sandie Fredrick, Project Manager II
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Job ID: 310-229343-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229343-1

Comments
No additional comments.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 1.7º C, 2.1º C, 2.3º C, 2.4º C, 2.6º C and 2.7º C.

Metals
Methods 200.8, 6020A: Due to sample matrix effect on the internal standard (ISTD), a dilution was required for the following samples: MW-306 (310-229343-6), MW-310A (310-229343-8) and MW-311A (310-229343-10).

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229343-1	MW-302	Water	04/12/22 09:48	04/15/22 17:10
310-229343-2	MW-303	Water	04/12/22 11:24	04/15/22 17:10
310-229343-3	MW-304	Water	04/12/22 13:46	04/15/22 17:10
310-229343-4	MW-305	Water	04/11/22 10:26	04/15/22 17:10
310-229343-5	MW-305A	Water	04/12/22 18:09	04/15/22 17:10
310-229343-6	MW-306	Water	04/12/22 15:20	04/15/22 17:10
310-229343-7	MW-310	Water	04/11/22 14:11	04/15/22 17:10
310-229343-8	MW-310A	Water	04/12/22 17:37	04/15/22 17:10
310-229343-9	MW-311	Water	04/11/22 12:08	04/15/22 17:10
310-229343-10	MW-311A	Water	04/14/22 15:00	04/15/22 17:10
310-229343-11	MW-312	Water	04/11/22 16:59	04/15/22 17:10
310-229343-12	MW-313	Water	04/11/22 15:54	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25222072

Job ID: 310-229343-1

Client Sample ID: MW-302 — Lab Sample ID: 310-229343-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	45	J	100	36	ug/L	1		6020A	Total/NA
Magnesium	49000		500	150	ug/L	1		6020A	Total/NA
Manganese	110		10	3.6	ug/L	1		6020A	Total/NA
Potassium	1600		500	150	ug/L	1		6020A	Total/NA
Sodium	240000		1000	610	ug/L	1		6020A	Total/NA
Manganese	91		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	100		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	100		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-303 — Lab Sample ID: 310-229343-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	26000		500	150	ug/L	1		6020A	Total/NA
Manganese	490		10	3.6	ug/L	1		6020A	Total/NA
Potassium	930		500	150	ug/L	1		6020A	Total/NA
Sodium	110000		1000	610	ug/L	1		6020A	Total/NA
Manganese	410		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	520		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	520		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-304 — Lab Sample ID: 310-229343-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	4800		100	36	ug/L	1		6020A	Total/NA
Magnesium	45000		500	150	ug/L	1		6020A	Total/NA
Manganese	4200		10	3.6	ug/L	1		6020A	Total/NA
Potassium	8700		500	150	ug/L	1		6020A	Total/NA
Sodium	240000		1000	610	ug/L	1		6020A	Total/NA
Iron	3800		100	36	ug/L	1		6020A	Dissolved
Manganese	3500		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	380		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	380		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-305 — Lab Sample ID: 310-229343-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	76	J	100	36	ug/L	1		6020A	Total/NA
Magnesium	53000		500	150	ug/L	1		6020A	Total/NA
Manganese	4000		10	3.6	ug/L	1		6020A	Total/NA
Potassium	8700		500	150	ug/L	1		6020A	Total/NA
Sodium	210000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	17		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	55	J	100	36	ug/L	1		6020A	Dissolved
Manganese	3200		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	520		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	520		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-305A — Lab Sample ID: 310-229343-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	32000		500	150	ug/L	1		6020A	Total/NA
Manganese	140		10	3.6	ug/L	1		6020A	Total/NA
Potassium	4200		500	150	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample ID: MW-305A (Continued) — Lab Sample ID: 310-229343-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	60000		1000	610	ug/L	1		6020A	Total/NA
Manganese	120		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	320		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	320		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-306 — Lab Sample ID: 310-229343-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	68	J	100	36	ug/L	1		6020A	Total/NA
Magnesium	44000		500	150	ug/L	1		6020A	Total/NA
Manganese	26000		100	36	ug/L	10		6020A	Total/NA
Potassium	6000		500	150	ug/L	1		6020A	Total/NA
Sodium	180000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	7.6		0.50	0.19	ug/L	1		6020A	Dissolved
Manganese	23000		70	25	ug/L	7		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	470		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	470		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-310 — Lab Sample ID: 310-229343-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	90000		500	150	ug/L	1		6020A	Total/NA
Manganese	520		10	3.6	ug/L	1		6020A	Total/NA
Potassium	16000		500	150	ug/L	1		6020A	Total/NA
Sodium	170000		1000	610	ug/L	1		6020A	Total/NA
Lithium	52		10	2.5	ug/L	1		6020A	Dissolved
Manganese	400		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	260		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	260		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-310A — Lab Sample ID: 310-229343-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	56	J	100	36	ug/L	1		6020A	Total/NA
Magnesium	42000		500	150	ug/L	1		6020A	Total/NA
Manganese	26		10	3.6	ug/L	1		6020A	Total/NA
Potassium	11000		500	150	ug/L	1		6020A	Total/NA
Sodium	650000		7000	4300	ug/L	7		6020A	Total/NA
Lithium	260		40	10	ug/L	4		6020A	Dissolved
Manganese	20	J	40	14	ug/L	4		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	360		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	360		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-311 — Lab Sample ID: 310-229343-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	37000		500	150	ug/L	1		6020A	Total/NA
Manganese	4.6	J	10	3.6	ug/L	1		6020A	Total/NA
Potassium	860		500	150	ug/L	1		6020A	Total/NA
Sodium	6300		1000	610	ug/L	1		6020A	Total/NA
Bicarbonate Alkalinity as CaCO3	440		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	440		10	4.6	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-311A — Lab Sample ID: 310-229343-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	25000		500	150	ug/L	1		6020A	Total/NA
Manganese	3.7	J	10	3.6	ug/L	1		6020A	Total/NA
Potassium	10000		500	150	ug/L	1		6020A	Total/NA
Sodium	800000		7000	4300	ug/L	7		6020A	Total/NA
Lithium	310		40	10	ug/L	4		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	370		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	370		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-312 — Lab Sample ID: 310-229343-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	350		100	36	ug/L	1		6020A	Total/NA
Magnesium	65000		500	150	ug/L	1		6020A	Total/NA
Manganese	1400		10	3.6	ug/L	1		6020A	Total/NA
Potassium	4800		500	150	ug/L	1		6020A	Total/NA
Sodium	170000		1000	610	ug/L	1		6020A	Total/NA
Iron	510		100	36	ug/L	1		6020A	Dissolved
Lithium	37		10	2.5	ug/L	1		6020A	Dissolved
Manganese	1200		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	240		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	240		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-229343-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	920		100	36	ug/L	1		6020A	Total/NA
Magnesium	68000		500	150	ug/L	1		6020A	Total/NA
Manganese	3800		10	3.6	ug/L	1		6020A	Total/NA
Potassium	6100		500	150	ug/L	1		6020A	Total/NA
Sodium	140000		1000	610	ug/L	1		6020A	Total/NA
Iron	630		100	36	ug/L	1		6020A	Dissolved
Lithium	26		10	2.5	ug/L	1		6020A	Dissolved
Manganese	3200		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	300		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	300		10	4.6	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-302
Date Collected: 04/12/22 09:48
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-1
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**45**	**J**	100	36	ug/L		04/25/22 09:00	04/29/22 17:48	1
Magnesium	**49000**		500	150	ug/L		04/25/22 09:00	04/29/22 17:48	1
Manganese	**110**		10	3.6	ug/L		04/25/22 09:00	04/29/22 17:48	1
Potassium	**1600**		500	150	ug/L		04/25/22 09:00	04/29/22 17:48	1
Sodium	**240000**		1000	610	ug/L		04/25/22 09:00	04/29/22 17:48	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/02/22 15:56	1
Manganese	**91**		10	3.6	ug/L		04/26/22 09:30	05/02/22 15:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**100**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**100**		10	4.6	mg/L			04/20/22 07:59	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-303
Date Collected: 04/12/22 11:24
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-2
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 17:52	1
Magnesium	**26000**		500	150	ug/L		04/25/22 09:00	04/29/22 17:52	1
Manganese	**490**		10	3.6	ug/L		04/25/22 09:00	04/29/22 17:52	1
Potassium	**930**		500	150	ug/L		04/25/22 09:00	04/29/22 17:52	1
Sodium	**110000**		1000	610	ug/L		04/25/22 09:00	04/29/22 17:52	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/08/22 00:58	1
Manganese	**410**		10	3.6	ug/L		04/26/22 09:30	05/08/22 00:58	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**520**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**520**		10	4.6	mg/L			04/20/22 07:59	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-304
Date Collected: 04/12/22 13:46
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-3
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4800		100	36	ug/L		04/25/22 09:00	04/29/22 17:55	1
Magnesium	45000		500	150	ug/L		04/25/22 09:00	04/29/22 17:55	1
Manganese	4200		10	3.6	ug/L		04/25/22 09:00	04/29/22 17:55	1
Potassium	8700		500	150	ug/L		04/25/22 09:00	04/29/22 17:55	1
Sodium	240000		1000	610	ug/L		04/25/22 09:00	04/29/22 17:55	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	3800		100	36	ug/L		04/26/22 09:30	05/08/22 01:02	1
Manganese	3500		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	380		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	380		10	4.6	mg/L			04/20/22 07:59	1

Client Sample ID: MW-305
Date Collected: 04/11/22 10:26
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-4
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	76	J	100	36	ug/L		04/25/22 09:00	04/29/22 17:59	1
Magnesium	53000		500	150	ug/L		04/25/22 09:00	04/29/22 17:59	1
Manganese	4000		10	3.6	ug/L		04/25/22 09:00	04/29/22 17:59	1
Potassium	8700		500	150	ug/L		04/25/22 09:00	04/29/22 17:59	1
Sodium	210000		1000	610	ug/L		04/25/22 09:00	04/29/22 17:59	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	17		0.50	0.19	ug/L		04/26/22 09:30	05/03/22 00:15	1
Iron	55	J	100	36	ug/L		04/26/22 09:30	05/08/22 01:22	1
Manganese	3200		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	520		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	520		10	4.6	mg/L			04/20/22 07:59	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-305A
Lab Sample ID: 310-229343-5
Date Collected: 04/12/22 18:09
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 18:03	1
Magnesium	**32000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:03	1
Manganese	**140**		10	3.6	ug/L		04/25/22 09:00	04/29/22 18:03	1
Potassium	**4200**		500	150	ug/L		04/25/22 09:00	04/29/22 18:03	1
Sodium	**60000**		1000	610	ug/L		04/25/22 09:00	04/29/22 18:03	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/08/22 01:26	1
Manganese	**120**		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**320**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**320**		10	4.6	mg/L			04/20/22 07:59	1

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-306
Date Collected: 04/12/22 15:20
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-6
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**68**	**J**	100	36	ug/L		04/25/22 09:00	04/29/22 18:07	1
Magnesium	**44000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:07	1
Manganese	**26000**		100	36	ug/L		04/25/22 09:00	05/07/22 16:15	10
Potassium	**6000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:07	1
Sodium	**180000**		1000	610	ug/L		04/25/22 09:00	04/29/22 18:07	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**7.6**		0.50	0.19	ug/L		04/26/22 09:30	05/03/22 00:23	1
Iron	<250		700	250	ug/L		04/26/22 09:30	05/08/22 01:30	7
Manganese	**23000**		70	25	ug/L		04/26/22 09:30	05/08/22 01:30	7

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**470**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**470**		10	4.6	mg/L			04/20/22 07:59	1

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-310
Lab Sample ID: 310-229343-7
Date Collected: 04/11/22 14:11
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 18:15	1
Magnesium	**90000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:15	1
Manganese	**520**		10	3.6	ug/L		04/25/22 09:00	04/29/22 18:15	1
Potassium	**16000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:15	1
Sodium	**170000**		1000	610	ug/L		04/25/22 09:00	04/29/22 18:15	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/08/22 01:34	1
Lithium	**52**		10	2.5	ug/L		04/26/22 09:30	05/08/22 01:34	1
Manganese	**400**		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**260**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**260**		10	4.6	mg/L			04/20/22 07:59	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-310A
Lab Sample ID: 310-229343-8
Date Collected: 04/12/22 17:37
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	**56**	**J**	100	36	ug/L		04/25/22 09:00	04/29/22 18:19	1
Magnesium	**42000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:19	1
Manganese	**26**		10	3.6	ug/L		04/25/22 09:00	04/29/22 18:19	1
Potassium	**11000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:19	1
Sodium	**650000**		7000	4300	ug/L		04/25/22 09:00	05/07/22 16:22	7

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<140		400	140	ug/L		04/26/22 09:30	05/08/22 01:37	4
Lithium	**260**		40	10	ug/L		04/26/22 09:30	05/08/22 01:37	4
Manganese	**20**	**J**	40	14	ug/L		04/26/22 09:30	05/08/22 01:37	4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**360**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**360**		10	4.6	mg/L			04/20/22 07:59	1

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-311
Lab Sample ID: 310-229343-9
Date Collected: 04/11/22 12:08
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 18:23	1
Magnesium	**37000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:23	1
Manganese	**4.6**	**J**	10	3.6	ug/L		04/25/22 09:00	04/29/22 18:23	1
Potassium	**860**		500	150	ug/L		04/25/22 09:00	04/29/22 18:23	1
Sodium	**6300**		1000	610	ug/L		04/25/22 09:00	04/29/22 18:23	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/08/22 01:41	1
Manganese	<3.6		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**440**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**440**		10	4.6	mg/L			04/20/22 07:59	1

Client Sample ID: MW-311A
Lab Sample ID: 310-229343-10

Date Collected: 04/14/22 15:00
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 18:42	1
Magnesium	**25000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:42	1
Manganese	**3.7**	**J**	10	3.6	ug/L		04/25/22 09:00	04/29/22 18:42	1
Potassium	**10000**		500	150	ug/L		04/25/22 09:00	04/29/22 18:42	1
Sodium	**800000**		7000	4300	ug/L		04/25/22 09:00	05/07/22 16:26	7

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<140		400	140	ug/L		04/26/22 09:30	05/08/22 01:45	4
Lithium	**310**		40	10	ug/L		04/26/22 09:30	05/08/22 01:45	4
Manganese	<14		40	14	ug/L		04/26/22 09:30	05/08/22 01:45	4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**370**		10	4.6	mg/L			04/27/22 09:00	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/27/22 09:00	1
Total Alkalinity as CaCO3	**370**		10	4.6	mg/L			04/27/22 09:00	1

Client Sample ID: MW-312
Date Collected: 04/11/22 16:59
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-11
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	350		100	36	ug/L		04/25/22 09:00	04/29/22 18:46	1
Magnesium	65000		500	150	ug/L		04/25/22 09:00	04/29/22 18:46	1
Manganese	1400		10	3.6	ug/L		04/25/22 09:00	04/29/22 18:46	1
Potassium	4800		500	150	ug/L		04/25/22 09:00	04/29/22 18:46	1
Sodium	170000		1000	610	ug/L		04/25/22 09:00	04/29/22 18:46	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	510		100	36	ug/L		04/26/22 09:30	05/08/22 01:53	1
Lithium	37		10	2.5	ug/L		04/26/22 09:30	05/08/22 01:53	1
Manganese	1200		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	240		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	240		10	4.6	mg/L			04/20/22 07:59	1

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-313
Date Collected: 04/11/22 15:54
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229343-12
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	920		100	36	ug/L		04/25/22 09:00	04/29/22 18:50	1
Magnesium	68000		500	150	ug/L		04/25/22 09:00	04/29/22 18:50	1
Manganese	3800		10	3.6	ug/L		04/25/22 09:00	04/29/22 18:50	1
Potassium	6100		500	150	ug/L		04/25/22 09:00	04/29/22 18:50	1
Sodium	140000		1000	610	ug/L		04/25/22 09:00	04/29/22 18:50	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	630		100	36	ug/L		04/26/22 09:30	05/08/22 01:57	1
Lithium	26		10	2.5	ug/L		04/26/22 09:30	05/08/22 01:57	1
Manganese	3200		10	3.6	ug/L		04/26/22 09:30	05/08/22 01:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	300		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	300		10	4.6	mg/L			04/20/22 07:59	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

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.

Glossary

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

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-350868/1-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350868

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 16:53	1
Magnesium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 16:53	1
Manganese	<3.6		10	3.6	ug/L		04/25/22 09:00	04/29/22 16:53	1
Potassium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 16:53	1
Sodium	<610		1000	610	ug/L		04/25/22 09:00	04/29/22 16:53	1

Lab Sample ID: LCS 310-350868/2-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	200	220		ug/L		110	80 - 120
Magnesium	2000	2220		ug/L		111	80 - 120
Manganese	100	108		ug/L		108	80 - 120
Potassium	2000	2230		ug/L		112	80 - 120
Sodium	2000	2280		ug/L		114	80 - 120

Lab Sample ID: 310-229343-6 DU
Matrix: Water
Analysis Batch: 351583

Client Sample ID: MW-306
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Iron	68	J	68.9	J	ug/L		2	20
Magnesium	44000		45500		ug/L		3	20
Potassium	6000		5970		ug/L		0.08	20
Sodium	180000		189000		ug/L		3	20

Lab Sample ID: 310-229343-6 DU
Matrix: Water
Analysis Batch: 352391

Client Sample ID: MW-306
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Manganese	26000		26400		ug/L		4	20

Lab Sample ID: MB 310-350973/1-A
Matrix: Water
Analysis Batch: 351804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350973

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.19		0.50	0.19	ug/L		04/26/22 09:30	05/02/22 15:45	1
Iron	<36		100	36	ug/L		04/26/22 09:30	05/02/22 15:45	1
Lithium	<2.5		10	2.5	ug/L		04/26/22 09:30	05/02/22 15:45	1
Manganese	<3.6		10	3.6	ug/L		04/26/22 09:30	05/02/22 15:45	1

Lab Sample ID: LCS 310-350973/2-A
Matrix: Water
Analysis Batch: 351804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350973

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	100	107		ug/L		107	80 - 120

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

Lab Sample ID: LCS 310-350973/2-A
Matrix: Water
Analysis Batch: 351804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350973

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Iron			200	202		ug/L		101	80 - 120		
Lithium			200	191		ug/L		95	80 - 120		
Manganese			100	99.2		ug/L		99	80 - 120		

Lab Sample ID: 310-229343-1 MS
Matrix: Water
Analysis Batch: 351804

Client Sample ID: MW-302
Prep Type: Dissolved
Prep Batch: 350973

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Cobalt	0.92		100	104		ug/L		103	75 - 125		
Iron	<36		200	214		ug/L		107	75 - 125		
Lithium	9.9	J	200	206		ug/L		98	75 - 125		
Manganese	91		100	195		ug/L		104	75 - 125		

Lab Sample ID: 310-229343-1 MSD
Matrix: Water
Analysis Batch: 351804

Client Sample ID: MW-302
Prep Type: Dissolved
Prep Batch: 350973

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cobalt	0.92		100	104		ug/L		103	75 - 125	0	20
Iron	<36		200	209		ug/L		104	75 - 125	3	20
Lithium	9.9	J	200	204		ug/L		97	75 - 125	1	20
Manganese	91		100	196		ug/L		105	75 - 125	0	20

Lab Sample ID: 310-229343-10 DU
Matrix: Water
Analysis Batch: 351804

Client Sample ID: MW-311A
Prep Type: Dissolved
Prep Batch: 350973

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Cobalt	<0.76			<0.76		ug/L				NC	20

Lab Sample ID: 310-229343-10 DU
Matrix: Water
Analysis Batch: 352391

Client Sample ID: MW-311A
Prep Type: Dissolved
Prep Batch: 350973

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Cobalt	<0.76			<0.76		ug/L				NC	20
Iron	<140			<140		ug/L				NC	20
Lithium	310			302		ug/L				2	20
Manganese	<14			<14		ug/L				NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-350414/1
Matrix: Water
Analysis Batch: 350414

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 310-350414/1
Matrix: Water
Analysis Batch: 350414

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1

Lab Sample ID: LCS 310-350414/2
Matrix: Water
Analysis Batch: 350414

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	1030		mg/L		103	90 - 110

Lab Sample ID: MB 310-351169/1
Matrix: Water
Analysis Batch: 351169

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/27/22 09:00	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/27/22 09:00	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/27/22 09:00	1

Lab Sample ID: LCS 310-351169/2
Matrix: Water
Analysis Batch: 351169

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	964		mg/L		96	90 - 110

Metals

Prep Batch: 350868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-1	MW-302	Total/NA	Water	3005A	
310-229343-2	MW-303	Total/NA	Water	3005A	
310-229343-3	MW-304	Total/NA	Water	3005A	
310-229343-4	MW-305	Total/NA	Water	3005A	
310-229343-5	MW-305A	Total/NA	Water	3005A	
310-229343-6	MW-306	Total/NA	Water	3005A	
310-229343-7	MW-310	Total/NA	Water	3005A	
310-229343-8	MW-310A	Total/NA	Water	3005A	
310-229343-9	MW-311	Total/NA	Water	3005A	
310-229343-10	MW-311A	Total/NA	Water	3005A	
310-229343-11	MW-312	Total/NA	Water	3005A	
310-229343-12	MW-313	Total/NA	Water	3005A	
MB 310-350868/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-229343-6 DU	MW-306	Total/NA	Water	3005A	

Prep Batch: 350973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-1	MW-302	Dissolved	Water	3005A	
310-229343-2	MW-303	Dissolved	Water	3005A	
310-229343-3	MW-304	Dissolved	Water	3005A	
310-229343-4	MW-305	Dissolved	Water	3005A	
310-229343-5	MW-305A	Dissolved	Water	3005A	
310-229343-6	MW-306	Dissolved	Water	3005A	
310-229343-7	MW-310	Dissolved	Water	3005A	
310-229343-8	MW-310A	Dissolved	Water	3005A	
310-229343-9	MW-311	Dissolved	Water	3005A	
310-229343-10	MW-311A	Dissolved	Water	3005A	
310-229343-11	MW-312	Dissolved	Water	3005A	
310-229343-12	MW-313	Dissolved	Water	3005A	
MB 310-350973/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350973/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-229343-1 MS	MW-302	Dissolved	Water	3005A	
310-229343-1 MSD	MW-302	Dissolved	Water	3005A	
310-229343-10 DU	MW-311A	Dissolved	Water	3005A	

Analysis Batch: 351583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-1	MW-302	Total/NA	Water	6020A	350868
310-229343-2	MW-303	Total/NA	Water	6020A	350868
310-229343-3	MW-304	Total/NA	Water	6020A	350868
310-229343-4	MW-305	Total/NA	Water	6020A	350868
310-229343-5	MW-305A	Total/NA	Water	6020A	350868
310-229343-6	MW-306	Total/NA	Water	6020A	350868
310-229343-7	MW-310	Total/NA	Water	6020A	350868
310-229343-8	MW-310A	Total/NA	Water	6020A	350868
310-229343-9	MW-311	Total/NA	Water	6020A	350868
310-229343-10	MW-311A	Total/NA	Water	6020A	350868
310-229343-11	MW-312	Total/NA	Water	6020A	350868
310-229343-12	MW-313	Total/NA	Water	6020A	350868
MB 310-350868/1-A	Method Blank	Total/NA	Water	6020A	350868

Metals (Continued)

Analysis Batch: 351583 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	6020A	350868
310-229343-6 DU	MW-306	Total/NA	Water	6020A	350868

Analysis Batch: 351804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-1	MW-302	Dissolved	Water	6020A	350973
310-229343-4	MW-305	Dissolved	Water	6020A	350973
310-229343-6	MW-306	Dissolved	Water	6020A	350973
MB 310-350973/1-A	Method Blank	Total/NA	Water	6020A	350973
LCS 310-350973/2-A	Lab Control Sample	Total/NA	Water	6020A	350973
310-229343-1 MS	MW-302	Dissolved	Water	6020A	350973
310-229343-1 MSD	MW-302	Dissolved	Water	6020A	350973
310-229343-10 DU	MW-311A	Dissolved	Water	6020A	350973

Analysis Batch: 352391

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-2	MW-303	Dissolved	Water	6020A	350973
310-229343-3	MW-304	Dissolved	Water	6020A	350973
310-229343-4	MW-305	Dissolved	Water	6020A	350973
310-229343-5	MW-305A	Dissolved	Water	6020A	350973
310-229343-6	MW-306	Dissolved	Water	6020A	350973
310-229343-6	MW-306	Total/NA	Water	6020A	350868
310-229343-7	MW-310	Dissolved	Water	6020A	350973
310-229343-8	MW-310A	Dissolved	Water	6020A	350973
310-229343-8	MW-310A	Total/NA	Water	6020A	350868
310-229343-9	MW-311	Dissolved	Water	6020A	350973
310-229343-10	MW-311A	Dissolved	Water	6020A	350973
310-229343-10	MW-311A	Total/NA	Water	6020A	350868
310-229343-11	MW-312	Dissolved	Water	6020A	350973
310-229343-12	MW-313	Dissolved	Water	6020A	350973
310-229343-6 DU	MW-306	Total/NA	Water	6020A	350868
310-229343-10 DU	MW-311A	Dissolved	Water	6020A	350973

General Chemistry

Analysis Batch: 350414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-1	MW-302	Total/NA	Water	SM 2320B	
310-229343-2	MW-303	Total/NA	Water	SM 2320B	
310-229343-3	MW-304	Total/NA	Water	SM 2320B	
310-229343-4	MW-305	Total/NA	Water	SM 2320B	
310-229343-5	MW-305A	Total/NA	Water	SM 2320B	
310-229343-6	MW-306	Total/NA	Water	SM 2320B	
310-229343-7	MW-310	Total/NA	Water	SM 2320B	
310-229343-8	MW-310A	Total/NA	Water	SM 2320B	
310-229343-9	MW-311	Total/NA	Water	SM 2320B	
310-229343-11	MW-312	Total/NA	Water	SM 2320B	
310-229343-12	MW-313	Total/NA	Water	SM 2320B	
MB 310-350414/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-350414/2	Lab Control Sample	Total/NA	Water	SM 2320B	

QC Association Summary

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

General Chemistry

Analysis Batch: 351169

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229343-10	MW-311A	Total/NA	Water	SM 2320B	
MB 310-351169/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-351169/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-302
Lab Sample ID: 310-229343-1
Date Collected: 04/12/22 09:48
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	351804	05/02/22 15:56	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:48	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-303
Lab Sample ID: 310-229343-2
Date Collected: 04/12/22 11:24
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 00:58	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:52	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-304
Lab Sample ID: 310-229343-3
Date Collected: 04/12/22 13:46
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:02	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:55	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-305
Lab Sample ID: 310-229343-4
Date Collected: 04/11/22 10:26
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	351804	05/03/22 00:15	SAP	TAL CF
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:22	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:59	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-305A
Lab Sample ID: 310-229343-5
Date Collected: 04/12/22 18:09
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:26	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:03	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-306
Lab Sample ID: 310-229343-6
Date Collected: 04/12/22 15:20
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	351804	05/03/22 00:23	SAP	TAL CF
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		7	352391	05/08/22 01:30	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:07	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		10	352391	05/07/22 16:15	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-310
Lab Sample ID: 310-229343-7
Date Collected: 04/11/22 14:11
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:34	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:15	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-310A
Lab Sample ID: 310-229343-8
Date Collected: 04/12/22 17:37
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		4	352391	05/08/22 01:37	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:19	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		7	352391	05/07/22 16:22	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-311
Lab Sample ID: 310-229343-9
Date Collected: 04/11/22 12:08
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:41	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:23	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-311A
Lab Sample ID: 310-229343-10
Date Collected: 04/14/22 15:00
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		4	352391	05/08/22 01:45	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:42	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		7	352391	05/07/22 16:26	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	351169	04/27/22 09:00	JMH2	TAL CF

Client Sample ID: MW-312
Lab Sample ID: 310-229343-11
Date Collected: 04/11/22 16:59
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:53	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:46	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: MW-313
Lab Sample ID: 310-229343-12
Date Collected: 04/11/22 15:54
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350973	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	352391	05/08/22 01:57	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:50	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229343-1
Project/Site: Ottumwa Generating Station 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25222072

Job ID: 310-229343-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF

Protocol References:

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.

Laboratory References:

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

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310-229343 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information					
Client	SCS Engineers				
City/State	CITY Madison		STATE WI	Project	
Receipt Information					
Date/Time Received	DATE 4/15/22		TIME 1710	Received By	MRH
Delivery Type	☐ UPS	☐ FedEx	☐ FedEx Ground	☐ US Mail	☐ Spee-Dee
	☒ Lab Courier	☐ Lab Field Services	☐ Client Drop-off	☐ Other._____	
Condition of Cooler/Containers					
Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes* Cooler ID		
Multiple Coolers?	☒ Yes	☐ No	*If yes* Cooler # 1 of 6		
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes* Cooler custody seals intact?	☒ Yes	☐ No
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes* Sample custody seals intact?	☐ Yes	☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes* Which VOA samples are in cooler? ↓		
Temperature Record					
Coolant	☒ Wet ice	☐ Blue ice	☐ Dry ice	☐ Other._____	☐ NONE
Thermometer ID	0-8 MRH 4/15/22		Correction Factor (°C)	0.0	
• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature					
Uncorrected Temp (°C)	2.3		Corrected Temp (°C)	2.3	
• **Sample Container Temperature**					
Container(s) used	CONTAINER 1		CONTAINER 2		
Uncorrected Temp (°C)					
Corrected Temp (°C)					

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes* Cooler ID
Multiple Coolers?	☒ Yes	☐ No	*If yes* Cooler # 2 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes* Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes.* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes* Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 028 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.6 | Corrected Temp (°C): 2.6

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes* Cooler ID
Multiple Coolers?	☒ Yes	☐ No	*If yes* Cooler # 3 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes* Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes* Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes* Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 0X MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.4 | Corrected Temp (°C): 2.4

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes* Cooler # 4 of 6

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

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

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

Temperature Record

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

Thermometer ID: 028 MRH 4/5/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.1 | Corrected Temp (°C): 2.1

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes ☐ No	*If yes* Cooler ID	
Multiple Coolers?	☒ Yes ☐ No	*If yes* Cooler # 5 of 6	
Cooler Custody Seals Present? No	☒ Yes ☐ No	*If yes* Cooler custody seals intact? ☒ Yes ☐	
Sample Custody Seals Present? No	☐ Yes ☒ No	*If yes* Sample custody seals intact? ☐ Yes ☐	
Trip Blank Present?	☐ Yes ☒ No	*If yes* Which VOA samples are in cooler? ↓	

Temperature Record

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

Thermometer ID: 0-8 MRH 4/5/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.7 | Corrected Temp (°C): 1.7

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes ☐ No	*If yes* Cooler ID	
Multiple Coolers?	☒ Yes ☐ No	*If yes* Cooler # 6 of 6	
Cooler Custody Seals Present? No	☒ Yes ☐ No	*If yes* Cooler custody seals intact? ☒ Yes ☐ No	
Sample Custody Seals Present? No	☐ Yes ☒ No	*If yes* Sample custody seals intact? ☐ Yes ☐ No	
Trip Blank Present?	☐ Yes ☒ No	*If yes* Which VOA samples are in cooler? ↓	

Temperature Record

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

Thermometer ID: 08 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.7 | Corrected Temp (°C): 2.7

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70159-17488.1
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: SCS Engineers	PWSID:			Job #:

Address: 2830 Dairy Drive	Due Date Requested:
City: Madison	TAT Requested (days):
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No
Phone:	PO #: 25221072
Email: mblodgett@scsengineers.com	WO #:
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020
Site:	SSOW#:

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Wwater Ssolid, Owaste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B Alkalinity/Carb/Bicarb	6020A Metals (5)	6020A D. Metals (2-4)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	D		
MW-302	4-12-22	9 48	G	Water							
MW-303	4-12-22	11 24	G	Water							
MW-304	4-12-22	13:46	G	Water							
MW-305	4-11-22	10 26	G	Water							
MW-305A	4-12-22	18.09	G	Water							
MW-306	4-12-22	15.26	G	Water							
MW-310	4-11-22	14'11	G	Water							
MW-310A	4-12-22	17 37	G	Water							
MW-311	4-11-22	1208	G	Water							
MW-311A	4-14-22	1500	G	Water							
MW-312	4-11-22	16.59	G	Water							

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time: 4-15-22 13 58	Company: SCS	Received by: James Vaux	Date/Time: 4/15/22 1358	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

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

Ver: 01/16/2019

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

Chain of Custody Record

eurofins — formerly TestAmerica

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70159-17488.2
Client Contact: Meghan Blodgett	Phone: 515-864-4340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B Alkalinity/Carb/Bicarb	6020A Metals (5)	6020A D. Metals (2-4)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	D		
MW-313	4-14-22	15:54	G	Water			X	X	X		
				Water							

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Rosa Cruz	4-15-22 1358	SCS	James Vaux	4/15/22 1358	Eurofins TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

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

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229343-1
SDG Number:

Login Number: 229343
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229324-2
Client Project/Site: Ottumwa Generating Station-25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
5/19/2022 8:47:08 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Job ID: 310-229324-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229324-2

Comments
No additional comments.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 1.7º C, 2.1º C, 2.3º C, 2.4º C, 2.6º C and 2.7º C.

RAD
Methods 903.0, 9315: Radium-226 batch 561488
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-302 (310-229324-1), MW-303 (310-229324-2), MW-304 (310-229324-3), MW-305 (310-229324-4), MW-305A (310-229324-5), MW-306 (310-229324-6), MW-310 (310-229324-7), (LCS 160-561488/1-A), (LCSD 160-561488/2-A) and (MB 160-561488/23-A)

Methods 903.0, 9315: Radium 226 batch 561918
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-310A (310-229324-8), MW-311 (310-229324-9), MW-311A (310-229324-10), MW-312 (310-229324-11), MW-313 (310-229324-12), (LCS 160-561918/1-A), (LCSD 160-561918/2-A) and (MB 160-561918/22-A)

Methods 904.0, 9320: Radium-228 prep batch 160-561498:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-302 (310-229324-1), MW-303 (310-229324-2), MW-304 (310-229324-3), MW-305 (310-229324-4), MW-305A (310-229324-5), MW-306 (310-229324-6), MW-310 (310-229324-7), (LCS 160-561498/1-A), (LCSD 160-561498/2-A) and (MB 160-561498/23-A)

Methods 904.0, 9320: Radium-228 prep batch 160-561925:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-310A (310-229324-8), MW-311 (310-229324-9), MW-311A (310-229324-10), MW-312 (310-229324-11), MW-313 (310-229324-12), (LCS 160-561925/1-A), (LCSD 160-561925/2-A) and (MB 160-561925/22-A)

Method 904.0: Radium-228 prep batch 160-561925:
The following sample(s) exhibited a negative result greater in magnitude than the 3 sigma TPU. This occurrence was evaluated and determined to be random in nature. Sporadic occurrences such as this are statistically expected. No further action is required. MW-312 (310-229324-11)

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229324-1	MW-302	Water	04/12/22 09:48	04/15/22 17:10
310-229324-2	MW-303	Water	04/12/22 11:24	04/15/22 17:10
310-229324-3	MW-304	Water	04/12/22 13:46	04/15/22 17:10
310-229324-4	MW-305	Water	04/11/22 10:26	04/15/22 17:10
310-229324-5	MW-305A	Water	04/12/22 18:09	04/15/22 17:10
310-229324-6	MW-306	Water	04/12/22 15:20	04/15/22 17:10
310-229324-7	MW-310	Water	04/11/22 14:11	04/15/22 17:10
310-229324-8	MW-310A	Water	04/12/22 17:37	04/15/22 17:10
310-229324-9	MW-311	Water	04/11/22 12:08	04/15/22 17:10
310-229324-10	MW-311A	Water	04/14/22 15:00	04/15/22 17:10
310-229324-11	MW-312	Water	04/11/22 16:59	04/15/22 17:10
310-229324-12	MW-313	Water	04/11/22 15:54	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-302 — Lab Sample ID: 310-229324-1

No Detections.

Client Sample ID: MW-303 — Lab Sample ID: 310-229324-2

No Detections.

Client Sample ID: MW-304 — Lab Sample ID: 310-229324-3

No Detections.

Client Sample ID: MW-305 — Lab Sample ID: 310-229324-4

No Detections.

Client Sample ID: MW-305A — Lab Sample ID: 310-229324-5

No Detections.

Client Sample ID: MW-306 — Lab Sample ID: 310-229324-6

No Detections.

Client Sample ID: MW-310 — Lab Sample ID: 310-229324-7

No Detections.

Client Sample ID: MW-310A — Lab Sample ID: 310-229324-8

No Detections.

Client Sample ID: MW-311 — Lab Sample ID: 310-229324-9

No Detections.

Client Sample ID: MW-311A — Lab Sample ID: 310-229324-10

No Detections.

Client Sample ID: MW-312 — Lab Sample ID: 310-229324-11

No Detections.

Client Sample ID: MW-313 — Lab Sample ID: 310-229324-12

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample ID: MW-302
Date Collected: 04/12/22 09:48
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-1
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.202	U	0.161	0.162	1.00	0.241	pCi/L	04/21/22 10:14	05/13/22 20:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*74.4*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:52*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.0914	U	0.257	0.257	1.00	0.447	pCi/L	04/21/22 10:59	05/10/22 12:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*74.4*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*
Y Carrier	*87.1*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*

Method: 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	0.294	U	0.303	0.304	5.00	0.447	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-303
Date Collected: 04/12/22 11:24
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-2
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.156	U	0.151	0.151	1.00	0.239	pCi/L	04/21/22 10:14	05/13/22 20:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.7*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:52*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**0.463**		0.267	0.271	1.00	0.405	pCi/L	04/21/22 10:59	05/10/22 12:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*86.7*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*
Y Carrier	*89.0*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*

Method: 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	**0.619**		0.307	0.310	5.00	0.405	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-304
Date Collected: 04/12/22 13:46
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-3
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	1.29		0.253	0.279	1.00	0.182	pCi/L	04/21/22 10:14	05/13/22 20:52	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.1*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:52*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	1.58		0.326	0.357	1.00	0.365	pCi/L	04/21/22 10:59	05/10/22 12:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*90.1*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*
Y Carrier	*93.5*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:22*	*1*

Method: 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	2.87		0.413	0.453	5.00	0.365	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-305
Date Collected: 04/11/22 10:26
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-4
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.433		0.163	0.168	1.00	0.171	pCi/L	04/21/22 10:14	05/13/22 20:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*87.2*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:53*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.601		0.254	0.260	1.00	0.355	pCi/L	04/21/22 10:59	05/10/22 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*87.2*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*
Y Carrier	*90.1*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*

Method: 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	1.03		0.302	0.310	5.00	0.355	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-305A
Lab Sample ID: 310-229324-5

Date Collected: 04/12/22 18:09
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	2.96		0.378	0.463	1.00	0.193	pCi/L	04/21/22 10:14	05/13/22 20:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.7*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:53*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.481		0.266	0.270	1.00	0.396	pCi/L	04/21/22 10:59	05/10/22 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*86.7*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*
Y Carrier	*87.5*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*

Method: 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	3.44		0.462	0.536	5.00	0.396	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-306
Date Collected: 04/12/22 15:20
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-6
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.115	U	0.112	0.112	1.00	0.175	pCi/L	04/21/22 10:14	05/13/22 20:53	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*04/21/22 10:14*	*05/13/22 20:53*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	**1.92**		0.364	0.404	1.00	0.399	pCi/L	04/21/22 10:59	05/10/22 12:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*91.1*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:24*	*1*
Y Carrier	*88.6*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:24*	*1*

Method: 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	**2.03**		0.381	0.419	5.00	0.399	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-310
Lab Sample ID: 310-229324-7

Date Collected: 04/11/22 14:11
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.0361	U	0.0633	0.0634	1.00	0.161	pCi/L	04/21/22 10:14	05/13/22 22:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.0*		*40 - 110*	*04/21/22 10:14*	*05/13/22 22:26*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.316	U	0.252	0.254	1.00	0.398	pCi/L	04/21/22 10:59	05/10/22 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*80.0*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*
Y Carrier	*88.2*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:23*	*1*

Method: 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	0.316	U	0.260	0.262	5.00	0.398	pCi/L		05/16/22 11:24	1

Client Sample ID: MW-310A
Lab Sample ID: 310-229324-8

Date Collected: 04/12/22 17:37
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**4.35**		0.387	0.551	1.00	0.133	pCi/L	04/25/22 08:44	05/18/22 12:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.2*		*40 - 110*	*04/25/22 08:44*	*05/18/22 12:39*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.267	U	0.257	0.258	1.00	0.414	pCi/L	04/25/22 09:22	05/11/22 12:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*85.2*		*40 - 110*	*04/25/22 09:22*	*05/11/22 12:59*	*1*
Y Carrier	*85.6*		*40 - 110*	*04/25/22 09:22*	*05/11/22 12:59*	*1*

Method: 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	**4.61**		0.465	0.608	5.00	0.414	pCi/L		05/19/22 16:45	1

Client Sample ID: MW-311
Date Collected: 04/11/22 12:08
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-9
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.0305	U	0.0746	0.0746	1.00	0.135	pCi/L	04/25/22 08:44	05/18/22 12:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*04/25/22 08:44*	*05/18/22 12:40*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.194	U	0.221	0.221	1.00	0.363	pCi/L	04/25/22 09:22	05/11/22 13:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*92.9*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*
Y Carrier	*87.1*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*

Method: 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	0.224	U	0.233	0.233	5.00	0.363	pCi/L		05/19/22 16:45	1

Client Sample ID: MW-311A
Lab Sample ID: 310-229324-10

Date Collected: 04/14/22 15:00
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	3.38		0.351	0.464	1.00	0.138	pCi/L	04/25/22 08:44	05/18/22 12:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*79.8*		*40 - 110*	*04/25/22 08:44*	*05/18/22 12:40*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.610		0.312	0.317	1.00	0.459	pCi/L	04/25/22 09:22	05/11/22 13:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*79.8*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*
Y Carrier	*88.2*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*

Method: 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	3.99		0.470	0.562	5.00	0.459	pCi/L		05/19/22 16:45	1

Client Sample ID: MW-312
Date Collected: 04/11/22 16:59
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229324-11
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**0.357**		0.136	0.139	1.00	0.151	pCi/L	04/25/22 08:44	05/18/22 12:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.8*		*40 - 110*	*04/25/22 08:44*	*05/18/22 12:40*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	-0.907	U	0.116	0.143	1.00	0.443	pCi/L	04/25/22 09:22	05/11/22 13:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*81.8*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*
Y Carrier	*87.1*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:00*	*1*

Method: 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	0.357	U	0.179	0.199	5.00	0.443	pCi/L		05/19/22 16:45	1

Client Sample ID: MW-313
Lab Sample ID: 310-229324-12

Date Collected: 04/11/22 15:54
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	**0.308**		0.124	0.127	1.00	0.139	pCi/L	04/25/22 08:44	05/18/22 12:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.0*		*40 - 110*	*04/25/22 08:44*	*05/18/22 12:40*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.235	U	0.286	0.287	1.00	0.473	pCi/L	04/25/22 09:22	05/11/22 13:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*84.0*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:01*	*1*
Y Carrier	*86.4*		*40 - 110*	*04/25/22 09:22*	*05/11/22 13:01*	*1*

Method: 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	**0.543**		0.312	0.314	5.00	0.473	pCi/L		05/19/22 16:45	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Qualifiers

Rad

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

Glossary

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

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-561488/23-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561488

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.03358	U	0.105	0.105	1.00	0.214	pCi/L	04/21/22 10:14	05/13/22 22:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*04/21/22 10:14*	*05/13/22 22:35*	*1*

Lab Sample ID: LCS 160-561488/1-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561488

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			11.3	11.09		1.22	1.00	0.169	pCi/L	98	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.8*		*40 - 110*

Lab Sample ID: LCSD 160-561488/2-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561488

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 226			11.3	10.68		1.20	1.00	0.202	pCi/L	94	75 - 125	0.17	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*93.8*		*40 - 110*

Lab Sample ID: MB 160-561918/22-A
Matrix: Water
Analysis Batch: 566379

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561918

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.05827	U	0.0742	0.0744	1.00	0.123	pCi/L	04/25/22 08:44	05/18/22 16:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.0*		*40 - 110*	*04/25/22 08:44*	*05/18/22 16:35*	*1*

Lab Sample ID: LCS 160-561918/1-A
Matrix: Water
Analysis Batch: 566379

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561918

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			11.3	9.836		1.04	1.00	0.132	pCi/L	87	75 - 125		

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

Lab Sample ID: LCS 160-561918/1-A
Matrix: Water
Analysis Batch: 566379

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561918

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	98.0		40 - 110

Lab Sample ID: LCSD 160-561918/2-A
Matrix: Water
Analysis Batch: 566379

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561918

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 226			11.3	10.27		1.09	1.00	0.126	pCi/L	91	75 - 125	0.20	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	96.6		40 - 110

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-561498/23-A
Matrix: Water
Analysis Batch: 564844

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561498

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.2973	U	0.209	0.211	1.00	0.325	pCi/L	04/21/22 10:59	05/10/22 12:25	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba	98.8		40 - 110	04/21/22 10:59	05/10/22 12:25	1
Y Carrier	89.7		40 - 110	04/21/22 10:59	05/10/22 12:25	1

Lab Sample ID: LCS 160-561498/1-A
Matrix: Water
Analysis Batch: 564827

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561498

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.63	10.09		1.15	1.00	0.373	pCi/L	117	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba	95.8		40 - 110
Y Carrier	86.4		40 - 110

Lab Sample ID: LCSD 160-561498/2-A
Matrix: Water
Analysis Batch: 564827

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561498

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 228			8.63	10.16		1.16	1.00	0.379	pCi/L	118	75 - 125	0.03	1

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

Lab Sample ID: LCSD 160-561498/2-A
Matrix: Water
Analysis Batch: 564827

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561498

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba	93.8		40 - 110
Y Carrier	85.2		40 - 110

Lab Sample ID: MB 160-561925/22-A
Matrix: Water
Analysis Batch: 564966

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561925

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.1887	U	0.243	0.244	1.00	0.404	pCi/L	04/25/22 09:22	05/11/22 13:03	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba	97.0		40 - 110	04/25/22 09:22	05/11/22 13:03	1
Y Carrier	86.0		40 - 110	04/25/22 09:22	05/11/22 13:03	1

Lab Sample ID: LCS 160-561925/1-A
Matrix: Water
Analysis Batch: 565165

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561925

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.63	8.967		1.05	1.00	0.324	pCi/L	104	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba	98.0		40 - 110
Y Carrier	88.2		40 - 110

Lab Sample ID: LCSD 160-561925/2-A
Matrix: Water
Analysis Batch: 565165

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561925

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 228			8.63	9.264		1.09	1.00	0.369	pCi/L	107	75 - 125	0.14	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba	96.6		40 - 110
Y Carrier	86.7		40 - 110

Rad

Prep Batch: 561488

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	PrecSep-21	
310-229324-2	MW-303	Total/NA	Water	PrecSep-21	
310-229324-3	MW-304	Total/NA	Water	PrecSep-21	
310-229324-4	MW-305	Total/NA	Water	PrecSep-21	
310-229324-5	MW-305A	Total/NA	Water	PrecSep-21	
310-229324-6	MW-306	Total/NA	Water	PrecSep-21	
310-229324-7	MW-310	Total/NA	Water	PrecSep-21	
MB 160-561488/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-561488/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-561488/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 561498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-1	MW-302	Total/NA	Water	PrecSep_0	
310-229324-2	MW-303	Total/NA	Water	PrecSep_0	
310-229324-3	MW-304	Total/NA	Water	PrecSep_0	
310-229324-4	MW-305	Total/NA	Water	PrecSep_0	
310-229324-5	MW-305A	Total/NA	Water	PrecSep_0	
310-229324-6	MW-306	Total/NA	Water	PrecSep_0	
310-229324-7	MW-310	Total/NA	Water	PrecSep_0	
MB 160-561498/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-561498/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-561498/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 561918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-8	MW-310A	Total/NA	Water	PrecSep-21	
310-229324-9	MW-311	Total/NA	Water	PrecSep-21	
310-229324-10	MW-311A	Total/NA	Water	PrecSep-21	
310-229324-11	MW-312	Total/NA	Water	PrecSep-21	
310-229324-12	MW-313	Total/NA	Water	PrecSep-21	
MB 160-561918/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-561918/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-561918/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 561925

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229324-8	MW-310A	Total/NA	Water	PrecSep_0	
310-229324-9	MW-311	Total/NA	Water	PrecSep_0	
310-229324-10	MW-311A	Total/NA	Water	PrecSep_0	
310-229324-11	MW-312	Total/NA	Water	PrecSep_0	
310-229324-12	MW-313	Total/NA	Water	PrecSep_0	
MB 160-561925/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-561925/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-561925/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-302
Lab Sample ID: 310-229324-1
Date Collected: 04/12/22 09:48
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565428	05/13/22 20:52	JCB	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:22	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-303
Lab Sample ID: 310-229324-2
Date Collected: 04/12/22 11:24
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565428	05/13/22 20:52	JCB	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:22	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-304
Lab Sample ID: 310-229324-3
Date Collected: 04/12/22 13:46
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565445	05/13/22 20:52	FLC	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:22	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-305
Lab Sample ID: 310-229324-4
Date Collected: 04/11/22 10:26
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565445	05/13/22 20:53	FLC	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:23	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-305A
Lab Sample ID: 310-229324-5
Date Collected: 04/12/22 18:09
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565445	05/13/22 20:53	FLC	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:23	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-306
Lab Sample ID: 310-229324-6
Date Collected: 04/12/22 15:20
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565445	05/13/22 20:53	FLC	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:24	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-310
Lab Sample ID: 310-229324-7
Date Collected: 04/11/22 14:11
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565428	05/13/22 22:26	JCB	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564827	05/10/22 12:23	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: MW-310A
Lab Sample ID: 310-229324-8
Date Collected: 04/12/22 17:37
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561918	04/25/22 08:44	LPS	TAL SL
Total/NA	Analysis	903.0		1	566206	05/18/22 12:39	CLP	TAL SL
Total/NA	Prep	PrecSep_0			561925	04/25/22 09:22	LPS	TAL SL
Total/NA	Analysis	904.0		1	565173	05/11/22 12:59	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	566444	05/19/22 16:45	EMH	TAL SL

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Client Sample ID: MW-311
Lab Sample ID: 310-229324-9
Date Collected: 04/11/22 12:08
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561918	04/25/22 08:44	LPS	TAL SL
Total/NA	Analysis	903.0		1	566379	05/18/22 12:40	CLP	TAL SL
Total/NA	Prep	PrecSep_0			561925	04/25/22 09:22	LPS	TAL SL
Total/NA	Analysis	904.0		1	565173	05/11/22 13:00	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	566444	05/19/22 16:45	EMH	TAL SL

Client Sample ID: MW-311A
Lab Sample ID: 310-229324-10
Date Collected: 04/14/22 15:00
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561918	04/25/22 08:44	LPS	TAL SL
Total/NA	Analysis	903.0		1	566379	05/18/22 12:40	CLP	TAL SL
Total/NA	Prep	PrecSep_0			561925	04/25/22 09:22	LPS	TAL SL
Total/NA	Analysis	904.0		1	565173	05/11/22 13:00	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	566444	05/19/22 16:45	EMH	TAL SL

Client Sample ID: MW-312
Lab Sample ID: 310-229324-11
Date Collected: 04/11/22 16:59
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561918	04/25/22 08:44	LPS	TAL SL
Total/NA	Analysis	903.0		1	566379	05/18/22 12:40	CLP	TAL SL
Total/NA	Prep	PrecSep_0			561925	04/25/22 09:22	LPS	TAL SL
Total/NA	Analysis	904.0		1	565173	05/11/22 13:00	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	566444	05/19/22 16:45	EMH	TAL SL

Client Sample ID: MW-313
Lab Sample ID: 310-229324-12
Date Collected: 04/11/22 15:54
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561918	04/25/22 08:44	LPS	TAL SL
Total/NA	Analysis	903.0		1	566379	05/18/22 12:40	CLP	TAL SL
Total/NA	Prep	PrecSep_0			561925	04/25/22 09:22	LPS	TAL SL
Total/NA	Analysis	904.0		1	565173	05/11/22 13:01	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	566444	05/19/22 16:45	EMH	TAL SL

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

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	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Method Summary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

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310-229324 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes*	Cooler ID
Multiple Coolers?	☒ Yes	☐ No	*If yes*	Cooler # 1 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes*	Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes*	Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 0 MRH 4/15/22 | Correction Factor (°C): 0.0

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

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

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes*	Cooler ID
Multiple Coolers?	☒ Yes	☐ No	*If yes*	Cooler # 2 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes*	Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes*	Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 04 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.6 | Corrected Temp (°C): 2.6

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes*	Cooler ID
Multiple Coolers?	☑ Yes	☐ No	*If yes*	Cooler # 3 of 6
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐ No
Sample Custody Seals Present? No	☐ Yes	☑ No	*If yes*	Sample custody seals intact? ☐ Yes ☐ No
Trip Blank Present?	☐ Yes	☒ No	*If yes*	Which VOA samples are in cooler? ↓

Temperature Record

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

Thermometer ID: 08 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.4 | Corrected Temp (°C): 2.4

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes.* Cooler # 4 of 6

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

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

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

Temperature Record

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

Thermometer ID: 0.8 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.1 | Corrected Temp (°C): 2.1

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes* Cooler # 5 of 6

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

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

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

Temperature Record

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

Thermometer ID: 08 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.7 | Corrected Temp (°C): 1.7

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project

Receipt Information

Date/Time Received: DATE 4/15/22 | TIME 1710 | Received By MRH

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

Condition of Cooler/Containers

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

Multiple Coolers? ☒ Yes ☐ No *If yes* Cooler # 6 of 6

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

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

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

Temperature Record

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

Thermometer ID: 0 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 2.7 | Corrected Temp (°C): 2.7

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

eurofins | mer Test America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70156-17487 1
Client Contact: Meghan Blodgett	Phone: 515-864-4340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-302	4-12-22	9 48	G	Water			X	X	X	X	X		
MW-303	4-12-22	11 24	G	Water			X	X	X	X	X		
MW-304	4-12 22	13 46	G	Water			X	X	X	X	X		
MW-305	4-11- 22	10.26	G	Water			X	X	X	X	X		
MW-305A	4-12-22	18 09	G	Water			X	X	X	X	X		
MW-306	4-12-22	15 20	G	Water			X	X	X	X	X		
MW-310	4-11- 22	14.11	G	Water			X	X	X	X	X		
MW-310A	4-12- 22	17 37	G	Water			X	X	X	X	X		
MW-311	4-11-22	12:08	G	Water			X	X	X	X	X		
MW-311A	4-14-22	15 00	G	Water			X	X	X	X	X		
MW-312	4-11-22	16.59	G	Water			X	X	X	Y	X		

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	4-13-22 1358	SCS	James Vaux	4/15/22 1358	Eurofins/IA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

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

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70156-17487.2
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 2 of 2
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-313	4-11-22	15:54	6	Water			Y	X	X	X	X		
				Water									

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

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

Deliverable Requested: I, II, III IV Other (specify)

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Rosa Cruz	4-15-22 1358	SCS	James Vaux	4/15/22 1358	Eurofins/TA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

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

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-48748.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-229324-2
Address: 13715 Rider Trail North,	Due Date Requested: 5/16/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station-25222072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-302 (310-229324-1)	4/12/22	09:48 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-303 (310-229324-2)	4/12/22	11:24 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-304 (310-229324-3)	4/12/22	13:46 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-305 (310-229324-4)	4/11/22	10:26 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-305A (310-229324-5)	4/12/22	18:09 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-306 (310-229324-6)	4/12/22	15:20 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-310 (310-229324-7)	4/11/22	14:11 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-310A (310-229324-8)	4/12/22	17:37 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-311 (310-229324-9)	4/11/22	12:08 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

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

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

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

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	4/1822 1120		FED EX		
FED EX			Sierra Worthington	4-19-22 0900	EMSL

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

5/19/2022

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

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-48748.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-229324-2
Address: 13715 Rider Trail North,	Due Date Requested: 5/16/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station-25222072	Project #: 31011020			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-311A (310-229324-10)	4/14/22	15:00 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-312 (310-229324-11)	4/11/22	16:59 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
MW-313 (310-229324-12)	4/11/22	15:54 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

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

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

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	4/18/22 1120		FED EX		
Relinquished by: FED EX	Date/Time:	Company	Received by: Dena Worthington	Date/Time: 4-19-22 0900	Company: ETMSR
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229324-2

Login Number: 229324
List Number: 1
Creator: Kizer, Preston V

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <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: 310-229324-2

Login Number: 229324
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 04/19/22 01:59 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	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229324-2

Login Number: 229324
List Number: 3
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 04/21/22 02:30 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.	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.	True	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-229324-2
Project/Site: Ottumwa Generating Station-25222072

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
310-229324-1	MW-302	74.4
310-229324-2	MW-303	86.7
310-229324-3	MW-304	90.1
310-229324-4	MW-305	87.2
310-229324-5	MW-305A	86.7
310-229324-6	MW-306	91.1
310-229324-7	MW-310	80.0
310-229324-8	MW-310A	85.2
310-229324-9	MW-311	92.9
310-229324-10	MW-311A	79.8
310-229324-11	MW-312	81.8
310-229324-12	MW-313	84.0
LCS 160-561488/1-A	Lab Control Sample	95.8
LCS 160-561918/1-A	Lab Control Sample	98.0
LCSD 160-561488/2-A	Lab Control Sample Dup	93.8
LCSD 160-561918/2-A	Lab Control Sample Dup	96.6
MB 160-561488/23-A	Method Blank	98.8
MB 160-561918/22-A	Method Blank	97.0

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
310-229324-1	MW-302	74.4	87.1
310-229324-2	MW-303	86.7	89.0
310-229324-3	MW-304	90.1	93.5
310-229324-4	MW-305	87.2	90.1
310-229324-5	MW-305A	86.7	87.5
310-229324-6	MW-306	91.1	88.6
310-229324-7	MW-310	80.0	88.2
310-229324-8	MW-310A	85.2	85.6
310-229324-9	MW-311	92.9	87.1
310-229324-10	MW-311A	79.8	88.2
310-229324-11	MW-312	81.8	87.1
310-229324-12	MW-313	84.0	86.4
LCS 160-561498/1-A	Lab Control Sample	95.8	86.4
LCS 160-561925/1-A	Lab Control Sample	98.0	88.2
LCSD 160-561498/2-A	Lab Control Sample Dup	93.8	85.2
LCSD 160-561925/2-A	Lab Control Sample Dup	96.6	86.7
MB 160-561498/23-A	Method Blank	98.8	89.7
MB 160-561925/22-A	Method Blank	97.0	86.0

Tracer/Carrier Legend

Ba = Ba
Y = Y Carrier

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229347-1
Client Project/Site: Ottumwa Generating Station 25222072
Revision: 1

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
5/13/2022 3:17:42 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Project/Site: Ottumwa Generating Station 25222072

Job ID: 310-229347-1

Job ID: 310-229347-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229347-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 5/9/2022. The report (revision 1) is being revised due to: Client requested reanalysis of Antimony due to possible carryover.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

HPLC/IC
Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-229347-1). 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.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229347-1	MW-301	Water	04/12/22 08:41	04/15/22 17:10
310-229347-2	Field Blank	Water	04/14/22 16:25	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229347-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	140		5.0	2.3	mg/L	5		9056A	Total/NA
Sulfate	160		5.0	2.0	mg/L	5		9056A	Total/NA
Barium	40		2.0	0.88	ug/L	1		6020A	Total/NA
Boron	640		100	58	ug/L	1		6020A	Total/NA
Calcium	92		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.23	J	0.50	0.19	ug/L	1		6020A	Total/NA
Lithium	19		10	2.5	ug/L	1		6020A	Total/NA
Selenium	6.0		5.0	0.96	ug/L	1		6020A	Total/NA
Total Dissolved Solids	610		50	26	mg/L	1		SM 2540C	Total/NA
pH	6.6	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	682.08				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	117.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	3.26				mg/L	1		Field Sampling	Total/NA
pH, Field	6.37				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	976				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	7.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	5.03				NTU	1		Field Sampling	Total/NA

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	5.9	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Date Collected: 04/12/22 08:41
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229347-1
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**140**		5.0	2.3	mg/L			04/26/22 20:12	5
Fluoride	<0.22		0.50	0.22	mg/L			04/26/22 20:12	5
Sulfate	**160**		5.0	2.0	mg/L			04/26/22 20:12	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/07/22 16:30	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	04/29/22 18:54	1
Barium	**40**		2.0	0.88	ug/L		04/25/22 09:00	04/29/22 18:54	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	04/29/22 18:54	1
Boron	**640**		100	58	ug/L		04/25/22 09:00	04/29/22 18:54	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	04/29/22 18:54	1
Calcium	**92**		0.50	0.19	mg/L		04/25/22 09:00	04/29/22 18:54	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	04/29/22 18:54	1
Cobalt	**0.23**	**J**	0.50	0.19	ug/L		04/25/22 09:00	04/29/22 18:54	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	04/29/22 18:54	1
Lithium	**19**		10	2.5	ug/L		04/25/22 09:00	04/29/22 18:54	1
Molybdenum	<1.2		2.0	1.2	ug/L		04/25/22 09:00	04/29/22 18:54	1
Selenium	**6.0**		5.0	0.96	ug/L		04/25/22 09:00	04/29/22 18:54	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	04/29/22 18:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:38	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**610**		50	26	mg/L			04/19/22 15:09	1
pH	**6.6**	**HF**	0.1	0.1	SU			04/18/22 12:06	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	**682.08**				ft			04/12/22 08:41	1
Oxidation Reduction Potential	**117.6**				millivolts			04/12/22 08:41	1
Oxygen, Dissolved, Client Supplied	**3.26**				mg/L			04/12/22 08:41	1
pH, Field	**6.37**				SU			04/12/22 08:41	1
Specific Conductance, Field	**976**				umhos/cm			04/12/22 08:41	1
Temperature, Field	**7.4**				Degrees C			04/12/22 08:41	1
Turbidity, Field	**5.03**				NTU			04/12/22 08:41	1

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2
Date Collected: 04/14/22 16:25
Matrix: Water
Date Received: 04/15/22 17:10

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.45		1.0	0.45	mg/L			04/26/22 20:28	1
Fluoride	<0.044		0.10	0.044	mg/L			04/26/22 20:28	1
Sulfate	<0.40		1.0	0.40	mg/L			04/26/22 20:28	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/13/22 14:00	1
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	04/29/22 18:58	1
Barium	<0.88		2.0	0.88	ug/L		04/25/22 09:00	04/29/22 18:58	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	04/29/22 18:58	1
Boron	<58		100	58	ug/L		04/25/22 09:00	04/29/22 18:58	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	04/29/22 18:58	1
Calcium	<0.19		0.50	0.19	mg/L		04/25/22 09:00	04/29/22 18:58	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	04/29/22 18:58	1
Cobalt	<0.19		0.50	0.19	ug/L		04/25/22 09:00	04/29/22 18:58	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	04/29/22 18:58	1
Lithium	<2.5		10	2.5	ug/L		04/25/22 09:00	04/29/22 18:58	1
Molybdenum	<1.2		2.0	1.2	ug/L		04/25/22 09:00	04/29/22 18:58	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	04/29/22 18:58	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	04/29/22 18:58	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:41	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		50	26	mg/L			04/20/22 14:22	1
pH	**5.9**	**HF**	0.1	0.1	SU			04/18/22 12:07	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

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	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-351278/3
Matrix: Water
Analysis Batch: 351278

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			04/26/22 16:34	1
Fluoride	<0.044		0.10	0.044	mg/L			04/26/22 16:34	1
Sulfate	<0.40		1.0	0.40	mg/L			04/26/22 16:34	1

Lab Sample ID: LCS 310-351278/4
Matrix: Water
Analysis Batch: 351278

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	9.37		mg/L		94	90 - 110
Fluoride	2.00	2.09		mg/L		105	90 - 110
Sulfate	10.0	9.67		mg/L		97	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-350868/1-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350868

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.75		2.0	0.75	ug/L		04/25/22 09:00	04/29/22 16:53	1
Barium	<0.88		2.0	0.88	ug/L		04/25/22 09:00	04/29/22 16:53	1
Beryllium	<0.27		1.0	0.27	ug/L		04/25/22 09:00	04/29/22 16:53	1
Boron	<58		100	58	ug/L		04/25/22 09:00	04/29/22 16:53	1
Cadmium	<0.055		0.10	0.055	ug/L		04/25/22 09:00	04/29/22 16:53	1
Calcium	<0.19		0.50	0.19	mg/L		04/25/22 09:00	04/29/22 16:53	1
Chromium	<1.1		5.0	1.1	ug/L		04/25/22 09:00	04/29/22 16:53	1
Cobalt	<0.19		0.50	0.19	ug/L		04/25/22 09:00	04/29/22 16:53	1
Lead	<0.24		0.50	0.24	ug/L		04/25/22 09:00	04/29/22 16:53	1
Lithium	<2.5		10	2.5	ug/L		04/25/22 09:00	04/29/22 16:53	1
Molybdenum	<1.2		2.0	1.2	ug/L		04/25/22 09:00	04/29/22 16:53	1
Selenium	<0.96		5.0	0.96	ug/L		04/25/22 09:00	04/29/22 16:53	1
Thallium	<0.26		1.0	0.26	ug/L		04/25/22 09:00	04/29/22 16:53	1

Lab Sample ID: MB 310-350868/1-A
Matrix: Water
Analysis Batch: 352391

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350868

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.69		2.0	0.69	ug/L		04/25/22 09:00	05/07/22 15:32	1

Lab Sample ID: LCS 310-350868/2-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	200	232		ug/L		116	80 - 120
Barium	100	109		ug/L		109	80 - 120
Beryllium	100	109		ug/L		109	80 - 120
Boron	200	215		ug/L		108	80 - 120

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

Lab Sample ID: LCS 310-350868/2-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	100	111		ug/L		111	80 - 120
Calcium	2.00	2.05		mg/L		103	80 - 120
Chromium	100	110		ug/L		110	80 - 120
Cobalt	100	108		ug/L		108	80 - 120
Lead	200	219		ug/L		110	80 - 120
Lithium	200	221		ug/L		110	80 - 120
Molybdenum	200	215		ug/L		107	80 - 120
Selenium	400	427		ug/L		107	80 - 120
Thallium	200	219		ug/L		109	80 - 120

Lab Sample ID: LCS 310-350868/2-A
Matrix: Water
Analysis Batch: 352391

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	200	215		ug/L		107	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-351241/1-A
Matrix: Water
Analysis Batch: 351414

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 351241

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.11		0.20	0.11	ug/L		04/27/22 13:20	04/28/22 14:09	1

Lab Sample ID: LCS 310-351241/2-A
Matrix: Water
Analysis Batch: 351414

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 351241

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.67	1.65		ug/L		99	80 - 120

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

Lab Sample ID: MB 310-350365/1
Matrix: Water
Analysis Batch: 350365

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	<26		50	26	mg/L			04/19/22 15:09	1

Lab Sample ID: MB 310-350518/1
Matrix: Water
Analysis Batch: 350518

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	<26		50	26	mg/L			04/20/22 14:22	1

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

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

Lab Sample ID: LCS 310-350518/2
Matrix: Water
Analysis Batch: 350518

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	946		mg/L		95	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-350217/28
Matrix: Water
Analysis Batch: 350217

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	7.1		SU		101	98 - 102

HPLC/IC

Analysis Batch: 351278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	9056A	
310-229347-2	Field Blank	Total/NA	Water	9056A	
MB 310-351278/3	Method Blank	Total/NA	Water	9056A	
LCS 310-351278/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 350868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	3005A	
310-229347-2	Field Blank	Total/NA	Water	3005A	
MB 310-350868/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 351241

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	7470A	
310-229347-2	Field Blank	Total/NA	Water	7470A	
MB 310-351241/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-351241/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 351414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	7470A	351241
310-229347-2	Field Blank	Total/NA	Water	7470A	351241
MB 310-351241/1-A	Method Blank	Total/NA	Water	7470A	351241
LCS 310-351241/2-A	Lab Control Sample	Total/NA	Water	7470A	351241

Analysis Batch: 351583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	6020A	350868
310-229347-2	Field Blank	Total/NA	Water	6020A	350868
MB 310-350868/1-A	Method Blank	Total/NA	Water	6020A	350868
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	6020A	350868

Analysis Batch: 352391

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	6020A	350868
MB 310-350868/1-A	Method Blank	Total/NA	Water	6020A	350868
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	6020A	350868

Analysis Batch: 353054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-2	Field Blank	Total/NA	Water	6020A	350868

General Chemistry

Analysis Batch: 350217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	SM 4500 H+ B	
310-229347-2	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-350217/28	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

QC Association Summary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

General Chemistry

Analysis Batch: 350365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	SM 2540C	
MB 310-350365/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-350365/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 350518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-2	Field Blank	Total/NA	Water	SM 2540C	
MB 310-350518/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-350518/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Field Service / Mobile Lab

Analysis Batch: 351494

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229347-1
Date Collected: 04/12/22 08:41
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	351278	04/26/22 20:12	JNR	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:54	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	352391	05/07/22 16:30	SAP	TAL CF
Total/NA	Prep	7470A			351241	04/27/22 13:20	EAM	TAL CF
Total/NA	Analysis	7470A		1	351414	04/28/22 14:38	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	350365	04/19/22 15:09	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350217	04/18/22 12:06	JAJ	TAL CF
Total/NA	Analysis	Field Sampling		1	351494	04/12/22 08:41	SLD	TAL CF

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2
Date Collected: 04/14/22 16:25
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	351278	04/26/22 20:28	JNR	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 18:58	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	353054	05/13/22 14:00	SAP	TAL CF
Total/NA	Prep	7470A			351241	04/27/22 13:20	EAM	TAL CF
Total/NA	Analysis	7470A		1	351414	04/28/22 14:41	EAM	TAL CF
Total/NA	Analysis	SM 2540C		1	350518	04/20/22 14:22	TGF	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	350217	04/18/22 12:07	JAJ	TAL CF

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-229347-1
Project/Site: Ottumwa Generating Station 25222072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

Protocol References:

EPA = US Environmental Protection Agency

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.

Laboratory References:

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

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310-229347 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client	SCS Engineers		
City/State	CITY Madison	STATE WI	Project:
Receipt Information			
Date/Time Received	DATE 4/15/22	TIME 1710	Received By MRH

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

Condition of Cooler/Containers

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

Temperature Record

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

Thermometer ID 028 MRH 4/15/22	Correction Factor (°C) 0.0

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

Uncorrected Temp (°C) 1.8	Corrected Temp (°C) 1.8

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

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Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70155-17485.1
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:

Address: 2830 Dairy Drive	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Madison	TAT Requested (days):		A HCL M Hexane B NaOH N None C Zn Acetate O AsNaO2 D Nitric Acid P Na2O4S E NaHSO4 Q Na2SO3 F MeOH R Na2S2O3 G Amchlor S H2SO4 H Ascorbic Acid T TSP Dodecahydrate I Ice U Acetone J Di Water V MCAA K EDTA W pH 4-5 L EDA Z other (specify) Other:
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No		
Phone:	PO #: 25221072		
Email: mblodgett@scsengineers.com	WO #:		
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-301	4-12-22	8:41	G	Water			X	X	X	X	X		
Field Blank	4-14-22	16:25	G	Water			X	X	X	X	X		
				Water									

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

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

Deliverable Requested: I, II, III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time: 4-13-22 13 58	Company	Received by: James Vaux	Date/Time: 4/15/22 1358	Company: Eurofins TTA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4-15-22 1710	Company

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

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229347-1
SDG Number:

Login Number: 229347
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229341-1
Client Project/Site: Ottumwa Generating Station 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
5/3/2022 12:04:07 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Job ID: 310-229341-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229341-1

Comments
No additional comments.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3º C.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229341-1	MW-301	Water	04/12/22 08:41	04/15/22 17:10
310-229341-2	Field Blank	Water	04/14/22 16:25	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229341-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	36000		500	150	ug/L	1		6020A	Total/NA
Manganese	8.1	J	10	3.6	ug/L	1		6020A	Total/NA
Potassium	1100		500	150	ug/L	1		6020A	Total/NA
Sodium	89000		1000	610	ug/L	1		6020A	Total/NA
Manganese	5.0	J	10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	190		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	190		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: Field Blank
Lab Sample ID: 310-229341-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Date Collected: 04/12/22 08:41
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229341-1
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 17:24	1
Magnesium	**36000**		500	150	ug/L		04/25/22 09:00	04/29/22 17:24	1
Manganese	**8.1**	**J**	10	3.6	ug/L		04/25/22 09:00	04/29/22 17:24	1
Potassium	**1100**		500	150	ug/L		04/25/22 09:00	04/29/22 17:24	1
Sodium	**89000**		1000	610	ug/L		04/25/22 09:00	04/29/22 17:24	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/02/22 17:15	1
Manganese	**5.0**	**J**	10	3.6	ug/L		04/26/22 09:30	05/02/22 17:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	**190**		10	4.6	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	**190**		10	4.6	mg/L			04/20/22 07:59	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-229341-2
Date Collected: 04/14/22 16:25
Matrix: Water
Date Received: 04/15/22 17:10

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 17:28	1
Magnesium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 17:28	1
Manganese	<3.6		10	3.6	ug/L		04/25/22 09:00	04/29/22 17:28	1
Potassium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 17:28	1
Sodium	<610		1000	610	ug/L		04/25/22 09:00	04/29/22 17:28	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

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.

Glossary

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

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-350868/1-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350868

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/25/22 09:00	04/29/22 16:53	1
Magnesium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 16:53	1
Manganese	<3.6		10	3.6	ug/L		04/25/22 09:00	04/29/22 16:53	1
Potassium	<150		500	150	ug/L		04/25/22 09:00	04/29/22 16:53	1
Sodium	<610		1000	610	ug/L		04/25/22 09:00	04/29/22 16:53	1

Lab Sample ID: LCS 310-350868/2-A
Matrix: Water
Analysis Batch: 351583

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350868

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	200	220		ug/L		110	80 - 120
Magnesium	2000	2220		ug/L		111	80 - 120
Manganese	100	108		ug/L		108	80 - 120
Potassium	2000	2230		ug/L		112	80 - 120
Sodium	2000	2280		ug/L		114	80 - 120

Lab Sample ID: MB 310-350970/1-A
Matrix: Water
Analysis Batch: 351804

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350970

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<36		100	36	ug/L		04/26/22 09:30	05/02/22 16:28	1
Manganese	<3.6		10	3.6	ug/L		04/26/22 09:30	05/02/22 16:28	1

Lab Sample ID: LCS 310-350970/2-A
Matrix: Water
Analysis Batch: 351804

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350970

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Iron	200	206		ug/L		103	80 - 120
Manganese	100	97.4		ug/L		97	80 - 120

Method: 2320B - Alkalinity (Low Level)

Lab Sample ID: MB 310-350906/1
Matrix: Water
Analysis Batch: 350906

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/25/22 10:59	1

Lab Sample ID: LCS 310-350906/2
Matrix: Water
Analysis Batch: 350906

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	964		mg/L		96	90 - 110

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-350414/1
Matrix: Water
Analysis Batch: 350414

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			04/20/22 07:59	1

Lab Sample ID: LCS 310-350414/2
Matrix: Water
Analysis Batch: 350414

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	1030		mg/L		103	90 - 110

QC Association Summary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Metals

Prep Batch: 350868

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-1	MW-301	Total/NA	Water	3005A	
310-229341-2	Field Blank	Total/NA	Water	3005A	
MB 310-350868/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 350970

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-1	MW-301	Dissolved	Water	3005A	
MB 310-350970/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-350970/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 351583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-1	MW-301	Total/NA	Water	6020A	350868
310-229341-2	Field Blank	Total/NA	Water	6020A	350868
MB 310-350868/1-A	Method Blank	Total/NA	Water	6020A	350868
LCS 310-350868/2-A	Lab Control Sample	Total/NA	Water	6020A	350868

Analysis Batch: 351804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-1	MW-301	Dissolved	Water	6020A	350970
MB 310-350970/1-A	Method Blank	Total/NA	Water	6020A	350970
LCS 310-350970/2-A	Lab Control Sample	Total/NA	Water	6020A	350970

General Chemistry

Analysis Batch: 350414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-1	MW-301	Total/NA	Water	SM 2320B	
MB 310-350414/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-350414/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Analysis Batch: 350906

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229341-2	Field Blank	Total/NA	Water	2320B	
MB 310-350906/1	Method Blank	Total/NA	Water	2320B	
LCS 310-350906/2	Lab Control Sample	Total/NA	Water	2320B	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229341-1
Date Collected: 04/12/22 08:41
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3005A			350970	04/26/22 09:30	ACM2	TAL CF
Dissolved	Analysis	6020A		1	351804	05/02/22 17:15	SAP	TAL CF
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:24	SAP	TAL CF
Total/NA	Analysis	SM 2320B		1	350414	04/20/22 07:59	JMH2	TAL CF

Client Sample ID: Field Blank
Lab Sample ID: 310-229341-2
Date Collected: 04/14/22 16:25
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3005A			350868	04/25/22 09:00	ACM2	TAL CF
Total/NA	Analysis	6020A		1	351583	04/29/22 17:28	SAP	TAL CF
Total/NA	Analysis	2320B		1	350906	04/25/22 10:59	JMH2	TAL CF

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-229341-1
Project/Site: Ottumwa Generating Station 25222072

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
2320B	Alkalinity (Low Level)	SM	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3005A	Preparation, Total Metals	SW846	TAL CF

Protocol References:

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.

Laboratory References:

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

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310-229341 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4-15-22 | TIME 1710 | Received By: HED

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

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes* Cooler ID: PC-71

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

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

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

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

Temperature Record

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

Thermometer ID: P | Correction Factor (°C): -0.1

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

Uncorrected Temp (°C): 3.4 | Corrected Temp (°C): 3.3

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

received empty dis-nitric bottle for field blank

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

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70158-17486.1
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:

Address: 2830 Dairy Drive	Due Date Requested:	
City: Madison	TAT Requested (days):	
State, Zip: WI 53718	Compliance Project: ∆ Yes ∆ No	
Phone:	PO #: 25221072	
Email: mblodgett@scsengineers.com	WO #:	
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2320B Alkalinity/Carb/Bicarb	6020A Metals (5)	6020A D. Metals (2-4)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	D	D		
MW-301	4-12-22	841	G	Water			Y	X	X		
Field Blank	4-14-22	1625	G	Water			X	X			
				Water							

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

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

Deliverable Requested. I, II III IV Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
		13 58	

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	4-15-22 ~~8 00 am~~		James Vaux	4/15/22 1358	Eurofins/TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	4-15-22 1710	Company

Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.

Cooler Temperature(s) °C and Other Remarks.

Ver: 01/16/2019

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229341-1
SDG Number:

Login Number: 229341
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-229347-2
Client Project/Site: Ottumwa Generating Station 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
5/16/2022 12:24:58 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Job ID: 310-229347-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-229347-2

Comments
No additional comments.

Receipt
The samples were received on 4/15/2022 5:10 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.8º C.

RAD
Methods 903.0, 9315: Radium-226 batch 561488
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-229347-1), Field Blank (310-229347-2), (LCS 160-561488/1-A), (LCSD 160-561488/2-A) and (MB 160-561488/23-A)

Methods 904.0, 9320: Radium-228 prep batch 160-561498:
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-229347-1), Field Blank (310-229347-2), (LCS 160-561498/1-A), (LCSD 160-561498/2-A) and (MB 160-561498/23-A)

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

Sample Summary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-229347-1	MW-301	Water	04/12/22 08:41	04/15/22 17:10
310-229347-2	Field Blank	Water	04/14/22 16:25	04/15/22 17:10

Detection Summary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229347-1

No Detections.

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Date Collected: 04/12/22 08:41
Date Received: 04/15/22 17:10

Lab Sample ID: 310-229347-1
Matrix: Water

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.149	U	0.135	0.136	1.00	0.207	pCi/L	04/21/22 10:14	05/13/22 22:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*72.7*		*40 - 110*	*04/21/22 10:14*	*05/13/22 22:34*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.229	U	0.301	0.302	1.00	0.501	pCi/L	04/21/22 10:59	05/10/22 12:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*72.7*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*
Y Carrier	*89.7*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*

Method: 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	0.378	U	0.330	0.331	5.00	0.501	pCi/L		05/16/22 11:24	1

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2

Date Collected: 04/14/22 16:25
Matrix: Water

Date Received: 04/15/22 17:10

Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	0.00794	U	0.118	0.118	1.00	0.230	pCi/L	04/21/22 10:14	05/13/22 22:35	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.3*		*40 - 110*	*04/21/22 10:14*	*05/13/22 22:35*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.144	U	0.270	0.270	1.00	0.459	pCi/L	04/21/22 10:59	05/10/22 12:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*78.3*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*
Y Carrier	*87.5*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*

Method: 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	0.152	U	0.295	0.295	5.00	0.459	pCi/L		05/16/22 11:24	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Qualifiers

Rad

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

Glossary

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

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-561488/23-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561488

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226	-0.03358	U	0.105	0.105	1.00	0.214	pCi/L	04/21/22 10:14	05/13/22 22:35	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*04/21/22 10:14*	*05/13/22 22:35*	*1*

Lab Sample ID: LCS 160-561488/1-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561488

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 226			11.3	11.09		1.22	1.00	0.169	pCi/L	98	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.8*		*40 - 110*

Lab Sample ID: LCSD 160-561488/2-A
Matrix: Water
Analysis Batch: 565428

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561488

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 226			11.3	10.68		1.20	1.00	0.202	pCi/L	94	75 - 125	0.17	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*93.8*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-561498/23-A
Matrix: Water
Analysis Batch: 564844

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 561498

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 228	0.2973	U	0.209	0.211	1.00	0.325	pCi/L	04/21/22 10:59	05/10/22 12:25	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba	*98.8*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*
Y Carrier	*89.7*		*40 - 110*	*04/21/22 10:59*	*05/10/22 12:25*	*1*

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

Lab Sample ID: LCS 160-561498/1-A
Matrix: Water
Analysis Batch: 564827

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 561498

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium 228			8.63	10.09		1.15	1.00	0.373	pCi/L	117	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba	*95.8*		*40 - 110*
Y Carrier	*86.4*		*40 - 110*

Lab Sample ID: LCSD 160-561498/2-A
Matrix: Water
Analysis Batch: 564827

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 561498

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium 228			8.63	10.16		1.16	1.00	0.379	pCi/L	118	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba	*93.8*		*40 - 110*
Y Carrier	*85.2*		*40 - 110*

QC Association Summary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Rad

Prep Batch: 561488

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	PrecSep-21	
310-229347-2	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-561488/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-561488/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-561488/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 561498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-229347-1	MW-301	Total/NA	Water	PrecSep_0	
310-229347-2	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-561498/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-561498/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-561498/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Client Sample ID: MW-301
Lab Sample ID: 310-229347-1
Date Collected: 04/12/22 08:41
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565428	05/13/22 22:34	JCB	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564844	05/10/22 12:25	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Client Sample ID: Field Blank
Lab Sample ID: 310-229347-2
Date Collected: 04/14/22 16:25
Matrix: Water
Date Received: 04/15/22 17:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			561488	04/21/22 10:14	LPS	TAL SL
Total/NA	Analysis	903.0		1	565428	05/13/22 22:35	JCB	TAL SL
Total/NA	Prep	PrecSep_0			561498	04/21/22 10:59	LPS	TAL SL
Total/NA	Analysis	904.0		1	564844	05/10/22 12:25	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	565778	05/16/22 11:24	EMH	TAL SL

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

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	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
Iowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Method Summary

Client: SCS Engineers
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

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310-229347 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison STATE WI | Project:

Receipt Information

Date/Time Received: DATE 4/15/22 TIME 1710 | Received By: MRH

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

Condition of Cooler/Containers

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

Temperature Record

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

Thermometer ID: 028 MRH 4/15/22 | Correction Factor (°C): 0.0

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

Uncorrected Temp (°C): 1.8 | Corrected Temp (°C): 1.8

• Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

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

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Rosa Cruz	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-70155-17485.1
Client Contact: Meghan Blodgett	Phone: 515-864-9340	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:	Analysis Requested		Job #:
Address: 2830 Dairy Drive	Due Date Requested:			Preservation Codes:
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25221072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station 25221072	Project #: 31011020			
Site:	SSOW#:			

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0 Radium-226 (GFPC)	904.0 Radium-228 (GFPC)	9056A_ORGFM_28D Chloride, Fluoride & Sulfate	6020A, 7470A	2540C_Calcd, SM4500_H+	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-301	4-12-22	8:41	G	Water			X	X	X	X	X		
Field Blank	4-14-22	16:25	G	Water			X	X	X	X	X		
				Water									

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

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

Deliverable Requested: I, II, III IV Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 4-15-22 1358	Company	Received by: James Vaux	Date/Time: 4/15/22 1358	Company: Eurofins/TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 4-15-22 1710	Company

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

Ver: 01/16/2019

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

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-48763.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State Program - Iowa		Job #: 310-229347-2
Address: 13715 Rider Trail North,	Due Date Requested: 5/16/2022			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Ottumwa Generating Station 25222072	Project #: 31011020			
Site:	SSOW#:			

Preservation Codes:

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

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	903.0/PrecSep_21 Radium-226 (GFPC)	904.0/PrecSep_0 Radium-228 (GFPC)	Ra226_228GFPC_P/ Combined Radium-226 and Radium-228	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-301 (310-229347-1)	4/12/22	08:41 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS
Field Blank (310-229347-2)	4/14/22	16:25 Central		Water			X	X	X	2	DO NOT SHIP ON ICE TO ST. LOUIS

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

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

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

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	4/18/22 1315		FED EX		
FED EX			Sima Worthington	4-19-22 0900	ETASR

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

Ver: 06/08/2021

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-229347-2
SDG Number:

Login Number: 229347
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	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 <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: 310-229347-2
SDG Number:

Login Number: 229347
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 04/19/22 01:59 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
Job ID: 310-229347-2
Project/Site: Ottumwa Generating Station 25222072

Method: 903.0 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
310-229347-1	MW-301	72.7
310-229347-2	Field Blank	78.3
LCS 160-561488/1-A	Lab Control Sample	95.8
LCSD 160-561488/2-A	Lab Control Sample Dup	93.8
MB 160-561488/23-A	Method Blank	98.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
310-229347-1	MW-301	72.7	89.7
310-229347-2	Field Blank	78.3	87.5
LCS 160-561498/1-A	Lab Control Sample	95.8	86.4
LCSD 160-561498/2-A	Lab Control Sample Dup	93.8	85.2
MB 160-561498/23-A	Method Blank	98.8	89.7

Tracer/Carrier Legend

Ba = Ba
Y = Y Carrier

C4 Supplemental Assessment Monitoring, August 2022

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-238852-1
Client Project/Site: Ottumwa Generating Station - 25222072
Revision: 1

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
9/20/2022 4:27:10 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-238852-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-238852-1

Comments
No additional comments.

Revision
The report being provided is a revision of the original report sent on 9/12/2022. The report (revision 1) is being revised due to: Client requested split reports.

Receipt
The samples were received on 8/25/2022 4:30 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 4.8º C.

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

Sample Summary

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-238852-1	Field Blank	Water	08/25/22 07:15	08/25/22 16:30
310-238852-2	MW-312	Water	08/25/22 08:35	08/25/22 16:30
310-238852-3	MW-313	Water	08/25/22 07:25	08/25/22 16:30

Detection Summary

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank — Lab Sample ID: 310-238852-1

No Detections.

Client Sample ID: MW-312 — Lab Sample ID: 310-238852-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	11		0.50	0.19	ug/L	1		6020A	Total/NA
Ground Water Elevation	640.80				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	116.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.18				mg/L	1		Field Sampling	Total/NA
pH, Field	7.14				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1949				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.47				NTU	1		Field Sampling	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-238852-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	3.9		0.50	0.19	ug/L	1		6020A	Total/NA
Ground Water Elevation	639.38				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	133.3				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.16				mg/L	1		Field Sampling	Total/NA
pH, Field	7.09				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1717				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	4.86				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-238852-1
Date Collected: 08/25/22 07:15
Matrix: Water
Date Received: 08/25/22 16:30

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.19		0.50	0.19	ug/L		08/29/22 10:30	09/09/22 21:10	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Date Collected: 08/25/22 08:35
Date Received: 08/25/22 16:30

Lab Sample ID: 310-238852-2
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	11		0.50	0.19	ug/L		08/29/22 10:30	09/09/22 21:14	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	640.80				ft			08/25/22 08:35	1
Oxidation Reduction Potential	116.7				millivolts			08/25/22 08:35	1
Oxygen, Dissolved, Client Supplied	0.18				mg/L			08/25/22 08:35	1
pH, Field	7.14				SU			08/25/22 08:35	1
Specific Conductance, Field	1949				umhos/cm			08/25/22 08:35	1
Temperature, Field	13.2				Degrees C			08/25/22 08:35	1
Turbidity, Field	1.47				NTU			08/25/22 08:35	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-313
Date Collected: 08/25/22 07:25
Date Received: 08/25/22 16:30

Lab Sample ID: 310-238852-3
Matrix: Water

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	3.9		0.50	0.19	ug/L		08/29/22 10:30	09/09/22 21:17	1

Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	639.38				ft			08/25/22 07:25	1
Oxidation Reduction Potential	133.3				millivolts			08/25/22 07:25	1
Oxygen, Dissolved, Client Supplied	0.16				mg/L			08/25/22 07:25	1
pH, Field	7.09				SU			08/25/22 07:25	1
Specific Conductance, Field	1717				umhos/cm			08/25/22 07:25	1
Temperature, Field	13.2				Degrees C			08/25/22 07:25	1
Turbidity, Field	4.86				NTU			08/25/22 07:25	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Glossary

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

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-363894/1-A
Matrix: Water
Analysis Batch: 365085

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363894

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.19		0.50	0.19	ug/L		08/29/22 10:30	09/08/22 16:01	1

Lab Sample ID: LCS 310-363894/2-A
Matrix: Water
Analysis Batch: 365085

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363894

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	100	103		ug/L		103	80 - 120

QC Association Summary

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Metals

Prep Batch: 363894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-1	Field Blank	Total/NA	Water	3005A	
310-238852-2	MW-312	Total/NA	Water	3005A	
310-238852-3	MW-313	Total/NA	Water	3005A	
MB 310-363894/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-363894/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 365085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-363894/1-A	Method Blank	Total/NA	Water	6020A	363894
LCS 310-363894/2-A	Lab Control Sample	Total/NA	Water	6020A	363894

Analysis Batch: 365238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-1	Field Blank	Total/NA	Water	6020A	363894
310-238852-2	MW-312	Total/NA	Water	6020A	363894
310-238852-3	MW-313	Total/NA	Water	6020A	363894

Field Service / Mobile Lab

Analysis Batch: 364984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Total/NA	Water	Field Sampling	
310-238852-3	MW-313	Total/NA	Water	Field Sampling	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: Field Blank
Lab Sample ID: 310-238852-1
Date Collected: 08/25/22 07:15
Matrix: Water
Date Received: 08/25/22 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			363894	QTZ5	EET CF	08/29/22 10:30
Total/NA	Analysis	6020A		1	365238	DHM5	EET CF	09/09/22 21:10

Client Sample ID: MW-312
Lab Sample ID: 310-238852-2
Date Collected: 08/25/22 08:35
Matrix: Water
Date Received: 08/25/22 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			363894	QTZ5	EET CF	08/29/22 10:30
Total/NA	Analysis	6020A		1	365238	DHM5	EET CF	09/09/22 21:14
Total/NA	Analysis	Field Sampling		1	364984	BJ0R	EET CF	08/25/22 08:35

Client Sample ID: MW-313
Lab Sample ID: 310-238852-3
Date Collected: 08/25/22 07:25
Matrix: Water
Date Received: 08/25/22 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			363894	QTZ5	EET CF	08/29/22 10:30
Total/NA	Analysis	6020A		1	365238	DHM5	EET CF	09/09/22 21:17
Total/NA	Analysis	Field Sampling		1	364984	BJ0R	EET CF	08/25/22 07:25

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-238852-1
Project/Site: Ottumwa Generating Station - 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-238852-1

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

Protocol References:

EPA = US Environmental Protection Agency

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

Laboratory References:

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

eurofins | Environment Testing America

310-238852 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 8/25/22 | TIME 1630 | Received By: EM

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

Condition of Cooler/Containers

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

Temperature Record

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

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

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

Uncorrected Temp (°C): 4.6 | Corrected Temp (°C): 4.8

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

Pace Analytical®
www.pacelabs.com

CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI
Project Contact:	Tom Karwoski
Phone:	(608) 224-2830
Project Number:	25222072.00
Project Name:	IPL-OGS GW Monitoring
Project State:	Iowa
Sampled By (Print):	Ryan Matzek
Sampled By (Sign):	
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Contact:	Tom Karwoski
Invoice To Company:	SCS Engineers
Invoice To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Phone:	(608) 224-2830

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, SL = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: Metals - 6020A (Ca)	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	~~MW-301~~			~~GW~~						
	~~MW-302~~			~~GW~~						
	~~MW-303~~			~~GW~~						
	~~MW-304~~			~~GW~~						
	~~MW-305~~			~~GW~~						
	~~MW-305A~~			~~GW~~						
	~~MW-306~~			~~GW~~						
	~~MW-310~~			~~GW~~						
	~~MW-310A~~			~~GW~~						
	~~MW-311~~			~~GW~~						
	~~MW-311A~~			~~GW~~						
	Field Blank	8/25	715	W			X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
	8/25/22 1200		8/25/22 1632
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

PACE Project No.

Receipt Temp = °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

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

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Ryan Matzak	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-73670-18087.1
Client Contact: Meghan Blodgett	Phone: 608 400 9597	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:	Analysis Requested		Job #:
Address: 2830 Dairy Drive	Due Date Requested:			Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlo; H - Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Acetone; V MCAA; W pH 4-5; Y Trizma; Z other (specify); Other:
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25222072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station - 252220~2	Project #: 31011020			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A Metals (Co) D	2320B Alkalinity N	6020A Metals (5) D	6020A D Metals (4) D	Total Number of containers	Special Instructions/Note
			Preservation Code:									
MW-312	8/25/22	835	G	Water			X	X	X	X		
MW-313	8/25/22	725	G	Water			X	X	X	X		
				Water								
				Water								
				Water								
				Water								
				Water								
				Water								

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time: 8/25/22 1200	Company: SCS	Received by:	Date/Time: 8/25/22 1630	Company: EUROFINS
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

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

Ver: 06/08/2021

		Background		CCR Set #2 (Ash Pond)												CCR Set #3 (ZLDP)			(near MW-310 nest)	
	Parameter	MW-301	Field Blank	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-307	MW-308	MW-309		TOTAL
Appendix III Parameters	Boron																			0
	Calcium																			0
	Chloride																			0
	Fluoride																			0
	pH																			0
	Sulfate																			0
	TDS																			0
Appendix IV Parameters	Antimony																			0
	Arsenic																			0
	Barium																			0
	Beryllium																			0
	Cadmium																			0
	Chromium																			0
	Cobalt		X											X	X	X				4
	Fluoride																			0
	Lead																			0
	Lithium																			0
	Mercury																			0
	Molybdenum																			0
	Selenium																			0
	Thallium																			0
	Radium (separate COC)																			0
Additional Lab Parameters REQUIRES SEPARATE COC	Bicarbonate (total)													X	X					2
	Carbonate (total)													X	X					2
	Calcium (total)													X	X					2
	Iron (total)													X	X					2
	Magnesium (total)													X	X					2
	Manganese (total)													X	X					2
	Potassium (total)													X	X					2
	Sodium (total)													X	X					2
	Cobalt (filtered)													X	X					2
	Iron (filtered)													X	X					2
	Lithium (filtered)													X	X					2
	Manganese (filtered)													X	X					2
Field Parameters	Ferrous Iron (CHEMets)													X	X					2
	Sulfide (CHEMets)													X	X					2
	Groundwater Elevation													X	X	X				3
	Surface Water Elevation																			0
	Well Depth																			0
	pH (field)													X	X	X				3
	Specific Conductance													X	X	X				3
	Dissolved Oxygen													X	X	X				3
	ORP													X	X	X				3
	Temperature													X	X	X				3
	Turbidity													X	X	X				3
	Color													X	X	X				3
	Odor													X	X	X				3

9/20/2022 (Rev. 1)

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-238852-1

Login Number: 238852
List Number: 1
Creator: Kizer, Preston V

List Source: Eurofins Cedar Falls

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

Table 1. Groundwater Monitoring Results - Field Parameters
Ottumwa Generating Station / SCS Engineers Project No. 25222072.00
August 2022

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-307	8/25/2022 1045	644.25	13.0	6.71	0.56	1727	67.5	2.17
MW-312	8/25/2022 835	640.80	13.2	7.14	0.18	1949	116.7	1.47
MW-313	8/25/2022 725	639.38	13.2	7.09	0.16	1717	133.3	4.86

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

Created by: MDB Date: 5/1/2017
Last revision by: RM Date: 8/30/2022
Checked by: ACW Date: 8/30/2022

C:\Users\hld0\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\USG3GGGC\[2208_August - OGS AP and ZLDP_CCR_Field.xlsx]GW Field Parameters

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-238852-2
Client Project/Site: Ottumwa Generating Station - 25222072

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
9/12/2022 3:37:39 PM

Sandie Fredrick, Project Manager II
(920)261-1660
Sandra.Fredrick@et.eurofinsus.com

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Case Narrative

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Job ID: 310-238852-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-238852-2

Comments
No additional comments.

Receipt
The samples were received on 8/25/2022 4:30 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 4.8º C.

Metals
Method 3005A: The reference method requires samples to be preserved to a pH of <2. The following sample was received with insufficient preservation at a pH of >2: MW-312 (310-238852-2). The sample(s) was preserved to the appropriate pH in the laboratory.

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

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

Sample Summary

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-238852-2	MW-312	Water	08/25/22 08:35	08/25/22 16:30
310-238852-3	MW-313	Water	08/25/22 07:25	08/25/22 16:30

Detection Summary

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312 — Lab Sample ID: 310-238852-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Iron	330		100	36	ug/L	1		6020A	Total/NA
Magnesium	58000		500	150	ug/L	1		6020A	Total/NA
Manganese	1200		10	3.6	ug/L	1		6020A	Total/NA
Potassium	4600		500	150	ug/L	1		6020A	Total/NA
Sodium	140000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	13		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	240		100	36	ug/L	1		6020A	Dissolved
Lithium	43		10	2.5	ug/L	1		6020A	Dissolved
Manganese	1100		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	250		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	250		10	4.6	mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-313 — Lab Sample ID: 310-238852-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Iron	1600		100	36	ug/L	1		6020A	Total/NA
Magnesium	52000		500	150	ug/L	1		6020A	Total/NA
Manganese	2700		10	3.6	ug/L	1		6020A	Total/NA
Potassium	4500		500	150	ug/L	1		6020A	Total/NA
Sodium	110000		1000	610	ug/L	1		6020A	Total/NA
Cobalt	4.4		0.50	0.19	ug/L	1		6020A	Dissolved
Iron	600		100	36	ug/L	1		6020A	Dissolved
Lithium	29		10	2.5	ug/L	1		6020A	Dissolved
Manganese	2400		10	3.6	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3	230		10	4.6	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Lab Sample ID: 310-238852-2
Date Collected: 08/25/22 08:35
Matrix: Water
Date Received: 08/25/22 16:30

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	180		0.50	0.19	mg/L		08/29/22 10:30	09/09/22 21:14	1
Iron	330		100	36	ug/L		08/29/22 10:30	09/09/22 21:14	1
Magnesium	58000		500	150	ug/L		08/29/22 10:30	09/09/22 21:14	1
Manganese	1200		10	3.6	ug/L		08/29/22 10:30	09/09/22 21:14	1
Potassium	4600		500	150	ug/L		08/29/22 10:30	09/09/22 21:14	1
Sodium	140000		1000	610	ug/L		08/29/22 10:30	09/09/22 21:14	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	13		0.50	0.19	ug/L		08/26/22 13:20	09/01/22 17:40	1
Iron	240		100	36	ug/L		08/26/22 13:20	08/31/22 21:50	1
Lithium	43		10	2.5	ug/L		08/26/22 13:20	09/01/22 17:40	1
Manganese	1100		10	3.6	ug/L		08/26/22 13:20	08/31/22 21:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	250		10	4.6	mg/L			08/27/22 08:49	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			08/27/22 08:49	1
Total Alkalinity as CaCO3	250		10	4.6	mg/L			08/27/22 08:49	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-313
Lab Sample ID: 310-238852-3
Date Collected: 08/25/22 07:25
Matrix: Water
Date Received: 08/25/22 16:30

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	180		0.50	0.19	mg/L		08/29/22 10:30	09/09/22 21:17	1
Iron	1600		100	36	ug/L		08/29/22 10:30	09/09/22 21:17	1
Magnesium	52000		500	150	ug/L		08/29/22 10:30	09/09/22 21:17	1
Manganese	2700		10	3.6	ug/L		08/29/22 10:30	09/09/22 21:17	1
Potassium	4500		500	150	ug/L		08/29/22 10:30	09/09/22 21:17	1
Sodium	110000		1000	610	ug/L		08/29/22 10:30	09/09/22 21:17	1

Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	4.4		0.50	0.19	ug/L		08/26/22 13:20	09/01/22 17:44	1
Iron	600		100	36	ug/L		08/26/22 13:20	08/31/22 21:53	1
Lithium	29		10	2.5	ug/L		08/26/22 13:20	09/01/22 17:44	1
Manganese	2400		10	3.6	ug/L		08/26/22 13:20	08/31/22 21:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	230		10	4.6	mg/L			08/27/22 08:49	1
Carbonate Alkalinity as CaCO3	<4.6		10	4.6	mg/L			08/27/22 08:49	1
Total Alkalinity as CaCO3	230		10	4.6	mg/L			08/27/22 08:49	1

Glossary

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

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-363878/1-A
Matrix: Water
Analysis Batch: 364398

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363878

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.19		0.50	0.19	ug/L		08/26/22 13:20	08/31/22 20:14	1
Iron	<36		100	36	ug/L		08/26/22 13:20	08/31/22 20:14	1
Manganese	<3.6		10	3.6	ug/L		08/26/22 13:20	08/31/22 20:14	1

Lab Sample ID: MB 310-363878/1-A
Matrix: Water
Analysis Batch: 364526

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363878

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	<2.5		10	2.5	ug/L		08/26/22 13:20	09/01/22 16:33	1

Lab Sample ID: LCS 310-363878/2-A
Matrix: Water
Analysis Batch: 364398

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363878

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cobalt	100	99.9		ug/L		100	80 - 120
Iron	200	225		ug/L		113	80 - 120
Manganese	100	100		ug/L		100	80 - 120

Lab Sample ID: LCS 310-363878/2-A
Matrix: Water
Analysis Batch: 364526

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363878

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	200	201		ug/L		101	80 - 120

Lab Sample ID: MB 310-363894/1-A
Matrix: Water
Analysis Batch: 365306

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 363894

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Potassium	<150		500	150	ug/L		08/29/22 10:30	09/12/22 14:11	1

Lab Sample ID: LCS 310-363894/2-A
Matrix: Water
Analysis Batch: 365306

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 363894

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Calcium	2.00	2.20		mg/L		110	80 - 120
Potassium	2000	2260		ug/L		113	80 - 120

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-363928/1
Matrix: Water
Analysis Batch: 363928

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			08/27/22 08:49	1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 310-363928/1
Matrix: Water
Analysis Batch: 363928

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Carbonate Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			08/27/22 08:49	1
Total Alkalinity as CaCO3	<2.3		5.0	2.3	mg/L			08/27/22 08:49	1

Lab Sample ID: LCS 310-363928/2
Matrix: Water
Analysis Batch: 363928

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	1000		mg/L		100	90 - 110		

QC Association Summary

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Metals

Prep Batch: 363878

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Dissolved	Water	3005A	
310-238852-3	MW-313	Dissolved	Water	3005A	
MB 310-363878/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-363878/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 363894

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Total/NA	Water	3005A	
310-238852-3	MW-313	Total/NA	Water	3005A	
MB 310-363894/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-363894/2-A	Lab Control Sample	Total/NA	Water	3005A	

Analysis Batch: 364398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Dissolved	Water	6020A	363878
310-238852-3	MW-313	Dissolved	Water	6020A	363878
MB 310-363878/1-A	Method Blank	Total/NA	Water	6020A	363878
LCS 310-363878/2-A	Lab Control Sample	Total/NA	Water	6020A	363878

Analysis Batch: 364526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Dissolved	Water	6020A	363878
310-238852-3	MW-313	Dissolved	Water	6020A	363878
MB 310-363878/1-A	Method Blank	Total/NA	Water	6020A	363878
LCS 310-363878/2-A	Lab Control Sample	Total/NA	Water	6020A	363878

Analysis Batch: 365238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Total/NA	Water	6020A	363894
310-238852-3	MW-313	Total/NA	Water	6020A	363894

Analysis Batch: 365306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-363894/1-A	Method Blank	Total/NA	Water	6020A	363894
LCS 310-363894/2-A	Lab Control Sample	Total/NA	Water	6020A	363894

General Chemistry

Analysis Batch: 363928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-238852-2	MW-312	Total/NA	Water	SM 2320B	
310-238852-3	MW-313	Total/NA	Water	SM 2320B	
MB 310-363928/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-363928/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Client Sample ID: MW-312
Lab Sample ID: 310-238852-2
Date Collected: 08/25/22 08:35
Matrix: Water
Date Received: 08/25/22 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			363878	QTZ5	EET CF	08/26/22 13:20
Dissolved	Analysis	6020A		1	364526	A6US	EET CF	09/01/22 17:40
Dissolved	Prep	3005A			363878	QTZ5	EET CF	08/26/22 13:20
Dissolved	Analysis	6020A		1	364398	A6US	EET CF	08/31/22 21:50
Total/NA	Prep	3005A			363894	QTZ5	EET CF	08/29/22 10:30
Total/NA	Analysis	6020A		1	365238	DHM5	EET CF	09/09/22 21:14
Total/NA	Analysis	SM 2320B		1	363928	MAQ3	EET CF	08/27/22 08:49

Client Sample ID: MW-313
Lab Sample ID: 310-238852-3
Date Collected: 08/25/22 07:25
Matrix: Water
Date Received: 08/25/22 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Dissolved	Prep	3005A			363878	QTZ5	EET CF	08/26/22 13:20
Dissolved	Analysis	6020A		1	364526	A6US	EET CF	09/01/22 17:44
Dissolved	Prep	3005A			363878	QTZ5	EET CF	08/26/22 13:20
Dissolved	Analysis	6020A		1	364398	A6US	EET CF	08/31/22 21:53
Total/NA	Prep	3005A			363894	QTZ5	EET CF	08/29/22 10:30
Total/NA	Analysis	6020A		1	365238	DHM5	EET CF	09/09/22 21:17
Total/NA	Analysis	SM 2320B		1	363928	MAQ3	EET CF	08/27/22 08:49

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Laboratory: Eurofins Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

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

Method Summary

Client: SCS Engineers
Job ID: 310-238852-2
Project/Site: Ottumwa Generating Station - 25222072

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	EET CF
SM 2320B	Alkalinity	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

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.

Laboratory References:

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

eurofins | Environment Testing America

310-238852 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 8/25/22 | TIME 1630 | Received By: EM

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

Condition of Cooler/Containers

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

Temperature Record

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

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

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

Uncorrected Temp (°C): 4.6 | Corrected Temp (°C): 4.8

• **Sample Container Temperature**

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

Exceptions Noted

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

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

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

Additional Comments

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

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CHAIN OF CUSTODY

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI
Project Contact:	Tom Karwoski
Phone:	(608) 224-2830
Project Number:	25222072.00
Project Name:	IPL-OGS GW Monitoring
Project State:	Iowa
Sampled By (Print):	Ryan Matzek
Sampled By (Sign):	
PO #:	Regulatory Program:

Quote #:	
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Contact:	Tom Karwoski
Invoice To Company:	SCS Engineers
Invoice To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Phone:	(608) 224-2830

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, SI = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

FILTERED? (YES/NO) — Y/N
PRESERVATION (CODE)* — Pick Letter

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Analyses Requested: Metals - 6020A (Fe)	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	~~MW-301~~			~~GW~~				
	~~MW-302~~			~~GW~~				
	~~MW-303~~			~~GW~~				
	~~MW-304~~			~~GW~~				
	~~MW-305~~			~~GW~~				
	~~MW-305A~~			~~GW~~				
	~~MW-306~~			~~GW~~				
	~~MW-310~~			~~GW~~				
	~~MW-310A~~			~~GW~~				
	~~MW-311~~			~~GW~~				
	~~MW-311A~~			~~GW~~				
	Field Blank	8/25	715	W	X			

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
	8/25/22 1200		8/25/22 1632
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

PACE Project No.

Receipt Temp = °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

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

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Ryan Matzak	Lab PM: Fredrick, Sandie	Carrier Tracking No(s):	COC No: 310-73670-18087.1
Client Contact: Meghan Blodgett	Phone: 608 400 9597	E-Mail: Sandra.Fredrick@et.eurofinsus.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:	Analysis Requested		Job #:
Address: 2830 Dairy Drive	Due Date Requested:			Preservation Codes: A HCL; B NaOH; C Zn Acetate; D Nitric Acid; E NaHSO4; F MeOH; G Amchlo; H - Ascorbic Acid; I Ice; J DI Water; K EDTA; L EDA; M Hexane; N None; O AsNaO2; P Na2O4S; Q Na2SO3; R Na2S2O3; S H2SO4; T TSP Dodecahydrate; U Acetone; V MCAA; W pH 4-5; Y Trizma; Z other (specify); Other:
City: Madison	TAT Requested (days):			
State, Zip: WI 53718	Compliance Project: Δ Yes Δ No			
Phone:	PO #: 25222072			
Email: mblodgett@scsengineers.com	WO #:			
Project Name: Ottumwa Generating Station - 252220~2	Project #: 31011020			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A Metals (Co) D	2320B Alkalinity N	6020A Metals (5) D	6020A D Metals (4) D	Total Number of containers	Special Instructions/Note
			Preservation Code:									
MW-312	8/25/22	835	G	Water			X	X	X	X		
MW-313	8/25/22	725	G	Water			X	X	X	X		
				Water								
				Water								
				Water								
				Water								
				Water								
				Water								

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

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

Deliverable Requested: I II III IV Other (specify)

Special Instructions/QC Requirements:

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

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
	8/25/22 1200	SCS		8/25/22 1630	EUROFINS
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

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

Ver: 06/08/2021

UPPER MIDWEST REGION
MN: 612-607-1700 WI: 920-469-2436

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CHAIN OF CUSTODY

(Please Print Clearly)	
Company Name:	SCS Engineers
Branch/Location:	Madison, WI
Project Contact:	Tom Karwoski
Phone:	(608) 224-2830
Project Number:	25223072.00
Project Name:	IPL-OGS GW Monitoring
Project State:	Iowa
Sampled By (Print):	Ryan Matzek
Sampled By (Sign):	
PO #:	Regulatory Program:

*Preservation Codes
A=None B=HCL C=H2SO4 D=HNO3 E=DI Water F=Methanol G=NaOH
H=Sodium Bisulfate Solution I=Sodium Thiosulfate J=Other

Quote #:	
Mail To Contact:	Tom Karwoski
Mail To Company:	SCS Engineers
Mail To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Contact:	Tom Karwoski
Invoice To Company:	SCS Engineers
Invoice To Address:	2830 Dairy Drive Madison, WI 53718
Invoice To Phone:	(608) 224-2830

Data Package Options (billable)
☐ EPA Level III
☐ EPA Level IV

MS/MSD
☐ On your sample (billable)
☐ NOT needed on your sample

Matrix Codes
A = Air, B = Biota, C = Charcoal, O = Oil, S = Soil, SL = Sludge, W = Water, DW = Drinking Water, GW = Ground Water, SW = Surface Water, WW = Waste Water, WP = Wipe

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	FILTERED? (YES/NO) Y/N	PRESERVATION (CODE)* Pick Letter	Analyses Requested: 6020A - Metals (Ca)	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	~~MW-301~~			~~GW~~						
	MW-307	8/25	1045	GW			X			
	~~MW-308~~			~~GW~~						
	~~MW-309~~			~~GW~~						
	~~Field Blank~~			~~W~~						

Rush Turnaround Time Requested - Prelims
(Rush TAT subject to approval/surcharge)
Date Needed:

Transmit Prelim Rush Results by (complete what you want):
Email #1:
Email #2:
Telephone:
Fax:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By:	Date/Time:	Received By:	Date/Time:
	8/25/22 1200		8/25/22

PACE Project No.

Receipt Temp = °C
Sample Receipt pH OK / Adjusted
Cooler Custody Seal Present / Not Present
Intact / Not Intact

Version 6.0 06/14/06

C019a(27Jun2006)

OHIO NEL

		Background		COC Set #2 (Ash Pond)												COC Set #3 (ZLDF)			(near MW-310 nest)	
	Parameter	MW-301	Field Blank	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-307	MW-308	MW-309		TOTAL
Appendix III Parameters	Boron																			0
	Calcium																			0
	Chloride																			0
	Fluoride																			0
	pH																			0
	Sulfate																			0
	TDS																			0
Appendix IV Parameters	Antimony																			0
	Arsenic																			0
	Barium																			0
	Beryllium																			0
	Cadmium																			0
	Chromium																			0
	Cobalt		X											X	X	X				4
	Fluoride																			0
	Lead																			0
	Lithium																			0
	Mercury																			0
	Molybdenum																			0
	Selenium																			0
	Thallium																			0
	Radium (separate COC)																			0
Additional Lab Parameters REQUIRES SEPARATE COC	Bicarbonate (total)													X	X					2
	Carbonate (total)													X	X					2
	Calcium (total)													X	X					2
	Iron (total)													X	X					2
	Magnesium (total)													X	X					2
	Manganese (total)													X	X					2
	Potassium (total)													X	X					2
	Sodium (total)													X	X					2
	Cobalt (filtered)													X	X					2
	Iron (filtered)													X	X					2
	Lithium (filtered)													X	X					2
	Manganese (filtered)													X	X					2
Field Parameters	Ferrous Iron (CHEMets)													X	X					2
	Sulfide (CHEMets)													X	X					2
	Groundwater Elevation													X	X	X				3
	Surface Water Elevation																			0
	Well Depth																			0
	pH (field)													X	X	X				3
	Specific Conductance													X	X	X				3
	Dissolved Oxygen													X	X	X				3
	ORP													X	X	X				3
	Temperature													X	X	X				3
	Turbidity													X	X	X				3
	Color													X	X	X				3
	Odor													X	X	X				3

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-238852-2

Login Number: 238852

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Kizer, Preston V

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	

Appendix D

Historical Monitoring Results

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-301
Number of Sampling Dates: 23

Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/23/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	2/5/2020	3/12/2020	4/14/2020	10/8/2020	4/14/2021	10/7/2021	4/12/2022
Boron	ug/L	574	612	597	620	599	565	657	779	488	480	735	--	410	--	380	680	540	--	700	650	690	800	640
Calcium	mg/L	66.9	62.5	65.6	71.9	74.1	61.5	59.3	66.8	65.2	63	72.5	--	47.2	--	43	78	68	--	84	94	96	100	92
Chloride	mg/L	63.4	66.9	73.3	76.3	71.6	54.8	69.8	73.5	59.8	63.4	--	63.1	33.9	--	50	110	120	--	140	170	150	180	140
Fluoride	mg/L	0.22	0.2	0.44	0.27	0.17	0.24	0.26	0.34	0.27	0.22	--	0.27	0.3	--	0.44	<0.23	--	--	<0.23	<0.23	<0.28	<0.28	<0.22
Field pH	Std. Units	6.54	6.06	6.08	6.26	6.47	6.64	6.31	6.16	6.41	6.41	6.26	6.31	6.27	5.68	6.61	6.33	6.39	6.48	6.58	6.22	6.26	6.26	6.37
Sulfate	mg/L	150	157	159	169	171	190	166	162	178	186	--	181	164	--	81	130	130	--	140	140	140	180	160
Total Dissolved Solids	mg/L	500	531	576	545	545	499	490	557	448	514	--	532	392	--	340	510	570	--	550	660	620	670	610
Antimony	ug/L	<0.058	0.13	0.12	<0.058	0.11	<0.026	0.054	0.063	--	<0.026	0.2	--	<0.078	--	<0.53	<0.53	--	--	<0.58	<0.51	<1.1	<1.1	<0.69
Arsenic	ug/L	0.38	0.38	0.26	0.14	0.23	0.22	0.15	0.14	--	0.074	0.29	--	0.16	--	<0.75	<0.75	<0.88	--	<0.88	<0.88	<0.75	<0.75	<0.75
Barium	ug/L	51.6	55.8	52.3	53.3	42.4	35.5	39.9	44	--	31.6	44.5	--	28.1	--	25	56	43	--	54	58	52	61	40
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	0.14	--	<0.089	--	<0.27	<0.27	--	--	<0.27	--	<0.27	<0.27	<0.27
Cadmium	ug/L	<0.029	<0.029	0.12	0.038	<0.029	0.035	0.044	0.037	--	0.023	0.16	--	<0.033	--	<0.077	0.04	<0.039	--	<0.039	0.075	<0.051	0.057	<0.055
Chromium	ug/L	0.59	0.74	0.64	<0.34	0.59	0.49	0.25	0.39	--	<0.054	0.25	--	0.11	--	<0.98	<0.98	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	4.1	3.1	1.8	1.8	1.3	0.97	1	0.96	--	0.46	1.4	--	0.36	--	0.44	0.6	1.1	0.43	0.52	0.41	0.29	0.48	0.23
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	0.06	0.1	0.049	--	0.041	0.18	--	<0.13	--	<0.27	<0.27	<0.27	--	<0.27	<0.11	<0.21	<0.21	<0.24
Lithium	ug/L	22.8	28.7	27.6	25.5	20.1	21.8	24.9	27.9	--	19.1	26.5	--	19.4	--	15	24	17	21	24	23	23	26	19
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
Molybdenum	ug/L	1.2	1.2	0.89	1	0.76	0.54	0.79	1.3	--	0.67	1.3	--	0.72	--	<1.1	1.1	--	--	1.2	<1.1	<1.3	<1.3	<1.2
Selenium	ug/L	4.7	5.4	6.1	6.5	5.9	4.2	5.5	7.2	--	4.3	6.3	--	3.4	--	3.1	6.2	--	--	6.8	7.7	6.5	7.5	6
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	<0.036	0.067	--	<0.036	0.16	--	<0.099	--	<0.27	<0.27	--	--	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	0.51	0.614	1.56	1.24	0.143	0.631	1.06	0.725	--	0.513	1.19	--	1.16	--	0.0956	0.956	0.228	--	0.315	0.407	0.598	1.04	0.378
Radium-226	pCi/L	0.084	0	0.831	-0.13	0.143	0.139	0.501	0.123	--	0.145	0.417	--	0.529	--	0.0726	0.15	0.049	--	0.0921	0.324	0.133	<0.339	0.149
Radium-228	pCi/L	0.426	0.614	0.732	1.24	-0.403	0.492	0.562	0.602	--	0.368	0.773	--	0.627	--	0.023	0.753	0.179	--	0.223	0.0831	0.465	0.744	0.229
Field Specific Conductance	umhos/cm	572	777	807	853	834	742	758	1107	743	770	867	781	599	310	501	902	966	962	939	1035	1062	1062	976
Field Temperature	deg C	10.5	17.1	19.9	16.3	6.8	10.8	17.3	19.7	13.9	7.2	20.4	20.6	16.6	7.88	7.27	13.71	5.38	6.9	8.7	15.4	9.1	17.9	7.4
Groundwater Elevation	feet	682.8	682.58	682.27	682.04	681.67	682.15	681.91	681.28	681.54	681.53	680.91	681.09	682.5	682.22	682.69	683.07	683.3	682.82	683.25	682.34	682.94	681.95	682.08
Oxygen, Dissolved	mg/L	4.04	2.55	3.43	3.72	4.87	5.74	4.34	2.88	4.16	6.52	3.18	4.71	4.12	5.68	8.32	4.94	7.28	5.31	5.14	4.2	5.99	4.17	3.26
Turbidity	NTU	1.82	1.51	0.52	0.9	0.6	0.47	0.38	0.79	1.03	0.66	0.52	0.63	2.91	0.77	1.87	1.6	1.43	1.33	0.87	0.02	1.61	8.9	5.03
pH at 25 Degrees C	Std. Units	6.5	6.4	6.5	6.7	6.8	6.7	6.5	6.4	6.4	6.6	--	6.5	6.6	--	7.1	7.1	6.7	--	6.6	6.4	6.8	6.5	6.6
Field Oxidation Potential	millivolts	244.1	74.6	58.6	91.3	30.2	148	67.2	41.4	200.7	105.5	-55.5	--	119.7	118.3	37.6	9.9	68	258.5	176.3	163.6	232.5	207.3	117.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	160	170	210	190
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	<4.6	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	160	170	210	190
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	<50	49	<36	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33000	38000	34000	36000	36000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	16	13	10	15	5
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1500	1500	1200	1300	1100
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	77000	87000	78000	88000	89000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	0.44	--	--	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	<50	<36	<36	<36
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	19	14	14	18	8.1
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	--	--	--	--	--

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-302
Number of Sampling Dates: 21

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	4/13/2021	10/7/2021	4/12/2022
Boron	ug/L	1110	1130	1110	1180	1250	1200	1180	1250	1320	1200	1240	--	1100	--	1300	1200	1200	1300	1300	1200	1300
Calcium	mg/L	193	177	171	184	188	184	175	179	183	177	185	--	146	--	200	180	180	180	180	170	170
Chloride	mg/L	258	258	276	270	259	281	253	264	254	246	--	259	214	--	240	220	220	230	190	200	170
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	0.33	<0.28	<0.22
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	6.44	6.49	6.43
Sulfate	mg/L	752	865	835	819	777	907	858	858	786	899	--	847	785	--	840	810	790	840	360	850	750
Total Dissolved Solids	mg/L	1680	1480	1770	1650	1660	1670	1670	1620	1620	1690	--	1840	1400	--	1600	1600	1500	1700	1500	1300	1100
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	<1.1	<1.1	<0.69
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	<0.75	<0.75	<0.75
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	22	18	17
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	--	<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	0.26	0.23	0.21
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	3	1.3	1.4
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	5.5	2.2	1.3
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	0.59	0.22	<0.24
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	10	11	9.1
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	--	<0.15	<0.15	<0.11
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	<1.3	1.7	2.6
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	<0.96	1.2	2.4
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	<0.26	0.56	<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	0.901	1.45	0.294
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	0.486	1.32	0.202
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	0.415	<0.744	0.0914
Field Specific Conductance	umhos/cm	1747	2228	2222	2279	2247	2220	2085	2991	2274	2248	2304	2357	1912	1473	2159	2184	1971	2100	2087	1920	1741
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	11.9	14.9	11.4
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	656.05	654.86	654.77
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	0.37	0.3	0.41
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	22.9	15.6	5.13
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	7.5	6.6	6.6
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	198.2	211.5	145.2
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72	72	120	100
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<1.9	<3.2	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72	72	120	100
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	500	100	350	65	45
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50000	57000	50000	46000	49000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	110	130	110	110	91
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1500	1900	1500	1400	1600
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	250000	280000	240000	220000	240000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.81	--	--	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	<36	<36	<36
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	140	200	120	110

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-303
Number of Sampling Dates: 21

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	4/13/2021	10/7/2021	4/12/2022
Boron	ug/L	417	579	726	811	738	577	834	1180	1070	987	1010	--	549	--	290	440	420	1100	420	860	620
Calcium	mg/L	179	172	180	204	173	226	210	200	234	212	213	--	195	--	170	170	170	210	160	190	190
Chloride	mg/L	109	155	234	230	190	141	186	268	185	198	--	64.8	57	--	22	35	47	210	29	140	58
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	<0.28	<0.28	<0.22
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	6.67	6.7	6.71
Sulfate	mg/L	183	190	200	208	168	333	284	215	348	328	--	164	389	--	260	180	180	190	140	170	200
Total Dissolved Solids	mg/L	856	988	1170	1120	1030	1170	1210	1220	1290	1300	--	832	1150	--	890	810	810	1100	720	720	630
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	<1.1	<1.1	<0.69
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	<0.75	<0.75	<0.75
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	63	80	64
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	--	<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	0.12	0.28	0.15
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	<1.1	<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	0.43	4	1.6
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	<0.21	<0.21	<0.24
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	4.1	5.8	4
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
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	2.9	1.4	2.7
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	5.1	<0.96	8.3
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	<0.26	<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	0.51	0.916	0.619
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	0.178	0.639	0.156
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	0.333	<0.514	0.463
Field Specific Conductance	umhos/cm	965	1176	1655	1730	1611	1687	1670	2474	1896	1862	1833	1161	1573	750	1181	1287	1097	1602	1118	1343	1245
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	9.7	17.6	9
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	653.82	649.8	652.95
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	2.83	0.32	1.19
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	4.31	11.1	6.2
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	7	6.8	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	184.7	66.5	158.2
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470	440	490	520
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	<4.6	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470	440	490	520
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	310	44	120	<36
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23000	31000	22000	26000	26000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220	1600	340	1800	410
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	960	1100	800	800	930
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100000	150000	89000	94000	110000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--	--	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	<36	100	<36
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	260	1600	330	1900	490

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-304
Number of Sampling Dates: 21

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	4/14/2021	10/8/2021	4/12/2022
Boron	ug/L	965	968	911	991	995	1030	982	1040	1040	991	1000	--	930	--	1100	970	1000	1000	990	990	940
Calcium	mg/L	124	123	112	125	122	129	126	130	136	131	138	--	123	--	130	120	130	120	120	120	130
Chloride	mg/L	311	316	336	364	383	430	382	409	417	400	--	375	410	--	320	280	250	250	240	260	270
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	1.1	<0.28	1.7
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	6.94	6.97	6.95
Sulfate	mg/L	230	234	225	241	204	208	254	194	194	198	--	185	184	--	180	190	220	230	200	230	260
Total Dissolved Solids	mg/L	1190	1160	1180	1270	1230	1310	1240	1250	1270	1300	--	3680	1180	--	1100	1100	1000	1200	1000	760	1700
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	<1.1	<1.1	<0.69
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	<0.75	0.88	0.76
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	80	79	78
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	--	<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	<0.051	<0.051	<0.055
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	<1.1	<1.1	<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	0.43	0.42	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	<0.21	<0.21	<0.24
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	3.3	4	3.4
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
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	1.7	2	1.9
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	<0.96	<0.96	1.3
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	<0.26	<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	2.49	3.49	2.87
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	1.24	1.84	1.29
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	1.25	1.65	1.58
Field Specific Conductance	umhos/cm	1580	1958	1948	2057	2052	2139	2029	2881	2205	2141	2085	2123	2058	1368	1876	1871	1764	1675	1797	1617	1772
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	13.1	13.8	13.3
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	654.34	649.53	652.14
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	0.2	0.32	0.13
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	16.9	7.3	3.7
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	7.1	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	-97.5	-78.7	-56.9
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380	360	470	380
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	<4.6	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380	360	470	380
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5200	4200	4500	3700	4800
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	43000	40000	40000	36000	45000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	3800	3400	3500
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7700	7800	8200	6800	8700
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000	210000	190000	240000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--	--	--	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4600	4200	4500	3900	3800
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	3600	3000	4200

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-305
Number of Sampling Dates: 22

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	10/6/2021	2/14/2022	4/11/2022
Boron	ug/L	888	906	832	878	956	907	889	903	925	886	911	835	--	1000	880	--	920	900	860	880	--	850
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	110	--	120
Chloride	mg/L	310	312	316	325	289	312	290	295	282	289	265	281	--	250	280	--	270	290	240	230	--	200
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	<0.28	--	<0.22
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	6.94	7.2	6.9
Sulfate	mg/L	65.7	71.3	74	79.5	90	109	121	124	138	147	139	129	--	110	76	--	63	93	120	150	--	150
Total Dissolved Solids	mg/L	1040	982	1040	1010	1020	1040	1010	1040	1040	1070	1060	1070	--	1000	1000	--	960	1100	900	680	--	950
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	<1.1	--	<0.69
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	0.75	--	<0.75
Barium	ug/L	131	120	108	115	117	115	110	114	--	116	118	125	--	120	110	--	110	120	130	120	--	120
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
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	<0.051	--	<0.055
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	<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	18	20	21
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	0.29	--	<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	3.2	<2.5	2.6	3.1	--	<2.5
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	<0.15	--	<0.11
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	8.1	--	7.8
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	<0.96	--	1.1
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	0.37	--	0.42
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	1.66	--	1.03
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	0.835	--	0.433
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	0.823	--	0.601
Field Specific Conductance	umhos/cm	1469	1796	1769	1831	1794	1822	1730	2422	1738	1840	1832	1836	1235	1728	1794	1788	1772	1810	1799	1629	1500	1742
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	13.7	12.38	12.8
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	654.83	656.35	657.62
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	0.44	4.8	0.23
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	3.8	0	4.97
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	7.1	--	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	46.9	50	134.8
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300	470	500	--	520
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	<4.6	<4.6	--	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300	470	500	--	520
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	390	330	200	170	75	--	76
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47000	48000	47000	44000	--	53000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3100	3400	3600	3800	3300	--	3200
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7600	8300	7900	7000	--	8700
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000	200000	180000	--	210000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	16	17	20	17	--	17
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51	66	63	85	150	--	55
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3200	3300	3600	3500	3200	--	4000
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.3	--	--	--	--	--	--

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-305A
Number of Sampling Dates: 6

Parameter Name	Units	3/13/2020	4/14/2020	10/9/2020	4/15/2021	10/8/2021	4/12/2022
Boron	ug/L	250	280	180	190	200	210
Calcium	mg/L	100	130	150	150	150	180
Chloride	mg/L	40	89	120	140	130	160
Fluoride	mg/L	0.77	0.73	0.73	0.56	<0.28	<0.22
Field pH	Std. Units	8.09	7.63	7.46	7.05	6.9	7.19
Sulfate	mg/L	40	93	130	150	140	160
Total Dissolved Solids	mg/L	400	570	660	780	730	700
Antimony	ug/L	1.3	0.88	<0.51	<1.1	<1.1	<0.69
Arsenic	ug/L	<0.88	<0.88	<0.88	<0.75	<0.75	<0.75
Barium	ug/L	70	80	75	80	84	91
Beryllium	ug/L	<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
Chromium	ug/L	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt	ug/L	2.4	2.7	1.5	0.5	0.94	1.7
Lead	ug/L	0.68	<0.27	<0.11	<0.21	<0.21	<0.24
Lithium	ug/L	14	16	13	17	17	17
Mercury	ug/L	<0.1	<0.1	--	<0.15	<0.15	<0.11
Molybdenum	ug/L	9	17	6.4	5.5	4.2	4.5
Selenium	ug/L	2.3	1.7	<1	<0.96	<0.96	<0.96
Thallium	ug/L	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.97	1.26	2.05	2.67	2.96	3.44
Radium-226	pCi/L	1.23	1.03	1.92	2.33	2.45	2.96
Radium-228	pCi/L	0.735	0.23	0.132	0.34	0.514	0.481
Field Specific Conductance	umhos/cm	745	807	1102	1224	1145	1242
Field Temperature	deg C	11.8	11.2	14.2	12.4	14.7	21.6
Groundwater Elevation	feet	--	--	648.01	651.16	645.57	649.24
Oxygen, Dissolved	mg/L	3.79	2.26	0.19	0.88	2.02	4.85
Turbidity	NTU	63.2	4.91	0	1.02	14.3	12.5
pH at 25 Degrees C	Std. Units	--	7.3	7.3	7.2	7	7.2
Field Oxidation Potential	millivolts	204.2	106.7	11	158.3	147.8	79.7
Bicarbonate Alkalinity as CaCO3	mg/L	--	270	340	300	300	320
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8	<4.2	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	270	340	300	300	320
Iron, total	ug/L	720	64	64	<36	<36	<36
Magnesium, total	ug/L	--	28000	31000	29000	26000	32000
Manganese, dissolved	ug/L	150	240	160	87	120	120
Potassium, total	ug/L	--	3800	4200	3600	3400	4200
Sodium, total	ug/L	--	46000	64000	68000	52000	60000
Cobalt, dissolved	ug/L	2.1	2.8	--	--	--	--
Iron, dissolved	ug/L	<50	<50	<50	<36	<36	<36
Manganese, total	ug/L	180	260	150	78	100	140
Lithium, dissolved	ug/L	15	--	--	--	--	--

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-306
Number of Sampling Dates: 23

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
Boron	ug/L	540	575	574	702	809	814	784	822	881	919	915	862	--	1100	980	1000	1100	--	1000	--	730	--	760
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
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
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
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
Sulfate	mg/L	264	271	266	277	285	300	282	264	274	289	275	285	--	270	280	310	360	--	370	--	460	--	70
Total Dissolved Solids	mg/L	899	849	846	864	828	819	775	769	773	805	840	884	--	930	870	820	900	--	880	--	1100	--	710
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
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
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
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
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	--	1.7	--	1.3
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
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
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160	--	270	--	270	--	470
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	--	<4.6	--	<4.6	--	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160	--	270	--	270	--	470
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	340	--	220	--	<360	--	68
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26000	23000	--	25000	--	43000	--	44000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	15000	--	15000	--	31000	--	23000
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	--	3500	--	3700	--	6000
Sodium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	160000	170000	--	170000	--	170000	--	180000
Cobalt, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4	5.1	--	6.1	--	9.9	--	7.6
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	100	--	110	--	100	--	<250
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	16000	--	15000	--	30000	--	26000

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-310
Number of Sampling Dates: 10

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
Boron	ug/L	720	620	--	550	800	--	360	--	520	640
Calcium	mg/L	230	160	--	200	180	--	210	--	130	190
Chloride	mg/L	150	120	--	130	150	--	250	--	120	200
Fluoride	mg/L	0.31	0.85	--	1.1	1	--	1.3	--	<0.28	<0.22
Field pH	Std. Units	7.15	7.08	6.89	7	7.07	7.11	7.07	8.23	7.2	6.86
Sulfate	mg/L	610	530	--	590	570	--	720	--	470	630
Total Dissolved Solids	mg/L	260	1200	--	1300	1200	--	1600	--	930	1400
Antimony	ug/L	<0.53	<0.58	--	<0.58	0.61	--	<1.1	--	<1.1	0.89
Arsenic	ug/L	0.78	<0.88	--	<0.88	0.94	--	0.97	--	1.1	1
Barium	ug/L	76	53	--	62	55	--	92	--	53	75
Beryllium	ug/L	<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
Chromium	ug/L	<0.98	<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
Lead	ug/L	<0.27	<0.27	--	<0.27	<0.11	--	<0.21	--	<0.21	<0.24
Lithium	ug/L	35	42	46	48	42	37	58	52	52	54
Mercury	ug/L	<0.1	<0.1	--	<0.1	--	--	<0.15	--	<0.15	<0.11
Molybdenum	ug/L	26	29	--	31	39	--	83	--	70	47
Selenium	ug/L	5	3.3	--	4.5	2.4	--	2.4	--	2.3	2.3
Thallium	ug/L	<0.27	<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
Radium-226	pCi/L	-0.0393	0.0344	--	0.0494	0.0766	--	-0.0354	--	<0.511	-0.0361
Radium-228	pCi/L	0.411	-0.137	--	0.222	0.353	--	-0.0334	--	<0.462	0.316
Field Specific Conductance	umhos/cm	1906	1723	1902	1823	1709	962	2362	1852	1425	2007
Field Temperature	deg C	13.74	12.49	12.8	10.3	13.9	13.6	12.6	13	15.4	12.6
Groundwater Elevation	feet	649.31	644.71	645.45	645.91	638.46	638.77	642.7	639.32	638.19	640.79
Oxygen, Dissolved	mg/L	0.41	0.68	0.3	0.22	0.16	0.09	0.46	0.21	0.48	0.3
Turbidity	NTU	2.29	0.9	2.77	0.87	0.02	0.02	2.38	0	1	4
pH at 25 Degrees C	Std. Units	7.2	7.1	--	7	7.3	--	7.4	--	7.1	7.1
Field Oxidation Potential	millivolts	-9.3	42.2	252.2	179.4	146.5	91.3	161	88.6	96.8	161.1
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	190	410	--	130	--	250	260
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<1.9	<3.8	--	<4.6	--	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	190	410	--	130	--	250	260
Iron, total	ug/L	--	--	--	<50	<50	--	<36	--	<36	<36
Magnesium, total	ug/L	--	--	--	86000	76000	--	100000	--	55000	90000
Manganese, dissolved	ug/L	--	--	250	280	350	--	330	--	830	400
Potassium, total	ug/L	--	--	--	12000	12000	--	17000	--	9900	16000
Sodium, total	ug/L	--	--	--	100000	100000	--	150000	--	110000	170000
Cobalt, dissolved	ug/L	--	--	0.31	0.23	--	--	--	--	--	--
Iron, dissolved	ug/L	--	--	<50	<50	<50	--	<36	--	<36	<36
Manganese, total	ug/L	--	--	260	280	390	--	290	--	350	520
Lithium, dissolved	ug/L	--	--	45	--	44	--	63	--	45	52

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-310A
Number of Sampling Dates: 6

Parameter Name	Units	3/13/2020	4/14/2020	10/12/2020	4/15/2021	10/8/2021	4/12/2022
Boron	ug/L	1500	1600	1700	1500	1500	1500
Calcium	mg/L	82	87	94	82	80	99
Chloride	mg/L	140	130	130	120	130	120
Fluoride	mg/L	1.7	1.8	2	1.9	0.28	0.4
Field pH	Std. Units	7.73	7.85	7.48	7.47	7.65	7.43
Sulfate	mg/L	1200	1100	1100	1100	1200	1200
Total Dissolved Solids	mg/L	2300	2300	2200	2300	1800	2100
Antimony	ug/L	<0.58	<0.58	<0.51	<1.1	<1.1	0.85
Arsenic	ug/L	<0.88	<0.88	<0.88	<0.75	<0.75	<0.75
Barium	ug/L	16	16	16	14	12	14
Beryllium	ug/L	<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
Chromium	ug/L	<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
Lead	ug/L	<0.27	<0.27	<0.11	<0.21	<0.21	<0.24
Lithium	ug/L	250	290	240	270	280	260
Mercury	ug/L	<0.1	<0.1	--	<0.15	<0.15	<0.11
Molybdenum	ug/L	2.6	2.7	3	5	1.9	4.4
Selenium	ug/L	<1	<1	<1	<0.96	<0.96	1.4
Thallium	ug/L	<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
Radium-226	pCi/L	3.27	3.48	3.9	4.14	4.35	4.35
Radium-228	pCi/L	0.157	0.418	0.563	0.293	1.07	0.267
Field Specific Conductance	umhos/cm	3160	2915	3122	3106	2808	2920
Field Temperature	deg C	12.5	8.8	13.1	12.5	15.6	17.2
Groundwater Elevation	feet	--	--	640.2	644.88	639.57	640.83
Oxygen, Dissolved	mg/L	6.28	6.39	0.48	0.98	6.21	4.72
Turbidity	NTU	109	--	0	2.25	15	14.2
pH at 25 Degrees C	Std. Units	--	7.5	7.7	7.7	7.7	7.7
Field Oxidation Potential	millivolts	178.9	146.1	89.7	160.2	143.1	26.7
Bicarbonate Alkalinity as CaCO3	mg/L	--	320	260	340	370	360
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8	<4.6	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	320	260	340	370	360
Iron, total	ug/L	99	230	280	<36	<140	56
Magnesium, total	ug/L	--	41000	45000	37000	36000	42000
Manganese, dissolved	ug/L	53	39	29	39	30	20
Potassium, total	ug/L	--	9900	11000	9200	8900	11000
Sodium, total	ug/L	--	630000	620000	600000	570000	650000
Cobalt, dissolved	ug/L	0.67	0.4	--	--	--	--
Iron, dissolved	ug/L	<50	220	<50	<36	38	<140
Manganese, total	ug/L	51	38	31	34	26	26
Lithium, dissolved	ug/L	250	--	230	300	240	260

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-311
Number of Sampling Dates: 7

Parameter Name	Units	10/24/2019	2/5/2020	3/13/2020	4/13/2020	10/12/2020	4/14/2021	4/11/2022
Boron	ug/L	<110	<100	--	<100	<80	64	79
Calcium	mg/L	170	130	--	170	160	160	150
Chloride	mg/L	13	14	--	13	14	11	17
Fluoride	mg/L	<0.23	<0.23	--	<0.23	<0.23	<0.28	<0.22
Field pH	Std. Units	6.95	6.72	7.11	6.86	6.93	6.66	6.74
Sulfate	mg/L	47	54	--	54	70	75	78
Total Dissolved Solids	mg/L	530	520	--	570	640	590	480
Antimony	ug/L	<0.53	<0.58	--	<0.58	<0.51	<1.1	<0.69
Arsenic	ug/L	<0.75	<0.88	--	<0.88	1.7	<0.75	<0.75
Barium	ug/L	200	160	--	180	220	180	170
Beryllium	ug/L	<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
Chromium	ug/L	<0.98	<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
Lead	ug/L	<0.27	<0.27	--	<0.27	1.8	<0.21	<0.24
Lithium	ug/L	4.7	2.9	4.7	6.2	4.6	5.9	6.3
Mercury	ug/L	<0.1	<0.1	--	<0.1	--	<0.15	<0.11
Molybdenum	ug/L	<1.1	<1.1	--	<1.1	<1.1	<1.3	<1.2
Selenium	ug/L	<1	1.2	--	<1	<1	2.1	2
Thallium	ug/L	<0.27	<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
Field Temperature	deg C	13.88	10.21	10	8.8	14.4	9.3	10.1
Groundwater Elevation	feet	647.8	645	644.18	646.79	638.73	643.02	641.44
Oxygen, Dissolved	mg/L	0.29	2.11	0.23	0.29	7.12	1.18	0.51
Turbidity	NTU	3.88	1.89	3.44	0.44	0	0.78	3.57
pH at 25 Degrees C	Std. Units	7	7.1	--	6.9	6.9	6.9	7
Field Oxidation Potential	millivolts	-24.7	21	222.6	103.4	-53	179.8	125.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	460	290	450	440
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<1.9	<3.8	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	--	--	460	290	450	440
Iron, total	ug/L	--	--	<50	<50	630	<36	<36
Magnesium, total	ug/L	--	--	--	40000	40000	36000	37000
Manganese, dissolved	ug/L	--	--	21	39	75	<4.4	<3.6
Potassium, total	ug/L	--	--	--	620	810	650	860
Sodium, total	ug/L	--	--	--	5000	5100	5200	6300
Cobalt, dissolved	ug/L	--	--	0.11	<0.091	--	--	--
Iron, dissolved	ug/L	--	--	<50	<50	<50	<36	<36
Manganese, total	ug/L	--	--	20	41	180	<4.4	4.6
Lithium, dissolved	ug/L	--	--	8	--	--	--	--

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-311A
Number of Sampling Dates: 9

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
Boron	ug/L	1400	1500	--	1600	--	1500	--	1400	1500
Calcium	mg/L	44	48	--	51	--	42	--	40	54
Chloride	mg/L	130	140	--	150	--	130	--	140	140
Fluoride	mg/L	3.4	4.1	3.7	4.4	3.9	4	3.8	2	2.4
Field pH	Std. Units	7.85	8.4	7.64	8.33	7.55	7.76	8.19	8.12	7.53
Sulfate	mg/L	1200	1200	--	1200	--	1100	--	1100	1200
Total Dissolved Solids	mg/L	2300	2400	--	2400	--	2200	--	2000	2200
Antimony	ug/L	<0.58	<0.58	--	<0.51	--	<1.1	--	<1.1	<0.69
Arsenic	ug/L	<0.88	<0.88	--	<0.88	--	<0.75	--	<0.75	<0.75
Barium	ug/L	20	20	--	15	--	12	--	8.7	10
Beryllium	ug/L	<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
Chromium	ug/L	<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
Lead	ug/L	<0.27	<0.27	--	<0.11	--	<0.21	--	<0.21	<0.24
Lithium	ug/L	260	310	--	240	--	290	--	290	280
Mercury	ug/L	<0.1	<0.1	--	--	--	<0.15	--	<0.15	<0.11
Molybdenum	ug/L	1.2	2.8	--	3.1	--	<1.3	--	<1.3	1.6
Selenium	ug/L	<1	<1	--	<1	--	<0.96	--	<0.96	1.3
Thallium	ug/L	<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
Radium-226	pCi/L	1.42	2.1	--	2.22	--	3.25	--	3.67	3.38
Radium-228	pCi/L	0.0555	0.214	--	0.88	--	0.6	--	0.774	0.61
Field Specific Conductance	umhos/cm	3336	3027	3391	3177	3243	3332	3381	2930	3211
Field Temperature	deg C	12.1	7.9	12.6	12.7	11.5	12.3	14.2	15.1	14.1
Groundwater Elevation	feet	--	--	647.73	641.09	641.16 ft	644.16	642.38	640.58	643.23
Oxygen, Dissolved	mg/L	2.29	3.87	1.51	0.44	3.23	0.77	0.42	1.68	4.66
Turbidity	NTU	7.74	3.19	1.43	0	0.02	0.02	0	9.6	9.61
pH at 25 Degrees C	Std. Units	--	7.9	--	7.9	--	7.8	--	7.9	7.7
Field Oxidation Potential	millivolts	206	115.8	23.4	39.6	129.7	146.9	80.8	140.7	54.6
Bicarbonate Alkalinity as CaCO3	mg/L	--	360	--	400	--	370	--	380	370
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	--	<3.8	--	<4.6	--	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	--	360	--	400	--	370	--	380	370
Iron, total	ug/L	<50	<50	--	<50	--	<36	--	<140	<36
Magnesium, total	ug/L	--	23000	--	25000	--	21000	--	20000	25000
Manganese, dissolved	ug/L	20	22	--	5.8	--	6.2	--	5.5	<14
Potassium, total	ug/L	--	9000	--	10000	--	8300	--	7700	10000
Sodium, total	ug/L	--	710000	--	700000	--	720000	--	670000	800000
Cobalt, dissolved	ug/L	0.36	0.12	--	--	--	--	--	--	--
Iron, dissolved	ug/L	<50	<50	--	<50	--	<36	--	<36	<140
Manganese, total	ug/L	20	13	--	8.3	--	6.1	--	<18	3.7
Lithium, dissolved	ug/L	250	--	--	230	--	330	--	250	310

Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-312
Number of Sampling Dates: 5

Parameter Name	Units	1/12/2022	2/14/2022	2/15/2022	4/11/2022	8/25/2022
Boron	ug/L	380	--	420	560	--
Calcium	mg/L	180	--	180	200	180
Chloride	mg/L	150	--	150	170	--
Fluoride	mg/L	<0.28	--	0.37	<0.22	--
Field pH	Std. Units	7.18	--	7.24	7.07	7.14
Sulfate	mg/L	620	--	570	550	--
Total Dissolved Solids	mg/L	1200	--	930	1100	--
Antimony	ug/L	<1.1	--	<0.69	<0.69	--
Arsenic	ug/L	3.4	--	4.1	4.4	--
Barium	ug/L	87	--	63	50	--
Beryllium	ug/L	<0.27	--	<0.27	<0.27	--
Cadmium	ug/L	0.053	--	<0.055	<0.055	--
Chromium	ug/L	<1.1	--	<1.1	<1.1	--
Cobalt	ug/L	4.9	--	6.1	9.1	11
Lead	ug/L	<0.21	--	<0.24	<0.24	--
Lithium	ug/L	41	--	31	40	--
Mercury	ug/L	<0.15	--	<0.11	<0.11	--
Molybdenum	ug/L	2.7	--	1.6	1.3	--
Selenium	ug/L	<0.96	--	<0.96	<0.96	--
Thallium	ug/L	<0.26	--	<0.26	<0.26	--
Total Radium	pCi/L	1.25	--	0.888	0.357	--
Radium-226	pCi/L	0.176	--	0.405	0.357	--
Radium-228	pCi/L	1.08	--	0.483	-0.907	--
Field Specific Conductance	umhos/cm	1762	--	1800	1855	1949
Field Temperature	deg C	12.62	--	13.01	12.3	13.2
Groundwater Elevation	feet	--	--	--	--	640.8
Oxygen, Dissolved	mg/L	0.32	--	1.34	0.15	0.18
Turbidity	NTU	0	--	0	8.39	1.47
pH at 25 Degrees C	Std. Units	7.4	--	7.3	7.3	--
Field Oxidation Potential	millivolts	-53.4	--	-67	112.1	116.7
Bicarbonate Alkalinity as CaCO3	mg/L	220	230	--	240	250
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	--	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	220	230	--	240	250
Iron, total	ug/L	--	440	--	350	330
Magnesium, total	ug/L	--	54000	--	65000	58000
Manganese, dissolved	ug/L	1300	1100	--	1200	1100
Potassium, total	ug/L	--	4300	--	4800	4600
Sodium, total	ug/L	--	130000	--	170000	140000
Cobalt, dissolved	ug/L	5.1	5.6	--	--	13
Iron, dissolved	ug/L	380	380	--	510	240
Manganese, total	ug/L	--	1300	--	1400	1200
Lithium, dissolved	ug/L	--	31	--	37	43
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: 5

Parameter Name	Units	1/12/2022	2/14/2022	2/15/2022	4/11/2022	8/25/2022
Boron	ug/L	530	--	510	570	--
Calcium	mg/L	190	--	200	200	180
Chloride	mg/L	180	--	170	170	--
Fluoride	mg/L	<0.28	--	<0.22	<0.22	--
Field pH	Std. Units	7	--	7.01	6.94	7.09
Sulfate	mg/L	620	--	570	500	--
Total Dissolved Solids	mg/L	1300	--	1100	3200	--
Antimony	ug/L	<1.1	--	<0.69	<0.69	--
Arsenic	ug/L	1.2	--	1	1.2	--
Barium	ug/L	48	--	44	44	--
Beryllium	ug/L	<0.27	--	<0.27	<0.27	--
Cadmium	ug/L	<0.051	--	<0.055	<0.055	--
Chromium	ug/L	<1.1	--	<1.1	<1.1	--
Cobalt	ug/L	5.9	--	5.7	5.7	3.9
Lead	ug/L	<0.21	--	<0.24	<0.24	--
Lithium	ug/L	33	--	26	28	--
Mercury	ug/L	<0.15	--	<0.11	<0.11	--
Molybdenum	ug/L	6.1	--	5.3	4.8	--
Selenium	ug/L	<0.96	--	<0.96	<0.96	--
Thallium	ug/L	<0.26	--	<0.26	<0.26	--
Total Radium	pCi/L	1.29	--	1.25	0.543	--
Radium-226	pCi/L	0.354	--	0.252	0.308	--
Radium-228	pCi/L	0.931	--	0.999	0.235	--
Field Specific Conductance	umhos/cm	1857	--	925	1788	1717
Field Temperature	deg C	14.6	--	13.89	13.2	13.2
Groundwater Elevation	feet	--	--	--	--	639.38
Oxygen, Dissolved	mg/L	0.15	--	1.22	0.09	0.16
Turbidity	NTU	0	--	0	7.44	4.86
pH at 25 Degrees C	Std. Units	7.1	--	7.1	7.2	--
Field Oxidation Potential	millivolts	-51	--	-29	126.5	133.3
Bicarbonate Alkalinity as CaCO3	mg/L	230	250	--	300	230
Carbonate Alkalinity as CaCO3	mg/L	<4.6	<4.6	--	<4.6	<4.6
Total Alkalinity as CaCO3	mg/L	230	250	--	300	230
Iron, total	ug/L	--	380	--	920	1600
Magnesium, total	ug/L	--	58000	--	68000	52000
Manganese, dissolved	ug/L	3600	3200	--	3200	2400
Potassium, total	ug/L	--	5900	--	6100	4500
Sodium, total	ug/L	--	120000	--	140000	110000
Cobalt, dissolved	ug/L	5.9	5.2	--	--	4.4
Iron, dissolved	ug/L	240	290	--	630	600
Manganese, total	ug/L	--	3700	--	3800	2700
Lithium, dissolved	ug/L	--	26	--	26	29
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	--	--	--	--

Appendix E

Statistical Evaluation

E1 LCL Evaluation – February 2022 Event
E2 LCL Evaluation – April 2022 Event
E3 UPL Update and Tolerance Limit Calculation – April 2022 Event

E1 LCL Evaluation – February 2022 Event

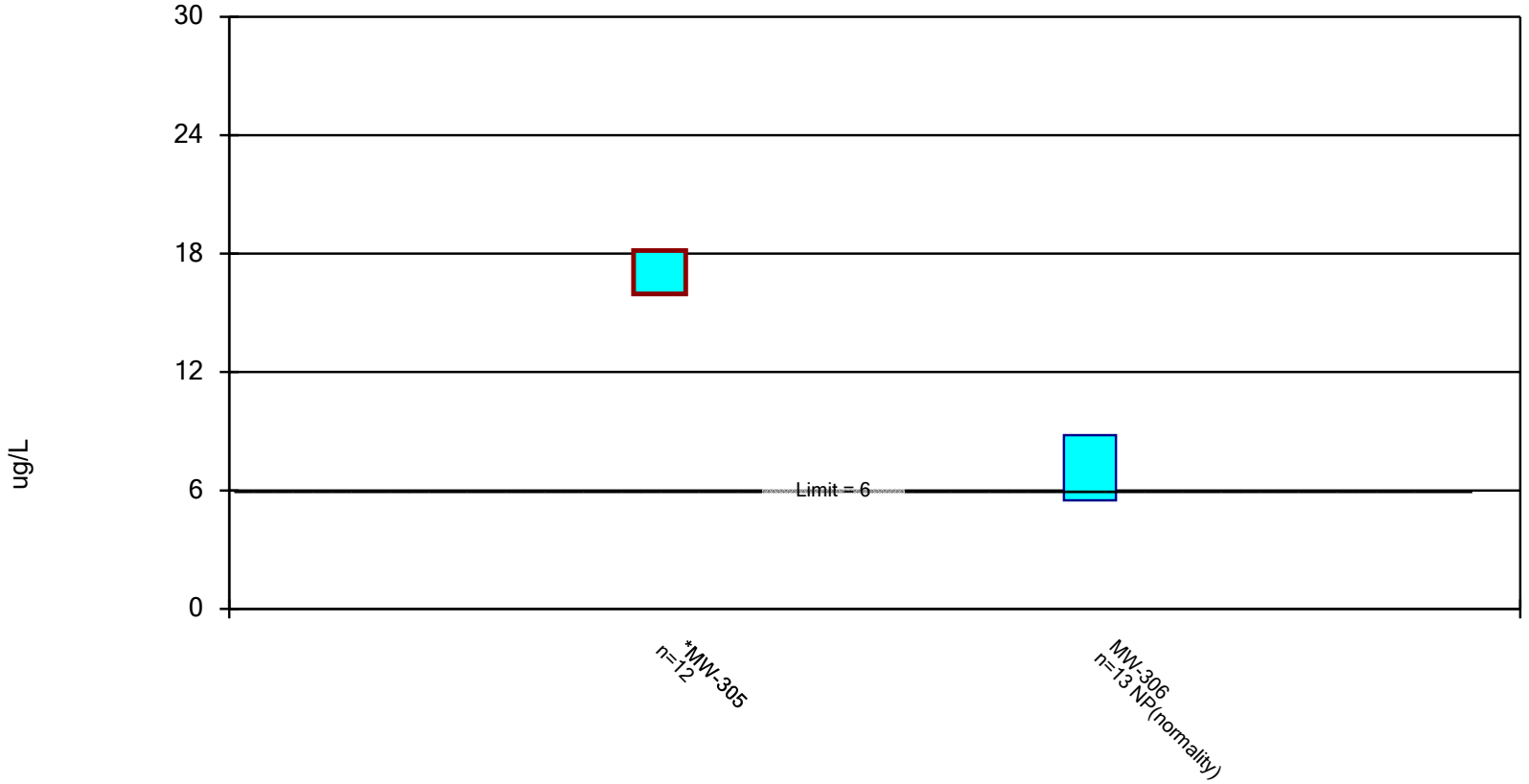
Confidence Interval

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 4/22/2022, 10:52 AM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt (ug/L)	**MW-305**	**18.16**	**15.96**	**6**	**Yes**	**12**	**0**	**No**	**0.01**	**Param.**
Cobalt (ug/L)	MW-306	8.8	5.5	6	No	13	0	No	0.01	NP (normality)

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 4/22/2022 10:50 AM View: OGS - Ash Pond

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

Constituent: Cobalt (ug/L) Analysis Run 4/22/2022 10:52 AM View: OGS - Ash Pond
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-305	MW-306
4/18/2018	14.5	4.8
8/15/2018	15.6	5.5
10/16/2018	17.2	6.4
1/8/2019	16.4	6.2
4/8/2019	17	6.9
10/23/2019	17	6.2
3/13/2020	18	
4/13/2020	16	
4/14/2020		5.5
10/9/2020	17	5.9
2/23/2021		5.6
4/13/2021		5.6
4/16/2021	18	
7/6/2021		5.8
10/6/2021	18	
10/8/2021		11
2/14/2022	20	8.8
Mean	17.06	6.477
Std. Dev.	1.4	1.664
Upper Lim.	18.16	8.8
Lower Lim.	15.96	5.5

E2 LCL Evaluation – April 2022 Event

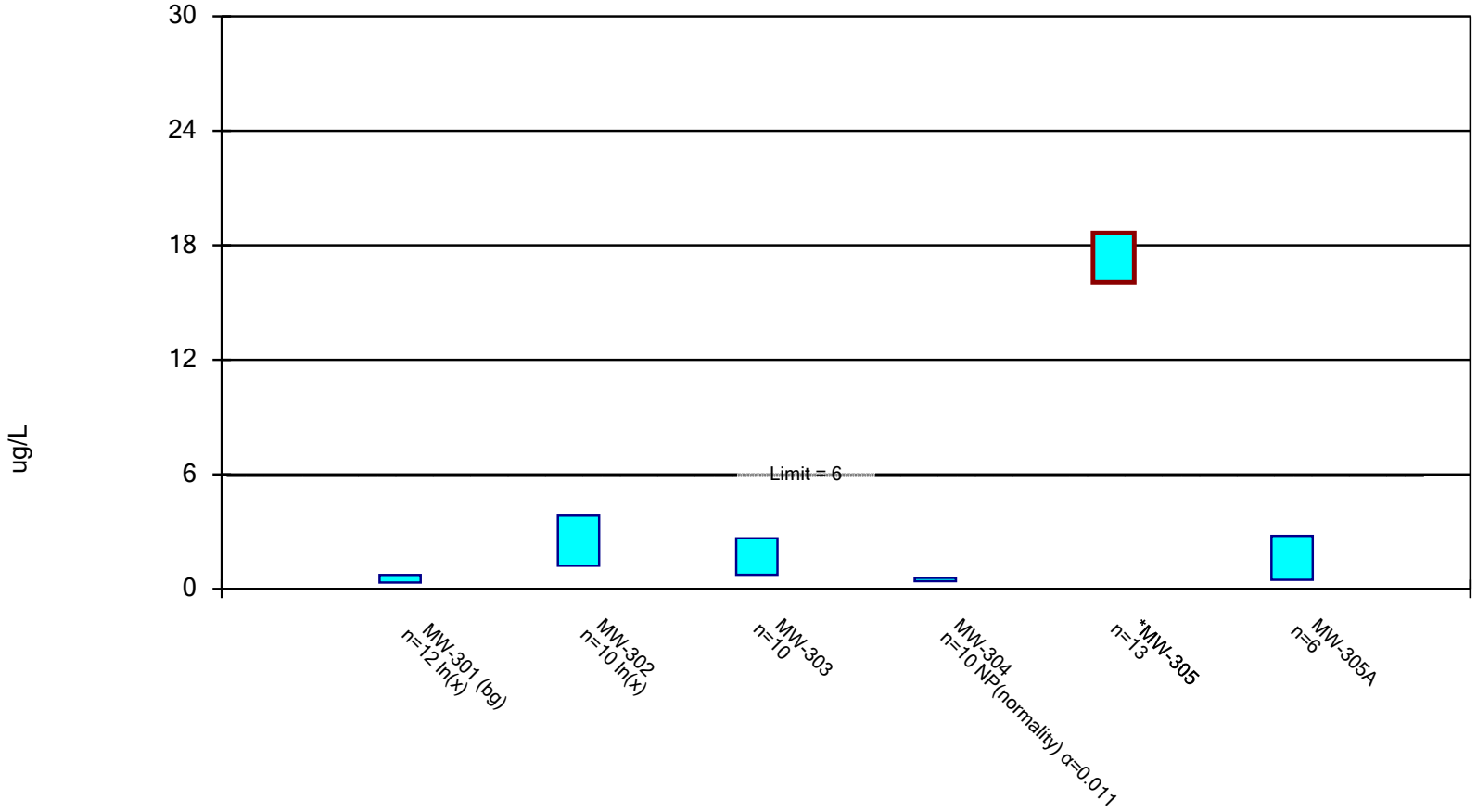
Confidence Interval

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 7/8/2022, 12:38 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
Cobalt (ug/L)	MW-301 (bg)	0.7303	0.3305	6	No	12	0	ln(x)	0.01	Param.
Cobalt (ug/L)	MW-302	3.837	1.214	6	No	10	0	ln(x)	0.01	Param.
Cobalt (ug/L)	MW-303	2.651	0.7334	6	No	10	0	No	0.01	Param.
Cobalt (ug/L)	MW-304	0.57	0.4	6	No	10	0	No	0.011	NP (normality)
Cobalt (ug/L)	**MW-305**	**18.65**	**16.08**	**6**	**Yes**	**13**	**0**	**No**	**0.01**	**Param.**
Cobalt (ug/L)	MW-305A	2.775	0.472	6	No	6	0	No	0.01	Param.
Cobalt (ug/L)	MW-306	8.8	5.5	6	No	14	0	No	0.01	NP (normality)
Cobalt (ug/L)	MW-310	0.7948	0.2627	6	No	8	0	No	0.01	Param.
Cobalt (ug/L)	MW-310A	0.5806	0.3629	6	No	6	0	ln(x)	0.01	Param.
Cobalt (ug/L)	MW-311	2.2	0.0455	6	No	7	57.14	No	0.008	NP (normality)
Cobalt (ug/L)	MW-311A	0.2551	0.09455	6	No	6	16.67	ln(x)	0.01	Param.
Fluoride (mg/L)	MW-301 (bg)	0.3	0.22	4	No	10	60	No	0.011	NP (normality)
Fluoride (mg/L)	MW-302	0.28	0.23	4	No	10	60	No	0.011	NP (normality)
Fluoride (mg/L)	MW-303	0.2618	0.2117	4	No	10	60	No	0.01	Param.
Fluoride (mg/L)	MW-304	1.349	0.6987	4	No	10	10	No	0.01	Param.
Fluoride (mg/L)	MW-305	0.4727	0.2421	4	No	10	30	ln(x)	0.01	Param.
Fluoride (mg/L)	MW-305A	0.7968	0.1476	4	No	6	33.33	No	0.01	Param.
Fluoride (mg/L)	MW-306	0.1838	0.09371	4	No	10	70	No	0.01	Param.
Fluoride (mg/L)	MW-310	1.215	0.2136	4	No	7	28.57	No	0.01	Param.
Fluoride (mg/L)	MW-310A	2	0.28	4	No	6	0	No	0.0155	NP (normality)
Fluoride (mg/L)	MW-311	0.28	0.22	4	No	6	100	No	0.0155	NP (NDs)
Fluoride (mg/L)	MW-311A	4.4	2	4	No	9	0	No	0.002	NP (normality)
Lithium (ug/L)	MW-301 (bg)	24.23	18.6	40	No	12	0	No	0.01	Param.
Lithium (ug/L)	MW-302	10.59	8.15	40	No	10	0	No	0.01	Param.
Lithium (ug/L)	MW-303	5.546	3.104	40	No	10	40	No	0.01	Param.
Lithium (ug/L)	MW-304	3.942	2.883	40	No	10	30	No	0.01	Param.
Lithium (ug/L)	MW-305	4.6	2.5	40	No	11	63.64	No	0.006	NP (normality)
Lithium (ug/L)	MW-305A	17	13	40	No	6	0	No	0.0155	NP (normality)
Lithium (ug/L)	MW-306	4.6	2.5	40	No	10	100	No	0.011	NP (NDs)
Lithium (ug/L)	MW-310	53.35	39.85	40	No	10	0	No	0.01	Param.
Lithium (ug/L)	**MW-310A**	**290.7**	**239.3**	**40**	**Yes**	**6**	**0**	**No**	**0.01**	**Param.**
Lithium (ug/L)	MW-311	6.471	3.614	40	No	7	0	No	0.01	Param.
Lithium (ug/L)	**MW-311A**	**312.4**	**244.2**	**40**	**Yes**	**6**	**0**	**No**	**0.01**	**Param.**

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

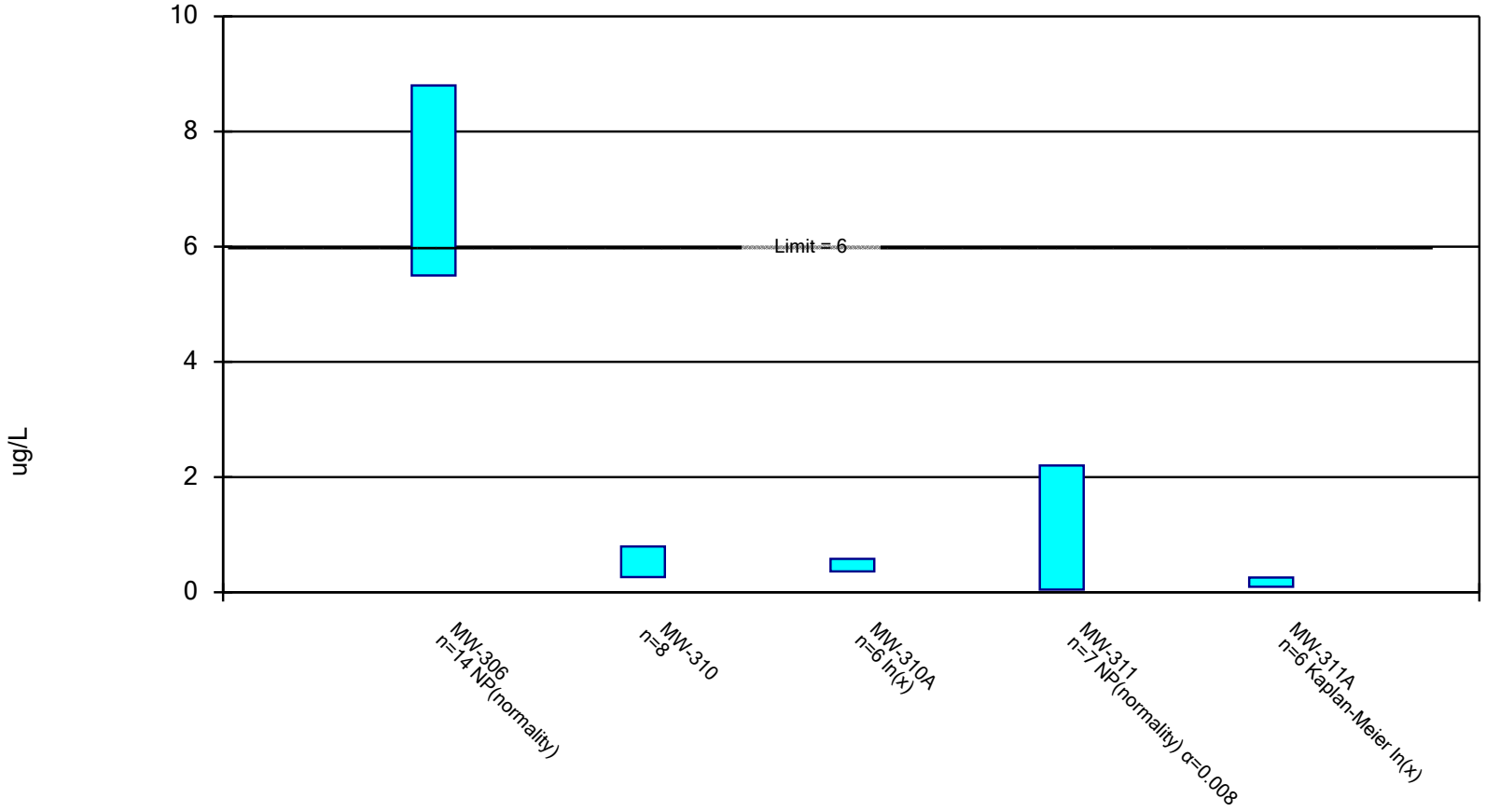
Constituent: Cobalt (ug/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-305A
4/18/2018	0.46 (J)	0.9 (J)	2.1	0.39 (J)	14.5	
8/14/2018	1.4	1.5	2.2			
8/15/2018				0.92 (J)	15.6	
10/16/2018	0.36 (J)	4	1.7	0.45 (J)	17.2	
1/8/2019					16.4	
4/8/2019	0.44 (J)	1.2	0.42 (J)	0.4 (J)	17	
10/23/2019				0.5	17	
10/24/2019	0.6	2.7	1.2			
2/5/2020	1.1					
3/12/2020	0.43 (J)					
3/13/2020					18	2.4
4/13/2020				0.57	16	
4/14/2020	0.52	5.3	0.87			2.7
10/8/2020	0.41 (J)	1.5	2.4	0.41 (J)		
10/9/2020					17	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
Mean	0.56	2.61	1.692	0.49	17.36	1.623
Std. Dev.	0.3428	1.725	1.074	0.1607	1.73	0.8381
Upper Lim.	0.7303	3.837	2.651	0.57	18.65	2.775
Lower Lim.	0.3305	1.214	0.7334	0.4	16.08	0.472

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

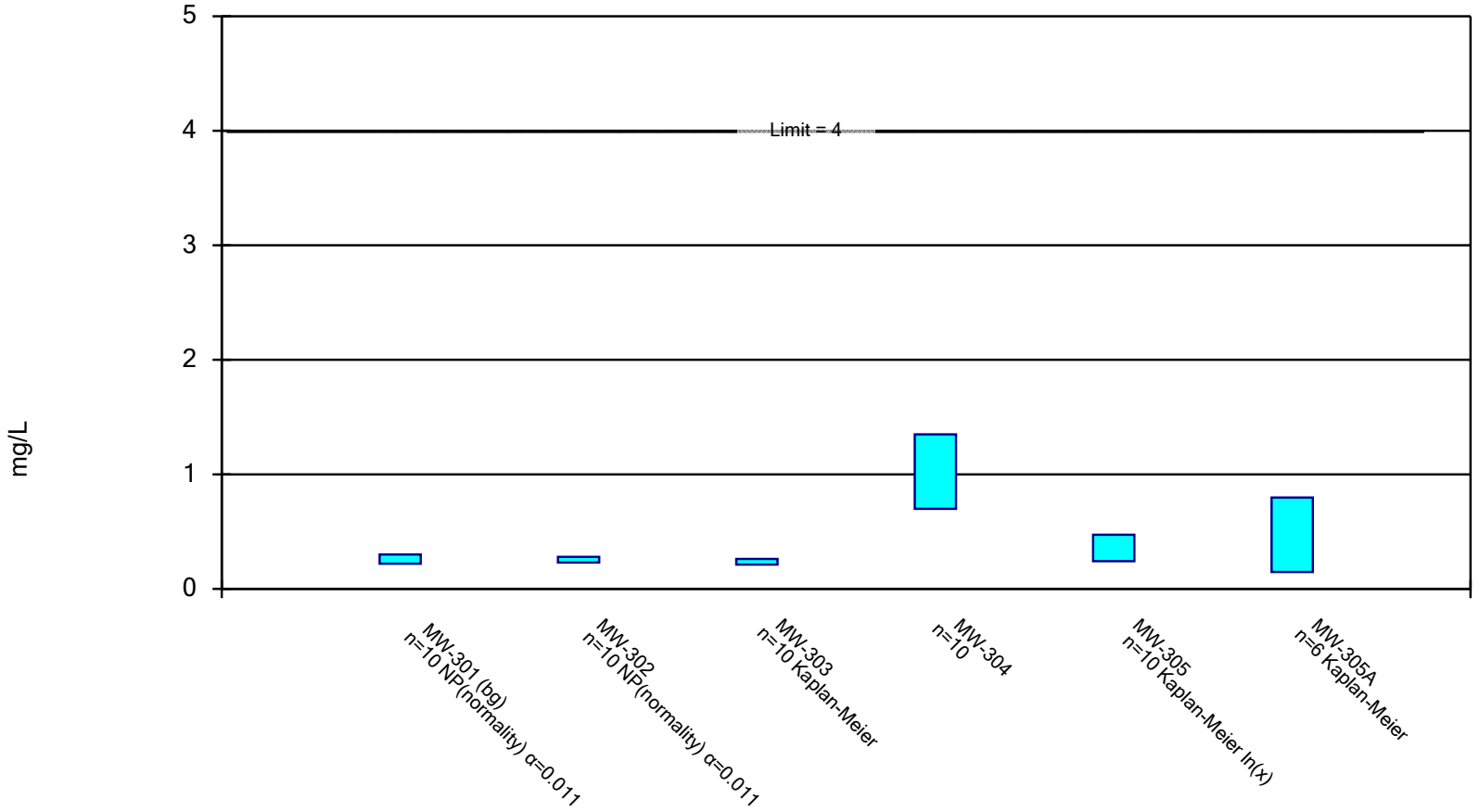
Constituent: Cobalt (ug/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-306	MW-310	MW-310A	MW-311	MW-311A
4/18/2018	4.8				
8/15/2018	5.5				
10/16/2018	6.4				
1/8/2019	6.2				
4/8/2019	6.9				
10/23/2019	6.2				
10/24/2019		0.57		0.78	
2/5/2020		0.32 (J)		0.11 (J)	
3/12/2020		0.32 (J)			
3/13/2020			0.63	<0.091 (U)	0.19 (J)
4/13/2020		0.24 (J)		<0.091 (U)	0.13 (J)
4/14/2020	5.5		0.39 (J)		
10/8/2020					0.12 (J)
10/9/2020	5.9				
10/12/2020		0.38 (J)	0.43 (J)	2.2	
2/23/2021	5.6				
4/13/2021	5.6	0.75			
4/14/2021				<0.091 (U)	
4/15/2021			0.48 (J)		
4/16/2021					0.13 (J)
7/6/2021	5.8				
10/6/2021		0.72			
10/8/2021	11		0.45 (J)		<0.19 (U)
2/14/2022	8.8				
4/11/2022		0.93		<0.19 (U)	
4/12/2022	9.1		0.41 (J)		
4/14/2022					0.32 (J)
Mean	6.664	0.5288	0.465	0.4745	0.1642
Std. Dev.	1.746	0.251	0.08666	0.8062	0.08249
Upper Lim.	8.8	0.7948	0.5806	2.2	0.2551
Lower Lim.	5.5	0.2627	0.3629	0.0455	0.09455

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

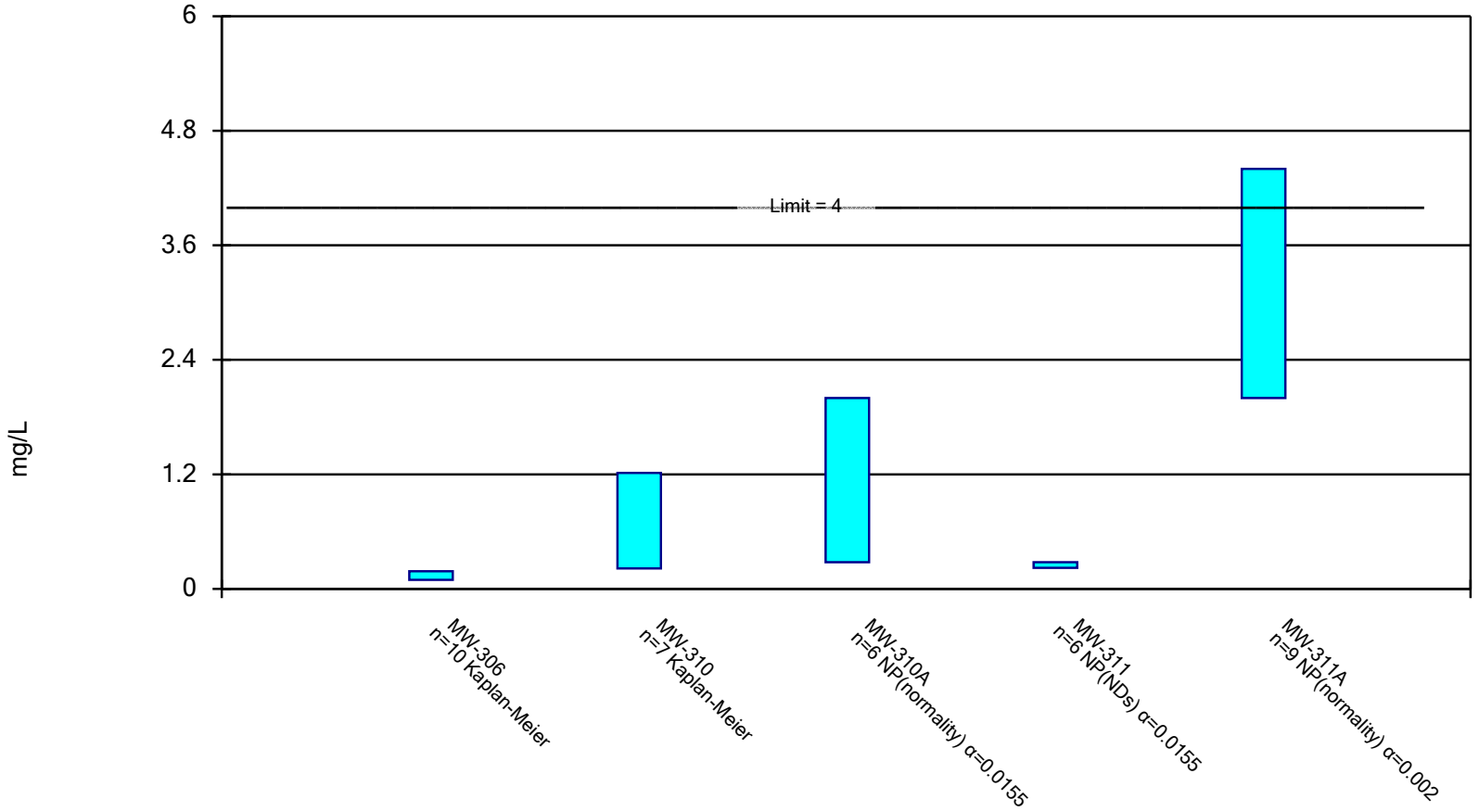
Constituent: Fluoride (mg/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-305A
4/18/2018	0.22	0.26	0.22	0.92	0.4	
8/15/2018					0.44	
8/29/2018	0.27	0.26	0.31	1		
10/16/2018	0.3	0.24	0.24	1	0.4	
4/8/2019	0.44 (J)	<0.23 (U)	<0.23 (U)	1.3	0.75	
10/23/2019				0.74	<0.23 (U)	
10/24/2019	<0.23 (U)	<0.23 (U)	<0.23 (U)			
3/13/2020						0.77
4/13/2020				1.1	0.35 (J)	
4/14/2020	<0.23 (U)	<0.23 (U)	<0.23 (U)			0.73
10/8/2020	<0.23 (U)	<0.23 (U)	0.26 (J)	1.1		
10/9/2020					0.38 (J)	0.73
4/13/2021		0.33 (J)	<0.28 (U)			
4/14/2021	<0.28 (U)			1.1		
4/15/2021						0.56
4/16/2021					0.37 (J)	
10/6/2021					<0.28 (U)	
10/7/2021	<0.28 (U)	<0.28 (U)	<0.28 (U)			
10/8/2021				<0.28 (U)		<0.28 (U)
4/11/2022					<0.22 (U)	
4/12/2022	<0.22 (U)	<0.22 (U)	<0.22 (U)	1.7		<0.22 (U)
Mean	0.27	0.251	0.25	1.024	0.382	0.5483
Std. Dev.	0.0665	0.03348	0.03091	0.3646	0.1492	0.2429
Upper Lim.	0.3	0.28	0.2618	1.349	0.4727	0.7968
Lower Lim.	0.22	0.23	0.2117	0.6987	0.2421	0.1476

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

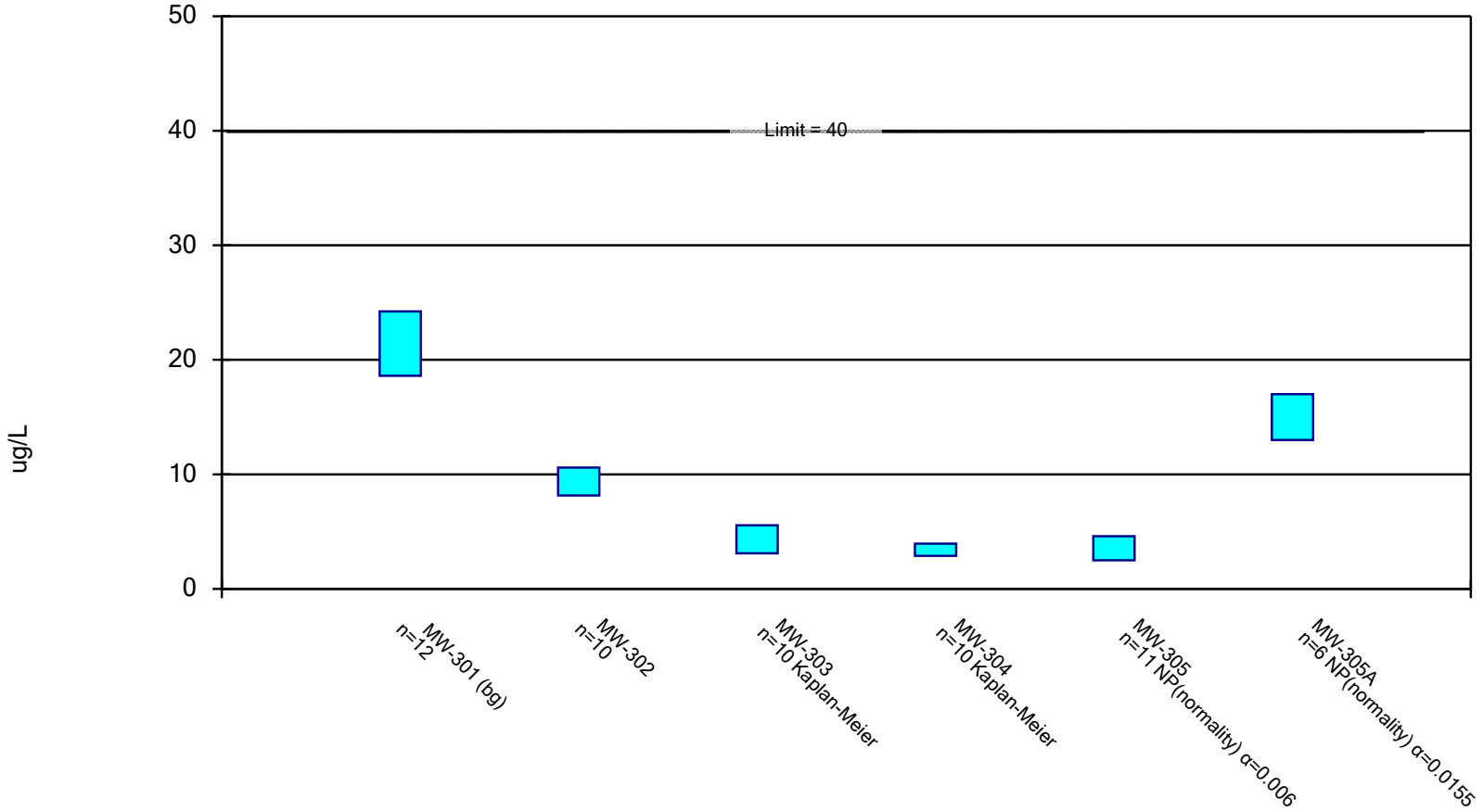
Constituent: Fluoride (mg/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-306	MW-310	MW-310A	MW-311	MW-311A
4/18/2018	0.11 (J)				
8/15/2018	0.13 (J)				
10/16/2018	<0.19 (U)				
4/8/2019	0.27 (J)				
10/23/2019	<0.23 (U)				
10/24/2019		0.31 (J)		<0.23 (U)	
2/5/2020		0.85		<0.23 (U)	
3/13/2020			1.7		3.4
4/13/2020		1.1		<0.23 (U)	4.1
4/14/2020	<0.23 (U)		1.8		
6/30/2020					3.7
10/8/2020					4.4
10/9/2020	<0.23 (U)				
10/12/2020		1	2	<0.23 (U)	
2/25/2021					3.9
4/13/2021	<0.28 (U)	1.3			
4/14/2021				<0.28 (U)	
4/15/2021			1.9		
4/16/2021					4
7/7/2021					3.8
10/6/2021		<0.28 (U)			
10/8/2021	<0.28 (U)		0.28 (J)		2
4/11/2022		<0.22 (U)		<0.22 (U)	
4/12/2022	<0.22 (U)		0.4 (J)		
4/14/2022					2.4
Mean	0.217	0.7229	1.347	0.2367	3.522
Std. Dev.	0.0587	0.4449	0.7871	0.0216	0.8043
Upper Lim.	0.1838	1.215	2	0.28	4.4
Lower Lim.	0.09371	0.2136	0.28	0.22	2

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

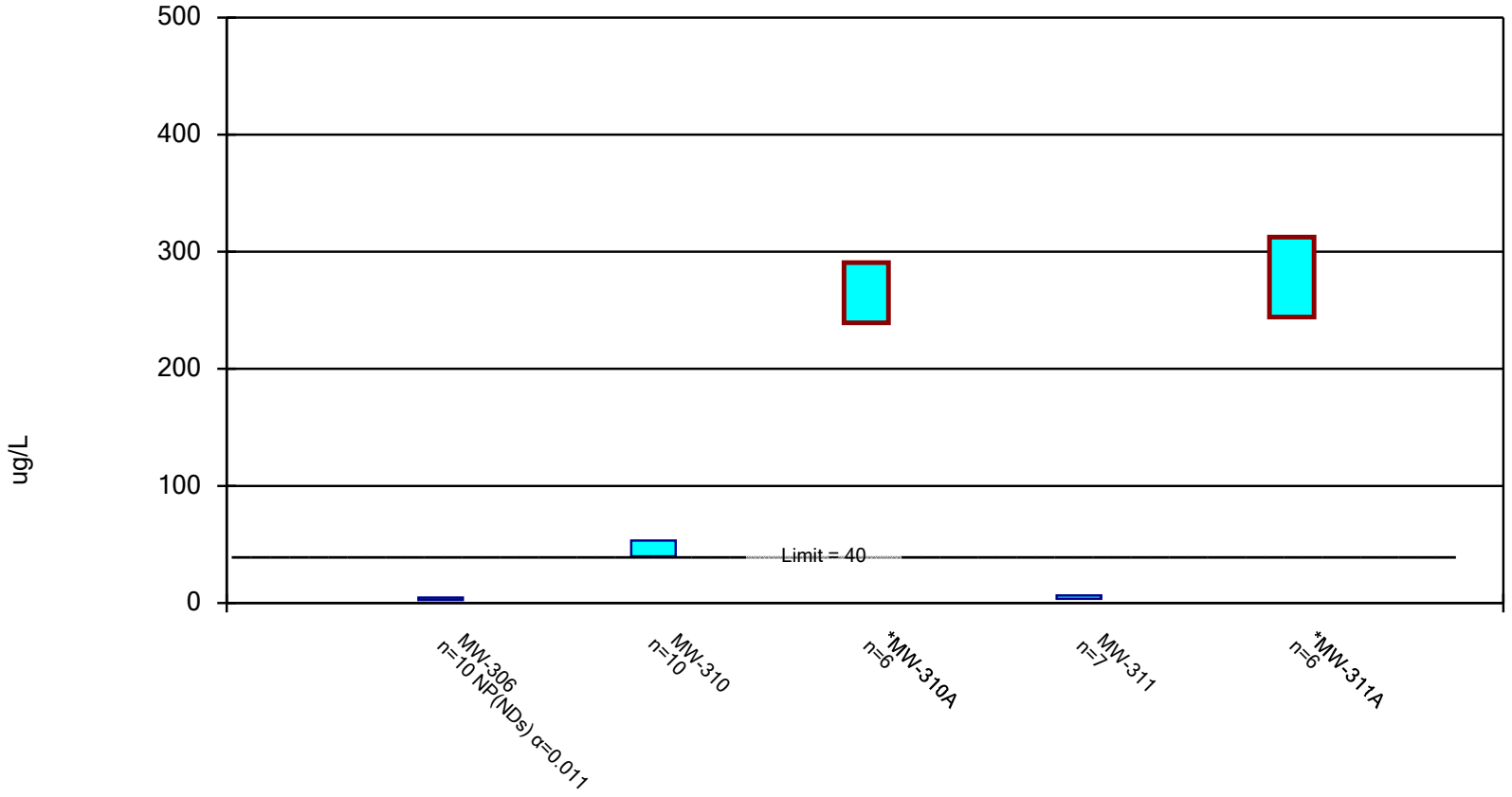
Constituent: Lithium (ug/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-305A
4/18/2018	19.1	7.5 (J)	<4.6 (U)	<4.6 (U)	<4.6 (U)	
8/14/2018	26.5	6.9 (J)	6.9 (J)			
8/15/2018				<4.6 (U)	<4.6 (U)	
10/16/2018	19.4	8.6 (J)	<4.6 (U)	<4.6 (U)	<4.6 (U)	
4/8/2019	15	10	<2.7 (U)	3.3 (J)	<2.7 (U)	
10/23/2019				2.8 (J)	<2.7 (U)	
10/24/2019	24	10	<2.7 (U)			
2/5/2020	17					
3/12/2020	21					
3/13/2020					2.3 (J)	14
4/13/2020				4.8 (J)	3.2 (J)	
4/14/2020	24	11	4.7 (J)			16
10/8/2020	23	9.6 (J)	5.6 (J)	3.1 (J)		
10/9/2020					<2.5 (U)	13
4/13/2021		10	4.1 (J)			
4/14/2021	23			3.3 (J)		
4/15/2021						17
4/16/2021					2.6 (J)	
10/6/2021					3.1 (J)	
10/7/2021	26	11	5.8 (J)			
10/8/2021				4 (J)		17
4/11/2022					<2.5 (U)	
4/12/2022	19	9.1 (J)	4 (J)	3.4 (J)		17
Mean	21.42	9.37	4.57	3.85	3.218	15.67
Std. Dev.	3.585	1.367	1.315	0.7517	0.9239	1.751
Upper Lim.	24.23	10.59	5.546	3.942	4.6	17
Lower Lim.	18.6	8.15	3.104	2.883	2.5	13

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: Lithium Analysis Run 7/8/2022 12:37 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Confidence Interval

Constituent: Lithium (ug/L) Analysis Run 7/8/2022 12:38 PM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-306	MW-310	MW-310A	MW-311	MW-311A
4/18/2018	<4.6 (U)				
8/15/2018	<4.6 (U)				
10/16/2018	<4.6 (U)				
4/8/2019	<2.7 (U)				
10/23/2019	<2.7 (U)				
10/24/2019		35		4.7 (J)	
2/5/2020		42		2.9 (J)	
3/12/2020		46			
3/13/2020			250	4.7 (J)	260
4/13/2020		48		6.2 (J)	310
4/14/2020	<2.3 (U)		290		
10/8/2020					240
10/9/2020	<2.5 (U)				
10/12/2020		42	240	4.6 (J)	
2/23/2021		37			
4/13/2021	<2.5 (U)	58			
4/14/2021				5.9 (J)	
4/15/2021			270		
4/16/2021					290
7/6/2021		52			
10/6/2021		52			
10/8/2021	<2.5 (U)		280		290
4/11/2022		54		6.3 (J)	
4/12/2022	<2.5 (U)		260		
4/14/2022					280
Mean	3.15	46.6	265	5.043	278.3
Std. Dev.	1.007	7.56	18.71	1.203	24.83
Upper Lim.	4.6	53.35	290.7	6.471	312.4
Lower Lim.	2.5	39.85	239.3	3.614	244.2

E3 UPL Update and Tolerance Limit Calculation – April 2022 Event

July 1, 2022
File No. 25222072.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – UPL Update and Tolerance Limit Calculation - Ottumwa Generating Station

PREPARED BY: Nicole Kron

CHECKED BY: Sherren Clark

STATISTICAL METHOD

For comparison to background, groundwater monitoring data for the multiunit system at the Ottumwa Generating Station (OGS) are evaluated in accordance with 40 CFR 257.93(f)(3), using a prediction interval or tolerance interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (UPL) or upper tolerance limit (UTL).

For assessment monitoring parameters, groundwater monitoring data is also evaluated by comparing the lower confidence limit (LCL) for the arithmetic mean of the monitoring results to the Groundwater Protection Standard (GPS) established in accordance with 40 CFR 257.95(h).

Statistical evaluation is performed using commercially available software (*Sanitas for Groundwater*© or similar) in general accordance with the USEPA's *Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* dated March 2009 (Unified Guidance) (USEPA, 2009) and generally accepted procedures.

The OGS monitoring data include one upgradient/background monitoring well, MW-301, five compliance monitoring wells, and seven delineation monitoring wells. The seven additional delineation wells were added following initiation of assessment monitoring and confirmation of cobalt concentrations in MW-305 and MW-306 exceeding the Groundwater Protection Standard (GPS).

The initial UPLs were calculated based on eight rounds of background monitoring performed prior to the initiation of compliance monitoring for the OGS Ash Pond, from April 2016 through August 2017. Since then, additional rounds of monitoring for Appendix III and IV parameters have been performed at the background well. As part of the evaluation of the 2022 monitoring results, the background data set for the UPL/UTL calculations is being updated to include data from the background well collected through April 2022. This memo addresses updated UPLs for Appendix III and UTLs for Appendix IV parameters.

Because the site is already in assessment monitoring and in the process of selecting a remedy, the purposes of the UPL/UTL analysis are to provide a basis for comparison of downgradient water

quality to background and to establish a GPS for any parameter where background water quality exceeds the GPS values in 40 CFR 257.95(h)(1) and (2).

TIME SERIES PLOTS

Time series plots are prepared for the monitoring parameters to show concentration variations over time. Time series graphs are included in **Attachment 1**. In the graphs, non-detect values are shown with hollow symbols, while detected values have solid symbols. For some Appendix IV parameters, many or all background results are non-detect, but detection limits may have increased or decreased since the earliest data were collected.

OUTLIER ANALYSIS - INTERWELL

For interwell analysis, an outlier evaluation is performed for background monitoring results at the upgradient wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1. Run normality test (Shapiro Wilk/Francia).

2. If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3. If not normally distributed, run Tukey's test for outliers.

4. Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors; however, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the evaluation of interwell background data collected through the April 2022 sampling event, the following background values were identified by Sanitas as potential outliers and handled as described:

- **Field pH, MW-301, January 8, 2019.** One low result from the January 2019 event was flagged as a statistical outlier. This result was not removed from the dataset because it appears to be within the range of potential natural variability for background. The other field pH results obtained on the same day were not similarly low; therefore, the low result for MW-301 does not appear to represent a low bias due to instrument or calibration error.

- **Sulfate, MW-301, April 8, 2019**. One low result from the April 2019 event was flagged as a statistical outlier. This result was not removed from the dataset because it appears to be within the range of potential natural variability for background.

Outlier analysis results are included in **Attachment 2.**

BACKGROUND UPDATE

The background data pool was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (April 2016 through August 2017) and the data to be added (November 2017 through April 2022) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1 percent level of significance.

The Sanitas background group comparison for the OGS background data sets, included in **Attachment 3**, indicated no significant difference at the 1 percent level, except for antimony, arsenic, beryllium, and mercury, where most results were non-detect and the shift reflected a change in detection limits. Based on these results, the more recent data can be added to the background pool. The comparison uses Welch's t-test for normally distributed data and the Mann-Whitney test for non-normal data.

INTERWELL PREDICTION LIMITS

Interwell prediction limits for Appendix III parameters are calculated using background data from the upgradient monitoring well (MW-301) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring, groundwater results from April 2016 through April 2022 were included to calculate the interwell prediction limits. The prediction limit analysis performed in Sanitas includes the following steps:

1. If 100 percent of the background values are non-detect, the Double Quantification rule applies and no prediction limit is calculated.

2. If more than 50 percent of results are non-detect, then a non-parametric prediction limit is calculated.

3. If 50 percent or fewer of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

4. If normal or transformed normal, calculate parametric prediction limit.

5. If not normal or transformed normal, calculate non-parametric prediction limit.

Consistent with the Unified Guidance, parametric prediction limits are calculated based on a 1-of-2 retesting protocol and a 10 percent site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For this update, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	Spring and Fall events
Constituents analyzed	7	Total of seven Appendix III constituents analyzed, all constituents detected at least once
Compliance wells	5	Five compliance wells at waste boundary

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or quanitification limit. All of the constituents were detected at least one in the background wells; therefore, UPLs were calculated for all. Although UPLs were calculated for constituents with a high proportion of non-detects, a future result will not be identified as an SSI unless two sample results exceed both the UPL and the reporting limit or quantification limit.

For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were adjusted using the Kaplan-Meier technique, unless the non-detects represent less than 15 percent of the total samples, in which case one-half of the detection limit was used.

Interwell prediction limit analysis results are included in **Attachment 4**.

INTERWELL TOLERANCE LIMITS

Interwell tolerance limits for Appendix IV parameters are calculated using background data from the upgradient monitoring well (MW-301) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring, groundwater results from April 2016 through April 2022 were included to calculate the interwell tolerance limits. The tolerance limit analysis was performed in Sanitas, including the same five steps listed above. Management of non-detect results in the background data was also the same as described above for prediction limits. As recommended in the Unified Guidance, the UTL was calculated with 95 percent confidence and 95 percent coverage.

Interwell tolerance limits analysis results are included in **Attachment 5**.

NDK/jsn/SCC

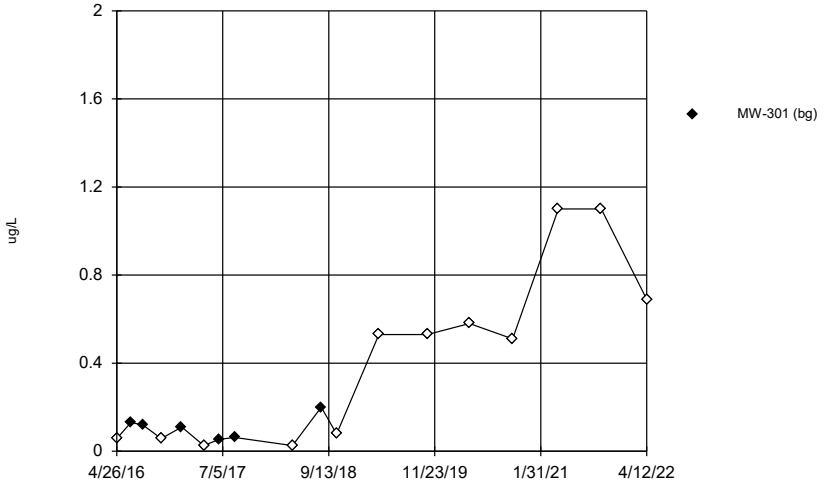
I:\25222072.00\Data and Calculations\Sanitas\2021 OGS UPLs and TLs\2203_OGS - CCR Stats Memo.docx

Attachment 1

Times Series Graphs

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Antimony



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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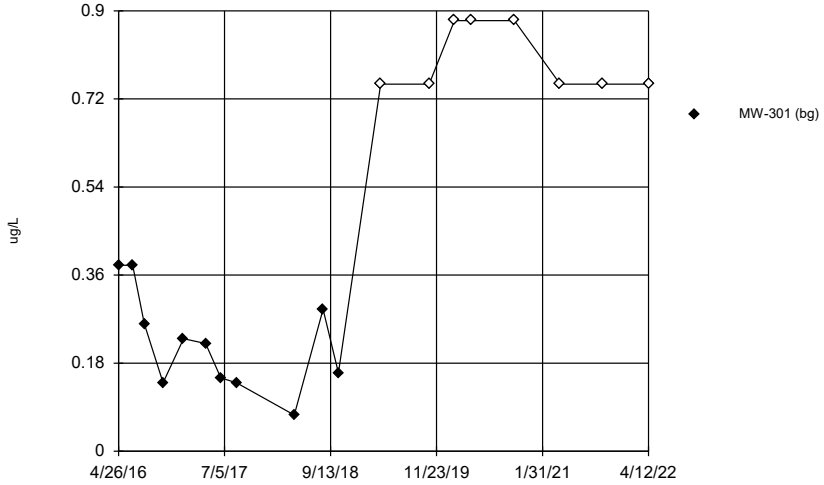
Hollow symbols indicate censored values.

Arsenic



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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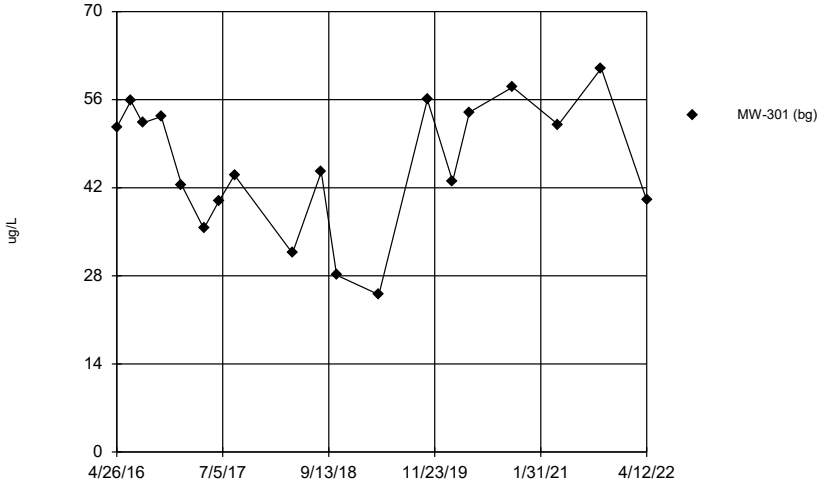
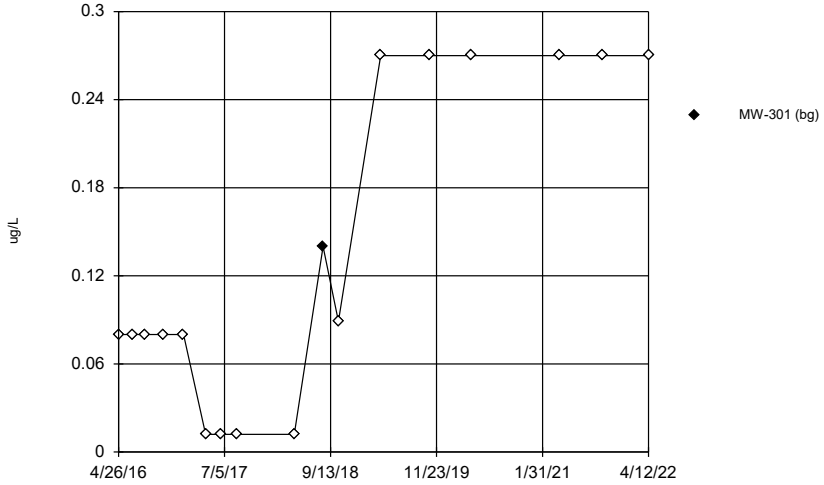
Barium



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Beryllium



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Antimony (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.058 (U)
6/23/2016	0.13 (J)
8/10/2016	0.12 (J)
10/26/2016	<0.058 (U)
1/18/2017	0.11 (J)
4/19/2017	<0.026 (U)
6/20/2017	0.054 (J)
8/23/2017	0.063 (J)
4/18/2018	<0.026 (U)
8/14/2018	0.2 (J)
10/16/2018	<0.078 (U)
4/8/2019	<0.53 (U)
10/24/2019	<0.53 (U)
4/14/2020	<0.58 (U)
10/8/2020	<0.51 (U)
4/14/2021	<1.1 (U)
10/7/2021	<1.1 (U)
4/12/2022	<0.69 (U)

Time Series

Constituent: Arsenic (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.38 (J)
6/23/2016	0.38 (J)
8/10/2016	0.26 (J)
10/26/2016	0.14 (J)
1/18/2017	0.23 (J)
4/19/2017	0.22 (J)
6/20/2017	0.15 (J)
8/23/2017	0.14 (J)
4/18/2018	0.074 (J)
8/14/2018	0.29 (J)
10/16/2018	0.16 (J)
4/8/2019	<0.75 (U)
10/24/2019	<0.75 (U)
2/5/2020	<0.88 (U)
4/14/2020	<0.88 (U)
10/8/2020	<0.88 (U)
4/14/2021	<0.75 (U)
10/7/2021	<0.75 (U)
4/12/2022	<0.75 (U)

Time Series

Constituent: Barium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	51.6
6/23/2016	55.8
8/10/2016	52.3
10/26/2016	53.3
1/18/2017	42.4
4/19/2017	35.5
6/20/2017	39.9
8/23/2017	44
4/18/2018	31.6
8/14/2018	44.5
10/16/2018	28.1
4/8/2019	25
10/24/2019	56
2/5/2020	43
4/14/2020	54
10/8/2020	58
4/14/2021	52
10/7/2021	61
4/12/2022	40

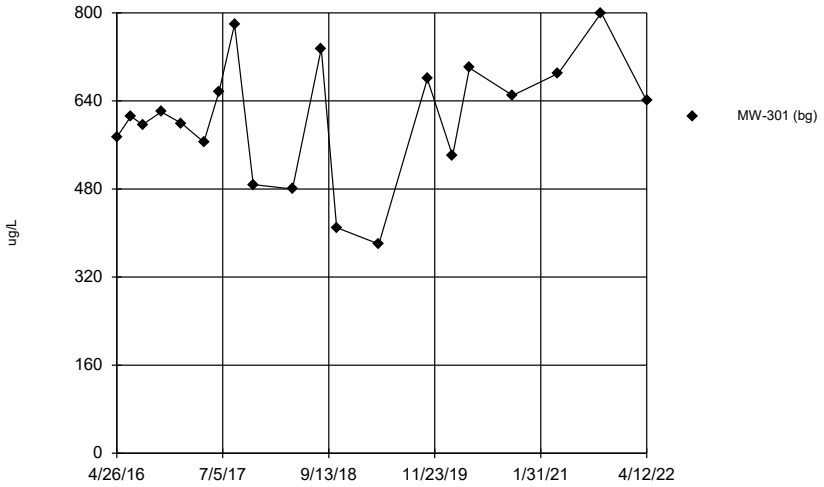
Time Series

Constituent: Beryllium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.08 (U)
6/23/2016	<0.08 (U)
8/10/2016	<0.08 (U)
10/26/2016	<0.08 (U)
1/18/2017	<0.08 (U)
4/19/2017	<0.012 (U)
6/20/2017	<0.012 (U)
8/23/2017	<0.012 (U)
4/18/2018	<0.012 (U)
8/14/2018	0.14 (J)
10/16/2018	<0.089 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
4/14/2020	<0.27 (U)
4/14/2021	<0.27 (U)
10/7/2021	<0.27 (U)
4/12/2022	<0.27 (U)

Boron

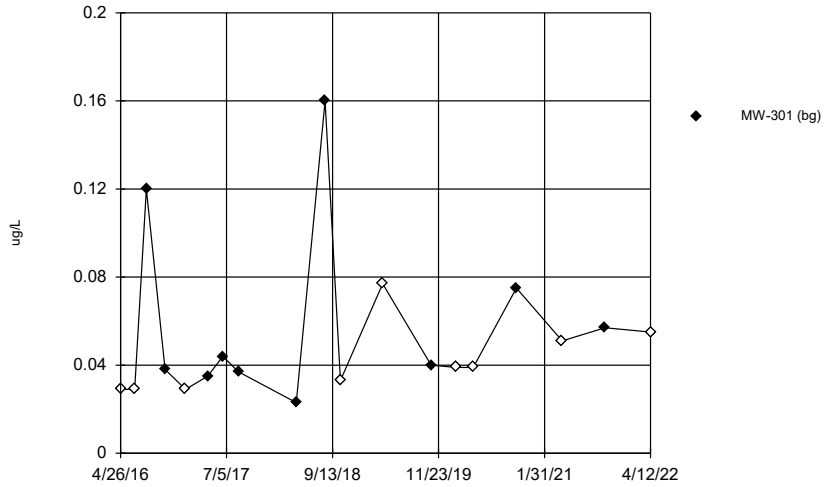


Time Series Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Hollow symbols indicate censored values.

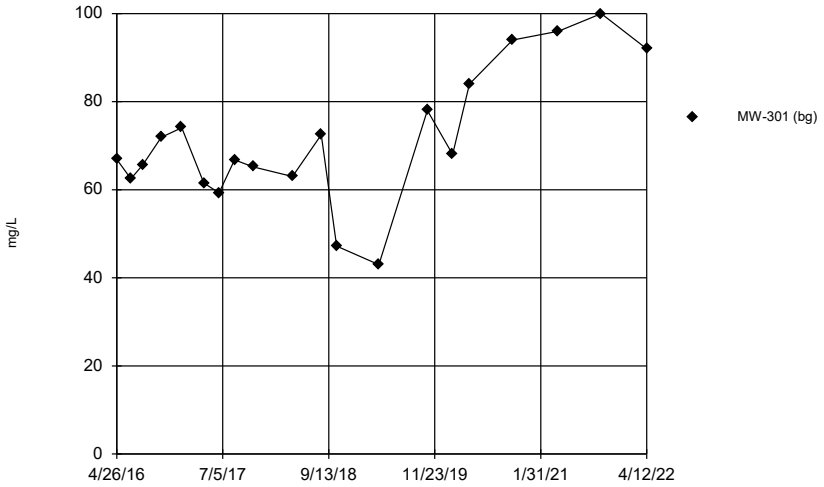
Cadmium



Time Series Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

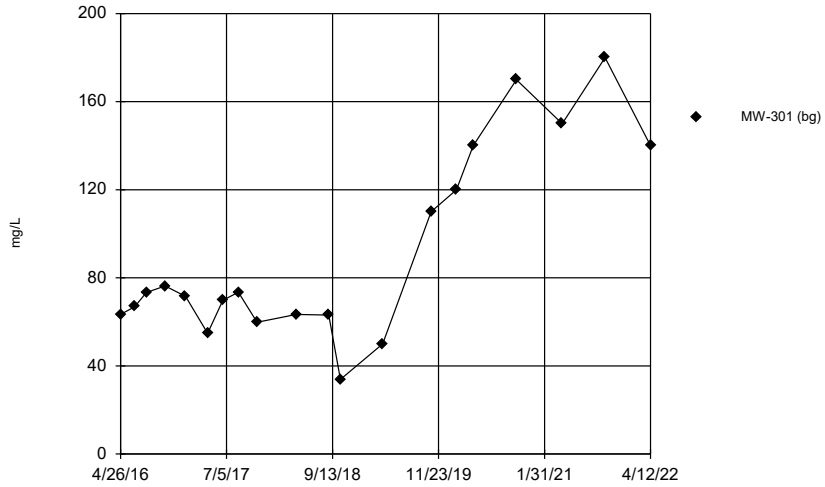
Calcium



Time Series Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Chloride



Time Series Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Boron (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	574
6/23/2016	612
8/10/2016	597
10/26/2016	620
1/18/2017	599
4/19/2017	565
6/20/2017	657
8/23/2017	779
11/8/2017	488
4/18/2018	480
8/14/2018	735
10/16/2018	410
4/8/2019	380
10/24/2019	680
2/5/2020	540
4/14/2020	700
10/8/2020	650
4/14/2021	690
10/7/2021	800
4/12/2022	640

Time Series

Constituent: Cadmium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.029 (U)
6/23/2016	<0.029 (U)
8/10/2016	0.12 (J)
10/26/2016	0.038 (J)
1/18/2017	<0.029 (U)
4/19/2017	0.035 (J)
6/20/2017	0.044 (J)
8/23/2017	0.037 (J)
4/18/2018	0.023 (J)
8/14/2018	0.16 (J)
10/16/2018	<0.033 (U)
4/8/2019	<0.077 (U)
10/24/2019	0.04 (J)
2/5/2020	<0.039 (U)
4/14/2020	<0.039 (U)
10/8/2020	0.075 (J)
4/14/2021	<0.051 (U)
10/7/2021	0.057 (J)
4/12/2022	<0.055 (U)

Time Series

Constituent: Calcium (mg/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	66.9
6/23/2016	62.5
8/10/2016	65.6
10/26/2016	71.9
1/18/2017	74.1
4/19/2017	61.5
6/20/2017	59.3
8/23/2017	66.8
11/8/2017	65.2
4/18/2018	63
8/14/2018	72.5
10/16/2018	47.2
4/8/2019	43
10/24/2019	78
2/5/2020	68
4/14/2020	84
10/8/2020	94
4/14/2021	96
10/7/2021	100
4/12/2022	92

Time Series

Constituent: Chloride (mg/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	63.4
6/23/2016	66.9
8/10/2016	73.3
10/26/2016	76.3
1/18/2017	71.6
4/19/2017	54.8
6/20/2017	69.8
8/23/2017	73.5
11/8/2017	59.8
4/18/2018	63.4
8/29/2018	63.1
10/16/2018	33.9
4/8/2019	50
10/24/2019	110
2/5/2020	120
4/14/2020	140
10/8/2020	170
4/14/2021	150
10/7/2021	180
4/12/2022	140

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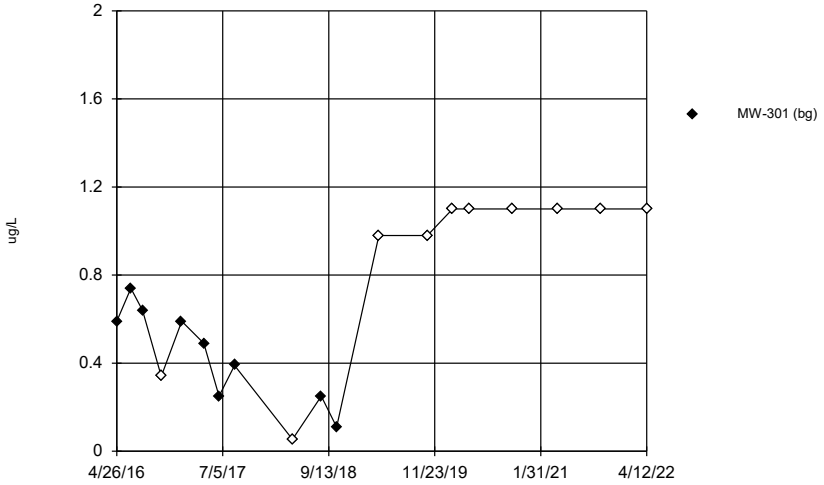
Chromium



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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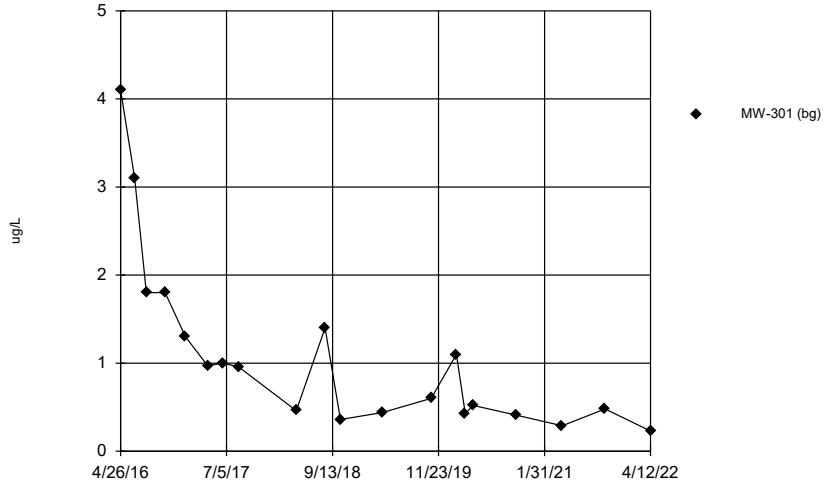
Cobalt



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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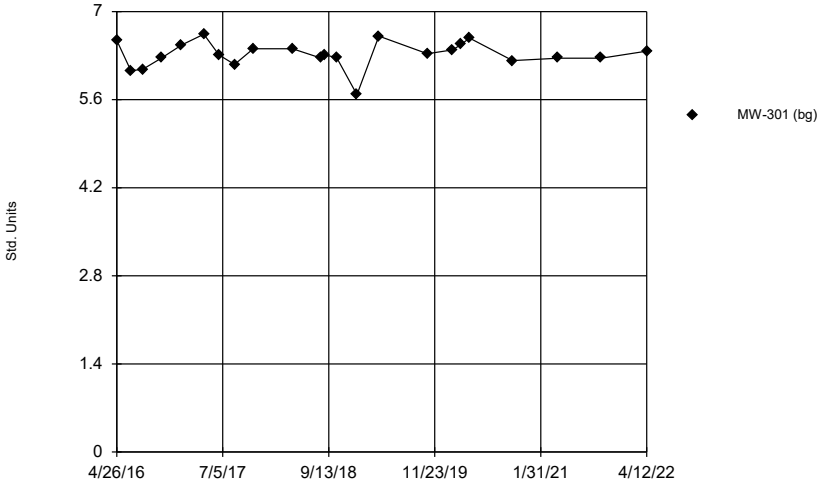
Field pH



Time Series Analysis Run 6/27/2022 11:47 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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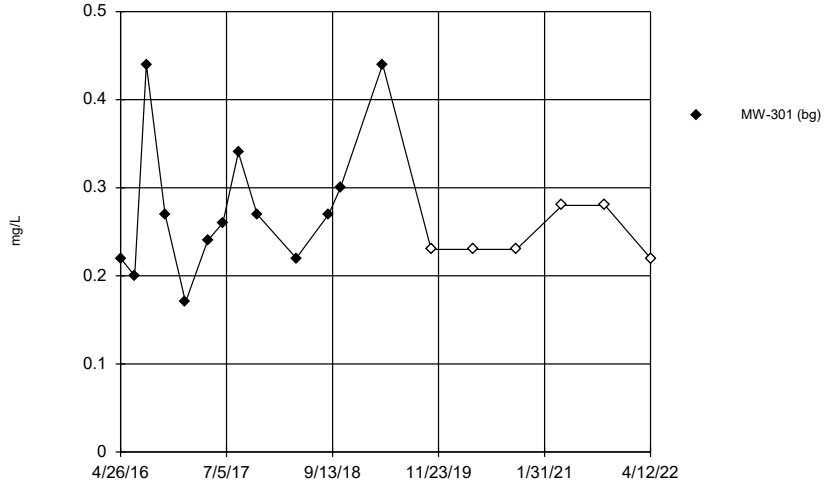
Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 6/27/2022 11:48 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Chromium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.59 (J)
6/23/2016	0.74 (J)
8/10/2016	0.64 (J)
10/26/2016	<0.34 (U)
1/18/2017	0.59 (J)
4/19/2017	0.49 (J)
6/20/2017	0.25 (J)
8/23/2017	0.39 (J)
4/18/2018	<0.054 (U)
8/14/2018	0.25 (J)
10/16/2018	0.11 (J)
4/8/2019	<0.98 (U)
10/24/2019	<0.98 (U)
2/5/2020	<1.1 (U)
4/14/2020	<1.1 (U)
10/8/2020	<1.1 (U)
4/14/2021	<1.1 (U)
10/7/2021	<1.1 (U)
4/12/2022	<1.1 (U)

Time Series

Constituent: Cobalt (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	4.1
6/23/2016	3.1
8/10/2016	1.8
10/26/2016	1.8
1/18/2017	1.3
4/19/2017	0.97 (J)
6/20/2017	1 (J)
8/23/2017	0.96 (J)
4/18/2018	0.46 (J)
8/14/2018	1.4
10/16/2018	0.36 (J)
4/8/2019	0.44 (J)
10/24/2019	0.6
2/5/2020	1.1
3/12/2020	0.43 (J)
4/14/2020	0.52
10/8/2020	0.41 (J)
4/14/2021	0.29 (J)
10/7/2021	0.48 (J)
4/12/2022	0.23 (J)

Time Series

Constituent: Field pH (Std. Units) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	6.54
6/23/2016	6.06
8/10/2016	6.08
10/26/2016	6.26
1/18/2017	6.47
4/19/2017	6.64
6/20/2017	6.31
8/23/2017	6.16
11/8/2017	6.41
4/18/2018	6.41
8/14/2018	6.26
8/29/2018	6.31
10/16/2018	6.27
1/8/2019	5.68
4/8/2019	6.61
10/24/2019	6.33
2/5/2020	6.39
3/12/2020	6.48
4/14/2020	6.58
10/8/2020	6.22
4/14/2021	6.26
10/7/2021	6.26
4/12/2022	6.37

Time Series

Constituent: Fluoride (mg/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.22
6/23/2016	0.2 (J)
8/10/2016	0.44
10/26/2016	0.27
1/18/2017	0.17 (J)
4/19/2017	0.24
6/20/2017	0.26
8/23/2017	0.34
11/8/2017	0.27
4/18/2018	0.22
8/29/2018	0.27
10/16/2018	0.3
4/8/2019	0.44 (J)
10/24/2019	<0.23 (U)
4/14/2020	<0.23 (U)
10/8/2020	<0.23 (U)
4/14/2021	<0.28 (U)
10/7/2021	<0.28 (U)
4/12/2022	<0.22 (U)

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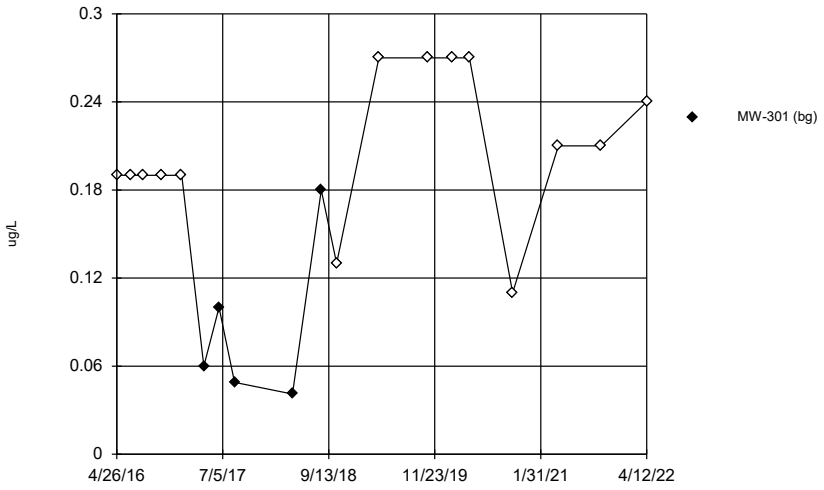
Lead



Time Series Analysis Run 6/27/2022 11:48 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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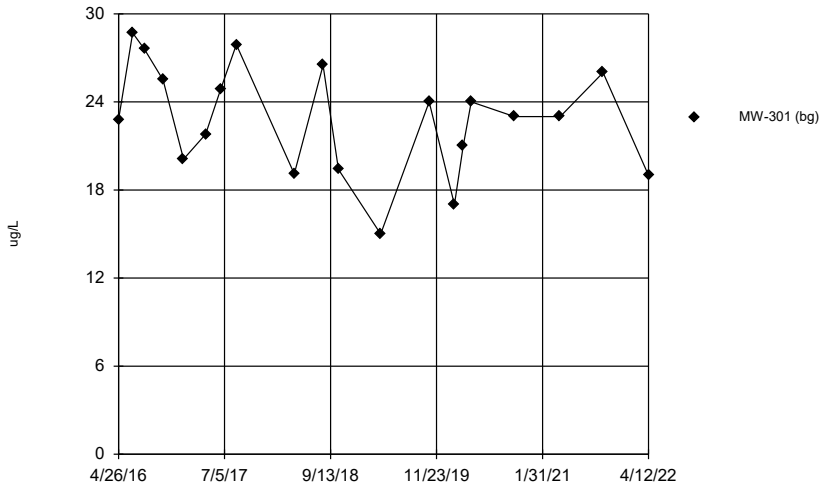
Lithium



Time Series Analysis Run 6/27/2022 11:48 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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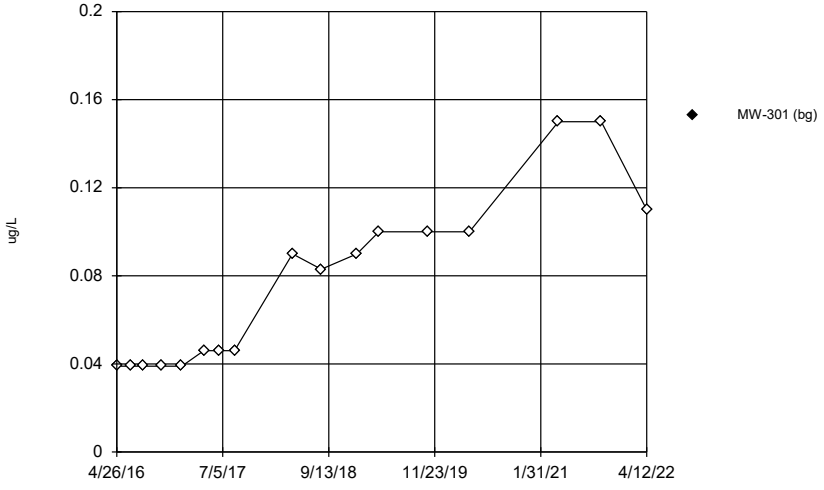
Hollow symbols indicate censored values.

Mercury



Time Series Analysis Run 6/27/2022 11:48 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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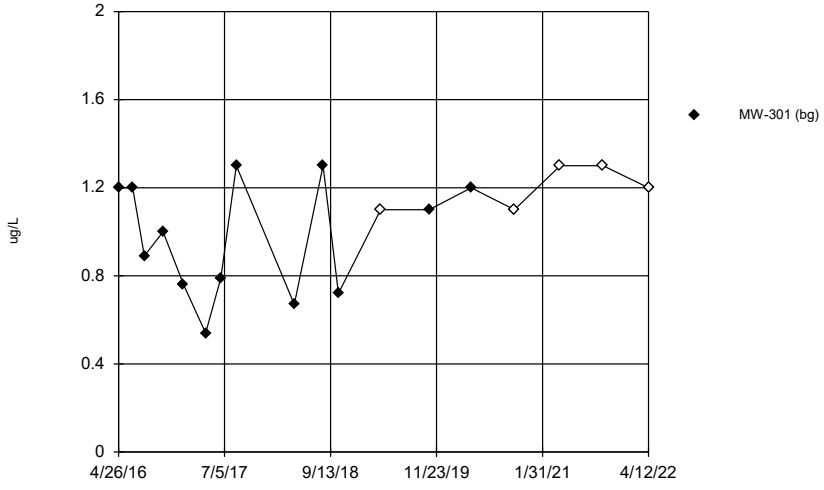
Hollow symbols indicate censored values.

Molybdenum



Time Series Analysis Run 6/27/2022 11:48 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Lead (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.19 (U)
6/23/2016	<0.19 (U)
8/10/2016	<0.19 (U)
10/26/2016	<0.19 (U)
1/18/2017	<0.19 (U)
4/19/2017	0.06 (J)
6/20/2017	0.1 (J)
8/23/2017	0.049 (J)
4/18/2018	0.041 (J)
8/14/2018	0.18 (J)
10/16/2018	<0.13 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
2/5/2020	<0.27 (U)
4/14/2020	<0.27 (U)
10/8/2020	<0.11 (U)
4/14/2021	<0.21 (U)
10/7/2021	<0.21 (U)
4/12/2022	<0.24 (U)

Time Series

Constituent: Lithium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	22.8
6/23/2016	28.7
8/10/2016	27.6
10/26/2016	25.5
1/18/2017	20.1
4/19/2017	21.8
6/20/2017	24.9
8/23/2017	27.9
4/18/2018	19.1
8/14/2018	26.5
10/16/2018	19.4
4/8/2019	15
10/24/2019	24
2/5/2020	17
3/12/2020	21
4/14/2020	24
10/8/2020	23
4/14/2021	23
10/7/2021	26
4/12/2022	19

Time Series

Constituent: Mercury (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.039 (U)
6/23/2016	<0.039 (U)
8/10/2016	<0.039 (U)
10/26/2016	<0.039 (U)
1/18/2017	<0.039 (U)
4/19/2017	<0.046 (U)
6/20/2017	<0.046 (U)
8/23/2017	<0.046 (U)
4/18/2018	<0.09 (U)
8/14/2018	<0.083 (U)
1/8/2019	<0.09 (U)
4/8/2019	<0.1 (U)
10/24/2019	<0.1 (U)
4/14/2020	<0.1 (U)
4/14/2021	<0.15 (U)
10/7/2021	<0.15 (U)
4/12/2022	<0.11 (U)

Time Series

Constituent: Molybdenum (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	1.2
6/23/2016	1.2
8/10/2016	0.89 (J)
10/26/2016	1
1/18/2017	0.76 (J)
4/19/2017	0.54 (J)
6/20/2017	0.79 (J)
8/23/2017	1.3
4/18/2018	0.67 (J)
8/14/2018	1.3
10/16/2018	0.72 (J)
4/8/2019	<1.1 (U)
10/24/2019	1.1 (J)
4/14/2020	1.2 (J)
10/8/2020	<1.1 (U)
4/14/2021	<1.3 (U)
10/7/2021	<1.3 (U)
4/12/2022	<1.2 (U)

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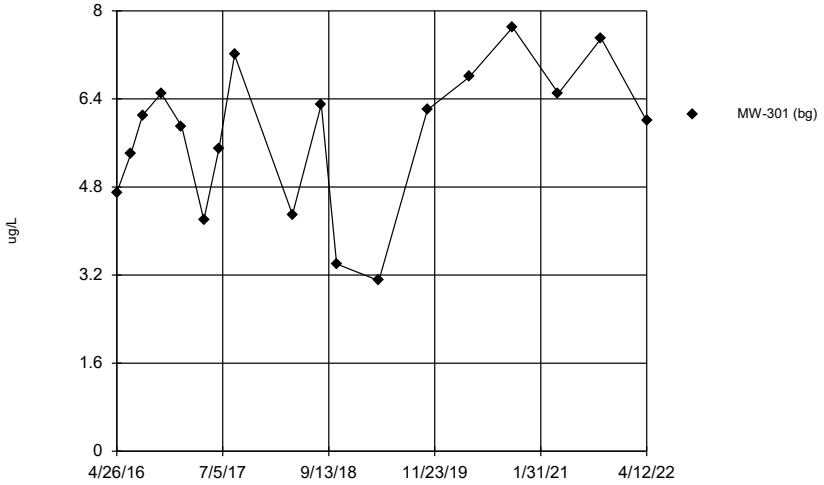
Selenium



Time Series Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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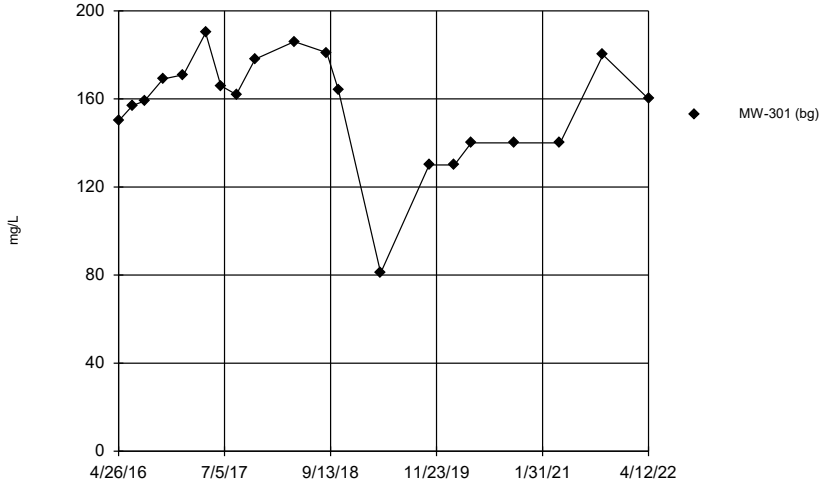
Sulfate



Time Series Analysis Run 6/27/2022 11:48 AM

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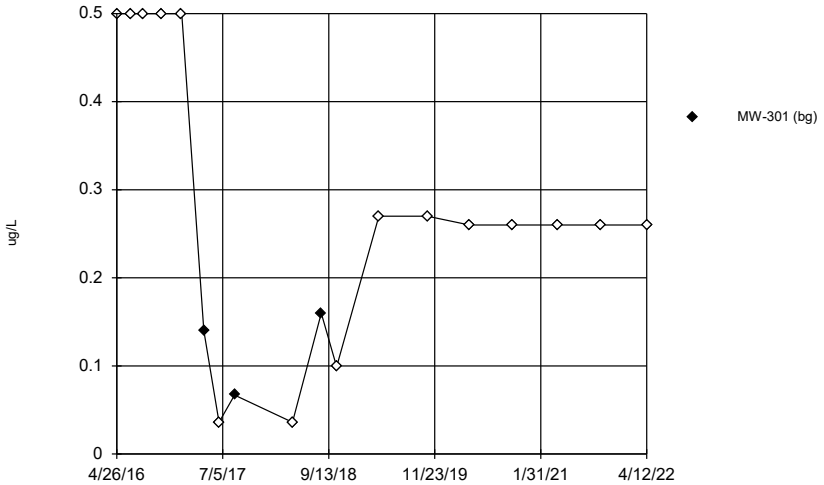
Hollow symbols indicate censored values.

Thallium



Time Series Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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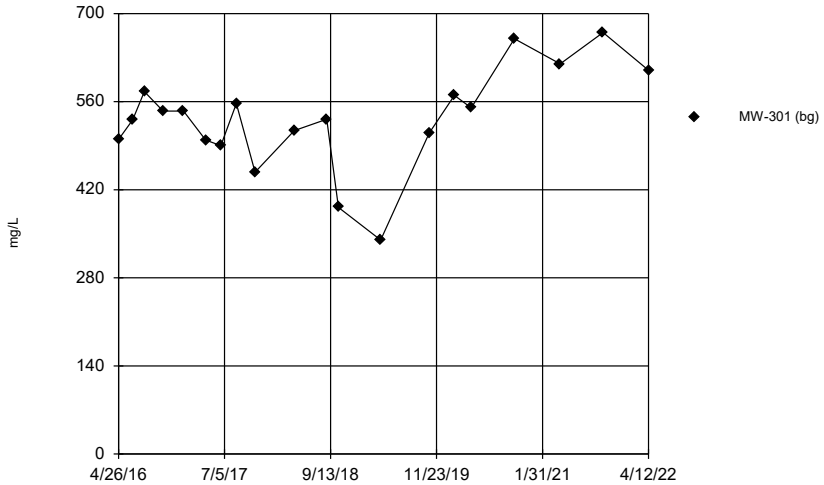
Total Dissolved Solids



Time Series Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Selenium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	4.7
6/23/2016	5.4
8/10/2016	6.1
10/26/2016	6.5
1/18/2017	5.9
4/19/2017	4.2
6/20/2017	5.5
8/23/2017	7.2
4/18/2018	4.3
8/14/2018	6.3
10/16/2018	3.4
4/8/2019	3.1 (J)
10/24/2019	6.2
4/14/2020	6.8
10/8/2020	7.7
4/14/2021	6.5
10/7/2021	7.5
4/12/2022	6

Time Series

Constituent: Sulfate (mg/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	150
6/23/2016	157
8/10/2016	159
10/26/2016	169
1/18/2017	171
4/19/2017	190
6/20/2017	166
8/23/2017	162
11/8/2017	178
4/18/2018	186
8/29/2018	181
10/16/2018	164
4/8/2019	81
10/24/2019	130
2/5/2020	130
4/14/2020	140
10/8/2020	140
4/14/2021	140
10/7/2021	180
4/12/2022	160

Time Series

Constituent: Thallium (ug/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

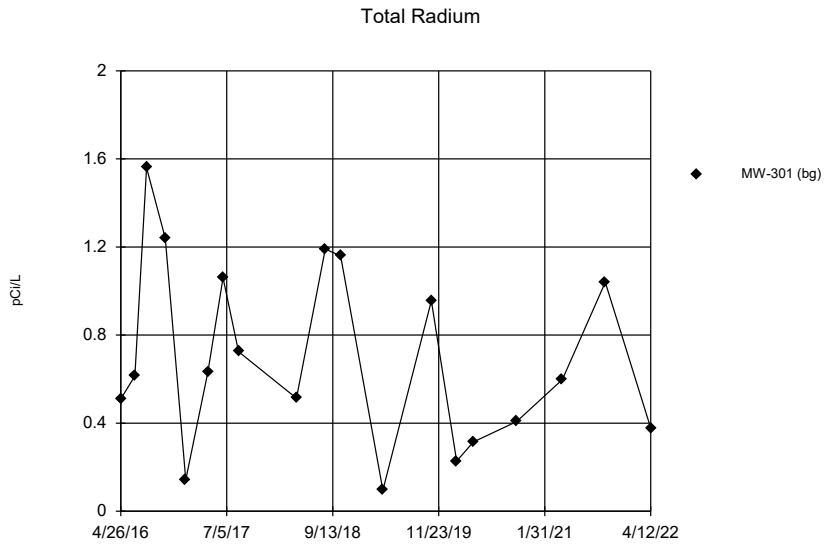
	MW-301 (bg)
4/26/2016	<0.5 (U)
6/23/2016	<0.5 (U)
8/10/2016	<0.5 (U)
10/26/2016	<0.5 (U)
1/18/2017	<0.5 (U)
4/19/2017	0.14 (J)
6/20/2017	<0.036 (U)
8/23/2017	0.067 (J)
4/18/2018	<0.036 (U)
8/14/2018	0.16 (J)
10/16/2018	<0.099 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
4/14/2020	<0.26 (U)
10/8/2020	<0.26 (U)
4/14/2021	<0.26 (U)
10/7/2021	<0.26 (U)
4/12/2022	<0.26 (U)

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	500
6/23/2016	531
8/10/2016	576
10/26/2016	545
1/18/2017	545
4/19/2017	499
6/20/2017	490
8/23/2017	557
11/8/2017	448
4/18/2018	514
8/29/2018	532
10/16/2018	392
4/8/2019	340
10/24/2019	510
2/5/2020	570
4/14/2020	550
10/8/2020	660
4/14/2021	620
10/7/2021	670
4/12/2022	610



Time Series Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Time Series

Constituent: Total Radium (pCi/L) Analysis Run 6/27/2022 11:48 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.51
6/23/2016	0.614
8/10/2016	1.56
10/26/2016	1.24
1/18/2017	0.143
4/19/2017	0.631
6/20/2017	1.06
8/23/2017	0.725
4/18/2018	0.513
8/14/2018	1.19
10/16/2018	1.16
4/8/2019	0.0956
10/24/2019	0.956
2/5/2020	0.228
4/14/2020	0.315
10/8/2020	0.407
4/14/2021	0.598
10/7/2021	1.04
4/12/2022	0.378

Attachment 2

Outlier Analysis

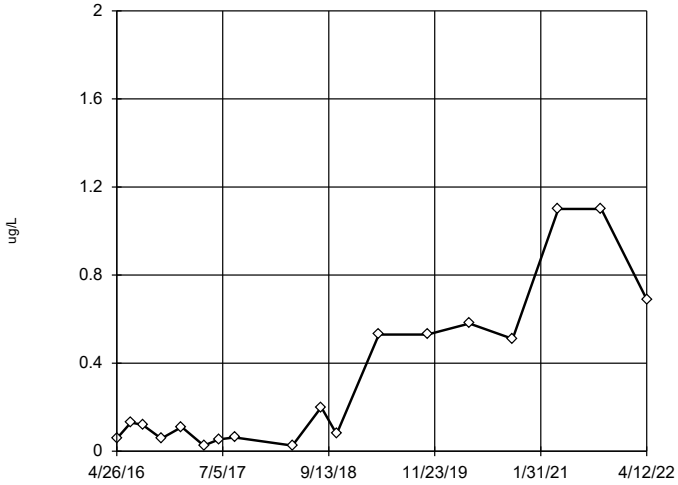
Outlier Analysis

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 6/27/2022, 11:47 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Antimony (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	18	0.3313	0.3584	unknown	ShapiroWilk
Arsenic (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	19	0.4639	0.3056	unknown	ShapiroWilk
Barium (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	19	45.68	10.46	normal	ShapiroWilk
Beryllium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	17	0.1351	0.1081	unknown	ShapiroWilk
Boron (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	20	609.8	111.8	normal	ShapiroWilk
Cadmium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	19	0.05316	0.03456	unknown	ShapiroWilk
Calcium (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	20	71.58	15.36	normal	ShapiroWilk
Chloride (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	20	91.49	43.17	ln(x)	ShapiroWilk
Chromium (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	19	0.6844	0.3787	unknown	ShapiroWilk
Cobalt (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	20	1.088	0.9962	ln(x)	ShapiroWilk
Field pH (Std. Units)	**MW-301 (bg)**	**Yes**	**5.68**	**1/8/2019**	**Dixon`s**	**0.05**	**23**	**6.32**	**0.2091**	**normal**	**ShapiroWilk**
Fluoride (mg/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	19	0.2689	0.07148	ln(x)	ShapiroWilk
Lead (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	19	0.1768	0.07557	unknown	ShapiroWilk
Lithium (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	20	22.82	3.757	normal	ShapiroWilk
Mercury (ug/L)	MW-301 (bg)	n/a	n/a	n/a	NP (nrm)	NaN	17	0.07682	0.03858	unknown	ShapiroWilk
Molybdenum (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	18	1.037	0.2471	unknown	ShapiroWilk
Selenium (ug/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	18	5.739	1.334	normal	ShapiroWilk
Sulfate (mg/L)	**MW-301 (bg)**	**Yes**	**81**	**4/8/2019**	**Dixon`s**	**0.05**	**20**	**156.7**	**25.27**	**normal**	**ShapiroWilk**
Thallium (ug/L)	MW-301 (bg)	No	n/a	n/a	NP (nrm)	NaN	18	0.271	0.167	unknown	ShapiroWilk
Total Dissolved Solids (mg/L)	MW-301 (bg)	No	n/a	n/a	Dixon`s	0.05	20	533	80.17	normal	ShapiroWilk
Total Radium (pCi/L)	MW-301 (bg)	No	n/a	n/a	EPA 1989	0.05	19	0.7033	0.4166	normal	ShapiroWilk

Antimony

MW-301 (bg)



n = 18

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 484.3, low cutoff = 0.0000664, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:45 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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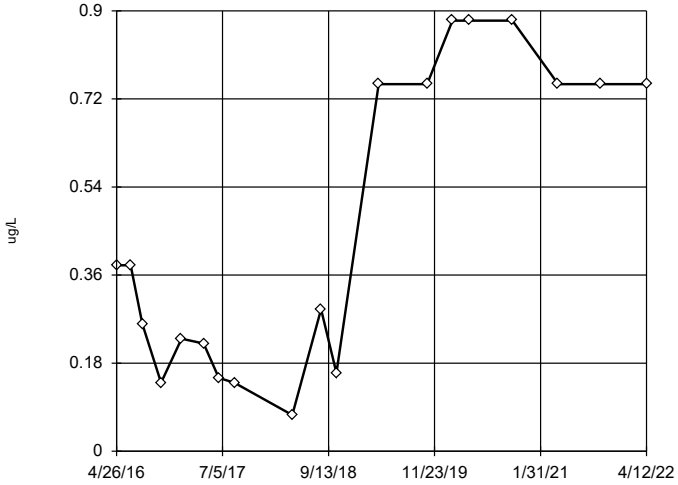
Arsenic

MW-301 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 77.25, low cutoff = 0.001553, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:45 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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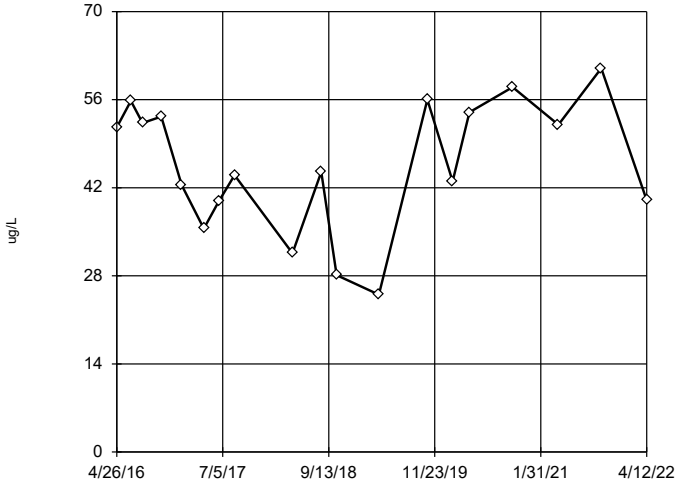
Barium

MW-301 (bg)



n = 19

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 45.68, std. dev. 10.46, critical Tn 2.532

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9443
Critical = 0.917
The distribution was found to be normally distrib-uted.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:45 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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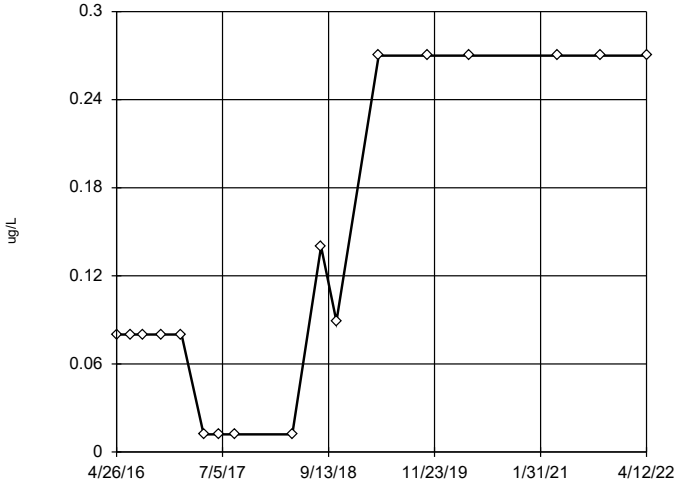
Beryllium

MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

High cutoff = 2.22, low cutoff = -0.5992, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:45 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Tukey's Outlier Screening

Constituent: Antimony (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.058 (U)
6/23/2016	0.13 (J)
8/10/2016	0.12 (J)
10/26/2016	<0.058 (U)
1/18/2017	0.11 (J)
4/19/2017	<0.026 (U)
6/20/2017	0.054 (J)
8/23/2017	0.063 (J)
4/18/2018	<0.026 (U)
8/14/2018	0.2 (J)
10/16/2018	<0.078 (U)
4/8/2019	<0.53 (U)
10/24/2019	<0.53 (U)
4/14/2020	<0.58 (U)
10/8/2020	<0.51 (U)
4/14/2021	<1.1 (U)
10/7/2021	<1.1 (U)
4/12/2022	<0.69 (U)

Tukey's Outlier Screening

Constituent: Arsenic (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.38 (J)
6/23/2016	0.38 (J)
8/10/2016	0.26 (J)
10/26/2016	0.14 (J)
1/18/2017	0.23 (J)
4/19/2017	0.22 (J)
6/20/2017	0.15 (J)
8/23/2017	0.14 (J)
4/18/2018	0.074 (J)
8/14/2018	0.29 (J)
10/16/2018	0.16 (J)
4/8/2019	<0.75 (U)
10/24/2019	<0.75 (U)
2/5/2020	<0.88 (U)
4/14/2020	<0.88 (U)
10/8/2020	<0.88 (U)
4/14/2021	<0.75 (U)
10/7/2021	<0.75 (U)
4/12/2022	<0.75 (U)

EPA 1989 Outlier Screening

Constituent: Barium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	51.6
6/23/2016	55.8
8/10/2016	52.3
10/26/2016	53.3
1/18/2017	42.4
4/19/2017	35.5
6/20/2017	39.9
8/23/2017	44
4/18/2018	31.6
8/14/2018	44.5
10/16/2018	28.1
4/8/2019	25
10/24/2019	56
2/5/2020	43
4/14/2020	54
10/8/2020	58
4/14/2021	52
10/7/2021	61
4/12/2022	40

Tukey's Outlier Screening

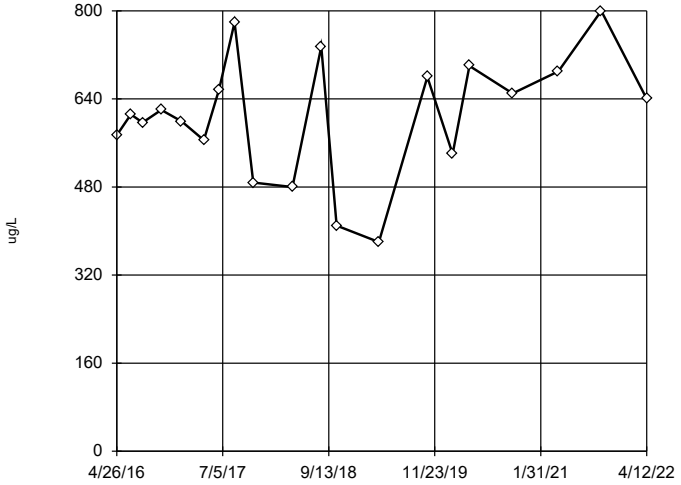
Constituent: Beryllium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.08 (U)
6/23/2016	<0.08 (U)
8/10/2016	<0.08 (U)
10/26/2016	<0.08 (U)
1/18/2017	<0.08 (U)
4/19/2017	<0.012 (U)
6/20/2017	<0.012 (U)
8/23/2017	<0.012 (U)
4/18/2018	<0.012 (U)
8/14/2018	0.14 (J)
10/16/2018	<0.089 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
4/14/2020	<0.27 (U)
4/14/2021	<0.27 (U)
10/7/2021	<0.27 (U)
4/12/2022	<0.27 (U)

Boron

MW-301 (bg)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 609.8, std. dev. 111.8, critical Tn 2.557

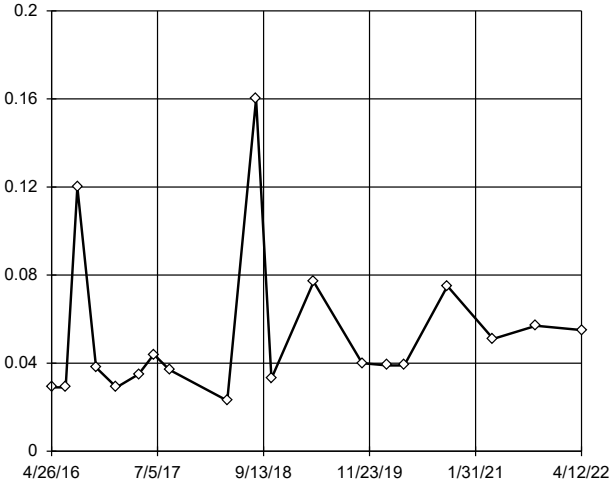
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9757
Critical = 0.92
The distribution was found to be normally distrib-uted.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Cadmium

MW-301 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

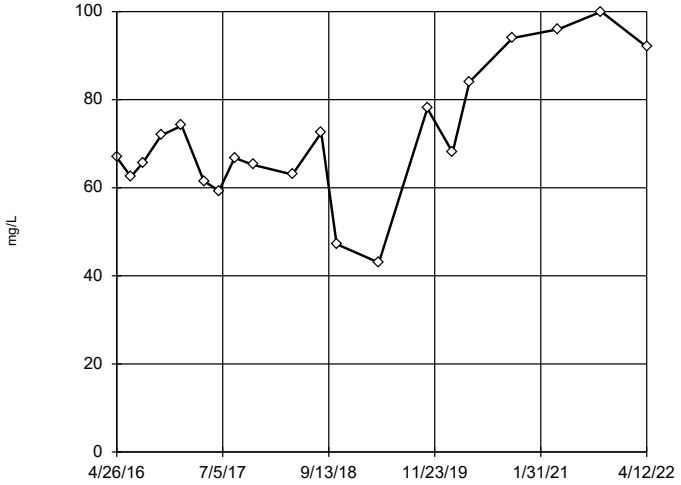
High cutoff = 0.2937, low cutoff = 0.006404, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Calcium

MW-301 (bg)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 71.58, std. dev. 15.36, critical Tn 2.557

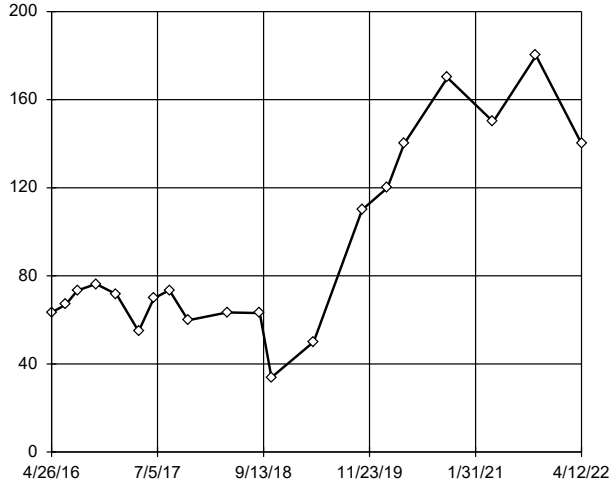
Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9478
Critical = 0.92
The distribution was found to be normally distrib-uted.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Chloride

MW-301 (bg)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 91.49, std. dev. 43.17, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9269
Critical = 0.92 (after natural log transforma-tion)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	574
6/23/2016	612
8/10/2016	597
10/26/2016	620
1/18/2017	599
4/19/2017	565
6/20/2017	657
8/23/2017	779
11/8/2017	488
4/18/2018	480
8/14/2018	735
10/16/2018	410
4/8/2019	380
10/24/2019	680
2/5/2020	540
4/14/2020	700
10/8/2020	650
4/14/2021	690
10/7/2021	800
4/12/2022	640

Tukey's Outlier Screening

Constituent: Cadmium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.029 (U)
6/23/2016	<0.029 (U)
8/10/2016	0.12 (J)
10/26/2016	0.038 (J)
1/18/2017	<0.029 (U)
4/19/2017	0.035 (J)
6/20/2017	0.044 (J)
8/23/2017	0.037 (J)
4/18/2018	0.023 (J)
8/14/2018	0.16 (J)
10/16/2018	<0.033 (U)
4/8/2019	<0.077 (U)
10/24/2019	0.04 (J)
2/5/2020	<0.039 (U)
4/14/2020	<0.039 (U)
10/8/2020	0.075 (J)
4/14/2021	<0.051 (U)
10/7/2021	0.057 (J)
4/12/2022	<0.055 (U)

EPA 1989 Outlier Screening

Constituent: Calcium (mg/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	66.9
6/23/2016	62.5
8/10/2016	65.6
10/26/2016	71.9
1/18/2017	74.1
4/19/2017	61.5
6/20/2017	59.3
8/23/2017	66.8
11/8/2017	65.2
4/18/2018	63
8/14/2018	72.5
10/16/2018	47.2
4/8/2019	43
10/24/2019	78
2/5/2020	68
4/14/2020	84
10/8/2020	94
4/14/2021	96
10/7/2021	100
4/12/2022	92

EPA 1989 Outlier Screening

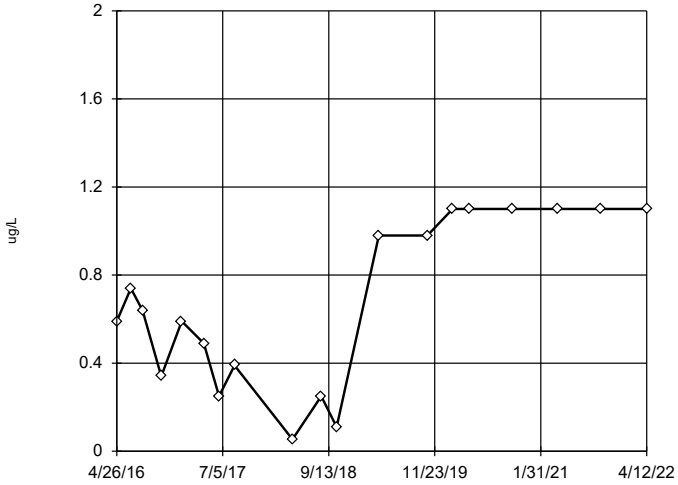
Constituent: Chloride (mg/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	63.4
6/23/2016	66.9
8/10/2016	73.3
10/26/2016	76.3
1/18/2017	71.6
4/19/2017	54.8
6/20/2017	69.8
8/23/2017	73.5
11/8/2017	59.8
4/18/2018	63.4
8/29/2018	63.1
10/16/2018	33.9
4/8/2019	50
10/24/2019	110
2/5/2020	120
4/14/2020	140
10/8/2020	170
4/14/2021	150
10/7/2021	180
4/12/2022	140

Chromium

MW-301 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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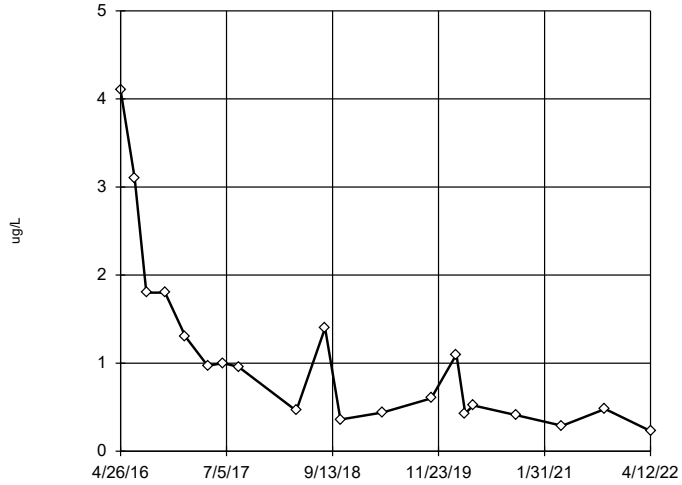
Cobalt

MW-301 (bg)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 1.088, std. dev. 0.9962, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9554
Critical = 0.92 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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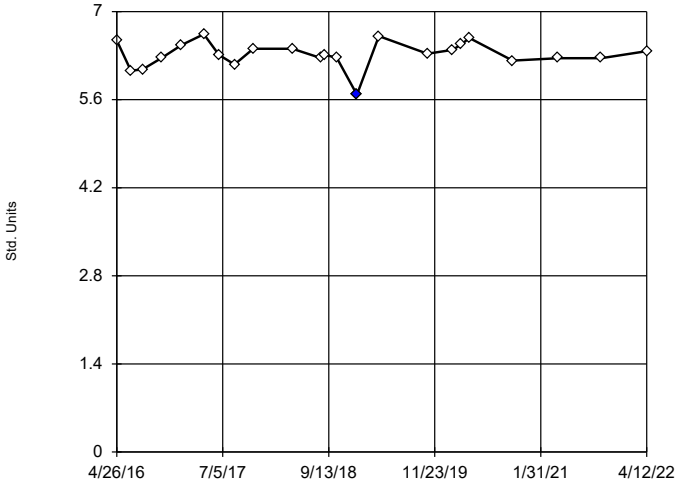
Field pH

MW-301 (bg)



n = 23

Statistical outlier is drawn as solid.
Testing for 1 low outlier.
Mean = 6.32.
Std. Dev. = 0.2091.
5.68: c = 0.4444
tabl = 0.421.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.969
Critical = 0.926
The distribution, after removal of suspect value, was found to be normally distributed.

Dixon's Outlier Test Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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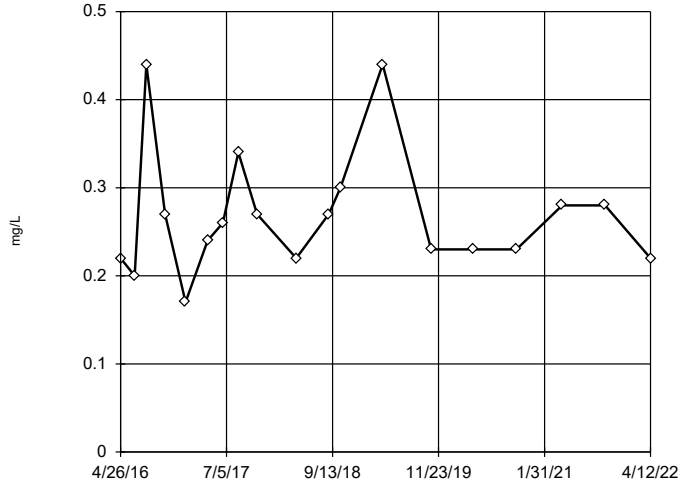
Fluoride

MW-301 (bg)



n = 19

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.2689, std. dev. 0.07148, critical Tn 2.532

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9193
Critical = 0.917 (after natural log transformation)
The distribution was found to be log-normal.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Tukey's Outlier Screening

Constituent: Chromium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.59 (J)
6/23/2016	0.74 (J)
8/10/2016	0.64 (J)
10/26/2016	<0.34 (U)
1/18/2017	0.59 (J)
4/19/2017	0.49 (J)
6/20/2017	0.25 (J)
8/23/2017	0.39 (J)
4/18/2018	<0.054 (U)
8/14/2018	0.25 (J)
10/16/2018	0.11 (J)
4/8/2019	<0.98 (U)
10/24/2019	<0.98 (U)
2/5/2020	<1.1 (U)
4/14/2020	<1.1 (U)
10/8/2020	<1.1 (U)
4/14/2021	<1.1 (U)
10/7/2021	<1.1 (U)
4/12/2022	<1.1 (U)

EPA 1989 Outlier Screening

Constituent: Cobalt (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	4.1
6/23/2016	3.1
8/10/2016	1.8
10/26/2016	1.8
1/18/2017	1.3
4/19/2017	0.97 (J)
6/20/2017	1 (J)
8/23/2017	0.96 (J)
4/18/2018	0.46 (J)
8/14/2018	1.4
10/16/2018	0.36 (J)
4/8/2019	0.44 (J)
10/24/2019	0.6
2/5/2020	1.1
3/12/2020	0.43 (J)
4/14/2020	0.52
10/8/2020	0.41 (J)
4/14/2021	0.29 (J)
10/7/2021	0.48 (J)
4/12/2022	0.23 (J)

Dixon's Outlier Test

Constituent: Field pH (Std. Units) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	6.54
6/23/2016	6.06
8/10/2016	6.08
10/26/2016	6.26
1/18/2017	6.47
4/19/2017	6.64
6/20/2017	6.31
8/23/2017	6.16
11/8/2017	6.41
4/18/2018	6.41
8/14/2018	6.26
8/29/2018	6.31
10/16/2018	6.27
1/8/2019	5.68 (O)
4/8/2019	6.61
10/24/2019	6.33
2/5/2020	6.39
3/12/2020	6.48
4/14/2020	6.58
10/8/2020	6.22
4/14/2021	6.26
10/7/2021	6.26
4/12/2022	6.37

EPA 1989 Outlier Screening

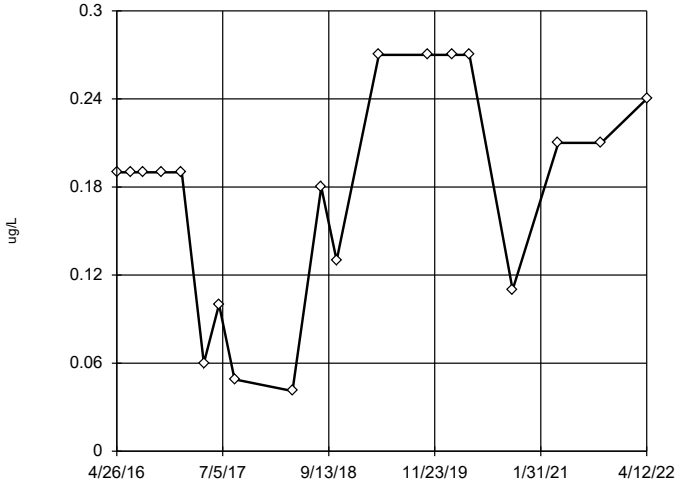
Constituent: Fluoride (mg/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.22
6/23/2016	0.2 (J)
8/10/2016	0.44
10/26/2016	0.27
1/18/2017	0.17 (J)
4/19/2017	0.24
6/20/2017	0.26
8/23/2017	0.34
11/8/2017	0.27
4/18/2018	0.22
8/29/2018	0.27
10/16/2018	0.3
4/8/2019	0.44 (J)
10/24/2019	<0.23 (U)
4/14/2020	<0.23 (U)
10/8/2020	<0.23 (U)
4/14/2021	<0.28 (U)
10/7/2021	<0.28 (U)
4/12/2022	<0.22 (U)

Lead

MW-301 (bg)



n = 19

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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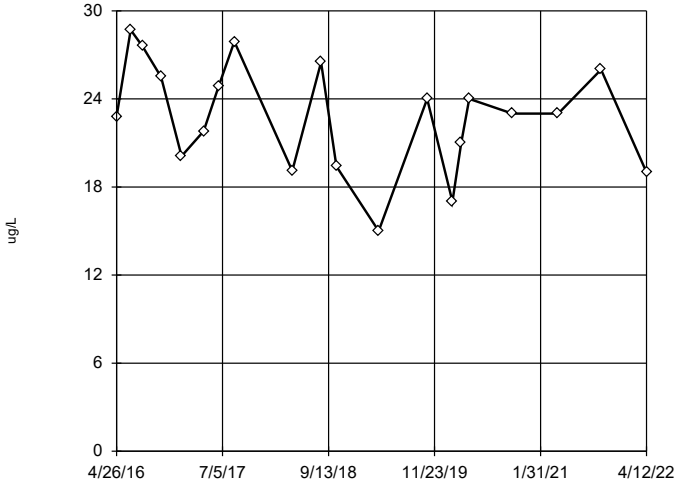
Lithium

MW-301 (bg)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 22.82, std. dev. 3.757, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9751
Critical = 0.92
The distribution was found to be normally distributed.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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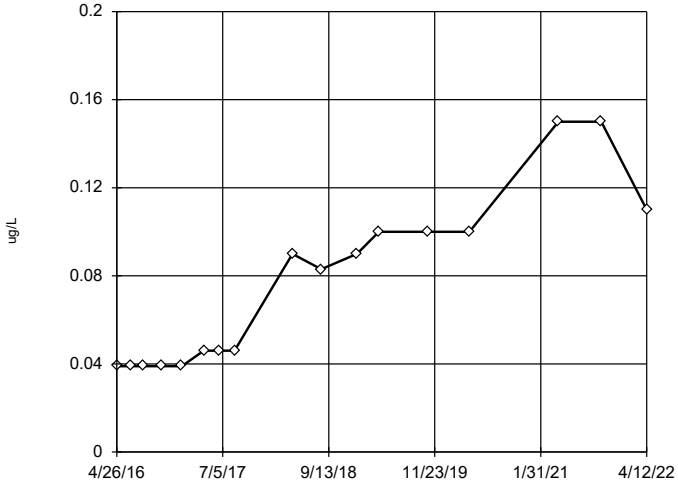
Mercury

MW-301 (bg)



n = 17

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were square root transformed to achieve best W statistic (graph shown in original units).

The results were invalidated, because both the lower and upper quartiles represent reporting limits.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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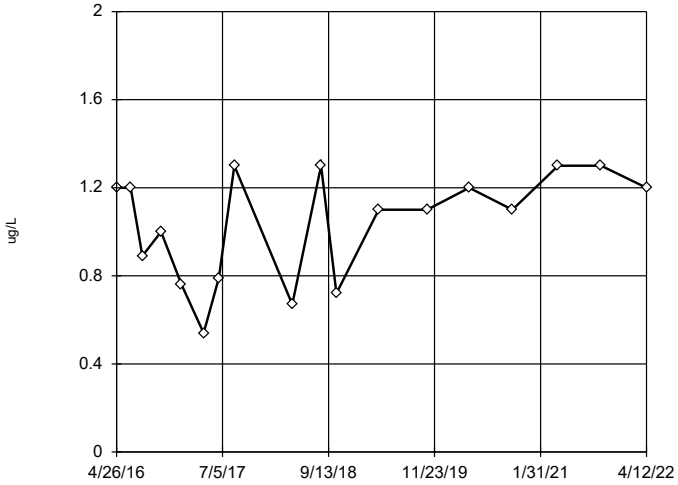
Molybdenum

MW-301 (bg)



n = 18

No outliers found.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were cube transformed to achieve best W statistic (graph shown in original units).

High cutoff = 1.862, low cutoff = -1.59, based on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Tukey's Outlier Screening

Constituent: Lead (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.19 (U)
6/23/2016	<0.19 (U)
8/10/2016	<0.19 (U)
10/26/2016	<0.19 (U)
1/18/2017	<0.19 (U)
4/19/2017	0.06 (J)
6/20/2017	0.1 (J)
8/23/2017	0.049 (J)
4/18/2018	0.041 (J)
8/14/2018	0.18 (J)
10/16/2018	<0.13 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
2/5/2020	<0.27 (U)
4/14/2020	<0.27 (U)
10/8/2020	<0.11 (U)
4/14/2021	<0.21 (U)
10/7/2021	<0.21 (U)
4/12/2022	<0.24 (U)

EPA 1989 Outlier Screening

Constituent: Lithium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	22.8
6/23/2016	28.7
8/10/2016	27.6
10/26/2016	25.5
1/18/2017	20.1
4/19/2017	21.8
6/20/2017	24.9
8/23/2017	27.9
4/18/2018	19.1
8/14/2018	26.5
10/16/2018	19.4
4/8/2019	15
10/24/2019	24
2/5/2020	17
3/12/2020	21
4/14/2020	24
10/8/2020	23
4/14/2021	23
10/7/2021	26
4/12/2022	19

Tukey's Outlier Screening

Constituent: Mercury (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	<0.039 (U)
6/23/2016	<0.039 (U)
8/10/2016	<0.039 (U)
10/26/2016	<0.039 (U)
1/18/2017	<0.039 (U)
4/19/2017	<0.046 (U)
6/20/2017	<0.046 (U)
8/23/2017	<0.046 (U)
4/18/2018	<0.09 (U)
8/14/2018	<0.083 (U)
1/8/2019	<0.09 (U)
4/8/2019	<0.1 (U)
10/24/2019	<0.1 (U)
4/14/2020	<0.1 (U)
4/14/2021	<0.15 (U)
10/7/2021	<0.15 (U)
4/12/2022	<0.11 (U)

Tukey's Outlier Screening

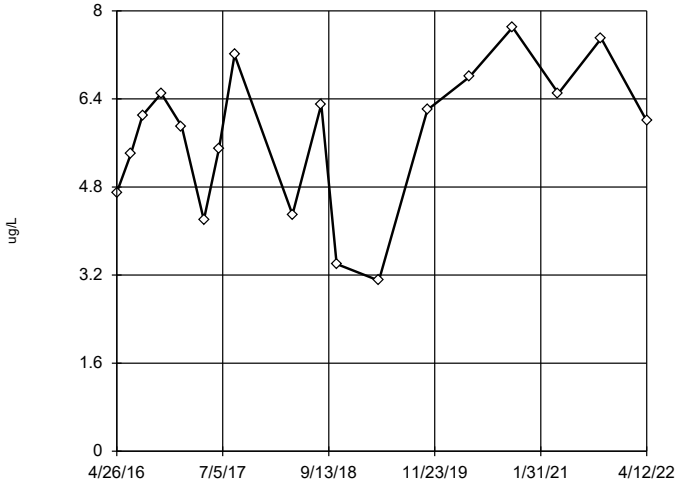
Constituent: Molybdenum (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	1.2
6/23/2016	1.2
8/10/2016	0.89 (J)
10/26/2016	1
1/18/2017	0.76 (J)
4/19/2017	0.54 (J)
6/20/2017	0.79 (J)
8/23/2017	1.3
4/18/2018	0.67 (J)
8/14/2018	1.3
10/16/2018	0.72 (J)
4/8/2019	<1.1 (U)
10/24/2019	1.1 (J)
4/14/2020	1.2 (J)
10/8/2020	<1.1 (U)
4/14/2021	<1.3 (U)
10/7/2021	<1.3 (U)
4/12/2022	<1.2 (U)

Selenium

MW-301 (bg)



n = 18

Dixon's will not be run.
No suspect values identified
or unable to establish
suspect values.
Mean 5.739, std. dev.
1.334, critical Tn 2.504

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9481
Critical = 0.914
The distribution was found
to be normally distrib-
uted.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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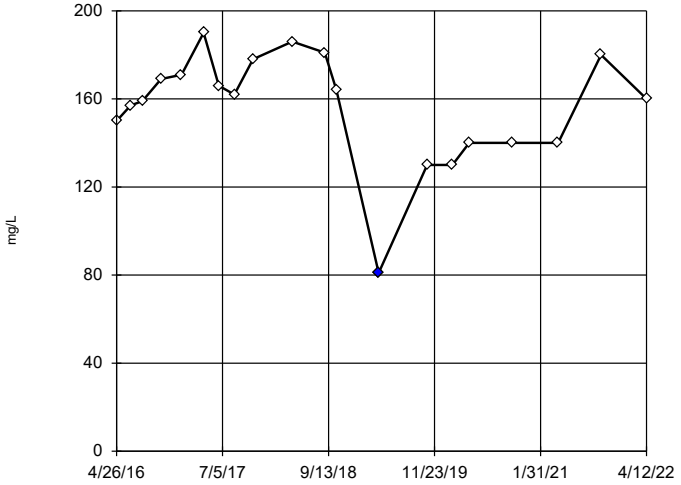
Sulfate

MW-301 (bg)



n = 20

Statistical outlier is
drawn as solid.
Testing for 1 low outlier.
Mean = 156.7.
Std. Dev. = 25.27.
81: c = 0.49
tabl = 0.45.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9533
Critical = 0.917
The distribution, after
removal of suspect val-
ue, was found to be nor-
mally distributed.

Dixon's Outlier Test Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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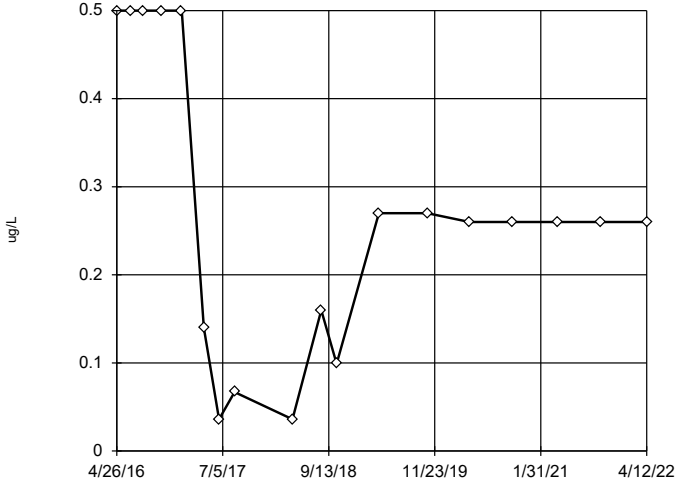
Thallium

MW-301 (bg)



n = 18

No outliers found.
Tukey's method used in
lieu of parametric test
because the Shapiro Wilk
normality test failed
at the 0.1 alpha level.

Data were square root
transformed to achieve
best W statistic (graph
shown in original units).

High cutoff = 3.223, low
cutoff = -0.5531, based
on IQR multiplier of 3.

Tukey's Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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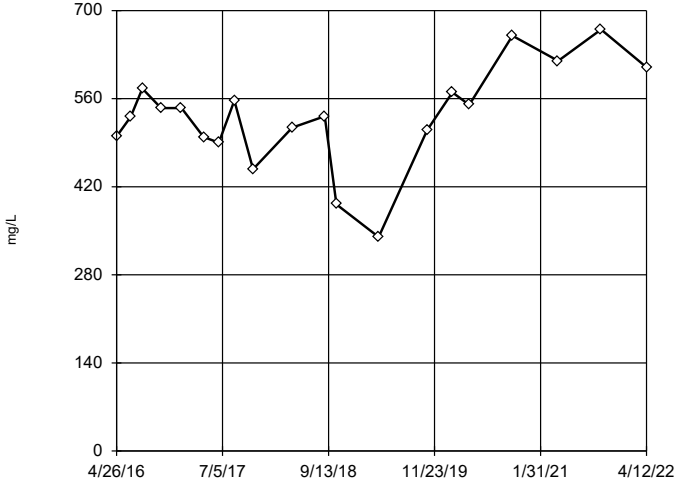
Total Dissolved Solids

MW-301 (bg)



n = 20

No statistical outliers.
Testing for 1 low outlier.
Mean = 533.
Std. Dev. = 80.17.
340: c = 0.3857
tabl = 0.45.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9726
Critical = 0.917
The distribution was found
to be normally distrib-
uted.

Dixon's Outlier Test Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

EPA 1989 Outlier Screening

Constituent: Selenium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	4.7
6/23/2016	5.4
8/10/2016	6.1
10/26/2016	6.5
1/18/2017	5.9
4/19/2017	4.2
6/20/2017	5.5
8/23/2017	7.2
4/18/2018	4.3
8/14/2018	6.3
10/16/2018	3.4
4/8/2019	3.1 (J)
10/24/2019	6.2
4/14/2020	6.8
10/8/2020	7.7
4/14/2021	6.5
10/7/2021	7.5
4/12/2022	6

Dixon's Outlier Test

Constituent: Sulfate (mg/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	150
6/23/2016	157
8/10/2016	159
10/26/2016	169
1/18/2017	171
4/19/2017	190
6/20/2017	166
8/23/2017	162
11/8/2017	178
4/18/2018	186
8/29/2018	181
10/16/2018	164
4/8/2019	81 (O)
10/24/2019	130
2/5/2020	130
4/14/2020	140
10/8/2020	140
4/14/2021	140
10/7/2021	180
4/12/2022	160

Tukey's Outlier Screening

Constituent: Thallium (ug/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

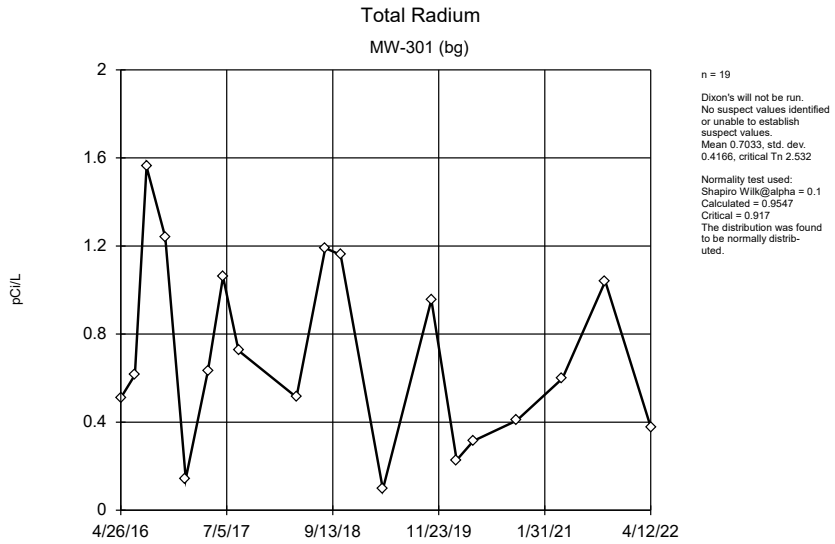
	MW-301 (bg)
4/26/2016	<0.5 (U)
6/23/2016	<0.5 (U)
8/10/2016	<0.5 (U)
10/26/2016	<0.5 (U)
1/18/2017	<0.5 (U)
4/19/2017	0.14 (J)
6/20/2017	<0.036 (U)
8/23/2017	0.067 (J)
4/18/2018	<0.036 (U)
8/14/2018	0.16 (J)
10/16/2018	<0.099 (U)
4/8/2019	<0.27 (U)
10/24/2019	<0.27 (U)
4/14/2020	<0.26 (U)
10/8/2020	<0.26 (U)
4/14/2021	<0.26 (U)
10/7/2021	<0.26 (U)
4/12/2022	<0.26 (U)

Dixon's Outlier Test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	500
6/23/2016	531
8/10/2016	576
10/26/2016	545
1/18/2017	545
4/19/2017	499
6/20/2017	490
8/23/2017	557
11/8/2017	448
4/18/2018	514
8/29/2018	532
10/16/2018	392
4/8/2019	340
10/24/2019	510
2/5/2020	570
4/14/2020	550
10/8/2020	660
4/14/2021	620
10/7/2021	670
4/12/2022	610



n = 19

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 0.7033, std. dev. 0.4166, critical Tn 2.532

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9547
Critical = 0.917
The distribution was found to be normally distrib-uted.

EPA 1989 Outlier Screening Analysis Run 6/27/2022 11:46 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

EPA 1989 Outlier Screening

Constituent: Total Radium (pCi/L) Analysis Run 6/27/2022 11:47 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)
4/26/2016	0.51
6/23/2016	0.614
8/10/2016	1.56
10/26/2016	1.24
1/18/2017	0.143
4/19/2017	0.631
6/20/2017	1.06
8/23/2017	0.725
4/18/2018	0.513
8/14/2018	1.19
10/16/2018	1.16
4/8/2019	0.0956
10/24/2019	0.956
2/5/2020	0.228
4/14/2020	0.315
10/8/2020	0.407
4/14/2021	0.598
10/7/2021	1.04
4/12/2022	0.378

Attachment 3

Welch's/Mann-Whitney Comparison

Welch's t-test/Mann-Whitney

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 6/27/2022, 11:52 AM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Antimony (ug/L)	**MW-301 (bg)**	**2.582**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Mann-W**
Arsenic (ug/L)	**MW-301 (bg)**	**2.381**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Mann-W**
Barium (ug/L)	MW-301 (bg)	0.04129	No	No	No	No	0.01	No	(intrawell)	Mann-W
Beryllium (ug/L)	**MW-301 (bg)**	**2.909**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Mann-W**
Boron (ug/L)	MW-301 (bg)	-0.0...	No	No	No	No	0.01	No	(intrawell)	Mann-W
Cadmium (ug/L)	MW-301 (bg)	1.614	Yes	No	No	No	0.01	No	(intrawell)	Mann-W
Calcium (mg/L)	MW-301 (bg)	1.427	Yes	No	No	No	0.01	No	(intrawell)	Mann-W
Chloride (mg/L)	MW-301 (bg)	0.8493	No	No	No	No	0.01	No	(intrawell)	Mann-W
Chromium (ug/L)	MW-301 (bg)	1.68	Yes	Yes	No	No	0.01	No	(intrawell)	Mann-W
Cobalt (ug/L)	MW-301 (bg)	-3.203	No	No	No	No	0.01	No	(intrawell)	Mann-W
Field pH (Std. Units)	MW-301 (bg)	0.4208	No	No	No	No	0.01	No	(intrawell)	Mann-W
Fluoride (mg/L)	MW-301 (bg)	0.4564	No	No	No	No	0.01	No	(intrawell)	Mann-W
Lead (ug/L)	MW-301 (bg)	1.716	Yes	Yes	No	No	0.01	No	(intrawell)	Mann-W
Lithium (ug/L)	MW-301 (bg)	-1.969	No	No	No	No	0.01	No	(intrawell)	Mann-W
Mercury (ug/L)	**MW-301 (bg)**	**3.481**	**Yes**	**Yes**	**Yes**	**Yes**	**0.01**	**Yes**	**(intrawell)**	**Mann-W**
Molybdenum (ug/L)	MW-301 (bg)	0.9809	No	No	No	No	0.01	No	(intrawell)	Mann-W
Selenium (ug/L)	MW-301 (bg)	0.6223	No	No	No	No	0.01	No	(intrawell)	Mann-W
Sulfate (mg/L)	MW-301 (bg)	-1.044	No	No	No	No	0.01	No	(intrawell)	Mann-W
Thallium (ug/L)	MW-301 (bg)	-1.272	No	No	No	No	0.01	No	(intrawell)	Mann-W
Total Dissolved Solids (mg/L)	MW-301 (bg)	0.5017	No	No	No	No	0.01	No	(intrawell)	Mann-W
Total Radium (pCi/L)	MW-301 (bg)	-1.197	No	No	No	No	0.01	No	(intrawell)	Mann-W

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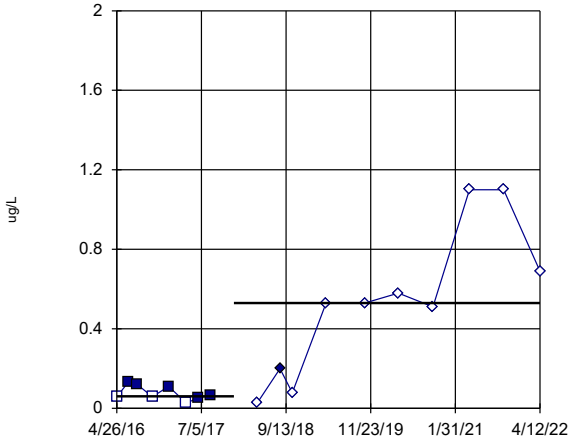
Hollow symbols indicate censored values.

Antimony

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 0.0605

compliance median = 0.53

Z = 2.582

Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	Yes
0.01	2.326	Yes

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:49 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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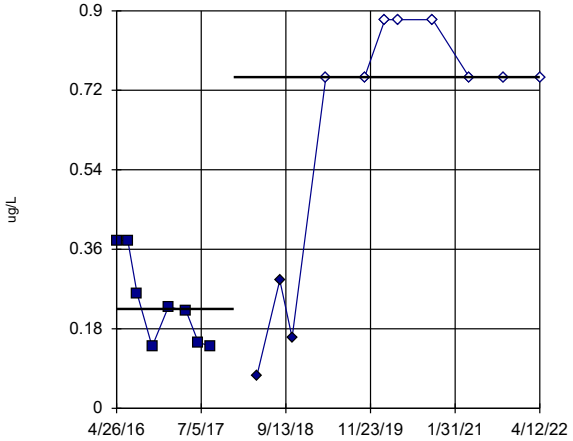
Arsenic

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 0.225

compliance median = 0.75

Z = 2.381

Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	Yes
0.01	2.326	Yes

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:49 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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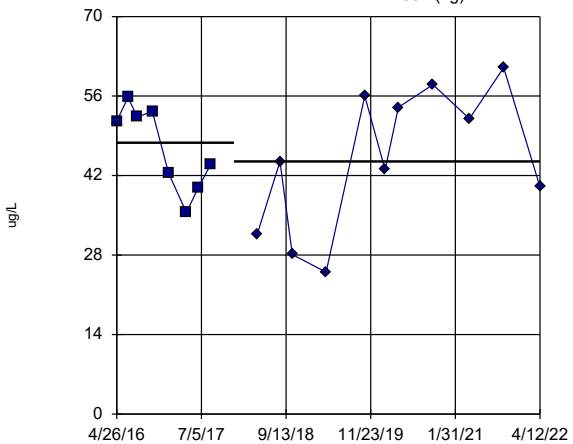
Barium

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 47.8

compliance median = 44.5

Z = 0.04129

Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:49 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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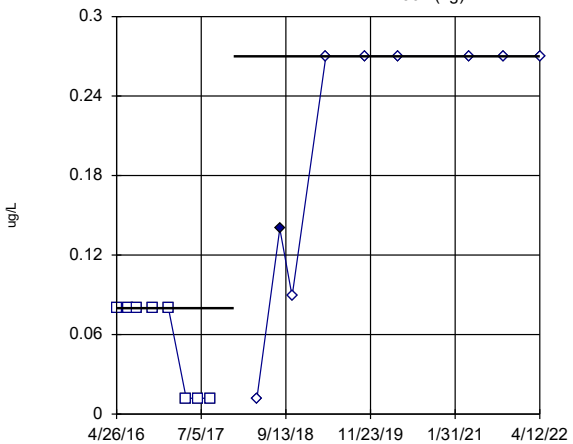
Hollow symbols indicate censored values.

Beryllium

MW-301 (bg)



MW-301 background

MW-301 compliance

background median = 0.08

compliance median = 0.27

Z = 2.909

Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	Yes
0.01	2.326	Yes

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:49 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Antimony (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	<0.058 (U)	
6/23/2016	0.13 (J)	
8/10/2016	0.12 (J)	
10/26/2016	<0.058 (U)	
1/18/2017	0.11 (J)	
4/19/2017	<0.026 (U)	
6/20/2017	0.054 (J)	
8/23/2017	0.063 (J)	
4/18/2018		<0.026 (U)
8/14/2018		0.2 (J)
10/16/2018		<0.078 (U)
4/8/2019		<0.53 (U)
10/24/2019		<0.53 (U)
4/14/2020		<0.58 (U)
10/8/2020		<0.51 (U)
4/14/2021		<1.1 (U)
10/7/2021		<1.1 (U)
4/12/2022		<0.69 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Arsenic (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	0.38 (J)	
6/23/2016	0.38 (J)	
8/10/2016	0.26 (J)	
10/26/2016	0.14 (J)	
1/18/2017	0.23 (J)	
4/19/2017	0.22 (J)	
6/20/2017	0.15 (J)	
8/23/2017	0.14 (J)	
4/18/2018		0.074 (J)
8/14/2018		0.29 (J)
10/16/2018		0.16 (J)
4/8/2019		<0.75 (U)
10/24/2019		<0.75 (U)
2/5/2020		<0.88 (U)
4/14/2020		<0.88 (U)
10/8/2020		<0.88 (U)
4/14/2021		<0.75 (U)
10/7/2021		<0.75 (U)
4/12/2022		<0.75 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Barium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	51.6	
6/23/2016	55.8	
8/10/2016	52.3	
10/26/2016	53.3	
1/18/2017	42.4	
4/19/2017	35.5	
6/20/2017	39.9	
8/23/2017	44	
4/18/2018		31.6
8/14/2018		44.5
10/16/2018		28.1
4/8/2019		25
10/24/2019		56
2/5/2020		43
4/14/2020		54
10/8/2020		58
4/14/2021		52
10/7/2021		61
4/12/2022		40

Mann-Whitney (Wilcoxon Rank Sum)

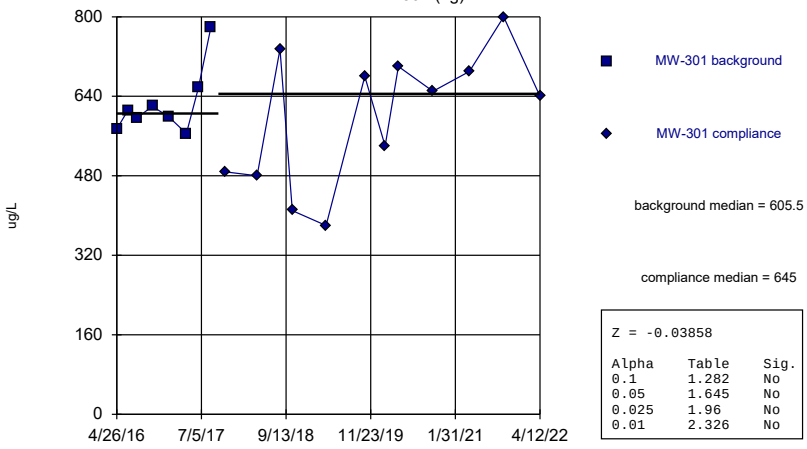
Constituent: Beryllium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	<0.08 (U)	
6/23/2016	<0.08 (U)	
8/10/2016	<0.08 (U)	
10/26/2016	<0.08 (U)	
1/18/2017	<0.08 (U)	
4/19/2017	<0.012 (U)	
6/20/2017	<0.012 (U)	
8/23/2017	<0.012 (U)	
4/18/2018		<0.012 (U)
8/14/2018		0.14 (J)
10/16/2018		<0.089 (U)
4/8/2019		<0.27 (U)
10/24/2019		<0.27 (U)
4/14/2020		<0.27 (U)
4/14/2021		<0.27 (U)
10/7/2021		<0.27 (U)
4/12/2022		<0.27 (U)

Boron

MW-301 (bg)



background median = 605.5

compliance median = 645

Z = -0.03858		
Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

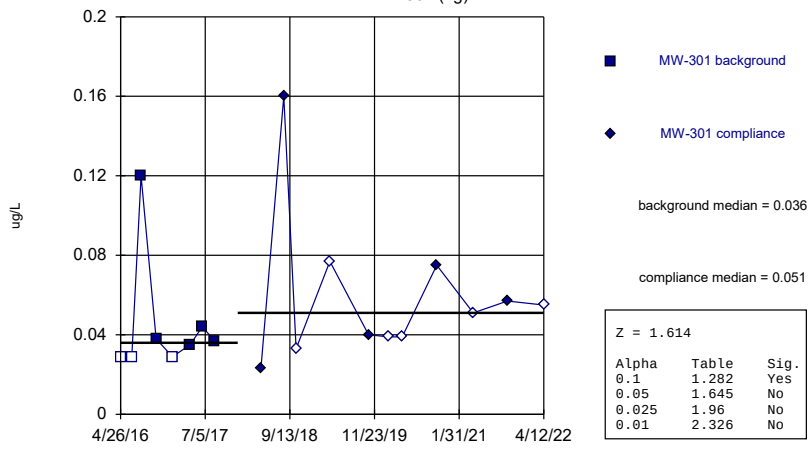
Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:49 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Hollow symbols indicate censored values.

Cadmium

MW-301 (bg)



background median = 0.036

compliance median = 0.051

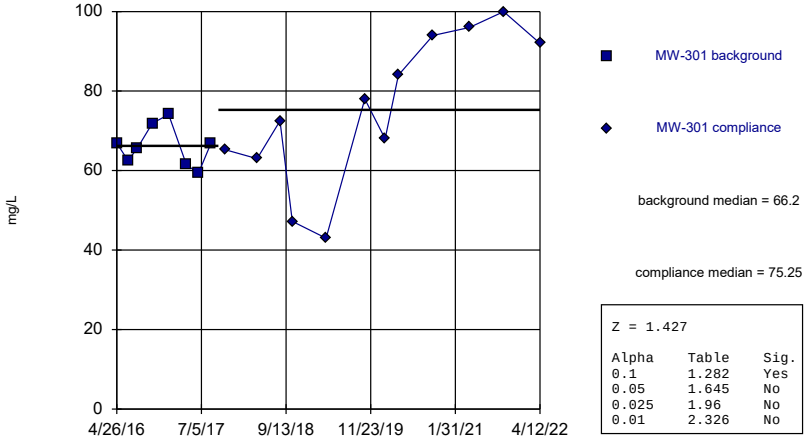
Z = 1.614		
Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Calcium

MW-301 (bg)



background median = 66.2

compliance median = 75.25

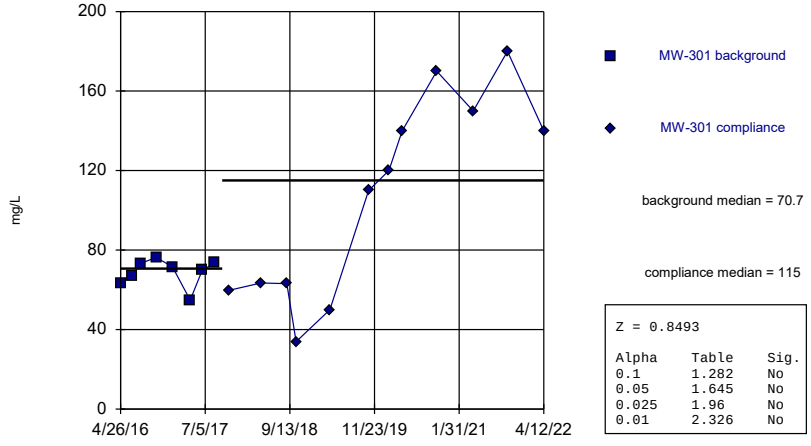
Z = 1.427		
Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Chloride

MW-301 (bg)



background median = 70.7

compliance median = 115

Z = 0.8493		
Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Boron (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	574	
6/23/2016	612	
8/10/2016	597	
10/26/2016	620	
1/18/2017	599	
4/19/2017	565	
6/20/2017	657	
8/23/2017	779	
11/8/2017		488
4/18/2018		480
8/14/2018		735
10/16/2018		410
4/8/2019		380
10/24/2019		680
2/5/2020		540
4/14/2020		700
10/8/2020		650
4/14/2021		690
10/7/2021		800
4/12/2022		640

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Cadmium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	<0.029 (U)	
6/23/2016	<0.029 (U)	
8/10/2016	0.12 (J)	
10/26/2016	0.038 (J)	
1/18/2017	<0.029 (U)	
4/19/2017	0.035 (J)	
6/20/2017	0.044 (J)	
8/23/2017	0.037 (J)	
4/18/2018		0.023 (J)
8/14/2018		0.16 (J)
10/16/2018		<0.033 (U)
4/8/2019		<0.077 (U)
10/24/2019		0.04 (J)
2/5/2020		<0.039 (U)
4/14/2020		<0.039 (U)
10/8/2020		0.075 (J)
4/14/2021		<0.051 (U)
10/7/2021		0.057 (J)
4/12/2022		<0.055 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Calcium (mg/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	66.9	
6/23/2016	62.5	
8/10/2016	65.6	
10/26/2016	71.9	
1/18/2017	74.1	
4/19/2017	61.5	
6/20/2017	59.3	
8/23/2017	66.8	
11/8/2017		65.2
4/18/2018		63
8/14/2018		72.5
10/16/2018		47.2
4/8/2019		43
10/24/2019		78
2/5/2020		68
4/14/2020		84
10/8/2020		94
4/14/2021		96
10/7/2021		100
4/12/2022		92

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Chloride (mg/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	63.4	
6/23/2016	66.9	
8/10/2016	73.3	
10/26/2016	76.3	
1/18/2017	71.6	
4/19/2017	54.8	
6/20/2017	69.8	
8/23/2017	73.5	
11/8/2017		59.8
4/18/2018		63.4
8/29/2018		63.1
10/16/2018		33.9
4/8/2019		50
10/24/2019		110
2/5/2020		120
4/14/2020		140
10/8/2020		170
4/14/2021		150
10/7/2021		180
4/12/2022		140

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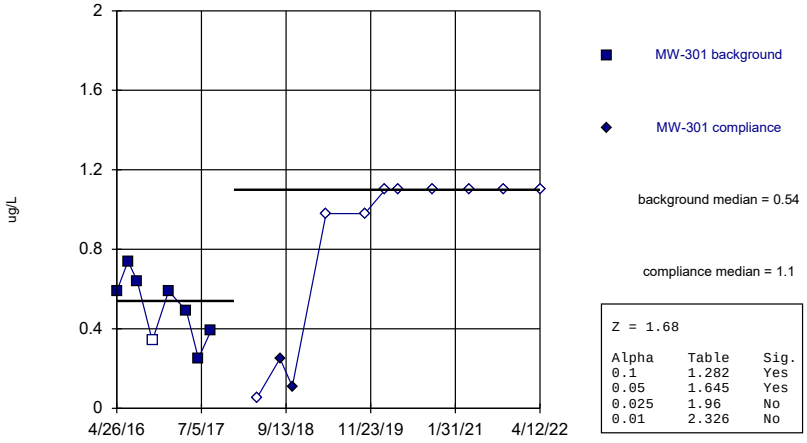
Chromium

MW-301 (bg)



Z = 1.68

Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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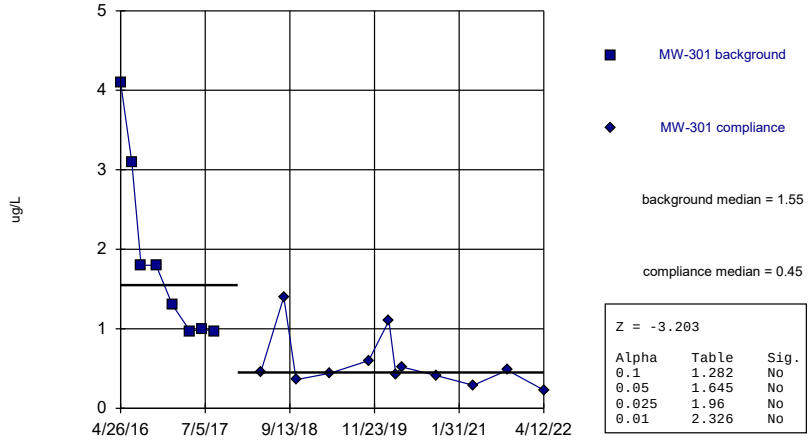
Cobalt

MW-301 (bg)



Z = -3.203

Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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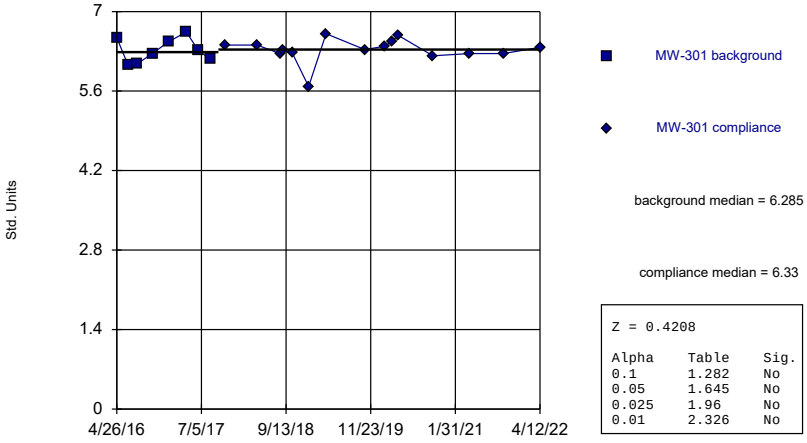
Field pH

MW-301 (bg)



Z = 0.4208

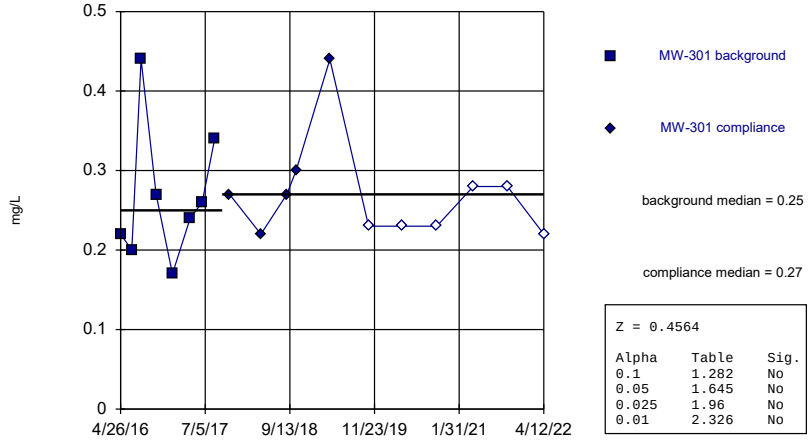
Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Fluoride

MW-301 (bg)



Z = 0.4564

Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Chromium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	0.59 (J)	
6/23/2016	0.74 (J)	
8/10/2016	0.64 (J)	
10/26/2016	<0.34 (U)	
1/18/2017	0.59 (J)	
4/19/2017	0.49 (J)	
6/20/2017	0.25 (J)	
8/23/2017	0.39 (J)	
4/18/2018		<0.054 (U)
8/14/2018		0.25 (J)
10/16/2018		0.11 (J)
4/8/2019		<0.98 (U)
10/24/2019		<0.98 (U)
2/5/2020		<1.1 (U)
4/14/2020		<1.1 (U)
10/8/2020		<1.1 (U)
4/14/2021		<1.1 (U)
10/7/2021		<1.1 (U)
4/12/2022		<1.1 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Cobalt (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	4.1	
6/23/2016	3.1	
8/10/2016	1.8	
10/26/2016	1.8	
1/18/2017	1.3	
4/19/2017	0.97 (J)	
6/20/2017	1 (J)	
8/23/2017	0.96 (J)	
4/18/2018		0.46 (J)
8/14/2018		1.4
10/16/2018		0.36 (J)
4/8/2019		0.44 (J)
10/24/2019		0.6
2/5/2020		1.1
3/12/2020		0.43 (J)
4/14/2020		0.52
10/8/2020		0.41 (J)
4/14/2021		0.29 (J)
10/7/2021		0.48 (J)
4/12/2022		0.23 (J)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Field pH (Std. Units) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	6.54	
6/23/2016	6.06	
8/10/2016	6.08	
10/26/2016	6.26	
1/18/2017	6.47	
4/19/2017	6.64	
6/20/2017	6.31	
8/23/2017	6.16	
11/8/2017		6.41
4/18/2018		6.41
8/14/2018		6.26
8/29/2018		6.31
10/16/2018		6.27
1/8/2019		5.68
4/8/2019		6.61
10/24/2019		6.33
2/5/2020		6.39
3/12/2020		6.48
4/14/2020		6.58
10/8/2020		6.22
4/14/2021		6.26
10/7/2021		6.26
4/12/2022		6.37

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Fluoride (mg/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	0.22	
6/23/2016	0.2 (J)	
8/10/2016	0.44	
10/26/2016	0.27	
1/18/2017	0.17 (J)	
4/19/2017	0.24	
6/20/2017	0.26	
8/23/2017	0.34	
11/8/2017		0.27
4/18/2018		0.22
8/29/2018		0.27
10/16/2018		0.3
4/8/2019		0.44 (J)
10/24/2019		<0.23 (U)
4/14/2020		<0.23 (U)
10/8/2020		<0.23 (U)
4/14/2021		<0.28 (U)
10/7/2021		<0.28 (U)
4/12/2022		<0.22 (U)

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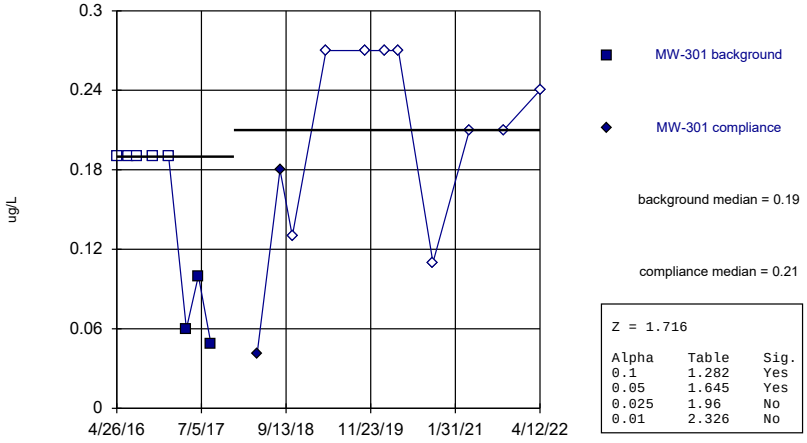
Hollow symbols indicate censored values.

Lead

MW-301 (bg)



background median = 0.19

compliance median = 0.21

Z = 1.716

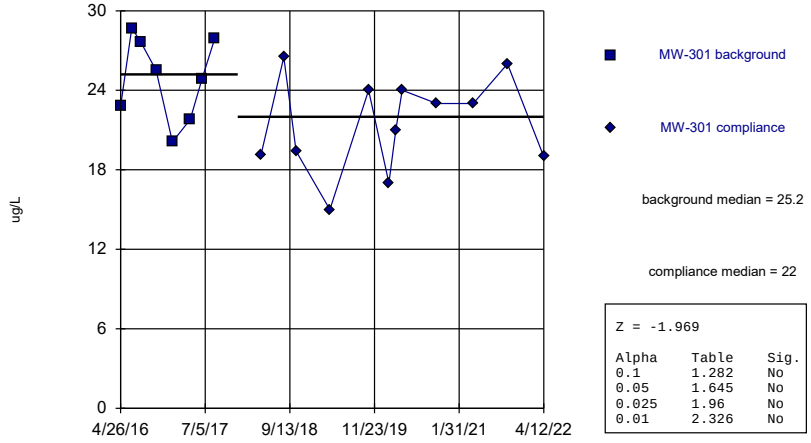
Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG

Lithium

MW-301 (bg)



background median = 25.2

compliance median = 22

Z = -1.969

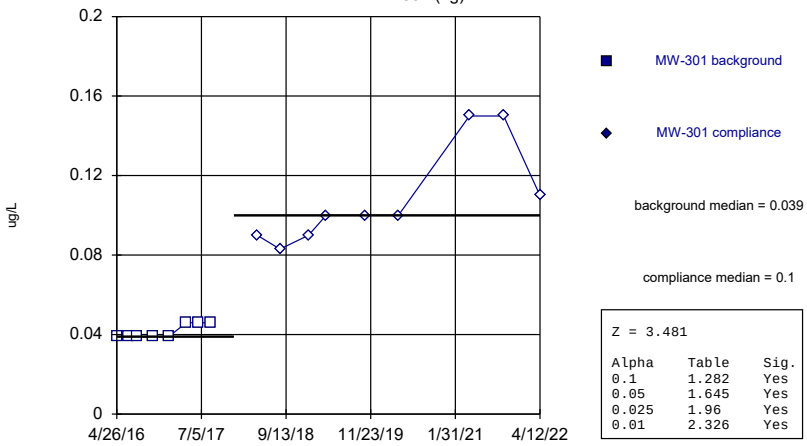
Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Mercury

MW-301 (bg)



background median = 0.039

compliance median = 0.1

Z = 3.481

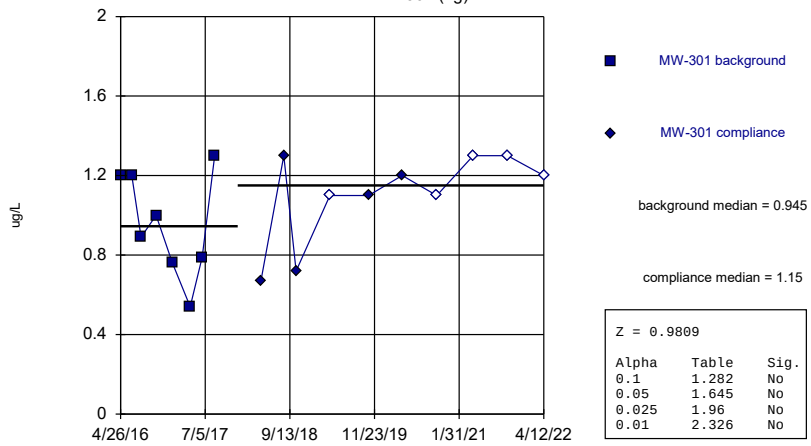
Alpha	Table	Sig.
0.1	1.282	Yes
0.05	1.645	Yes
0.025	1.96	Yes
0.01	2.326	Yes

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Molybdenum

MW-301 (bg)



background median = 0.945

compliance median = 1.15

Z = 0.9809

Alpha	Table	Sig.
0.1	1.282	No
0.05	1.645	No
0.025	1.96	No
0.01	2.326	No

Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Lead (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	<0.19 (U)	
6/23/2016	<0.19 (U)	
8/10/2016	<0.19 (U)	
10/26/2016	<0.19 (U)	
1/18/2017	<0.19 (U)	
4/19/2017	0.06 (J)	
6/20/2017	0.1 (J)	
8/23/2017	0.049 (J)	
4/18/2018		0.041 (J)
8/14/2018		0.18 (J)
10/16/2018		<0.13 (U)
4/8/2019		<0.27 (U)
10/24/2019		<0.27 (U)
2/5/2020		<0.27 (U)
4/14/2020		<0.27 (U)
10/8/2020		<0.11 (U)
4/14/2021		<0.21 (U)
10/7/2021		<0.21 (U)
4/12/2022		<0.24 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Lithium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	22.8	
6/23/2016	28.7	
8/10/2016	27.6	
10/26/2016	25.5	
1/18/2017	20.1	
4/19/2017	21.8	
6/20/2017	24.9	
8/23/2017	27.9	
4/18/2018		19.1
8/14/2018		26.5
10/16/2018		19.4
4/8/2019		15
10/24/2019		24
2/5/2020		17
3/12/2020		21
4/14/2020		24
10/8/2020		23
4/14/2021		23
10/7/2021		26
4/12/2022		19

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Mercury (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	<0.039 (U)	
6/23/2016	<0.039 (U)	
8/10/2016	<0.039 (U)	
10/26/2016	<0.039 (U)	
1/18/2017	<0.039 (U)	
4/19/2017	<0.046 (U)	
6/20/2017	<0.046 (U)	
8/23/2017	<0.046 (U)	
4/18/2018		<0.09 (U)
8/14/2018		<0.083 (U)
1/8/2019		<0.09 (U)
4/8/2019		<0.1 (U)
10/24/2019		<0.1 (U)
4/14/2020		<0.1 (U)
4/14/2021		<0.15 (U)
10/7/2021		<0.15 (U)
4/12/2022		<0.11 (U)

Mann-Whitney (Wilcoxon Rank Sum)

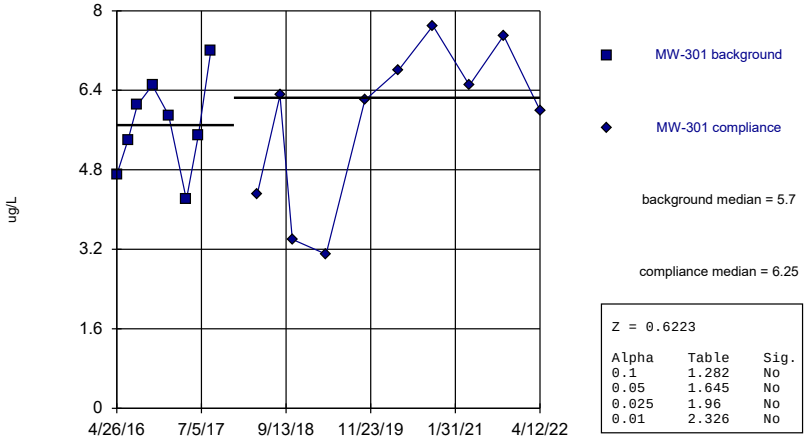
Constituent: Molybdenum (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	1.2	
6/23/2016	1.2	
8/10/2016	0.89 (J)	
10/26/2016	1	
1/18/2017	0.76 (J)	
4/19/2017	0.54 (J)	
6/20/2017	0.79 (J)	
8/23/2017	1.3	
4/18/2018		0.67 (J)
8/14/2018		1.3
10/16/2018		0.72 (J)
4/8/2019		<1.1 (U)
10/24/2019		1.1 (J)
4/14/2020		1.2 (J)
10/8/2020		<1.1 (U)
4/14/2021		<1.3 (U)
10/7/2021		<1.3 (U)
4/12/2022		<1.2 (U)

Selenium

MW-301 (bg)

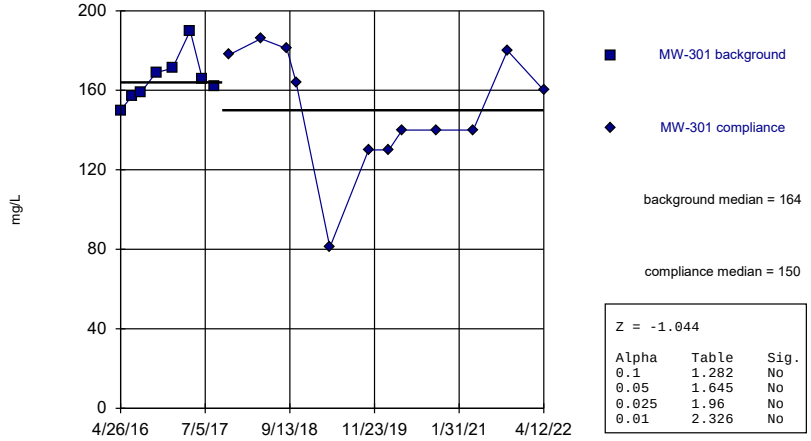


Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sulfate

MW-301 (bg)



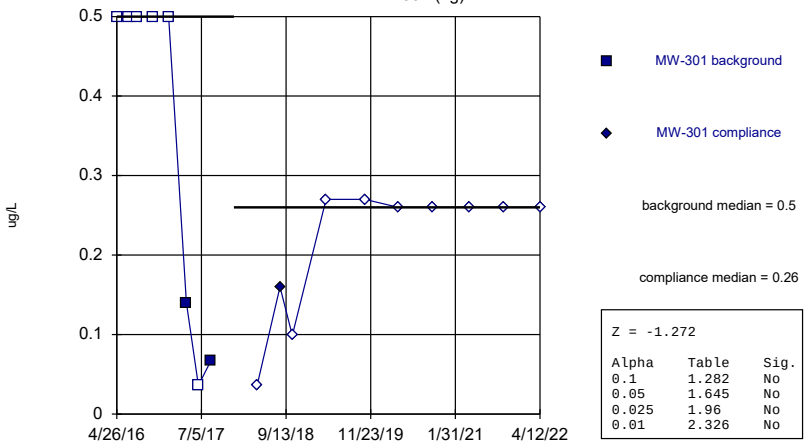
Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Hollow symbols indicate censored values.

Thallium

MW-301 (bg)

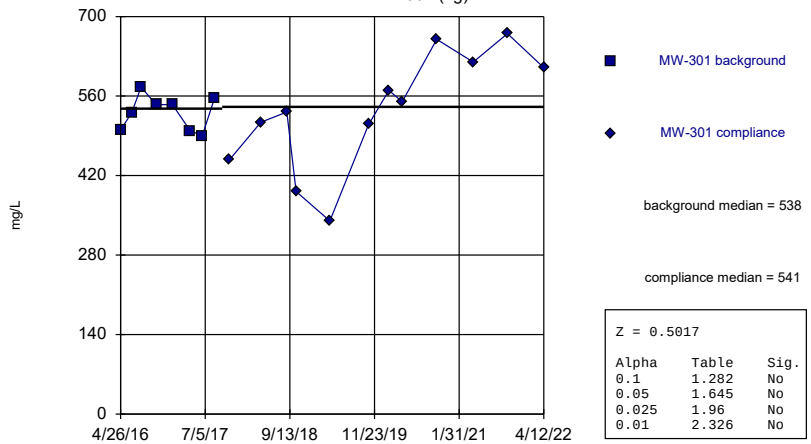


Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Total Dissolved Solids

MW-301 (bg)



Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Selenium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	4.7	
6/23/2016	5.4	
8/10/2016	6.1	
10/26/2016	6.5	
1/18/2017	5.9	
4/19/2017	4.2	
6/20/2017	5.5	
8/23/2017	7.2	
4/18/2018		4.3
8/14/2018		6.3
10/16/2018		3.4
4/8/2019		3.1 (J)
10/24/2019		6.2
4/14/2020		6.8
10/8/2020		7.7
4/14/2021		6.5
10/7/2021		7.5
4/12/2022		6

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Sulfate (mg/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	150	
6/23/2016	157	
8/10/2016	159	
10/26/2016	169	
1/18/2017	171	
4/19/2017	190	
6/20/2017	166	
8/23/2017	162	
11/8/2017		178
4/18/2018		186
8/29/2018		181
10/16/2018		164
4/8/2019		81
10/24/2019		130
2/5/2020		130
4/14/2020		140
10/8/2020		140
4/14/2021		140
10/7/2021		180
4/12/2022		160

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Thallium (ug/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

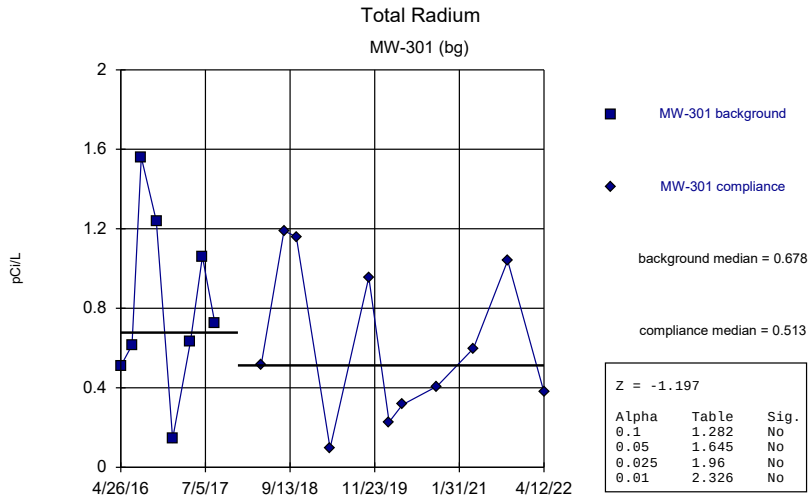
	MW-301	MW-301
4/26/2016	<0.5 (U)	
6/23/2016	<0.5 (U)	
8/10/2016	<0.5 (U)	
10/26/2016	<0.5 (U)	
1/18/2017	<0.5 (U)	
4/19/2017	0.14 (J)	
6/20/2017	<0.036 (U)	
8/23/2017	0.067 (J)	
4/18/2018		<0.036 (U)
8/14/2018		0.16 (J)
10/16/2018		<0.099 (U)
4/8/2019		<0.27 (U)
10/24/2019		<0.27 (U)
4/14/2020		<0.26 (U)
10/8/2020		<0.26 (U)
4/14/2021		<0.26 (U)
10/7/2021		<0.26 (U)
4/12/2022		<0.26 (U)

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Total Dissolved Solids (mg/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	500	
6/23/2016	531	
8/10/2016	576	
10/26/2016	545	
1/18/2017	545	
4/19/2017	499	
6/20/2017	490	
8/23/2017	557	
11/8/2017		448
4/18/2018		514
8/29/2018		532
10/16/2018		392
4/8/2019		340
10/24/2019		510
2/5/2020		570
4/14/2020		550
10/8/2020		660
4/14/2021		620
10/7/2021		670
4/12/2022		610



Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 6/27/2022 11:50 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: Total Radium (pCi/L) Analysis Run 6/27/2022 11:52 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301	MW-301
4/26/2016	0.51	
6/23/2016	0.614	
8/10/2016	1.56	
10/26/2016	1.24	
1/18/2017	0.143	
4/19/2017	0.631	
6/20/2017	1.06	
8/23/2017	0.725	
4/18/2018		0.513
8/14/2018		1.19
10/16/2018		1.16
4/8/2019		0.0956
10/24/2019		0.956
2/5/2020		0.228
4/14/2020		0.315
10/8/2020		0.407
4/14/2021		0.598
10/7/2021		1.04
4/12/2022		0.378

Attachment 4

Interwell Prediction Limit Analysis

Prediction Limit

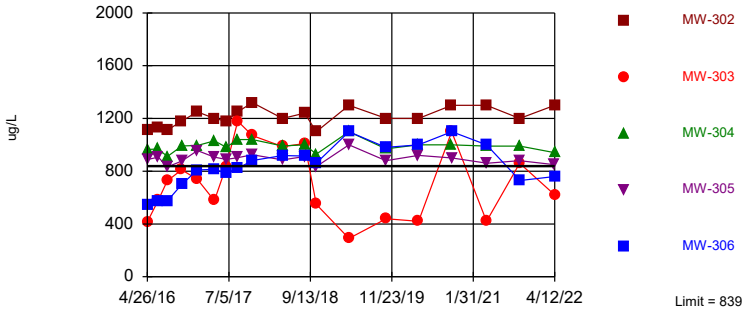
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 6/27/2022, 11:55 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	**MW-302**	**839**	**n/a**	**4/12/2022**	**1300**	**Yes**	**20**	**MW-301**	**609.8**	**111.8**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Boron (ug/L)	MW-303	839	n/a	4/12/2022	620	No	20	MW-301	609.8	111.8	0	None	No	0.001504	Param Inter 1 of 2
Boron (ug/L)	**MW-304**	**839**	**n/a**	**4/12/2022**	**940**	**Yes**	**20**	**MW-301**	**609.8**	**111.8**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-305**	**839**	**n/a**	**4/11/2022**	**850**	**Yes**	**20**	**MW-301**	**609.8**	**111.8**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Boron (ug/L)	MW-306	839	n/a	4/12/2022	760	No	20	MW-301	609.8	111.8	0	None	No	0.001504	Param Inter 1 of 2
Calcium (mg/L)	**MW-302**	**103**	**n/a**	**4/12/2022**	**170**	**Yes**	**20**	**MW-301**	**71.58**	**15.36**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-303**	**103**	**n/a**	**4/12/2022**	**190**	**Yes**	**20**	**MW-301**	**71.58**	**15.36**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-304**	**103**	**n/a**	**4/12/2022**	**130**	**Yes**	**20**	**MW-301**	**71.58**	**15.36**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-305**	**103**	**n/a**	**4/11/2022**	**120**	**Yes**	**20**	**MW-301**	**71.58**	**15.36**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Calcium (mg/L)	**MW-306**	**103**	**n/a**	**4/12/2022**	**110**	**Yes**	**20**	**MW-301**	**71.58**	**15.36**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-302	210	n/a	4/12/2022	170	No	20	MW-301	4.417	0.4542	0	None	ln(x)	0.001504	Param Inter 1 of 2
Chloride (mg/L)	MW-303	210	n/a	4/12/2022	58	No	20	MW-301	4.417	0.4542	0	None	ln(x)	0.001504	Param Inter 1 of 2
Chloride (mg/L)	**MW-304**	**210**	**n/a**	**4/12/2022**	**270**	**Yes**	**20**	**MW-301**	**4.417**	**0.4542**	**0**	**None**	**ln(x)**	**0.001504**	**Param Inter 1 of 2**
Chloride (mg/L)	MW-305	210	n/a	4/11/2022	200	No	20	MW-301	4.417	0.4542	0	None	ln(x)	0.001504	Param Inter 1 of 2
Chloride (mg/L)	**MW-306**	**210**	**n/a**	**4/12/2022**	**260**	**Yes**	**20**	**MW-301**	**4.417**	**0.4542**	**0**	**None**	**ln(x)**	**0.001504**	**Param Inter 1 of 2**
Field pH (Std. Units)	MW-302	6.74	n/a	4/12/2022	6.43	No	23	MW-301	6.32	0.2091	0	None	No	0.001504	Param Inter 1 of 2
Field pH (Std. Units)	MW-303	6.74	n/a	4/12/2022	6.71	No	23	MW-301	6.32	0.2091	0	None	No	0.001504	Param Inter 1 of 2
Field pH (Std. Units)	**MW-304**	**6.74**	**n/a**	**4/12/2022**	**6.95**	**Yes**	**23**	**MW-301**	**6.32**	**0.2091**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Field pH (Std. Units)	**MW-305**	**6.74**	**n/a**	**4/11/2022**	**6.9**	**Yes**	**23**	**MW-301**	**6.32**	**0.2091**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Field pH (Std. Units)	MW-306	6.74	n/a	4/12/2022	6.66	No	23	MW-301	6.32	0.2091	0	None	No	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-302	0.381	n/a	4/12/2022	0.22ND	No	19	MW-301	-1.491	0.2544	31.58	Kapla...	ln(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-303	0.381	n/a	4/12/2022	0.22ND	No	19	MW-301	-1.491	0.2544	31.58	Kapla...	ln(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	**MW-304**	**0.381**	**n/a**	**4/12/2022**	**1.7**	**Yes**	**19**	**MW-301**	**-1.491**	**0.2544**	**31.58**	**Kapla...**	**ln(x)**	**0.001504**	**Param Inter 1 of 2**
Fluoride (mg/L)	MW-305	0.381	n/a	4/11/2022	0.22ND	No	19	MW-301	-1.491	0.2544	31.58	Kapla...	ln(x)	0.001504	Param Inter 1 of 2
Fluoride (mg/L)	MW-306	0.381	n/a	4/12/2022	0.22ND	No	19	MW-301	-1.491	0.2544	31.58	Kapla...	ln(x)	0.001504	Param Inter 1 of 2
Sulfate (mg/L)	**MW-302**	**208**	**n/a**	**4/12/2022**	**750**	**Yes**	**20**	**MW-301**	**156.7**	**25.27**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-303	208	n/a	4/12/2022	200	No	20	MW-301	156.7	25.27	0	None	No	0.001504	Param Inter 1 of 2
Sulfate (mg/L)	**MW-304**	**208**	**n/a**	**4/12/2022**	**260**	**Yes**	**20**	**MW-301**	**156.7**	**25.27**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-305	208	n/a	4/11/2022	150	No	20	MW-301	156.7	25.27	0	None	No	0.001504	Param Inter 1 of 2
Sulfate (mg/L)	MW-306	208	n/a	4/12/2022	70	No	20	MW-301	156.7	25.27	0	None	No	0.001504	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	**MW-302**	**697**	**n/a**	**4/12/2022**	**1100**	**Yes**	**20**	**MW-301**	**533**	**80.17**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	MW-303	697	n/a	4/12/2022	630	No	20	MW-301	533	80.17	0	None	No	0.001504	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	**MW-304**	**697**	**n/a**	**4/12/2022**	**1700**	**Yes**	**20**	**MW-301**	**533**	**80.17**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	**MW-305**	**697**	**n/a**	**4/11/2022**	**950**	**Yes**	**20**	**MW-301**	**533**	**80.17**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**
Total Dissolved Solids (mg/L)	**MW-306**	**697**	**n/a**	**4/12/2022**	**710**	**Yes**	**20**	**MW-301**	**533**	**80.17**	**0**	**None**	**No**	**0.001504**	**Param Inter 1 of 2**

Exceeds Limit: MW-302, MW-304, MW-305

Boron

Interwell Parametric



Background Data Summary: Mean=609.8, Std. Dev.=111.8, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9757, critical = 0.868. Kappa = 2.048 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

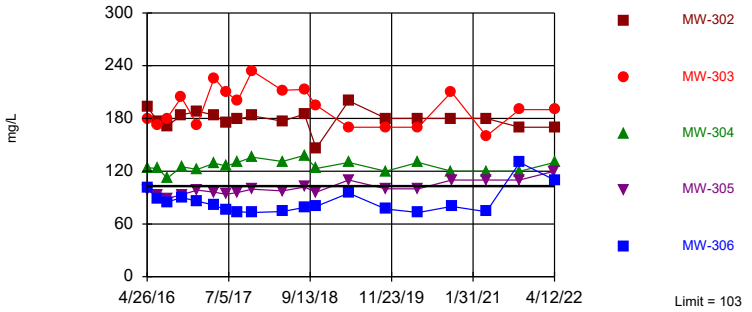
Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Exceeds Limit: MW-302, MW-303, MW-304, MW-305, MW-306

Calcium

Interwell Parametric



Background Data Summary: Mean=71.58, Std. Dev.=15.36, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9478, critical = 0.868. Kappa = 2.048 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

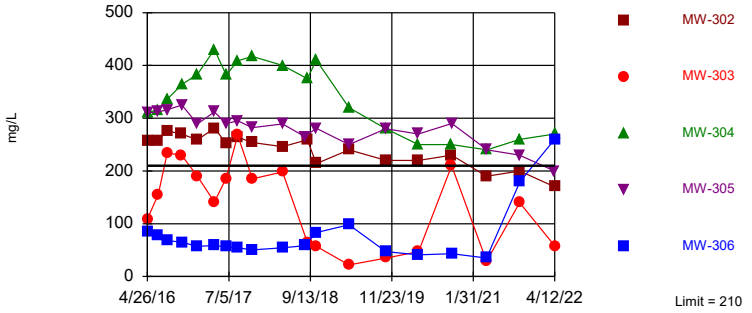
Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Exceeds Limit: MW-304, MW-306

Chloride

Interwell Parametric



Background Data Summary (based on natural log transformation): Mean=4.417, Std. Dev.=0.4542, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9269, critical = 0.868. Kappa = 2.048 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

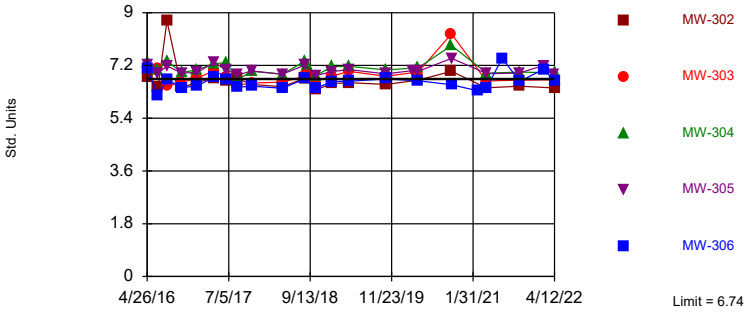
Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Exceeds Limit: MW-304, MW-305

Field pH

Interwell Parametric



Background Data Summary: Mean=6.32, Std. Dev.=0.2091, n=23. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.921, critical = 0.881. Kappa = 2.01 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-305	MW-306	MW-302	MW-303
4/26/2016	574	965	888	540	1110	417
6/23/2016	612	968	906	575	1130	579
8/10/2016	597				1110	726
8/11/2016		911	832	574		
10/26/2016	620				1180	811
10/27/2016		991	878	702		
1/18/2017	599	995	956	809	1250	738
4/19/2017	565	1030	907	814	1200	577
6/20/2017	657				1180	834
6/21/2017		982	889	784		
8/22/2017		1040			1250	1180
8/23/2017	779		903	822		
11/8/2017	488	1040	925	881	1320	1070
4/18/2018	480	991	886	919	1200	987
8/14/2018	735				1240	1010
8/15/2018		1000	911	915		
10/16/2018	410	930	835	862	1100	549
4/8/2019	380	1100	1000	1100	1300	290
10/23/2019		970	880	980		
10/24/2019	680				1200	440
2/5/2020	540					
4/13/2020		1000	920			
4/14/2020	700			1000	1200	420
10/8/2020	650	1000			1300	1100
10/9/2020			900	1100		
4/13/2021				1000	1300	420
4/14/2021	690	990				
4/16/2021			860			
10/6/2021			880			
10/7/2021	800				1200	860
10/8/2021		990		730		
4/11/2022			850			
4/12/2022	640	940		760	1300	620

Prediction Limit

Constituent: Calcium (mg/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-305	MW-306	MW-302	MW-303
4/26/2016	66.9	124	98.1	101	193	179
6/23/2016	62.5	123	92.1	88.5	177	172
8/10/2016	65.6				171	180
8/11/2016		112	88.8	85		
10/26/2016	71.9				184	204
10/27/2016		125	93.2	90		
1/18/2017	74.1	122	98.5	85.9	188	173
4/19/2017	61.5	129	96.2	81.3	184	226
6/20/2017	59.3				175	210
6/21/2017		126	93.8	75.6		
8/22/2017		130			179	200
8/23/2017	66.8		95.8	73.9		
11/8/2017	65.2	136	99.5	73.1	183	234
4/18/2018	63	131	97.6	74.1	177	212
8/14/2018	72.5				185	213
8/15/2018		138	102	78.9		
10/16/2018	47.2	123	96.2	80	146	195
4/8/2019	43	130	110	95	200	170
10/23/2019		120	100	77		
10/24/2019	78				180	170
2/5/2020	68					
4/13/2020		130	100			
4/14/2020	84			73	180	170
10/8/2020	94	120			180	210
10/9/2020			110	80		
4/13/2021				74	180	160
4/14/2021	96	120				
4/16/2021			110			
10/6/2021			110			
10/7/2021	100				170	190
10/8/2021		120		130		
4/11/2022			120			
4/12/2022	92	130		110	170	190

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-305	MW-306	MW-302	MW-303
4/26/2016	63.4	311	310	85.8	258	109
6/23/2016	66.9	316	312	77.6	258	155
8/10/2016	73.3				276	234
8/11/2016		336	316	67.9		
10/26/2016	76.3				270	230
10/27/2016		364	325	64.9		
1/18/2017	71.6	383	289	57.2	259	190
4/19/2017	54.8	430	312	58.5	281	141
6/20/2017	69.8				253	186
6/21/2017		382	290	56		
8/22/2017		409			264	268
8/23/2017	73.5		295	54.4		
11/8/2017	59.8	417	282	50.4	254	185
4/18/2018	63.4	400	289	54.4	246	198
8/15/2018			265	58.2		
8/29/2018	63.1	375			259	64.8
10/16/2018	33.9	410	281	83.3	214	57
4/8/2019	50	320	250	98	240	22
10/23/2019		280	280	47		
10/24/2019	110				220	35
2/5/2020	120					
4/13/2020		250	270			
4/14/2020	140			41	220	47
10/8/2020	170	250			230	210
10/9/2020			290	43		
4/13/2021				35	190	29
4/14/2021	150	240				
4/16/2021			240			
10/6/2021			230			
10/7/2021	180				200	140
10/8/2021		260		180		
4/11/2022			200			
4/12/2022	140	270		260	170	58

Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-306	MW-305	MW-303	MW-302	MW-304
4/26/2016	6.54	7.08	7.23	7.08	6.82	7.3
6/23/2016	6.06	6.17	6.94	7.08	6.46	7.07
8/10/2016	6.08			6.51	8.72	
8/11/2016		6.72	7.18			7.34
10/26/2016	6.26			6.62	6.45	
10/27/2016		6.44	6.94			6.96
1/18/2017	6.47	6.51	6.96	6.77	6.62	7.05
4/19/2017	6.64	6.79	7.3	7.02	6.78	7.27
6/20/2017	6.31			6.81	6.67	
6/21/2017		6.71	7.06			7.29
8/22/2017				6.53	6.75	6.72
8/23/2017	6.16	6.46	6.88			
11/8/2017	6.41	6.49	7.01	6.6	6.55	7
4/18/2018	6.41	6.42	6.9	6.63	6.47	6.9
8/14/2018	6.26			6.83	6.76	
8/15/2018		6.74	7.21			7.34
8/29/2018	6.31			7.03	6.77	7.22
10/16/2018	6.27	6.42	6.86	6.66	6.37	6.86
1/8/2019	5.68	6.65	6.99	6.83	6.58	7.16
4/8/2019	6.61	6.66	7.06	7	6.61	7.17
10/23/2019		6.74	6.91			7.05
10/24/2019	6.33			6.83	6.55	
2/5/2020	6.39					
3/12/2020	6.48					
3/13/2020			7.02			
4/13/2020			7			7.12
4/14/2020	6.58	6.68		6.98	6.7	
10/8/2020	6.22			8.28	7	7.88
10/9/2020		6.54	7.44			
2/23/2021		6.34				
4/13/2021		6.42		6.67	6.44	
4/14/2021	6.26					6.94
4/16/2021			6.92			
7/6/2021		7.44				
10/6/2021			6.94			
10/7/2021	6.26			6.7	6.49	
10/8/2021		6.66				6.97
2/14/2022		7.07	7.2			
4/11/2022			6.9			
4/12/2022	6.37	6.66		6.71	6.43	6.95

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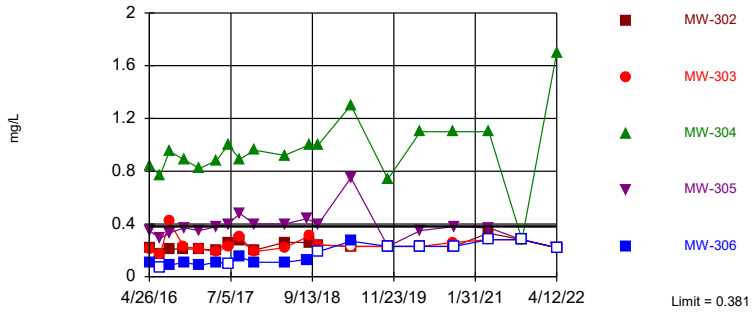
Hollow symbols indicate censored values.

Exceeds Limit: MW-304

Fluoride

Interwell Parametric



Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-1.491, Std. Dev.=0.2544, n=19, 31.58% NDs. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9193, critical = 0.863. Kappa = 2.07 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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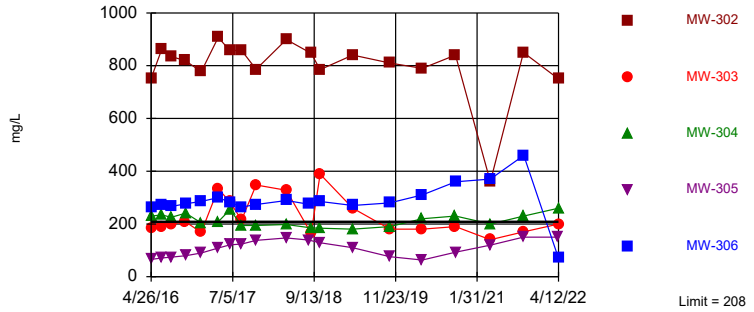
Exceeds Limit: MW-302, MW-304

Sulfate

Interwell Parametric



Background Data Summary: Mean=156.7, Std. Dev.=25.27, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8975, critical = 0.868. Kappa = 2.048 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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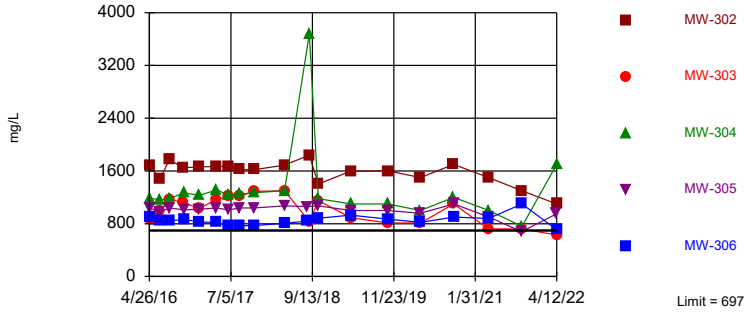
Exceeds Limit: MW-302, MW-304, MW-305, MW-306

Total Dissolved Solids

Interwell Parametric



Background Data Summary: Mean=533, Std. Dev.=80.17, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9569, critical = 0.868. Kappa = 2.048 (c=7, w=5, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.001504. Comparing 5 points to limit.

Prediction Limit Analysis Run 6/27/2022 11:54 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-305	MW-304	MW-303	MW-306	MW-302
4/26/2016	0.22	0.35	0.84	0.21	0.11 (J)	0.22
6/23/2016	0.2 (J)	0.29	0.77	0.17 (J)	<0.073 (U)	0.17 (J)
8/10/2016	0.44			0.42		0.21
8/11/2016		0.33	0.95		0.086 (J)	
10/26/2016	0.27			0.23		0.21
10/27/2016		0.37	0.89		0.11 (J)	
1/18/2017	0.17 (J)	0.35	0.82	0.21	0.087 (J)	0.21
4/19/2017	0.24	0.38	0.88	0.19 (J)	0.11 (J)	0.2 (J)
6/20/2017	0.26			0.23		0.26
6/21/2017		0.4	1		<0.1 (U)	
8/22/2017			0.89	0.3		0.27
8/23/2017	0.34	0.48			0.15 (J)	
11/8/2017	0.27	0.4	0.96	0.19 (J)	0.11 (J)	0.2 (J)
4/18/2018	0.22	0.4	0.92	0.22	0.11 (J)	0.26
8/15/2018		0.44			0.13 (J)	
8/29/2018	0.27		1	0.31		0.26
10/16/2018	0.3	0.4	1	0.24	<0.19 (U)	0.24
4/8/2019	0.44 (J)	0.75	1.3	<0.23 (U)	0.27 (J)	<0.23 (U)
10/23/2019		<0.23 (U)	0.74		<0.23 (U)	
10/24/2019	<0.23 (U)			<0.23 (U)		<0.23 (U)
4/13/2020		0.35 (J)	1.1			
4/14/2020	<0.23 (U)			<0.23 (U)	<0.23 (U)	<0.23 (U)
10/8/2020	<0.23 (U)		1.1	0.26 (J)		<0.23 (U)
10/9/2020		0.38 (J)			<0.23 (U)	
4/13/2021				<0.28 (U)	<0.28 (U)	0.33 (J)
4/14/2021	<0.28 (U)		1.1			
4/16/2021		0.37 (J)				
10/6/2021		<0.28 (U)				
10/7/2021	<0.28 (U)			<0.28 (U)		<0.28 (U)
10/8/2021			<0.28 (U)		<0.28 (U)	
4/11/2022		<0.22 (U)				
4/12/2022	<0.22 (U)		1.7	<0.22 (U)	<0.22 (U)	<0.22 (U)

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-305	MW-306	MW-302	MW-303
4/26/2016	150	230	65.7	264	752	183
6/23/2016	157	234	71.3	271	865	190
8/10/2016	159				835	200
8/11/2016		225	74	266		
10/26/2016	169				819	208
10/27/2016		241	79.5	277		
1/18/2017	171	204	90	285	777	168
4/19/2017	190	208	109	300	907	333
6/20/2017	166				858	284
6/21/2017		254	121	282		
8/22/2017		194			858	215
8/23/2017	162		124	264		
11/8/2017	178	194	138	274	786	348
4/18/2018	186	198	147	289	899	328
8/15/2018			139	275		
8/29/2018	181	185			847	164
10/16/2018	164	184	129	285	785	389
4/8/2019	81	180	110	270	840	260
10/23/2019		190	76	280		
10/24/2019	130				810	180
2/5/2020	130					
4/13/2020		220	63			
4/14/2020	140			310	790	180
10/8/2020	140	230			840	190
10/9/2020			93	360		
4/13/2021				370	360	140
4/14/2021	140	200				
4/16/2021			120			
10/6/2021			150			
10/7/2021	180				850	170
10/8/2021		230		460		
4/11/2022			150			
4/12/2022	160	260		70	750	200

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 6/27/2022 11:55 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-305	MW-306	MW-302	MW-303
4/26/2016	500	1190	1040	899	1680	856
6/23/2016	531	1160	982	849	1480	988
8/10/2016	576				1770	1170
8/11/2016		1180	1040	846		
10/26/2016	545				1650	1120
10/27/2016		1270	1010	864		
1/18/2017	545	1230	1020	828	1660	1030
4/19/2017	499	1310	1040	819	1670	1170
6/20/2017	490				1670	1210
6/21/2017		1240	1010	775		
8/22/2017		1250			1620	1220
8/23/2017	557		1040	769		
11/8/2017	448	1270	1040	773	1620	1290
4/18/2018	514	1300	1070	805	1690	1300
8/15/2018			1060	840		
8/29/2018	532	3680			1840	832
10/16/2018	392	1180	1070	884	1400	1150
4/8/2019	340	1100	1000	930	1600	890
10/23/2019		1100	1000	870		
10/24/2019	510				1600	810
2/5/2020	570					
4/13/2020		1000	960			
4/14/2020	550			820	1500	810
10/8/2020	660	1200			1700	1100
10/9/2020			1100	900		
4/13/2021				880	1500	720
4/14/2021	620	1000				
4/16/2021			900			
10/6/2021			680			
10/7/2021	670				1300	720
10/8/2021		760		1100		
4/11/2022			950			
4/12/2022	610	1700		710	1100	630

Attachment 5

Interwell Tolerance Limit Analysis

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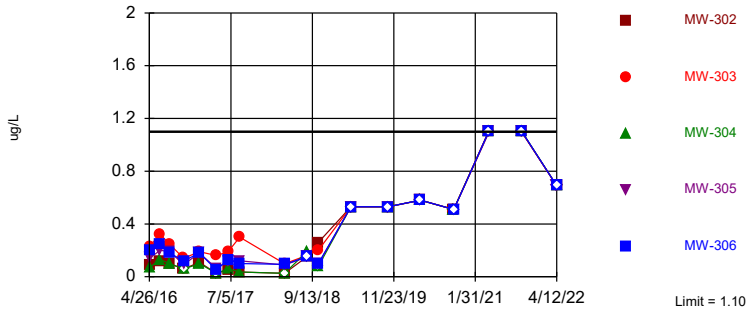
Hollow symbols indicate censored values.

Within Limit

Antimony

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 18 background values. 66.67% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

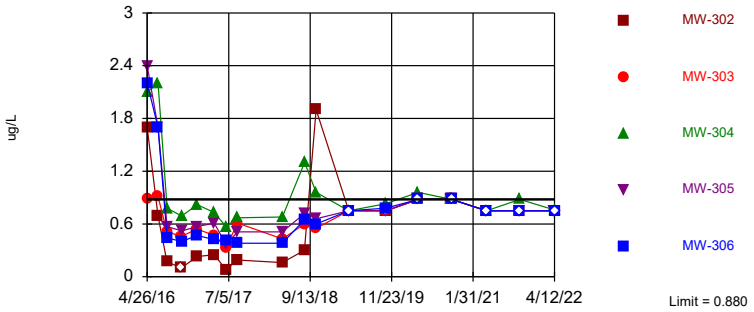
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Arsenic

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Most recent observation is compared with limit. Limit is highest of 19 background values. 42.11% NDs. 78.32% coverage at alpha=0.01; 85.35% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3774.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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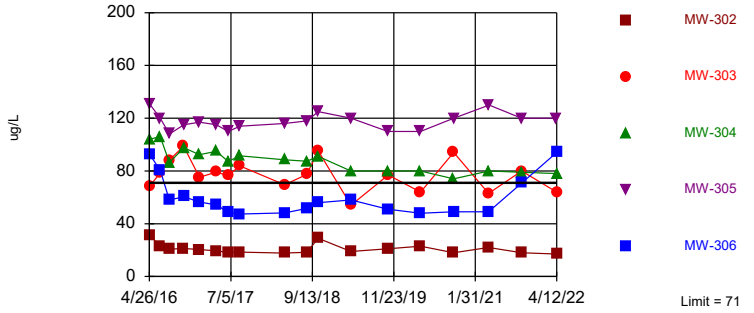
Exceeds Limit: MW-304, MW-305, MW-306

Barium

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary: Mean=45.68, Std. Dev.=10.46, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9443, critical = 0.901. Report alpha = 0.05.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

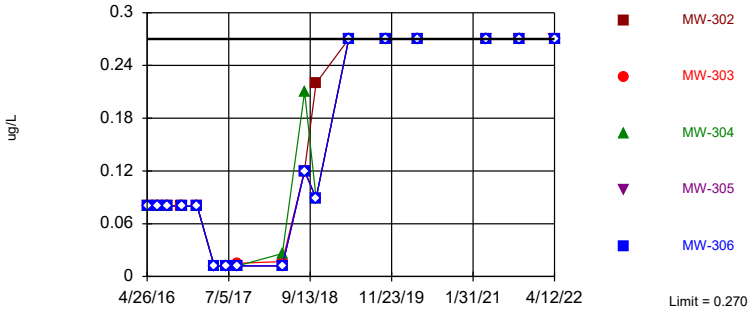
Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Within Limit

Beryllium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 17 background values. 94.12% NDs. 76.37% coverage at alpha=0.01; 83.79% coverage at alpha=0.05; 95.9% coverage at alpha=0.5. Report alpha = 0.4181.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Tolerance Limit

Constituent: Antimony (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-306	MW-302	MW-303	MW-305
4/26/2016	<0.058 (U)	0.069 (J)	0.2 (J)	0.088 (J)	0.23 (J)	0.14 (J)
6/23/2016	0.13 (J)	0.13 (J)	0.25 (J)	0.12 (J)	0.32 (J)	0.2 (J)
8/10/2016	0.12 (J)			0.1 (J)	0.25 (J)	
8/11/2016		0.1 (J)	0.18 (J)			0.19 (J)
10/26/2016	<0.058 (U)			<0.058 (U)	0.14 (J)	
10/27/2016		<0.058 (U)	0.12 (J)			0.094 (J)
1/18/2017	0.11 (J)	0.1 (J)	0.18 (J)	0.11 (J)	0.19 (J)	0.18 (J)
4/19/2017	<0.026 (U)	<0.026 (U)	0.051 (J)	<0.026 (U)	0.16 (J)	0.063 (J)
6/20/2017	0.054 (J)			0.052 (J)	0.19 (J)	
6/21/2017		0.06 (J)	0.13 (J)			0.12 (J)
8/22/2017		0.035 (J)		0.036 (J)	0.3 (J)	
8/23/2017	0.063 (J)		0.1 (J)			0.12 (J)
4/18/2018	<0.026 (U)	<0.026 (U)	0.094 (J)	<0.026 (U)	0.098 (J)	0.089 (J)
8/14/2018	0.2 (J)			<0.15 (U)	0.16 (J)	
8/15/2018		0.19 (J)	<0.15 (U)			<0.15 (U)
10/16/2018	<0.078 (U)	<0.078 (U)	0.1 (J)	0.26 (J)	0.2 (J)	0.096 (J)
4/8/2019	<0.53 (U)	<0.53 (U)	<0.53 (U)	<0.53 (U)	<0.53 (U)	<0.53 (U)
10/23/2019		<0.53 (U)	<0.53 (U)			<0.53 (U)
10/24/2019	<0.53 (U)			<0.53 (U)	<0.53 (U)	
4/13/2020		<0.58 (U)				<0.58 (U)
4/14/2020	<0.58 (U)		<0.58 (U)	<0.58 (U)	<0.58 (U)	
10/8/2020	<0.51 (U)	<0.51 (U)		<0.51 (U)	<0.51 (U)	
10/9/2020			<0.51 (U)			<0.51 (U)
4/13/2021			<1.1 (U)	<1.1 (U)	<1.1 (U)	
4/14/2021	<1.1 (U)	<1.1 (U)				
4/16/2021						<1.1 (U)
10/6/2021						<1.1 (U)
10/7/2021	<1.1 (U)			<1.1 (U)	<1.1 (U)	
10/8/2021		<1.1 (U)	<1.1 (U)			
4/11/2022						<0.69 (U)
4/12/2022	<0.69 (U)	<0.69 (U)	<0.69 (U)	<0.69 (U)	<0.69 (U)	

Tolerance Limit

Constituent: Arsenic (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	0.38 (J)	2.1	0.89 (J)	2.2	1.7	2.4
6/23/2016	0.38 (J)	2.2	0.91 (J)	1.7	0.69 (J)	1.7
8/10/2016	0.26 (J)		0.51 (J)		0.17 (J)	
8/11/2016		0.78 (J)		0.44 (J)		0.57 (J)
10/26/2016	0.14 (J)		0.46 (J)		<0.1 (U)	
10/27/2016		0.69 (J)		0.4 (J)		0.52 (J)
1/18/2017	0.23 (J)	0.82 (J)	0.54 (J)	0.47 (J)	0.23 (J)	0.57 (J)
4/19/2017	0.22 (J)	0.73 (J)	0.47 (J)	0.42 (J)	0.25 (J)	0.61 (J)
6/20/2017	0.15 (J)		0.33 (J)		0.083 (J)	
6/21/2017		0.57 (J)		0.41 (J)		0.37 (J)
8/22/2017		0.67 (J)	0.61 (J)		0.19 (J)	
8/23/2017	0.14 (J)			0.38 (J)		0.51 (J)
4/18/2018	0.074 (J)	0.68 (J)	0.43 (J)	0.38 (J)	0.16 (J)	0.51 (J)
8/14/2018	0.29 (J)		0.6 (J)		0.3 (J)	
8/15/2018		1.3		0.65 (J)		0.72 (J)
10/16/2018	0.16 (J)	0.96 (J)	0.55 (J)	0.6 (J)	1.9	0.66 (J)
4/8/2019	<0.75 (U)	<0.75 (U)	<0.75 (U)	<0.75 (U)	<0.75 (U)	<0.75 (U)
10/23/2019		0.83 (J)		0.78 (J)		<0.75 (U)
10/24/2019	<0.75 (U)		<0.75 (U)		<0.75 (U)	
2/5/2020	<0.88 (U)					
4/13/2020		0.96 (J)				<0.88 (U)
4/14/2020	<0.88 (U)		<0.88 (U)	<0.88 (U)	<0.88 (U)	
10/8/2020	<0.88 (U)	<0.88 (U)	<0.88 (U)		<0.88 (U)	
10/9/2020				<0.88 (U)		<0.88 (U)
4/13/2021			<0.75 (U)	<0.75 (U)	<0.75 (U)	
4/14/2021	<0.75 (U)	<0.75 (U)				
4/16/2021						<0.75 (U)
10/6/2021						0.75 (J)
10/7/2021	<0.75 (U)		<0.75 (U)		<0.75 (U)	
10/8/2021		0.88 (J)		<0.75 (U)		
4/11/2022						<0.75 (U)
4/12/2022	<0.75 (U)	0.76 (J)	<0.75 (U)	<0.75 (U)	<0.75 (U)	

Tolerance Limit

Constituent: Barium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	51.6	104	68.2	93	31.5	131
6/23/2016	55.8	106	78.5	80.5	23	120
8/10/2016	52.3		88.1		20.7	
8/11/2016		86.4		58		108
10/26/2016	53.3		98.8		21.2	
10/27/2016		97.6		60.5		115
1/18/2017	42.4	92.4	75.3	56.4	20.4	117
4/19/2017	35.5	94.9	79.1	54.3	19.4	115
6/20/2017	39.9		76.4		18.2	
6/21/2017		87.1		48.7		110
8/22/2017		91.5	83.8		18.5	
8/23/2017	44			47.4		114
4/18/2018	31.6	88.5	69.5	48.2	17.7	116
8/14/2018	44.5		77.3		18.3	
8/15/2018		87.4		51.6		118
10/16/2018	28.1	91	95.2	56	28.9	125
4/8/2019	25	80	54	58	19	120
10/23/2019		80		51		110
10/24/2019	56		77		21	
2/5/2020	43					
4/13/2020		80				110
4/14/2020	54		64	48	23	
10/8/2020	58	74	94		18	
10/9/2020				49		120
4/13/2021			63	49	22	
4/14/2021	52	80				
4/16/2021						130
10/6/2021						120
10/7/2021	61		80		18	
10/8/2021		79		71		
4/11/2022						120
4/12/2022	40	78	64	94	17	

Tolerance Limit

Constituent: Beryllium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)
6/23/2016	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)
8/10/2016	<0.08 (U)		<0.08 (U)		<0.08 (U)	
8/11/2016		<0.08 (U)		<0.08 (U)		<0.08 (U)
10/26/2016	<0.08 (U)		<0.08 (U)		<0.08 (U)	
10/27/2016		<0.08 (U)		<0.08 (U)		<0.08 (U)
1/18/2017	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)	<0.08 (U)
4/19/2017	<0.012 (U)	<0.012 (U)	<0.012 (U)	<0.012 (U)	<0.012 (U)	<0.012 (U)
6/20/2017	<0.012 (U)		<0.012 (U)		<0.012 (U)	
6/21/2017		<0.012 (U)		<0.012 (U)		<0.012 (U)
8/22/2017		<0.012 (U)	0.015 (J)		<0.012 (U)	
8/23/2017	<0.012 (U)			<0.012 (U)		<0.012 (U)
4/18/2018	<0.012 (U)	0.026 (J)	0.017 (J)	<0.012 (U)	<0.012 (U)	<0.012 (U)
8/14/2018	0.14 (J)		<0.12 (U)		<0.12 (U)	
8/15/2018		0.21 (J)		<0.12 (U)		<0.12 (U)
10/16/2018	<0.089 (U)	<0.089 (U)	<0.089 (U)	<0.089 (U)	0.22 (J)	<0.089 (U)
4/8/2019	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)
10/23/2019		<0.27 (U)		<0.27 (U)		<0.27 (U)
10/24/2019	<0.27 (U)		<0.27 (U)		<0.27 (U)	
4/13/2020		<0.27 (U)				<0.27 (U)
4/14/2020	<0.27 (U)		<0.27 (U)	<0.27 (U)	<0.27 (U)	
4/13/2021			<0.27 (U)	<0.27 (U)	<0.27 (U)	
4/14/2021	<0.27 (U)	<0.27 (U)				
4/16/2021						<0.27 (U)
10/6/2021						<0.27 (U)
10/7/2021	<0.27 (U)		<0.27 (U)		<0.27 (U)	
10/8/2021		<0.27 (U)		<0.27 (U)		
4/11/2022						<0.27 (U)
4/12/2022	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	

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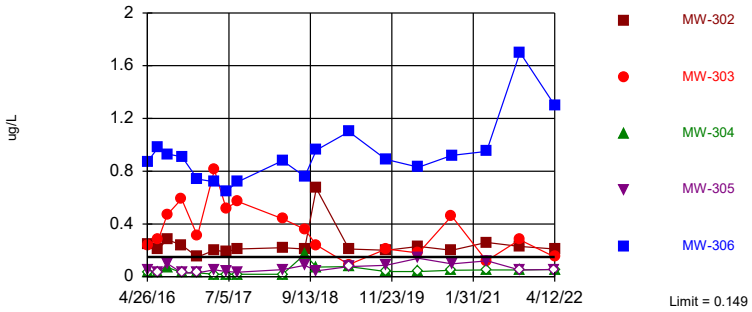
Hollow symbols indicate censored values.

Exceeds Limit: MW-302, MW-303, MW-306

Cadmium

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-3.274, Std. Dev.=0.5642, n=19, 47.37% NDs. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9045, critical = 0.901. Report alpha = 0.05.

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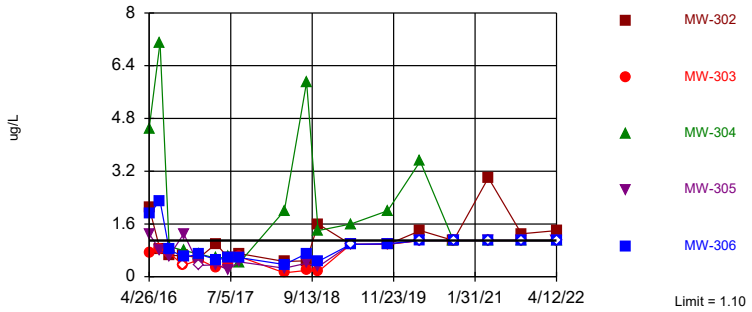
Hollow symbols indicate censored values.

Within Limit

Chromium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 19 background values. 52.63% NDs. 78.32% coverage at alpha=0.01; 85.35% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3774.

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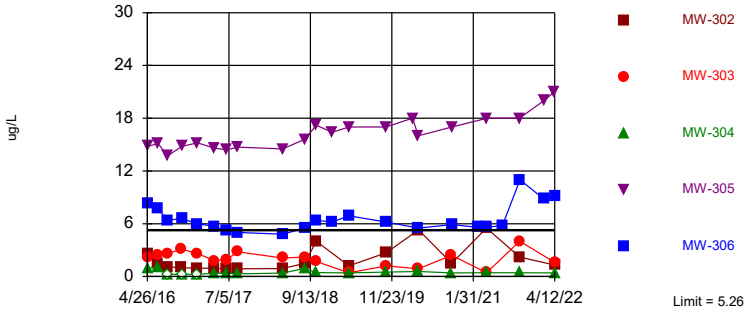
Hollow symbols indicate censored values.

Exceeds Limit: MW-305, MW-306

Cobalt

Interwell Parametric



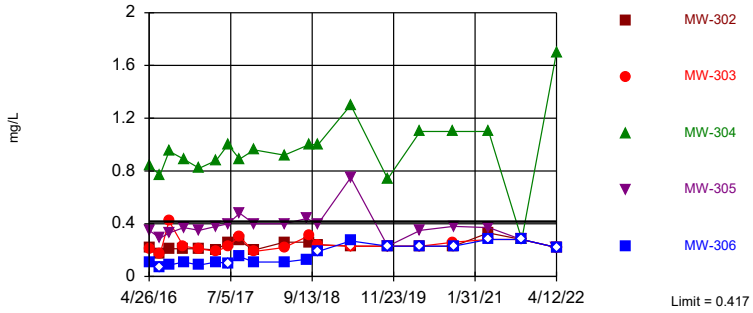
95% coverage. Most recent observation is compared with limit. Background Data Summary (based on natural log transformation): Mean=-0.231, Std. Dev.=0.7893, n=20. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9554, critical = 0.905. Report alpha = 0.05.

Sanitas™ v.9.6.32 Software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Exceeds Limit: MW-304

Fluoride

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary (based on natural log transformation) (after Kaplan-Meier Adjustment): Mean=-1.491, Std. Dev.=0.2544, n=19, 31.58% NDs. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9193, critical = 0.901. Report alpha = 0.05.

Tolerance Limit

Constituent: Cadmium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	<0.029 (U)	<0.029 (U)	0.24 (J)	0.87	0.25 (J)	0.051 (J)
6/23/2016	<0.029 (U)	<0.029 (U)	0.28 (J)	0.98	0.21 (J)	<0.029 (U)
8/10/2016	0.12 (J)		0.47 (J)		0.28 (J)	
8/11/2016		0.072 (J)		0.93		0.1 (J)
10/26/2016	0.038 (J)		0.59		0.24 (J)	
10/27/2016		<0.029 (U)		0.91		<0.029 (U)
1/18/2017	<0.029 (U)	<0.029 (U)	0.31 (J)	0.74	0.15 (J)	<0.029 (U)
4/19/2017	0.035 (J)	<0.018 (U)	0.81	0.72	0.2 (J)	0.052 (J)
6/20/2017	0.044 (J)		0.52		0.19 (J)	
6/21/2017		<0.018 (U)		0.65		0.039 (J)
8/22/2017		<0.018 (U)	0.57		0.21 (J)	
8/23/2017	0.037 (J)			0.72		0.034 (J)
4/18/2018	0.023 (J)	<0.018 (U)	0.44 (J)	0.88	0.22 (J)	0.054 (J)
8/14/2018	0.16 (J)		0.36 (J)		0.21 (J)	
8/15/2018		0.17 (J)		0.76		0.086 (J)
10/16/2018	<0.033 (U)	0.073 (J)	0.24 (J)	0.96	0.67	0.044 (J)
4/8/2019	<0.077 (U)	<0.077 (U)	0.092 (J)	1.1	0.21 (J)	<0.077 (U)
10/23/2019		<0.039 (U)		0.89		0.087 (J)
10/24/2019	0.04 (J)		0.21		0.2	
2/5/2020	<0.039 (U)					
4/13/2020		<0.039 (U)				0.14
4/14/2020	<0.039 (U)		0.18	0.83	0.23	
10/8/2020	0.075 (J)	<0.049 (U)	0.46		0.2	
10/9/2020				0.92		0.097 (J)
4/13/2021			0.12	0.95	0.26	
4/14/2021	<0.051 (U)	<0.051 (U)				
4/16/2021						0.12
10/6/2021						<0.051 (U)
10/7/2021	0.057 (J)		0.28		0.23	
10/8/2021		<0.051 (U)		1.7		
4/11/2022						<0.055 (U)
4/12/2022	<0.055 (U)	<0.055 (U)	0.15	1.3	0.21	

Tolerance Limit

Constituent: Chromium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	0.59 (J)	4.5	0.74 (J)	1.9	2.1	1.3
6/23/2016	0.74 (J)	7.1	0.83 (J)	2.3	0.82 (J)	0.8 (J)
8/10/2016	0.64 (J)		0.73 (J)		0.64 (J)	
8/11/2016		0.92 (J)		0.82 (J)		0.62 (J)
10/26/2016	<0.34 (U)		<0.34 (U)		0.64 (J)	
10/27/2016		0.79 (J)		0.6 (J)		1.3
1/18/2017	0.59 (J)	0.69 (J)	0.52 (J)	0.68 (J)	0.58 (J)	<0.34 (U)
4/19/2017	0.49 (J)	0.56 (J)	0.27 (J)	0.52 (J)	1	0.36 (J)
6/20/2017	0.25 (J)		0.37 (J)		0.58 (J)	
6/21/2017		0.6 (J)		0.57 (J)		0.22 (J)
8/22/2017		0.43 (J)	0.61 (J)		0.7 (J)	
8/23/2017	0.39 (J)			0.58 (J)		0.45 (J)
4/18/2018	<0.054 (U)	2	0.12 (J)	0.37 (J)	0.46 (J)	0.26 (J)
8/14/2018	0.25 (J)		0.19 (J)		0.48 (J)	
8/15/2018		5.9		0.7 (J)		0.41 (J)
10/16/2018	0.11 (J)	1.4	0.15 (J)	0.46 (J)	1.6	0.3 (J)
4/8/2019	<0.98 (U)	1.6 (J)	<0.98 (U)	<0.98 (U)	<0.98 (U)	<0.98 (U)
10/23/2019		2 (J)		1 (J)		<0.98 (U)
10/24/2019	<0.98 (U)		<0.98 (U)		<0.98 (U)	
2/5/2020	<1.1 (U)					
4/13/2020		3.5 (J)				<1.1 (U)
4/14/2020	<1.1 (U)		<1.1 (U)	<1.1 (U)	1.4 (J)	
10/8/2020	<1.1 (U)	<1.1 (U)	<1.1 (U)		<1.1 (U)	
10/9/2020				<1.1 (U)		<1.1 (U)
4/13/2021			<1.1 (U)	<1.1 (U)	3 (J)	
4/14/2021	<1.1 (U)	<1.1 (U)				
4/16/2021						<1.1 (U)
10/6/2021						<1.1 (U)
10/7/2021	<1.1 (U)		<1.1 (U)		1.3 (J)	
10/8/2021		<1.1 (U)		<1.1 (U)		
4/11/2022						<1.1 (U)
4/12/2022	<1.1 (U)	<1.1 (U)	<1.1 (U)	<1.1 (U)	1.4 (J)	

Tolerance Limit

Constituent: Cobalt (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-303	MW-304	MW-306	MW-305	MW-302
4/26/2016	4.1	2.2	0.89 (J)	8.3	14.8	2.6
6/23/2016	3.1	2.5	1.1	7.7	15.1	1.4
8/10/2016	1.8	2.6				1.1
8/11/2016			<0.5 (U)	6.4	13.7	
10/26/2016	1.8	3.1				1
10/27/2016			<0.5 (U)	6.6	14.8	
1/18/2017	1.3	2.6	<0.5 (U)	6	15.2	0.94 (J)
4/19/2017	0.97 (J)	1.8	0.37 (J)	5.7	14.6	0.95 (J)
6/20/2017	1 (J)	1.9				0.86 (J)
6/21/2017			0.36 (J)	5.2	14.4	
8/22/2017		2.8	0.3 (J)			0.88 (J)
8/23/2017	0.96 (J)			5	14.7	
4/18/2018	0.46 (J)	2.1	0.39 (J)	4.8	14.5	0.9 (J)
8/14/2018	1.4	2.2				1.5
8/15/2018			0.92 (J)	5.5	15.6	
10/16/2018	0.36 (J)	1.7	0.45 (J)	6.4	17.2	4
1/8/2019				6.2	16.4	
4/8/2019	0.44 (J)	0.42 (J)	0.4 (J)	6.9	17	1.2
10/23/2019			0.5	6.2	17	
10/24/2019	0.6	1.2				2.7
2/5/2020	1.1					
3/12/2020	0.43 (J)					
3/13/2020					18	
4/13/2020			0.57		16	
4/14/2020	0.52	0.87		5.5		5.3
10/8/2020	0.41 (J)	2.4	0.41 (J)			1.5
10/9/2020				5.9	17	
2/23/2021				5.6		
4/13/2021		0.43 (J)		5.6		5.5
4/14/2021	0.29 (J)		0.43 (J)			
4/16/2021					18	
7/6/2021				5.8		
10/6/2021					18	
10/7/2021	0.48 (J)	4				2.2
10/8/2021			0.42 (J)	11		
2/14/2022				8.8	20	
4/11/2022					21	
4/12/2022	0.23 (J)	1.6	0.41 (J)	9.1		1.3

Tolerance Limit

Constituent: Fluoride (mg/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-305	MW-304	MW-303	MW-306	MW-302
4/26/2016	0.22	0.35	0.84	0.21	0.11 (J)	0.22
6/23/2016	0.2 (J)	0.29	0.77	0.17 (J)	<0.073 (U)	0.17 (J)
8/10/2016	0.44			0.42		0.21
8/11/2016		0.33	0.95		0.086 (J)	
10/26/2016	0.27			0.23		0.21
10/27/2016		0.37	0.89		0.11 (J)	
1/18/2017	0.17 (J)	0.35	0.82	0.21	0.087 (J)	0.21
4/19/2017	0.24	0.38	0.88	0.19 (J)	0.11 (J)	0.2 (J)
6/20/2017	0.26			0.23		0.26
6/21/2017		0.4	1		<0.1 (U)	
8/22/2017			0.89	0.3		0.27
8/23/2017	0.34	0.48			0.15 (J)	
11/8/2017	0.27	0.4	0.96	0.19 (J)	0.11 (J)	0.2 (J)
4/18/2018	0.22	0.4	0.92	0.22	0.11 (J)	0.26
8/15/2018		0.44			0.13 (J)	
8/29/2018	0.27		1	0.31		0.26
10/16/2018	0.3	0.4	1	0.24	<0.19 (U)	0.24
4/8/2019	0.44 (J)	0.75	1.3	<0.23 (U)	0.27 (J)	<0.23 (U)
10/23/2019		<0.23 (U)	0.74		<0.23 (U)	
10/24/2019	<0.23 (U)			<0.23 (U)		<0.23 (U)
4/13/2020		0.35 (J)	1.1			
4/14/2020	<0.23 (U)			<0.23 (U)	<0.23 (U)	<0.23 (U)
10/8/2020	<0.23 (U)		1.1	0.26 (J)		<0.23 (U)
10/9/2020		0.38 (J)			<0.23 (U)	
4/13/2021				<0.28 (U)	<0.28 (U)	0.33 (J)
4/14/2021	<0.28 (U)		1.1			
4/16/2021		0.37 (J)				
10/6/2021		<0.28 (U)				
10/7/2021	<0.28 (U)			<0.28 (U)		<0.28 (U)
10/8/2021			<0.28 (U)		<0.28 (U)	
4/11/2022		<0.22 (U)				
4/12/2022	<0.22 (U)		1.7	<0.22 (U)	<0.22 (U)	<0.22 (U)

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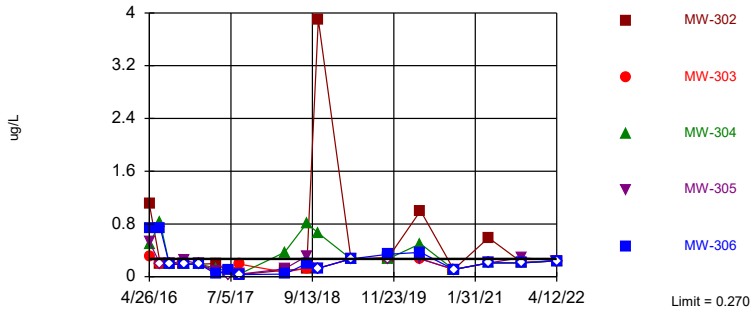
Hollow symbols indicate censored values.

Within Limit

Lead

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 19 background values. 73.68% NDs. 78.32% coverage at alpha=0.01; 85.35% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3774.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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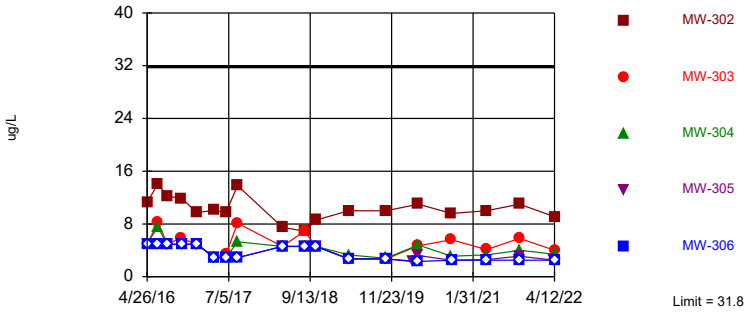
Hollow symbols indicate censored values.

Within Limit

Lithium

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary: Mean=22.82, Std. Dev.=3.757, n=20. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9751, critical = 0.905. Report alpha = 0.05.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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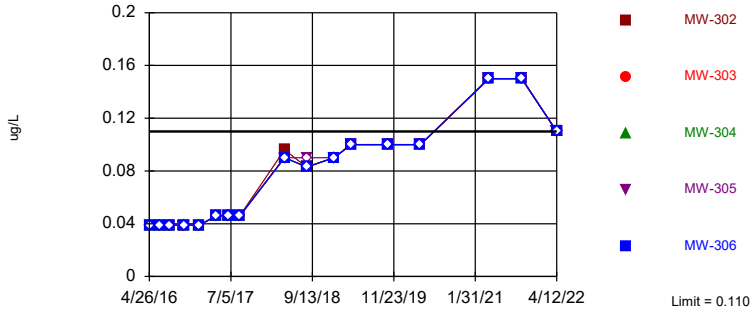
Hollow symbols indicate censored values.

Within Limit

Mercury

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. All background values were censored; limit is most recent reporting limit. 76.37% coverage at alpha=0.01; 83.79% coverage at alpha=0.05; 95.9% coverage at alpha=0.5. Report alpha = 0.4181.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

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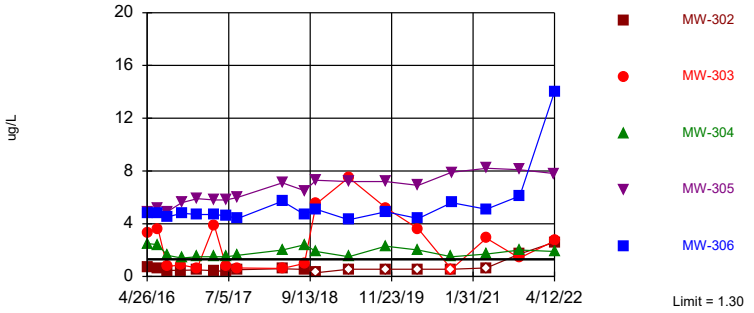
Hollow symbols indicate censored values.

Exceeds Limit: MW-302, MW-303, MW-305, MW-306

Molybdenum

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level. Most recent observation is compared with limit. Limit is highest of 18 background values. 27.78% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

Tolerance Limit Analysis Run 6/27/2022 10:57 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

Tolerance Limit

Constituent: Lead (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	<0.19 (U)	0.5 (J)	0.31 (J)	0.74 (J)	1.1	0.53 (J)
6/23/2016	<0.19 (U)	0.82 (J)	<0.19 (U)	0.74 (J)	0.2 (J)	<0.19 (U)
8/10/2016	<0.19 (U)		<0.19 (U)		<0.19 (U)	
8/11/2016		<0.19 (U)		<0.19 (U)		<0.19 (U)
10/26/2016	<0.19 (U)		0.2 (J)		<0.19 (U)	
10/27/2016		<0.19 (U)		<0.19 (U)		0.25 (J)
1/18/2017	<0.19 (U)	<0.19 (U)	<0.19 (U)	<0.19 (U)	<0.19 (U)	<0.19 (U)
4/19/2017	0.06 (J)	0.13 (J)	0.068 (J)	0.038 (J)	0.2 (J)	0.093 (J)
6/20/2017	0.1 (J)		0.07 (J)		0.081 (J)	
6/21/2017		0.081 (J)		0.1 (J)		<0.033 (U)
8/22/2017		0.041 (J)	0.19 (J)		<0.033 (U)	
8/23/2017	0.049 (J)			<0.033 (U)		0.039 (J)
4/18/2018	0.041 (J)	0.37 (J)	0.069 (J)	0.04 (J)	0.098 (J)	0.12 (J)
8/14/2018	0.18 (J)		0.13 (J)		0.12 (J)	
8/15/2018		0.81 (J)		0.2 (J)		0.31 (J)
10/16/2018	<0.13 (U)	0.66 (J)	<0.13 (U)	<0.13 (U)	3.9	<0.13 (U)
4/8/2019	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)
10/23/2019		0.27 (J)		0.34 (J)		<0.27 (U)
10/24/2019	<0.27 (U)		<0.27 (U)		0.29 (J)	
2/5/2020	<0.27 (U)					
4/13/2020		0.5				0.27 (J)
4/14/2020	<0.27 (U)		<0.27 (U)	0.37 (J)	1	
10/8/2020	<0.11 (U)	<0.11 (U)	<0.11 (U)		<0.11 (U)	
10/9/2020				<0.11 (U)		<0.11 (U)
4/13/2021			<0.21 (U)	<0.21 (U)	0.59	
4/14/2021	<0.21 (U)	<0.21 (U)				
4/16/2021						<0.21 (U)
10/6/2021						0.29 (J)
10/7/2021	<0.21 (U)		<0.21 (U)		0.22 (J)	
10/8/2021		<0.21 (U)		<0.21 (U)		
4/11/2022						<0.24 (U)
4/12/2022	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	<0.24 (U)	

Tolerance Limit

Constituent: Lithium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	22.8	5.1 (J)	<4.9 (U)	<4.9 (U)	11.3	<4.9 (U)
6/23/2016	28.7	7.5 (J)	8.3 (J)	<4.9 (U)	14.1	<4.9 (U)
8/10/2016	27.6		5 (J)		12.2	
8/11/2016		<4.9 (U)		<4.9 (U)		<4.9 (U)
10/26/2016	25.5		5.8 (J)		11.9	
10/27/2016		<4.9 (U)		<4.9 (U)		<4.9 (U)
1/18/2017	20.1	<4.9 (U)	<4.9 (U)	<4.9 (U)	9.7 (J)	<4.9 (U)
4/19/2017	21.8	<2.9 (U)	<2.9 (U)	<2.9 (U)	10.1	<2.9 (U)
6/20/2017	24.9		3.4 (J)		9.7 (J)	
6/21/2017		<2.9 (U)		<2.9 (U)		<2.9 (U)
8/22/2017		5.3 (J)	8.1 (J)		13.8	
8/23/2017	27.9			<2.9 (U)		<2.9 (U)
4/18/2018	19.1	<4.6 (U)	<4.6 (U)	<4.6 (U)	7.5 (J)	<4.6 (U)
8/14/2018	26.5		6.9 (J)		6.9 (J)	
8/15/2018		<4.6 (U)		<4.6 (U)		<4.6 (U)
10/16/2018	19.4	<4.6 (U)	<4.6 (U)	<4.6 (U)	8.6 (J)	<4.6 (U)
4/8/2019	15	3.3 (J)	<2.7 (U)	<2.7 (U)	10	<2.7 (U)
10/23/2019		2.8 (J)		<2.7 (U)		<2.7 (U)
10/24/2019	24		<2.7 (U)		10	
2/5/2020	17					
3/12/2020	21					
3/13/2020						2.3 (J)
4/13/2020		4.8 (J)				3.2 (J)
4/14/2020	24		4.7 (J)	<2.3 (U)	11	
10/8/2020	23	3.1 (J)	5.6 (J)		9.6 (J)	
10/9/2020				<2.5 (U)		<2.5 (U)
4/13/2021			4.1 (J)	<2.5 (U)	10	
4/14/2021	23	3.3 (J)				
4/16/2021						2.6 (J)
10/6/2021						3.1 (J)
10/7/2021	26		5.8 (J)		11	
10/8/2021		4 (J)		<2.5 (U)		
4/11/2022						<2.5 (U)
4/12/2022	19	3.4 (J)	4 (J)	<2.5 (U)	9.1 (J)	

Tolerance Limit

Constituent: Mercury (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)
6/23/2016	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)
8/10/2016	<0.039 (U)		<0.039 (U)		<0.039 (U)	
8/11/2016		<0.039 (U)		<0.039 (U)		<0.039 (U)
10/26/2016	<0.039 (U)		<0.039 (U)		<0.039 (U)	
10/27/2016		<0.039 (U)		<0.039 (U)		<0.039 (U)
1/18/2017	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)	<0.039 (U)
4/19/2017	<0.046 (U)	<0.046 (U)	<0.046 (U)	<0.046 (U)	<0.046 (U)	<0.046 (U)
6/20/2017	<0.046 (U)		<0.046 (U)		<0.046 (U)	
6/21/2017		<0.046 (U)		<0.046 (U)		<0.046 (U)
8/22/2017		<0.046 (U)	<0.046 (U)		<0.046 (U)	
8/23/2017	<0.046 (U)			<0.046 (U)		<0.046 (U)
4/18/2018	<0.09 (U)	<0.09 (U)	<0.09 (U)	<0.09 (U)	0.096 (J)	<0.09 (U)
8/14/2018	<0.083 (U)		<0.083 (U)		<0.083 (U)	
8/15/2018		<0.083 (U)		<0.083 (U)		<0.09 (U)
1/8/2019	<0.09 (U)	<0.09 (U)	<0.09 (U)	<0.09 (U)	<0.09 (U)	<0.09 (U)
4/8/2019	<0.1 (U)	<0.1 (U)	<0.1 (U)	<0.1 (U)	<0.1 (U)	<0.1 (U)
10/23/2019		<0.1 (U)		<0.1 (U)		<0.1 (U)
10/24/2019	<0.1 (U)		<0.1 (U)		<0.1 (U)	
4/13/2020		<0.1 (U)				<0.1 (U)
4/14/2020	<0.1 (U)		<0.1 (U)	<0.1 (U)	<0.1 (U)	
4/13/2021			<0.15 (U)	<0.15 (U)	<0.15 (U)	
4/14/2021	<0.15 (U)	<0.15 (U)				
4/16/2021						<0.15 (U)
10/6/2021						<0.15 (U)
10/7/2021	<0.15 (U)		<0.15 (U)		<0.15 (U)	
10/8/2021		<0.15 (U)		<0.15 (U)		
4/11/2022						<0.11 (U)
4/12/2022	<0.11 (U)	<0.11 (U)	<0.11 (U)	<0.11 (U)	<0.11 (U)	

Tolerance Limit

Constituent: Molybdenum (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-306	MW-302	MW-303	MW-305
4/26/2016	1.2	2.5	4.8	0.68 (J)	3.3	4.9
6/23/2016	1.2	2.4	4.8	0.6 (J)	3.6	5.2
8/10/2016	0.89 (J)			0.46 (J)	0.77 (J)	
8/11/2016		1.6	4.5			4.9
10/26/2016	1			0.46 (J)	0.87 (J)	
10/27/2016		1.4	4.8			5.6
1/18/2017	0.76 (J)	1.5	4.7	0.5 (J)	0.64 (J)	5.9
4/19/2017	0.54 (J)	1.5	4.7	0.44 (J)	3.9	5.8
6/20/2017	0.79 (J)			0.38 (J)	0.81 (J)	
6/21/2017		1.5	4.6			5.8
8/22/2017		1.6		0.51 (J)	0.64 (J)	
8/23/2017	1.3		4.4			6
4/18/2018	0.67 (J)	2	5.7	0.59 (J)	0.61 (J)	7.1
8/14/2018	1.3			0.54 (J)	0.98 (J)	
8/15/2018		2.4	4.7			6.5
10/16/2018	0.72 (J)	1.9	5.1	<0.57 (U)	5.5	7.3
4/8/2019	<1.1 (U)	1.5 (J)	4.3	<1.1 (U)	7.5	7.2
10/23/2019		2.3	4.9			7.2
10/24/2019	1.1 (J)			<1.1 (U)	5.2	
4/13/2020		2				6.9
4/14/2020	1.2 (J)		4.4	<1.1 (U)	3.6	
10/8/2020	<1.1 (U)	1.5 (J)		<1.1 (U)	<1.1 (U)	
10/9/2020			5.6			7.9
4/13/2021			5.1	<1.3 (U)	2.9	
4/14/2021	<1.3 (U)	1.7 (J)				
4/16/2021						8.2
10/6/2021						8.1
10/7/2021	<1.3 (U)			1.7 (J)	1.4 (J)	
10/8/2021		2	6.1			
4/11/2022						7.8
4/12/2022	<1.2 (U)	1.9 (J)	14	2.6	2.7	

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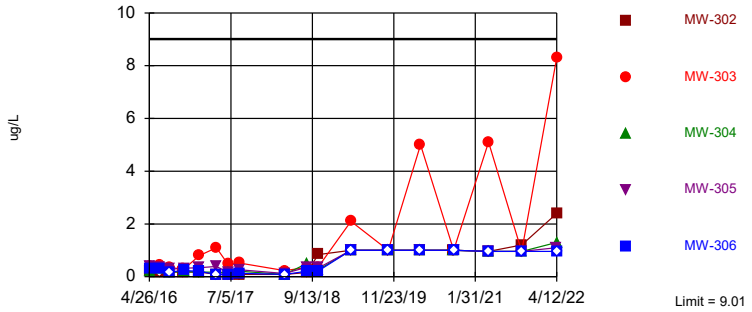
Hollow symbols indicate censored values.

Within Limit

Selenium

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary: Mean=5.739, Std. Dev.=1.334, n=18. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9481, critical = 0.897. Report alpha = 0.05.

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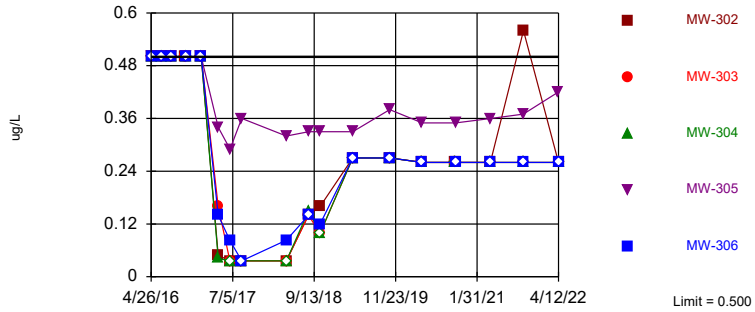
Hollow symbols indicate censored values.

Within Limit

Thallium

Interwell Non-parametric



Non-parametric test used in lieu of parametric tolerance limit because censored data exceeded 50%. Most recent observation is compared with limit. Limit is highest of 18 background values. 83.33% NDs. 77.54% coverage at alpha=0.01; 84.57% coverage at alpha=0.05; 96.29% coverage at alpha=0.5. Report alpha = 0.3972.

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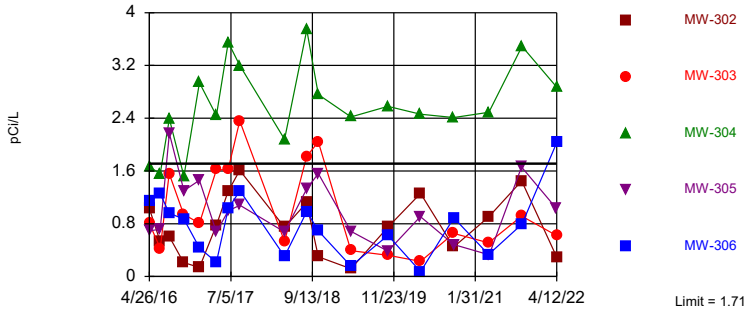
Exceeds Limit: MW-304, MW-306

Total Radium

Interwell Parametric



95% coverage. Most recent observation is compared with limit. Background Data Summary: Mean=0.7033, Std. Dev.=0.4166, n=19. Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9547, critical = 0.901. Report alpha = 0.05.

Tolerance Limit

Constituent: Selenium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-306	MW-302	MW-303	MW-305
4/26/2016	4.7	0.23 (J)	0.3 (J)	0.23 (J)	0.38 (J)	0.38 (J)
6/23/2016	5.4	0.32 (J)	0.3 (J)	<0.18 (U)	0.43 (J)	0.37 (J)
8/10/2016	6.1			<0.18 (U)	0.36 (J)	
8/11/2016		<0.18 (U)	<0.18 (U)			0.28 (J)
10/26/2016	6.5			<0.18 (U)	0.28 (J)	
10/27/2016		0.19 (J)	0.24 (J)			0.32 (J)
1/18/2017	5.9	<0.18 (U)	0.2 (J)	<0.18 (U)	0.8 (J)	0.34 (J)
4/19/2017	4.2	0.17 (J)	<0.086 (U)	<0.086 (U)	1.1	0.39 (J)
6/20/2017	5.5			<0.086 (U)	0.47 (J)	
6/21/2017		0.14 (J)	0.088 (J)			0.16 (J)
8/22/2017		0.21 (J)		<0.086 (U)	0.52 (J)	
8/23/2017	7.2		0.13 (J)			0.26 (J)
4/18/2018	4.3	<0.086 (U)	<0.086 (U)	<0.086 (U)	0.23 (J)	0.12 (J)
8/14/2018	6.3			<0.16 (U)	0.35 (J)	
8/15/2018		0.5 (J)	0.21 (J)			0.36 (J)
10/16/2018	3.4	0.26 (J)	0.22 (J)	0.84 (J)	0.37 (J)	0.33 (J)
4/8/2019	3.1 (J)	<1 (U)	<1 (U)	<1 (U)	2.1 (J)	<1 (U)
10/23/2019		<1 (U)	<1 (U)			<1 (U)
10/24/2019	6.2			<1 (U)	<1 (U)	
4/13/2020		<1 (U)				<1 (U)
4/14/2020	6.8		<1 (U)	<1 (U)	5	
10/8/2020	7.7	<1 (U)		<1 (U)	<1 (U)	
10/9/2020			<1 (U)			<1 (U)
4/13/2021			<0.96 (U)	<0.96 (U)	5.1	
4/14/2021	6.5	<0.96 (U)				
4/16/2021						<0.96 (U)
10/6/2021						<0.96 (U)
10/7/2021	7.5			1.2 (J)	<0.96 (U)	
10/8/2021		<0.96 (U)	<0.96 (U)			
4/11/2022						1.1 (J)
4/12/2022	6	1.3 (J)	<0.96 (U)	2.4 (J)	8.3	

Tolerance Limit

Constituent: Thallium (ug/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-306	MW-302	MW-303	MW-305
4/26/2016	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)
6/23/2016	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)
8/10/2016	<0.5 (U)			<0.5 (U)	<0.5 (U)	
8/11/2016		<0.5 (U)	<0.5 (U)			<0.5 (U)
10/26/2016	<0.5 (U)			<0.5 (U)	<0.5 (U)	
10/27/2016		<0.5 (U)	<0.5 (U)			<0.5 (U)
1/18/2017	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)	<0.5 (U)
4/19/2017	0.14 (J)	0.042 (J)	0.14 (J)	0.049 (J)	0.16 (J)	0.34 (J)
6/20/2017	<0.036 (U)			<0.036 (U)	<0.036 (U)	
6/21/2017		<0.036 (U)	0.082 (J)			0.29 (J)
8/22/2017		<0.036 (U)		<0.036 (U)	<0.036 (U)	
8/23/2017	0.067 (J)		<0.036 (U)			0.36 (J)
4/18/2018	<0.036 (U)	<0.036 (U)	0.083 (J)	<0.036 (U)	<0.036 (U)	0.32 (J)
8/14/2018	0.16 (J)			<0.14 (U)	<0.14 (U)	
8/15/2018		0.15 (J)	<0.14 (U)			0.33 (J)
10/16/2018	<0.099 (U)	<0.099 (U)	0.12 (J)	0.16 (J)	<0.099 (U)	0.33 (J)
4/8/2019	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	<0.27 (U)	0.33 (J)
10/23/2019		<0.27 (U)	<0.27 (U)			0.38 (J)
10/24/2019	<0.27 (U)			<0.27 (U)	<0.27 (U)	
4/13/2020		<0.26 (U)				0.35 (J)
4/14/2020	<0.26 (U)		<0.26 (U)	<0.26 (U)	<0.26 (U)	
10/8/2020	<0.26 (U)	<0.26 (U)		<0.26 (U)	<0.26 (U)	
10/9/2020			<0.26 (U)			0.35 (J)
4/13/2021			<0.26 (U)	<0.26 (U)	<0.26 (U)	
4/14/2021	<0.26 (U)	<0.26 (U)				
4/16/2021						0.36 (J)
10/6/2021						0.37 (J)
10/7/2021	<0.26 (U)			0.56 (J)	<0.26 (U)	
10/8/2021		<0.26 (U)	<0.26 (U)			
4/11/2022						0.42 (J)
4/12/2022	<0.26 (U)	<0.26 (U)	<0.26 (U)	<0.26 (U)	0.26 (J)	

Tolerance Limit

Constituent: Total Radium (pCi/L) Analysis Run 6/27/2022 11:00 AM

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122

	MW-301 (bg)	MW-304	MW-303	MW-306	MW-302	MW-305
4/26/2016	0.51	1.66	0.806	1.14	1.03	0.693
6/23/2016	0.614	1.56	0.426	1.25	0.527	0.716
8/10/2016	1.56		1.56		0.606	
8/11/2016		2.39		0.958		2.17
10/26/2016	1.24		0.944		0.211	
10/27/2016		1.52		0.868		1.3
1/18/2017	0.143	2.94	0.805	0.435	0.136	1.46
4/19/2017	0.631	2.44	1.62	0.213	0.776	0.673
6/20/2017	1.06		1.62		1.29	
6/21/2017		3.55		1.03		0.996
8/22/2017		3.2	2.36		1.61	
8/23/2017	0.725			1.3		1.08
4/18/2018	0.513	2.08	0.529	0.305	0.746	0.676
8/14/2018	1.19		1.82		1.12	
8/15/2018		3.74		0.985		1.33
10/16/2018	1.16	2.76	2.04	0.693	0.299	1.56
4/8/2019	0.0956	2.42	0.391	0.155	0.116	0.685
10/23/2019		2.58		0.624		0.383
10/24/2019	0.956		0.321		0.752	
2/5/2020	0.228					
4/13/2020		2.46				0.909
4/14/2020	0.315		0.229	0.0738	1.26	
10/8/2020	0.407	2.41	0.654		0.447	
10/9/2020				0.889		0.483
4/13/2021			0.51	0.334	0.901	
4/14/2021	0.598	2.49				
4/16/2021						0.327
10/6/2021						1.66
10/7/2021	1.04		0.916		1.45	
10/8/2021		3.49		0.794		
4/11/2022						1.03
4/12/2022	0.378	2.87	0.619	2.03	0.294	

Tolerance Limit

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 6/27/2022, 11:00 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Antimony (ug/L)	MW-302	1.10	4/12/2022	<0.69 (U)	No	18	66.67	n/a	0.09628	NP Inter(NDs)
Antimony (ug/L)	MW-303	1.10	4/12/2022	<0.69 (U)	No	18	66.67	n/a	0.09628	NP Inter(NDs)
Antimony (ug/L)	MW-304	1.10	4/12/2022	<0.69 (U)	No	18	66.67	n/a	0.09628	NP Inter(NDs)
Antimony (ug/L)	MW-305	1.10	4/11/2022	<0.69 (U)	No	18	66.67	n/a	0.09628	NP Inter(NDs)
Antimony (ug/L)	MW-306	1.10	4/12/2022	<0.69 (U)	No	18	66.67	n/a	0.09628	NP Inter(NDs)
Arsenic (ug/L)	MW-302	0.880	4/12/2022	<0.75 (U)	No	19	42.11	n/a	0.0904	NP Inter(normal...
Arsenic (ug/L)	MW-303	0.880	4/12/2022	<0.75 (U)	No	19	42.11	n/a	0.0904	NP Inter(normal...
Arsenic (ug/L)	MW-304	0.880	4/12/2022	0.76	No	19	42.11	n/a	0.0904	NP Inter(normal...
Arsenic (ug/L)	MW-305	0.880	4/11/2022	<0.75 (U)	No	19	42.11	n/a	0.0904	NP Inter(normal...
Arsenic (ug/L)	MW-306	0.880	4/12/2022	<0.75 (U)	No	19	42.11	n/a	0.0904	NP Inter(normal...
Barium (ug/L)	MW-302	71	4/12/2022	17	No	19	0	No	0.01021	Inter
Barium (ug/L)	MW-303	71	4/12/2022	64	No	19	0	No	0.01021	Inter
Barium (ug/L)	**MW-304**	**71**	**4/12/2022**	**78**	**Yes**	**19**	**0**	**No**	**0.01021**	**Inter**
Barium (ug/L)	**MW-305**	**71**	**4/11/2022**	**120**	**Yes**	**19**	**0**	**No**	**0.01021**	**Inter**
Barium (ug/L)	**MW-306**	**71**	**4/12/2022**	**94**	**Yes**	**19**	**0**	**No**	**0.01021**	**Inter**
Beryllium (ug/L)	MW-302	0.270	4/12/2022	<0.27 (U)	No	17	94.12	n/a	0.1026	NP Inter(NDs)
Beryllium (ug/L)	MW-303	0.270	4/12/2022	<0.27 (U)	No	17	94.12	n/a	0.1026	NP Inter(NDs)
Beryllium (ug/L)	MW-304	0.270	4/12/2022	<0.27 (U)	No	17	94.12	n/a	0.1026	NP Inter(NDs)
Beryllium (ug/L)	MW-305	0.270	4/11/2022	<0.27 (U)	No	17	94.12	n/a	0.1026	NP Inter(NDs)
Beryllium (ug/L)	MW-306	0.270	4/12/2022	<0.27 (U)	No	17	94.12	n/a	0.1026	NP Inter(NDs)
Cadmium (ug/L)	**MW-302**	**0.149**	**4/12/2022**	**0.21**	**Yes**	**19**	**47.37**	**ln(x)**	**0.01021**	**Inter**
Cadmium (ug/L)	**MW-303**	**0.149**	**4/12/2022**	**0.15**	**Yes**	**19**	**47.37**	**ln(x)**	**0.01021**	**Inter**
Cadmium (ug/L)	MW-304	0.149	4/12/2022	<0.055 (U)	No	19	47.37	ln(x)	0.01021	Inter
Cadmium (ug/L)	MW-305	0.149	4/11/2022	<0.055 (U)	No	19	47.37	ln(x)	0.01021	Inter
Cadmium (ug/L)	**MW-306**	**0.149**	**4/12/2022**	**1.3**	**Yes**	**19**	**47.37**	**ln(x)**	**0.01021**	**Inter**
Chromium (ug/L)	MW-302	1.10	4/12/2022	1.4	No	19	52.63	n/a	0.0904	NP Inter(NDs)
Chromium (ug/L)	MW-303	1.10	4/12/2022	<1.1 (U)	No	19	52.63	n/a	0.0904	NP Inter(NDs)
Chromium (ug/L)	MW-304	1.10	4/12/2022	<1.1 (U)	No	19	52.63	n/a	0.0904	NP Inter(NDs)
Chromium (ug/L)	MW-305	1.10	4/11/2022	<1.1 (U)	No	19	52.63	n/a	0.0904	NP Inter(NDs)
Chromium (ug/L)	MW-306	1.10	4/12/2022	<1.1 (U)	No	19	52.63	n/a	0.0904	NP Inter(NDs)
Cobalt (ug/L)	MW-302	5.26	4/12/2022	1.3	No	20	0	ln(x)	0.01021	Inter
Cobalt (ug/L)	MW-303	5.26	4/12/2022	1.6	No	20	0	ln(x)	0.01021	Inter
Cobalt (ug/L)	MW-304	5.26	4/12/2022	0.41	No	20	0	ln(x)	0.01021	Inter
Cobalt (ug/L)	**MW-305**	**5.26**	**4/11/2022**	**21**	**Yes**	**20**	**0**	**ln(x)**	**0.01021**	**Inter**
Cobalt (ug/L)	**MW-306**	**5.26**	**4/12/2022**	**9.1**	**Yes**	**20**	**0**	**ln(x)**	**0.01021**	**Inter**
Fluoride (mg/L)	MW-302	0.417	4/12/2022	<0.22 (U)	No	19	31.58	ln(x)	0.01021	Inter
Fluoride (mg/L)	MW-303	0.417	4/12/2022	<0.22 (U)	No	19	31.58	ln(x)	0.01021	Inter
Fluoride (mg/L)	**MW-304**	**0.417**	**4/12/2022**	**1.7**	**Yes**	**19**	**31.58**	**ln(x)**	**0.01021**	**Inter**
Fluoride (mg/L)	MW-305	0.417	4/11/2022	<0.22 (U)	No	19	31.58	ln(x)	0.01021	Inter
Fluoride (mg/L)	MW-306	0.417	4/12/2022	<0.22 (U)	No	19	31.58	ln(x)	0.01021	Inter
Lead (ug/L)	MW-302	0.270	4/12/2022	<0.24 (U)	No	19	73.68	n/a	0.0904	NP Inter(NDs)
Lead (ug/L)	MW-303	0.270	4/12/2022	<0.24 (U)	No	19	73.68	n/a	0.0904	NP Inter(NDs)
Lead (ug/L)	MW-304	0.270	4/12/2022	<0.24 (U)	No	19	73.68	n/a	0.0904	NP Inter(NDs)
Lead (ug/L)	MW-305	0.270	4/11/2022	<0.24 (U)	No	19	73.68	n/a	0.0904	NP Inter(NDs)
Lead (ug/L)	MW-306	0.270	4/12/2022	<0.24 (U)	No	19	73.68	n/a	0.0904	NP Inter(NDs)
Lithium (ug/L)	MW-302	31.8	4/12/2022	9.1	No	20	0	No	0.01021	Inter
Lithium (ug/L)	MW-303	31.8	4/12/2022	4	No	20	0	No	0.01021	Inter
Lithium (ug/L)	MW-304	31.8	4/12/2022	3.4	No	20	0	No	0.01021	Inter
Lithium (ug/L)	MW-305	31.8	4/11/2022	<2.5 (U)	No	20	0	No	0.01021	Inter
Lithium (ug/L)	MW-306	31.8	4/12/2022	<2.5 (U)	No	20	0	No	0.01021	Inter

Tolerance Limit

Ottumwa Generating Station Client: SCS Engineers Data: OGS_CP_Export_201122 Printed 6/27/2022, 11:00 AM

Constituent	Well	Upper Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
Mercury (ug/L)	MW-302	0.110	4/12/2022	<0.11 (U)	No	17	100	n/a	0.1026	NP Inter(NDs)
Mercury (ug/L)	MW-303	0.110	4/12/2022	<0.11 (U)	No	17	100	n/a	0.1026	NP Inter(NDs)
Mercury (ug/L)	MW-304	0.110	4/12/2022	<0.11 (U)	No	17	100	n/a	0.1026	NP Inter(NDs)
Mercury (ug/L)	MW-305	0.110	4/11/2022	<0.11 (U)	No	17	100	n/a	0.1026	NP Inter(NDs)
Mercury (ug/L)	MW-306	0.110	4/12/2022	<0.11 (U)	No	17	100	n/a	0.1026	NP Inter(NDs)
Molybdenum (ug/L)	**MW-302**	**1.30**	**4/12/2022**	**2.6**	**Yes**	**18**	**27.78**	**n/a**	**0.09628**	**NP Inter(normal...**
Molybdenum (ug/L)	**MW-303**	**1.30**	**4/12/2022**	**2.7**	**Yes**	**18**	**27.78**	**n/a**	**0.09628**	**NP Inter(normal...**
Molybdenum (ug/L)	MW-304	1.30	4/12/2022	1.9	No	18	27.78	n/a	0.09628	NP Inter(normal...
Molybdenum (ug/L)	**MW-305**	**1.30**	**4/11/2022**	**7.8**	**Yes**	**18**	**27.78**	**n/a**	**0.09628**	**NP Inter(normal...**
Molybdenum (ug/L)	**MW-306**	**1.30**	**4/12/2022**	**14**	**Yes**	**18**	**27.78**	**n/a**	**0.09628**	**NP Inter(normal...**
Selenium (ug/L)	MW-302	9.01	4/12/2022	2.4	No	18	0	No	0.01021	Inter
Selenium (ug/L)	MW-303	9.01	4/12/2022	8.3	No	18	0	No	0.01021	Inter
Selenium (ug/L)	MW-304	9.01	4/12/2022	1.3	No	18	0	No	0.01021	Inter
Selenium (ug/L)	MW-305	9.01	4/11/2022	1.1	No	18	0	No	0.01021	Inter
Selenium (ug/L)	MW-306	9.01	4/12/2022	<0.96 (U)	No	18	0	No	0.01021	Inter
Thallium (ug/L)	MW-302	0.500	4/12/2022	<0.26 (U)	No	18	83.33	n/a	0.09628	NP Inter(NDs)
Thallium (ug/L)	MW-303	0.500	4/12/2022	0.26	No	18	83.33	n/a	0.09628	NP Inter(NDs)
Thallium (ug/L)	MW-304	0.500	4/12/2022	<0.26 (U)	No	18	83.33	n/a	0.09628	NP Inter(NDs)
Thallium (ug/L)	MW-305	0.500	4/11/2022	0.42	No	18	83.33	n/a	0.09628	NP Inter(NDs)
Thallium (ug/L)	MW-306	0.500	4/12/2022	<0.26 (U)	No	18	83.33	n/a	0.09628	NP Inter(NDs)
Total Radium (pCi/L)	MW-302	1.71	4/12/2022	0.294	No	19	0	No	0.01021	Inter
Total Radium (pCi/L)	MW-303	1.71	4/12/2022	0.619	No	19	0	No	0.01021	Inter
Total Radium (pCi/L)	**MW-304**	**1.71**	**4/12/2022**	**2.87**	**Yes**	**19**	**0**	**No**	**0.01021**	**Inter**
Total Radium (pCi/L)	MW-305	1.71	4/11/2022	1.03	No	19	0	No	0.01021	Inter
Total Radium (pCi/L)	**MW-306**	**1.71**	**4/12/2022**	**2.03**	**Yes**	**19**	**0**	**No**	**0.01021**	**Inter**